World Congress on Special Needs Education
August 17-20, 2015
Temple University, Philadelphia, USA

WCSNE 2015
Proceedings

Edited By
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ISBN: 978-1-908320-56-8
Message from the Steering Committee Chairs

Welcome to the World Congress on Special Needs Education (WCSNE-2015) collocated with Adult Learner Summit (ALS-2015). The WCSNE-2015 provides opportunity for academicians and professionals to bridge the knowledge gap and to promote research esteem.

We received 320 papers from 38 countries of which 102 papers were accepted after the first review and 81 papers were finally accepted for presentation, 9 Posters, and 5 Workshops. The WCSNE-2015 double blind review method was adopted to evaluate each submission and selected papers of the conference will appear in high impact International Journals published by Infonomics Society.

We would like to thank all who have helped in making WCSNE-2015 a success. The Steering Committees and reviewers each deserve credit for their excellent job. We thank all the authors, workshops and panel discussion organisers, Keynote Speakers: Dr Cynthia Northington-Purdie, Dr Judith Rényi, Dr Kourtland R. Koch, Dr Leigh Ann Ranieri, Dr Richard Cooper and invited workshops organisers: Dr Jeff Graham and Dr Barba Aldis Patton for agreeing to participate in WCSNE-2015. We also like to acknowledge our appreciation to the following organisations for their support: Infonomics Society, Temple University, National Association for Adults with Special Learning Needs (NAASLN), Worldwide Interactive Network (WIN), Department of Behavioural Health and Intellectual disAbility Services and Canadian Teacher Magazine. The long term goal of WCSNE is to build a reputation and respectable conference for the international community.

On behalf of the WCSNE-2015 Executive members, we would like to encourage you to contribute to the future of WCSNE as authors, speakers, panellists, and volunteer conference organisers. We wish you a pleasant stay in Philadelphia, and please feel free to exchange ideas with other colleagues.

WCSNE-2015 Steering Committee Chairs:

Charles Shoniregun, Infonomics Society, UK and Ireland
Richard Cooper, Harcum College, Bryn Mawr, USA
Ulicia Lawrence, Temple University, USA
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Keynote Speakers
Keynote Speaker 1

Professor Cynthia Northington-Purdie holds a Ph.D. in psychological development from New York University, a Master of Arts in educational psychology from Montclair State University and a Bachelor of Arts degree in psychology from Fairleigh Dickinson University. Professor Northington-Purdie is a psychologist and life coach at William Paterson University of New Jersey. She has taught a variety of courses including educational psychology, applied child psychology, the psychology of classroom management and the philosophical and psychological foundations of education. She also has the distinction of having been William Paterson University’s coordinator for the National Council of Accreditation for Teacher Educators (NCATE). Before joining the university faculty, she enjoyed a long career as a teacher of both regular and special education in New Jersey’s public schools. She provides educational services to schools and organizations, conducts staff development workshops and symposia for various school districts across country on a variety of topics including: behaviour management, contemporary classroom management options, parental involvement, organizational strategies for inclusion and mainstreaming. She routinely assists schools in constructing school-wide classroom management priorities. She is interviewed frequently on television, radio and for print media on a variety of current issues in psychological development.

Title: The Practice and Frequency of Corporal Punishment of Disabled Children in the U.S. Public Schools

Abstract: Corporal punishment is still legal under various circumstances in the United States public schools. This practice is specified in the discipline policies of cities and towns in roughly twenty-two states. Corporal punishment usually takes the form of paddling with wooden paddles or sticks by school administrators and with the consent of the parents. Research has shown that this type of punishment is disproportionately administered to disabled children. This is particularly true among autistic children. Non disabled students are paddled with far less frequency. This practice of adult bullying teaches school children that it is acceptable for larger, older people to inflict pain on small, young, and/or defenceless people. The behavioural and social ramifications for development are ominous.
Dr Judith Rényi was appointed Executive Director of the newly reconstituted Mayor’s Commission on Literacy by Philadelphia Mayor Michael A. Nutter in January, 2011, who charged her with focusing the work of the Commission on adult work-readiness for the City’s large, under-educated population. With support from the City of Philadelphia, private and corporate funders, Dr Rényi has instituted systems to increase quality and access to adult literacy and ESL throughout the city. She established the Philadelphia Adult Literacy Alliance, bringing together all literacy and ESL providers, workforce development professionals, and other partners, for professional development, networking and advocacy. Dr Rényi has also introduced the first-ever electronic registration and enrollment system for low literate adults in the U.S., and the first-ever cohort-based, interactive online courses. She is a trustee of the Community College of Philadelphia and a member of the Board of Directors of Philadelphia Works, Inc. Dr Rényi has worked at the cutting edge of instructional technology for K-12 and higher education for 30 years, first as a Dean at New York University and later Rosemont College, founding Vice President of Academic Affairs and Partnerships for American College of Education, and President and CEO of The NEA Foundation for the Improvement of Education. She also worked in K-12 school reform as the founding Executive Director of what is now called The Philadelphia Education Fund and, on behalf of The Rockefeller Foundation, a national network of urban education reform projects. Widely known as a speaker and writer on education reform, her book, Going Public: Schooling for a Diverse Democracy was published in 1994. She has served as a national advisor on education to the National Science Foundation, the National Endowment for the Humanities, the American Council for the Humanities, and The President’s Commission on the Humanities. She was also a founding member of the Board of Directors of Grantmakers for Education.

Title: Educating Philadelphia’s Job Seekers for 21st-Century Jobs, or, Taming the Wild West

Abstract: How can adult literacy providers address the enormous task of preparing our country’s 36 million low-skilled adults for 21st-century jobs? The Mayor’s Commission on Literacy in Philadelphia has developed a system that leverages our collective adult literacy assets, increases the quality and efficient use of our scarce resources, and that can rise to a scale that could actually turn the tide for our City’s half-million low-skilled job-seekers.
Keynote Speaker 3

Dr Kourtland R. Koch is an Associate Professor in the Department of Special Education at Ball State University. He works primarily with undergraduate students majoring in early childhood special education and mild disabilities. He completed the requirements for the Doctor of Philosophy degree in Interdisciplinary Education, University of South Florida in August of 1998. He also worked in the public school system for more than 15 years serving in positions as an elementary, middle and high school teacher, school psychologist, coordinator of vocational special education programs, and as a special education consultant. Dr Koch’s research interests include: using functional MRI to identify key developmental milestones within the brain, federal legislation pertaining to early childhood special education services and using brain based research to design instructional best practices.

Title: Arising Issues Related to the Identification and Labeling of Children At-Risk for Developmental Delay Under Parts B and C of IDEIA 2004

Abstract: Ever since the U.S government allowed each state to use the DD label for children ranging in age up to age 9, this has created a lot of variation from one state to the next. Some states have selected quantitative criteria, such as standard deviation, while other states have used criterion-referenced tests, with a set determination of what percent of delay must be present. Other states have implemented the criteria of developmental age, while specifying a 20% to 50% range of delay. The IDEA 2004 provisions of using a DD label has created issues such as over/under identification, children with low incidence disabilities, appropriateness of norm-referenced tools and costs involved in providing necessary services. The dilemma is that final decisions may be mostly based upon funding availability and not on best practices. As a result, we will continue to see a discrepancy of services across the states until we will have a clear mandate from the federal government.
Keynote Speaker 4

Dr Leigh Ann Ranieri, has held the position of Director of Pupil Services for the West Chester Area School District in Chester County PA for the last six years. She has thirty years of experience in education focusing on special education as well as supervising the following services: special education; psychological; guidance; nursing; English as a Second Language and gifted. Dr Ranieri received her doctorate in Educational Leadership from Immaculata University in 2006. In addition to her experience in public schools, Dr Ranieri has been an adjunct professor at Penn State University in Berks County teaching special education courses and is currently an adjunct professor at Delaware Valley College teaching special education supervisor certification courses to graduate students. Recently, she has been a speaker at WIDA, NABE and TESOL conferences concentrating the dual identification of English Language Learners. For the last five years, she has served on the board of the West Chester Communities That Care WCCTC with the mission of prevention and minimizing risk factors among youth, while partnering with community agencies, schools and families.

Title: Strategies for At-Risk Students and Mental Health Services in the School Environment

Abstract: The Pennsylvania Youth Survey (PAYS) results are used to target needs and implement school based strategies. West Chester Area School District (WCASD) has participated in the PAYS for over fifteen years and has used the data to create a variety of programs including a school based mental health program. The district’s ongoing collaboration with the West Chester Communities That Care (WCCTC) has provided opportunities to receive grant monies in order to implement preventive programs and offer a variety of awareness activities with little or no cost. An overview of PAYS results, process to implement programs and collaboration with WCCTC with the goal of meeting student needs will be presented.
Keynote Speaker 5

Dr Richard Cooper is the Director of Disability Services at Harcum College, Bryn Mawr, Pennsylvania. He is also the Founder and Director of the Center for Alternative Learning and Learning disAbilities Resources, organizations dedicated to providing educational and social support to children and adults with learning disabilities, problems and differences. He is an internationally recognized lecturer and expert on alternative instructional techniques and tools for reading, writing, math, and study skills. He has authored a number of books and articles describing the use of these techniques and tools. He speaks nationally and internationally about a wide range of learning problems and instructional techniques to help both children and adults improve their skills. He maintains a private practice through which he provides assessment, counselling and tutoring of children and adults. He was a member of the Observer Delegation from the United States to the 1997 UNESCO Conference on Adult Education in Hamburg, Germany. He is a founding member and current co-president of the National Association for Adults with Special Learning Needs. Most recently, he co-authored a book entitled Test Anxiety, A Student Manual and Teacher’s Guide (2009).

Title: Technology For Those Who Learn Differently

Abstract: Participants will experience through simulated behaviours, how individuals who think and learn differently can be frustrated by activities that others find simple and routine. The presenter will then explain the underlying causes of the difficulties that the participants just experienced and how these activities lead to frustration and avoidance. He will conclude by reviewing some technology now available to compensate for such problems. Participants will gain an appreciation for the struggles that students with special needs face every day and will leave with links to new tools for enabling student success.
Invited Workshops
Invited Workshop 1

Dr. Jeff Graham is an Associate Professor, Teaching Stream in the Department of Psychology, University of Toronto Mississauga. He is a cognitive psychologist with interests in computer-assisted instruction, neural network modeling, and health psychology. He received his M.A. from the University of Western Ontario and his Ph.D. from the University of Waterloo. As an Associate Professor at the University of Otago (Dunedin, New Zealand) Jeff developed connectionist models of children's arithmetic and studied an accelerated learning curriculum for early childhood mathematics. Since 1988 Jeff has used computers to teach psychology. Jeff and his colleagues have developed educational software projects like Sniffy, the Virtual Rat, a simulation of behavioural concepts in learning, and DeckChair Tutor, an online learning toolkit for teaching, assessment, and psychology experiment hosting. Dr. Graham designs and implements the computer-laboratory component of a large Introductory Psychology course. He develops new lab experiments that make appropriate use of eLearning technologies to teach core concepts and research methods.

Title: Adaptive eLearning Powered by DeckChair Tutor

Abstract: DeckChair Learning Systems presents a fully mobile eLearning platform designed to help students' master concepts quickly in any course domain (K-20). The software's internet technology can be used to implement research on curriculum effectiveness in hybrid course settings. Unique adaptive learning features promote behavioural fluency and retention which are demonstrated in a new commercial application developed in a large Introductory Psychology course at the University of Toronto Mississauga (AdapTrack Psychology Labs, Nelson Education). Patented algorithms are used to measure the learner's speed and accuracy during placement, assessment, teaching, and remediation assignments. Instructors can customize learning for each student or groups of students and provide layers of help and feedback options that guide students as needed. DeckChair's engine measures thinking time and reaction time during the learner's online experience. It adjusts content to remediate weaknesses and adapts questions to match the student's knowledge level. The system integrates into any LMS to track the development of specific knowledge, skills, and course related grades. It is an eLearning platform for the mastery of core skills, vocabulary, rules, and problem solving procedures. An extensive data export tool provides timely reports for students, instructors, and researchers interested in analytics to measure effectiveness of course components, and predict final grades in the course. DeckChair creates and manages the roles of course authors, session instructors, graders and students and is easily implemented into any blended learning environment.
Invited Workshop 2

Barba Aldis Patton, Ed.D. is a professor of Mathematics Education in the School of Education, Health Professions and Human Development at the University of Houston-Victoria, Victoria, Tx, USA. She has taught many levels from Kindergarten to University as well as worked in administration. Her passion is teaching math in a manner in which all children can learn as well as have fun while learning. She earned the Research Award for her school in 2014, Member of the year 2014 for National Social Science Association among other awards while publishing some forty or so articles nationally and internationally in the last few years. Barba gave a keynote address at the London International Conference on Education in 2013 and was honoured to be able to present at the Oxford Round Table. She usually makes about twelve nation/international presentations each year. She is primary investigator for the second year for a grant trying to motivate and teach basic math skills to elementary students. In addition, she is Editor-in-chief for the International Journal for Cross-Disciplinary Subjects in Education and Editor for the National Social Science Association Journal. NSSA has over 3000 members and its journal is highly recognized as it only has an acceptance rate of 10-12%.

Title: Interviewing skills for the special Needs student: Developing Questions with a Purpose

Abstract: Some 50 plus years ago, Benjamin Bloom published his work Bloom’s taxonomy. Many seem to think his work is outdated but the new versions are very close to the original and are very relevant in teaching today. His work is definitely not outdated. Dichotomous questions are at the lowest level in Bloom’s taxonomy. As an educator, when a student is asked a dichotomous question you really do not have much information to help you understand the student’s need. In reality, it is a 50-50 chance to get the correct answer by just guessing. In this workshop the audience will participate in small groups to investigate questioning techniques which lead to higher level thinking skills. The development of questioning skills can and will make one a better prepared educator to meet the needs of all students. As the audience leaves the session and returns to the classroom, it is hoped that he/she will no longer rely on the lower level questions which have the high chance of guess. When students are asked questions with a yes/no type answer/response, they have a 50% chance of being correct even if they have never heard of the subject matter prior to answering the question. Remember dichotomous questions are quick to grade on an assignment but one rarely know more than a grade. The educator really does not know what or even where to begin working with the struggling 60% student.
Workshops
Workshop 1: Partners in Learning: A Higher Education Model for Teaching Preservice Educators and Students with Disabilities in Art

The Art Education Program at Moore College of Art and Design threads theory, issues, best practices, and research on working with students with special needs throughout its undergraduate and post-baccalaureate coursework, and focuses its Master's Degree solely on this population of students. The College recognizes the importance of training art educators not only in student-centered, materials-focused pedagogical practices that actively engage specialized learners, but also on the knowledge and understanding of art and special education needed to remain effective and relevant teachers. This presentation will share how the Program incorporates art education for special populations throughout its course of study, how it is linked to current research and trends in the field, and how it has impacted the educators who have graduated from the program. Also shared will be the structure and outcomes of the Special Populations course, and examples of lessons, assessments, modifications, and student-teacher narratives. Participants will be guided in a mini hands-on art lesson that has been written using Universal Design for Learning in which they will be provided with the lesson format, assessment strategies and classroom management techniques proven highly effective for working with students with disabilities.

Organisers: Amanda Newman-Godfrey, Lauren Stichter
Moore College of Art and Design, Philadelphia, USA
Workshop 2: Helping Students Reduce Test Anxiety

Test anxiety is a problem for many students. This workshop will demonstrate techniques to help students prepare for and take tests. These include learning how to teach students relaxation and study skills and when to implement accommodations. Techniques for analyzing test taking problems will also be demonstrated. Test anxiety is a problem for many students at all levels of education. Using the evidenced based method of direct instruction, the presenter will teach the participants how to use exercises from his new student manual about stress and anxiety. They will explore every day stressors and crisis situations and describe their reactions to these situations. The presenter will describe ways teachers, tutors, and counsellors can help students recognize and deal with the physical symptoms, nervous activities and avoidance behaviours caused by anxiety.

Organiser: Richard Cooper, Learning Specialist, Center for Alternative Learning, USA
Workshop 3: Reasons, Causes, Results: The Basis of the Essay

Through active participation in the proposed workshop, attendees will be able to have an understanding of the genre known as the essay by explaining the different essay formats and be able to create the necessary "templates" that distinguish essay writing from other written formats. The essay formats will provide a simple structure for expressing complex ideas. The starting sentences also prepare the reader for what to expect and allow the writer to set up detailed, informative paragraphs. From these starters and thinking in threes, students can eventually graduate to the more complex forms of academic writing that will be required in the higher grades and beyond high school. Three of the main essay formats - personal narrative, persuasive, and explanatory - based on the topics teachers often assign will be presented beginning with a Defining Format template that answers the question "What is an essay?" and provides the structure as illustrated.

Organiser: Evelyn Rothstein, Educational Consultant, New York, USA
Panel Discussion
Panel Discussion: Acknowledge, Express, Unite: Convergent Themes in Evidence-Based Art Education Research with Culturally Diverse Art Students with Disabilities

The panel focuses on successful educational practices addressing intersections of race, gender and ability in art students through qualitative inquiry and evidence-based research methods. Panel members apply these key principles when teaching culturally diverse art students with disabilities in the visual arts:

✓ Acknowledge
  • Practicing mindfulness through validation of student identities and experiences

✓ Express
  • Organizing diverse ways for students with disabilities to create visual arts that embody aspects of their cultural values

✓ Unite
  • Connecting evidence of student transformations of personal beliefs in their abilities to successful teaching practices

Organisers: Veronica Hicks, The Pennsylvania State University, USA
  Lauren Stichter, Moore College of Art and Design, USA
  Lisa Kay, Tyler School of Art, Temple University, USA
  Tina Matzack, Moore College of Art and Design, USA
  Alexandra P. Alberda, University of Nebraska-Lincoln, USA
PhD and Doctorate Consortium

The idea of writing a research paper or developing a topic of research interest that can lead to a PhD / Doctorate degree or proposal is always an endless thinking of where, when, why, what and who. Therefore, becoming an experienced researcher and writer in any field or discipline takes a great deal of practice. The Consortium has the following objectives:

- Provide a supportive setting for feedback on current research that will stimulate exchange of ideas;
- Guide on the future research directions;
- Promote the development of a supportive community of scholars and a spirit of collaborative research;
- Contribute to the conference goals through interaction with other researchers and conference events.

The PhD and Doctorate Consortium highlights possible solutions in response to the lack of competence demonstrated by young researchers and PhD and Doctorate students, and the understanding of what contributes to knowledge gap.

Organiser: Charles A. Shoniregun, Infonomics Society, UK and Ireland
Sessions
Session 1: Special Education

MESH Guides - Bringing Research to Practice in Education of the Deaf  
(Author: Joy F. Rosenberg)

Building Self-Efficacy and Self-Regulated Learning in Students Identified with Having an Emotional Disturbance through Visual And Graphic Art  
(Author: Tina Marie Matczak)

Examining the Challenges of a Special Needs Third Grader with Addition  
(Authors: Estella De Los Santos, Barba Patton)

Where Two Paths Merge: Considerations for Teaching Art to Adolescents with Autism Spectrum Disorder  
(Author: Amanda Newman-Godfrey)
MESH Guides - Bringing Research to Practice in Education of the Deaf

Joy F. Rosenberg
Mary Hare partnered with University of Hertfordshire, United Kingdom

Abstract

Knowledge management is a growth industry though still emergent for education of the deaf. This paper investigates use of MESH (Mapping Educational Specialist knowHow) Guides to support evidence-based teaching practice. MESH Guides are ‘a sustainable system using resources already available in education’ (MESH, 2015). Literature review revealed a very current knowledge and research base underpins education of the deaf and is currently managed through a few main peer-review journals and websites. Focus group findings were generally positive though cautious in their view toward engaging with MESH Guides as a postgraduate learning and teaching activity. Findings from the literature revealed a significant evidence base for education of the deaf, but without yet having significant knowledge management vehicles available such as exist in other disciplines. A significant opportunity exists for education of the deaf as a discipline to move forward in access to evidence-based practice in the vehicle of MESH Guides.

1. Introduction

Nearly every sector of professional and commercial life is viewing the management of related knowledge and research as an imperative [35]. Fields such as medicine have had robust systems in place since before the world wide web - PubMed for example [37]. Other fields, such as education, are further behind. The Organisation for Economic Co-operation and Development cites the increasing attention that governments are paying to international educational comparisons. They are looking for effective social and economic policies to meet rising demands and targeting education as key. This suggests that educational practitioners should help their profession become a ‘knowledge industry in the sense that its own practices are transformed by knowledge about the efficacy of those practices’ [36]. Built on extensive investment of taxpayer money, strong evidence exists for teachers’ desire to and difficulties in accessing research relevant to practice [23]. MESH Guides [26] and their innovators aspire to be to educational practitioners what NICE guidelines [28] in the UK or NIH Consensus Statements [27] in the USA are to clinical practitioners -- a means of translational research for the busy practitioner to help readily develop evidence-based teaching practice. They are embryonic at present; and thus there is little published on MESH Guides themselves, and none related to education of the deaf.

Healey [19] describes a nexus featuring teaching and research where subjects ideally move from passive observer to active user of research for the sake of better practice. She is touching on the rationale behind MESH Guides as does Simon Sintek [41] in his motto and book title ‘Start with Why’. He proposes that this question should be the starting point of any worthwhile product or idea for robust processes and to attract significant uptake. This rationale resonates with the author’s own work in training Teachers of the Deaf and Educational Audiologists for whom access to and currency of translational research is imperative. It also resonates with such access challenges in the education profession; and with MESH Guides development aim of ‘supporting professional judgment with evidence from the science of learning’ MESH [26]. Several entities in education of the deaf are looking to address this and these are taken up later in the literature review. Together they imply that the imperative to which Nutley [35] refers applies to any professional who wishes to ‘secure the future for deaf children and young people’ [25].

This paper attempts to answer the research question: Can MESH Guide development be used to rigourously support evidence-based teaching practice in education of the deaf and teacher training? After a review of pertinent literature, methodology used to complete the review is outlined, followed by a discussion of findings, and finishing with conclusion and recommendations.
2. Literature Review

The key aim of this review was to investigate the merits and feasibility of use of readily accessible translational research in a time-efficient manner to promote evidence-based practice in education of the deaf. This was achieved by examining two aspects: research in the field of education of the deaf, and the broader ‘knowledge management’ body of research.

The first aspect revealed several categories of information management in education of the deaf; namely peer-reviewed journals, specific articles or studies, charities’ and professional bodies’ positions, quality standards, practice guidance and new efforts at making this information available online. Peer-reviewed education journals specifically for Teachers of the Deaf include many pedagogical topics, such as literacy. Watson [45] in Deafness and Education International, demonstrates that deaf children had internalised print concepts. In the Journal of Deaf Studies and Deaf Education, Apel [2] analyses spelling ability in children with hearing loss. American Annals of the Deaf produced a special issue on English reading development for individuals who are deaf and hard of hearing [44]. Luckhurst, et al. [24] conjectures in Volta Review about lexical skills in children who use cochlear implants. Additionally, articles in journals of other disciplines or unpublished studies sometimes address practice in education of the deaf as it applies to teacher training. Swanick, et al. [42] suggest a flexible framework of principles, finding it a robust model for development of critical thinking based on evidence for trainee Teachers of the Deaf. Positive Support [3] set out with one of its several aims to find the most effective strategies in education of the deaf and early intervention. Teachers of the Deaf also access the medical literature (e.g., Bond et. al. [7]) who selected from 1580 abstracts for his review on cochlear implants) and audiology research (e.g., The Nottingham Hearing Biometric Research Unit [27] whose commitment is ‘to pursue research … that can be translated into practical benefits’.

Professional bodies and charities supporting education of the deaf maintain that research is a prime concern. The British Association of Teachers of the Deaf [5] national executive committee campaign included the aim to support evidence-based and reflective practice of its membership; and the purpose of the Council on Education of the Deaf [10] includes ‘reflecting current research’ in its mission statement, although neither website includes a bespoke specific tool or database for doing so. The National Deaf Children’s Society [30] publish position statements and quality standards on a variety of matters from inclusion to FM, all reference-based to current literature. Quality standards and practice guidance, also reference based, have been established by other bodies for areas such as early intervention [33] and paediatric tinnitus management [20] though not held centrally in one access point.

More recently new efforts to provide online resource and access to deaf-education-specific research have begun to develop. The National Sensory Impairment Partnership website [29] has had a government grant, one objective of which was to create an online resource portal for sensory impairment. A website operating in association with the Journal of Deaf Studies and Deaf Education [38] ‘seeks to provide objective, evidence-based information for policy-making and practice’ with e-bulletins.

The second aspect of the literature review examined knowledge management and translational research more generally. The pioneering work of the medical field in the area of translational research is fairly well known. PubMed, NICE guidelines and NIH position statements have already been mentioned. Additional insight is available from Cochrane [11] who set a high standard. Their contributors are world leaders from 120 countries who work together to produce credible, accessible health information. Their work ‘is recognised as representing an international gold standard for high quality, trusted information’.

In the education discipline, Davies [16] argues along with OECD (see introduction) that education should become more evidence-based, while distinguishing between existing research and establishing new (by virtue in part of reviewing the literature). He calls evidence-based education a set of principles for enhancing educational policy and practice. Subscribing to this argument (It would be very difficult to find arguments to the contrary.) that striving for a rationale behind practice related to evidence will produce better outcomes, then the question becomes how to go about doing so. The Association for Information Technology in Teacher Education exists in part to help answer Davies argument and the critical question that arises, with an aim to impact teacher education for effective use of digital technology providing tools and support for the dissemination of the results as key to improving educational outcomes.
There is little to no controvertible evidence against using evidence-based practice, controversies do arise, however, around the use of evidence. Cooper’s article [14] explores these controversies, and examines the education profession’s use of the emerging ‘knowledge mobilisation’ field to address research and practice and close the gap. They look at both international initiatives and discuss related challenges, the one most notable for this article’s purposes being that of dissemination with rigour and accessibility. Besides controversies, concerns are identified [35] related to forming strategies to manage knowledge: types of knowledge, ways and models of use and implementation, and interventions to increase uptake. Teachers do use many if not all of these strategies as they plan interventions, curriculum or lessons, but developing the criticality to manage these well take time and thought. Another challenge to using evidence in practice is that judging the quality of knowledge (research synthesis) is complex and another reason why teachers face time constraints in terms of readily implementing research findings, as Gough [18] acknowledges. He suggests empirical study of how judgements are made, and that greater clarity will enable greater participation and implementation of research findings or impact on decision-making bodies. To help evaluate some of the debates and inform the judgements, the British Educational Research Association [8] describe a pyramid model of educational research with each level appealing to different audiences, and on this basis explore the research ethic of respect for persons and respect for academic integrity. This ethic underpins the framework for teaching, for evidence-based practice in education and for provision of tools to such practice to take place efficiently and effectively.

### 3. Methodology

The methods employed for this study were a literature review and focus groups.

### 3.1. Literature Review

The literature review search strategy examined three main databases (PubMed, ERIC and EBSCO) and identified 47 sources as being most relevant and fitting with the dual topics of translational research and education of the deaf. These included not only peer-reviewed journal articles and books but also in keeping with an information-age-related aim, websites that produce or disseminate some of the evidence and/or reviews. The search terms used included ‘knowledge management’, ‘translational research’, ‘knowledge mobilization’, ‘evidence-based classroom teaching’, ‘research utilization’, ‘informed practice’, ‘teacher training’, ‘education of the deaf, hearing-impaired or hard of hearing’, and ‘teacher of the deaf, hearing-impaired or hard of hearing’ without using abbreviations. Boolean operators were used in respect of the last two terms to broaden the search.

Quality, relevance and robustness was considered on the following bases where applicable:

- Hierarchy of evidence based on four levels of qualitative evidence [15]
- Research Excellence Framework’s 4 star quality profile [39]
- Reporting Guidelines from EPPI (Evidence for Policy and Practice Information and Co-ordinating Centre) [43]

### 3.2. Focus Groups

Additionally, focus groups were employed. Group members included stakeholders, service-users, module leaders and link tutor for master’s level programmes training Teachers of the Deaf; as well as Higher Education professionals from other disciplines. Groups were convened as an assessment strategy meeting (5 participants); a course development meeting (8 participants); a module leaders’ working party (6 participants); and a continuing professional development course small group (8 participants). Overall, the participants were mixed in terms of gender (90% male), race (95% white British) and adult middle age. They came from a homogenous social class, and were acquainted with one another. The recruitment source limited the nature of the data due to its inherent bias toward academics, which was viewed as beneficial to the purpose of the study. The number of groups was judged adequate for...
saturation (i.e., the point after which no further new insight is likely to be gained).

The chosen question paradigm was open-ended with limited structure, as this was exploratory research, in order to allow discussion to develop. They focused on

- the potential benefits and disadvantages of development of MESH Guides as a learning and teaching activity in higher education which can then be disseminated to the profession at large, and
- the benefits of and barriers to integration of research to education practice.

Data/discussions of the focus groups were recorded in written notes. Consensus confirmed verbally and also recorded. Classical content analysis was applied, adapted to allow placing chunks of data into themed similar groupings.

4. Results and Discussion

4.1. Focus Groups

Focus group consensus revealed a generally positive view of MESH Guide use as a learning and teaching activity for Teachers of the Deaf as follows: It lends itself readily to the type of critical thinking necessary in postgraduate work, and contributes to the development of the profession. The need for literature review as part of the work, and the critical judgement that could be evidenced in the production were deemed merit-worthy aspects. It promotes collaborative thinking and working across the profession, and could be valuable for inset training. Concerns enumerated related to intellectual property in light of the creative commons attribution non-commercial international license; to keeping data and implications current, to quality assurance of the editorial board, to cost implications for authors and institutions and to impact on recruitment and enrolment for fee bearing courses. As mentioned in the literature review, there is a paucity of studies about MESH Guides, so focus group participants did not have references upon which to rely but instead used their experience to infer positive expectations and concerns. Personal integrity, the development of new knowledge, public safety, quality assurance and a competitive current edge were all cited as reasons for educators to base their practice on sound research. Certain complexities proved obstructive to utilizing research regularly in the classroom, including disinterest, time constraints, complex terminology, workload and priorities clashes [4].

4.2. Literature Review

Literature Review results revealed that a significant valuable evidence base exists in various forms and from various sources for education of the deaf, that successful models exist for translational research such as NICE guidelines, and that knowledge management is a growth industry in which the embryonic MESH Guide development sits.

MESH Guides aim to help provide some of the clarity to which Gough [18] refers, by virtue of the structures and the editorial boards. Nutley’s [35] concerns for managing knowledge are factors considered in MESH Guides concept map development within which editors work with authors to take a well-researched text document and to an editorial board where after approval it is published online in an easily navigable layout and slated for regular updates. Comparatively, the strength of clinical guidelines to influence practice [46] is rooted in the desire to resolve challenges that healthcare systems face such as costs, demand, expensive technologies, variations in service delivery and the very human desire of healthcare professionals to provide the best care possible. Very similar factors impact education of the deaf, and teachers partnering with parents also have an intrinsic aim of doing what is best for children who are deaf. For these children the advent of new technologies in early identification and intervention have heralded a paradigm shift and the potential for much better outcomes and quality of life. Still, professionals would be better able to empower children and families to realise that potential, if they had more pragmatic access in a timely way to translational research.

Capel et al. [9] outline forms of professional knowledge to include content, curriculum, general pedagogy, educational contexts and ends, learner characteristics, and finally pedagogical content knowledge (i.e. ‘how to teach specific concepts effectively so all learners can progress’). It is this last form especially that stands to benefit most from the advent of a tool like MESH Guides. The advent of this tool is fitting to the age that Tabberer in Leask [21] modelled, illustrating a paradigm shift from 19th to 21st century information development and exchange as seen in Figure 1, used with permission from Leask [22].
Roger’s theory of Diffusions of Innovations [40] seeks to explain the spread through societies of new ideas and technologies by looking at how and why. He used a bell curve to illustrate, it with innovators being the first 2.5% of take-up, as seen in Figure 2, used with permission from Leask [21]. Although MESH Guides are very much in the innovators stage, nevertheless a start has been made on which all future developments can now build.

Considerations for future work in this area include establishing new focus groups as well as working parties for specific tasks. These could be related to using MESH Guide development as an actual learning and teaching activity for training Teachers of the Deaf and for classrooms with deaf children. Data that could be considered in future can be collected from MESH Guides themselves, as the databases can be interrogated for different purposes relating to such parameters as the number of users over a given period of time, the countries from which they come, the feedback provided in open-ended surveys, and impact ratings.

5. Conclusion

‘The last decade of education change has been characterised by the rise of evidence-based policy and practice agendas. Internationally, we are witnessing efforts to increase and incorporate research use in public services’ [14]. Now more than ever before with a constantly growing body of evidence and knowledge being published at an accelerating rate, Teachers of the Deaf have the opportunity to make an even more significant difference in the lives and outcomes of children and young people who are deaf, if they can access the evidence in a timely way for regular use as a basis for their teaching. Current knowledge and research underpinning education of the deaf is highly valuable and currently managed mainly through a few main peer-review journals and websites. A step further for these valuable contributions collectively would be to engage with the particularly pragmatic aim of MESH Guides which is to make the implications of the evidence for education practice very readily available globally to classroom practitioners who have significant time constraints. Limitations of this study as well as of MESH Guides themselves is essentially that not enough longitudinal data yet exists to draw authoritative conclusions without some amount of speculation. Nevertheless, sufficient potential exists so that BATOD Foundation Trustees [6] have formed a subject editorial board within MESH Guides on Deafness and Hearing Impairment with the stated aim of providing easily accessible and robust information for creating good listening and learning environments.

The growth industry of translational research and knowledge management is well-established in certain disciplines and just emergent in others such as education. MESH Guides, in its embryonic stage, stand at the juncture between these two as an opportunity and vehicle to move the wealth of the existing and growing underpinning research for education of the deaf, very actively and pragmatically into the minds and hands of those who are at the chalk face. Adapting a line from the medical field [11] ‘MESH Guides exists so that education decisions get better’.

6. References


http://www.ndcs.org.uk/about_us/position_statements/index.html


Building Self-Efficacy and Self-Regulated Learning in Students Identified with Having an Emotional Disturbance through Visual And Graphic Art

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Abstract

This action research study served two purposes. First is to show how students that are identified with having an Emotional Disturbance (ED) can develop self-esteem through art as a medium of engagement and curricula. Secondly, to explore various ways art pedagogy can improve the functional and social skills for students who are identified with an Emotional Disturbance (ED). The Student Participants in this study are at-risk and are identified with having an Emotional Disturbance (ED). All reside in Pennsylvania and are between the ages of 15 and 18. Each has committed a crime that resulted them in being placed under intensive supervision and mandatory participation in 22 to 25 hours of community-based activities per week, under supervision at a Treatment Center. My study contributed to those hours for the Student Participants. The findings presented in this study confirmed that visual and graphic arts played a significant role in increasing the level of self-efficacy and self-regulated learning in students identified with an Emotional Disturbance (ED). Throughout the production of the mural the Students Participants developed awareness as to what self-esteem is and that knowledge increased their self-esteem. This study holds substantial evidence that educators should utilize art making as a tool to increase the level of self-esteem for students who struggle with having an Emotional Disturbance.
Examsining the Challenges of a Special Needs Third Grader with Addition

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Abstract

A case study will be used to investigate a third-grade student’s knowledge of whole number addition. The overall goal of the work is to improve the student’s understanding of addition concepts including one and two digit addends with and without regrouping. The information gained from the pre-test will be used to develop an individualized education plan for the student. Anodal records will be kept on the student’s advancement and to monitor the progress. A posttest will be given at the conclusion.

1. Introduction

The student is currently in the third grade and this investigation will be conducted during the summer following the school year. The student has been in inclusion classrooms and has gone to special education classrooms for reading, writing, and mathematics since pre-kindergarten. The student was diagnosed with mild retardation and was performing at least one level below grade level in the three subjects.

According to the student’s third-grade reports, the student was having difficulty with several mathematics concepts including addition. The student had been introduced to several models in mathematics such as counters, touch points, base-ten blocks, a hundred chart, multi-link blocks and the number line. The teacher observed that the student seemed to lose focus when presented with various models. In this study the researchers addressed addition concepts with one and two digit addends.

The research objectives of the study were: 1) to assess the student’s knowledge of addition concepts, 2) to develop an individualized education plan (IEP) and 3) to use the IEP to improve the student’s comprehension of whole number addition with one and two digit addends.

2. Literature Review

The National Council of Teachers of Mathematics has set as one of the standards for grades Pre-K through 2nd grade: “develop and use strategies for whole-number computations, with a focus on addition and subtraction” [1]. The Common Core State Standards Initiative [2] states that second grade students should “use place value understanding and properties of operation to add and subtract”. Knowledge of what addition means and how to add numbers is necessary before students can progress to problems requiring higher level thinking such as application type word problems. Many students with learning disabilities fail to achieve an understanding of basic math facts such as addition [3].

Researchers [4,5] have followed a concrete-representational-abstract (CRA) model used by Mercer and Miller [3] to help young children learn basic math facts such as addition, subtraction, multiplication, and division concepts. The model is also referred to as a concrete-semiconcrete-abstract (CSA) model [6]. In the first stage concrete objects are used such as base ten block manipulatives, in stage two semi-concrete objects are used such as pictures or drawings of the base ten blocks, and in the third stage abstractions are used such as writing addition problems in vertical form on paper.

The research in mathematics has shown that teaching abstracts algorithms without teaching for conceptual understanding to young children is harmful [7]. Algorithms that require children to focus on rules, such as “carry the one”, prevent them from thinking and developing number sense. It is important that young students use concrete objects to make sense of the processes involved in mathematics concepts such as addition of whole numbers.

Miller and Hudson [8] provided several guidelines for helping students with disabilities understand math concepts: use several models to represent the concepts, use appropriate lesson structures for specific concepts, use appropriate mathematical language, use real life applications, and use clear and explicit instruction.

The lessons should include giving an advanced organizer, describing and modeling, conducting guided practice, conducting independent practice, conducting problem-solving practice, administering facts review, and providing feedback [3]. These procedures have been shown to be effective with teaching basic facts to students with learning difficulties.
3. Methodology

A single subject case study will be conducted to help a student learn addition concepts. Information from a pre-test will (a) identify the unique needs of the student, (b) provide guidance in the selection of instructional content and materials, and (c) provide information for the creation of an individualized education plan (IEP). In the study, the student’s progress will be monitored to evaluate progress of the learning [9]. The study will have adequate representation of content, appropriate scope and sequence of the content and developmentally appropriate content to insure accurate measures.

The student has completed the third grade during the 2014-2015 school year. The student attends school in an area where there is an approximate twelve week summer break. The lessons will be conducted during this Summer 2015 break; therefore the student will not be receiving any other math instruction during the research period. The researchers worked with the same student during the Summer break of 2014 on place value concepts.

The authors developed a pretest, formative lessons, and a posttest modeled after the work of Mercer and Miller [3]. The student will be given a pretest to assess knowledge of whole number single digit and double digit addition. The assessment will include addition of single digit by single digit with and without renaming; two digit by single digit without renaming; two digit by single digit with renaming 1’s, and both; double digit without renaming; and double digit with renaming 1’s, 10’s, and both [10].

Based on the results of the pretest, an individualized education plan (IEP) will be designed for the student. A minimum of ten lessons will be provided for the student and additional lessons will be used as necessary. Two review lessons on two digit place value will first take place with the student. The review will be followed by the lessons over addition. The first three lessons will utilize concrete models or manipulatives, lessons four through six will use semi-concrete models or drawings, lesson 7 will be used to teach abstract strategies, and lessons eight through ten will use abstract models [3]. The instructional timeline will be individualized and adjusted according to the student’s needs.

A posttest will be used to evaluate the student’s overall progress after the lessons over addition. The student’s comprehension of single and double digit addition of whole numbers with and without regrouping will be assessed. The lessons will have adequate representation of content, appropriate scope and sequence of the content and developmentally appropriate content to insure accurate measures.

4. Conclusions

The results of the study will be provided to the student’s classroom teacher in order that the student’s needs may be more adequately addressed during the next school year. The researchers plan to use this model with other third-grade students who are having difficulties with math concepts.

5. References


Where Two Paths Merge: Considerations for Teaching Art to Adolescents with Autism Spectrum Disorder

Amanda Newman-Godfrey

Teachers College Columbia University
Moore College of Art and Design

Abstract

This summary of an integrative literature review discusses issues for art educators working with adolescents with Autism Spectrum Disorder in an attempt to reveal new pedagogical paths that merge the fields of art education and special education. The first issue examined is the phenomena of disability, and its governmental, societal, medical and educational roots. Philosopher Michel Foucault is referenced given that the field of disability theory regularly employs his work. The second issue considered is the nature and needs of adolescent students with Autism Spectrum Disorder and literature that evidences personal voice and self-direction. The third issue reviewed is how a developmental approach to art education might address similar goals seen as important in special education and evidenced in Individual Education Plans. Lastly, possible new directions for research in the field of working with adolescents with Autism Spectrum Disorder are shared.

1. Introduction

For adolescents with Autism Spectrum Disorder (hereinafter known as ASD), engagement with art materials and dialogue around works of art can facilitate stronger interpersonal and intrapersonal communication given that these students might otherwise lack an effective channel to develop such connections [18]. In particular, making and talking about art can prompt verbal responses that bridge the interior and exterior worlds of students with ASD [12; 25]. The opportunity to engage with art materials or talk about works of art, however, is not always a component included in a special education framework, nor is its inclusion looked upon as meaningful in terms of encouraging student growth and development [19; 15; 5]. Through a review of special education literature, little research could be found that identifies engaging in art making or discussing works of art as a viable and valuable educational opportunity for students with ASD [7; 21; 5; 3]. Yet through a review of art education literature, much qualitative data could be found that anecdotally reports the value and benefit of art education for students with ASD.

This summary of an extensive integrative literature review examines student-centered art education and the history of special education, and how roots of both fields can be combined into a new pedagogical approach for educating students with ASD in art. Furthermore, this summary of the reviewed literature suggests that through slight shifts in boundaries and interpretations of how students with disabilities are perceived, new understandings about their social, emotional, cognitive and artistic growth can be revealed through engagement in and with art. To that end, connections can be formed between research, philosophy, pedagogy and theory in art education and special education, and in doing so, suggest that academic and artistic programming for students with ASD may not be at cross-purposes with one another as much art education research states. As such, the two paths of special education and art education can begin to merge into one.

2. An approach to and the importance of art education for individuals with ASD

Much art education literature has been written on the qualitative impact of art for individuals with disabilities. This impact is triggered by many students with special needs beginning their inclusion in public schools by being assigned to art, music, and physical education classes as a first gateway to their typical peers to satisfy Least Restrictive Environment requirements identified in the Individuals with Disabilities Educational Act (hereinafter known as IDEA) [15; 19]. As a result, art education and special education professionals are immediately faced with the unique challenge
of making these classes successful, productive, and enriching [5; 3]. Unfortunately, many of these teachers have not been adequately prepared to make necessary connections, nor are they familiar enough with each other’s fields to initiate bridges. In addition, school administrators may not foster connections between these professionals, nor follow the federally mandated law that requires all teachers to be informed of educational accommodations for students with IEPs [15; 19].

Engagement in art can encourage self-expression, and foster connections to the inner-self and outer world [20; 17]. Students with ASD can experience challenges in these areas as they may not initiate conversation, be incapable of expressing appropriate emotions, and withdraw from social interactions [26]. These behaviors will immediately separate them socially and emotionally from their typical peers, and without facilitation and intervention, may worsen as they grow into adolescence. It is here that art education and dialogue around artwork can serve to bridge the social and emotional gap between students with ASD and their typically developed peers. Given that student-centered art education includes the sharing of students’ personal experiences and ideas [20; 17], it would serve to reason that the art classroom in particular would be the perfect, pressure-free environment to foster better peer relationships and communication skills. Focus is also paid to helping students make personal connections through the exploration of varied art materials, and develop verbal and visual expressive language. Lessons are commonly paced at speeds conducive to all types of learners, and multiple options for completing artworks and engaging in art processes are offered. Lastly, student-centered art education assumes a holistic approach to improving a student’s in-school and in-life skills [20; 17] by supporting the development of critical thinking skills, creative problem solving, and imagination.

3. Path of challenges: History and perceptions of educating students with disabilities

To begin a conversation on how special education was constructed in the United States, one must review how disability has been identified, defined, and viewed through multiple perspectives over time. Essential to this argument is understanding that individuals who express differences in behavioral, physical or cognitive functions have historically been segregated from society from severe to mild ways. Even in the twenty-first century when disability awareness is at its height compared to past decades, exclusionary practices and beliefs are still in place [8; 22]. Also spurring this phenomenon are a wealth of print and internet-based resources which are fed by misinformation or unsound research claiming to eliminate or greatly improve disability that are promoted by media, advocacy groups and parents alike.

3.1 Philosophical and ontological backdrop for understanding disability

Through a review of the work of philosopher Michel Foucault [9; 10; 11] in three of his texts, History of Madness, Madness and Civilization, and The Birth of the Clinic, it becomes apparent how society and government have played roles in the treatment of people with disabilities, the emergence of the clinical setting, and ultimately medicine’s role in designing restorative and curative processes. Foucault [9; 10; 11] not only frames his work by lending voice to a group of individuals who in many ways lacked one at that time, but he also paints a picture of how the discourse in which they are trapped was constructed by those in power. It is important to note the lasting influence Foucault [as cited in 23] had on the field of critical disability theory and how through his original paradigms, theorists continue to question and reshape ways in which individuals with disabilities fit within the larger frameworks of government, medicine and education [23].

Once connections are established, it is easier to understand how the field of medicine has laid the groundwork for accepted interventions, education and research in special education. Historian Henri-Jacques Stiker [22, p. 167], who refers to Foucault in The Birth of the Clinic [11] as the founder of thought on how medicine has guided intervention practices, discusses how doctors have moved from clinical to more humanistic approaches of treatment. It can be argued though that since Stiker’s [22] text was written only seven years after the authorization of IDEA, the field of special education was still young and undeveloped making a fair assessment challenging. Many practitioners now believe the pendulum of special education pedagogy has swung in the direction of pure diagnostic, clinical and curative practices [24]. Regardless of the time period under examination, the overall picture of medicine’s role
in how disability is addressed by health and education professionals is evident.

3.2 Autism enters the scene of disability

The medical diagnosis of ASD includes deficits in planning skills, social interactions, functional communication, and cognitive ability. Issues include stereotypical and self-injurious behavior, mood swings, aggression, and anxiousness [1]. Individuals with ASD can shy away from or lack interest in forming peer relationships, have reduced social and emotional responsiveness, express the need for rigid and ritualistic structure, and may perseverate on objects, people, or events. Learning challenges stem from being unable to channel information through one or more of the sensory pathways. With communication, individuals with ASD experience verbal language delays, have difficulty following conversational cues, may not initiate or sustain dialogue, and have impaired social skills [14]. Adolescents in particular may be unable to follow social etiquette and express subtle emotions, or read these qualities in others. In addition, they may be prone to asking repetitive, inappropriate, highly personal questions to gather unconnected bits of information or seek constant reassurance from an authority figure [26]. Adolescence in ASD creates greater ripples in the formation of identity and integration into society and adulthood than one might see in a typically developed adolescent [6].

Controversy around the definition of disability led to the development of a social model that considers the needs of the whole person as compared to the medical model that purely focuses on diagnostic methods and behavioral characteristics. In the 1970s, a group of disability advocates banded together to bring about a movement entitled the “social model of disability” which set forth a group of principles quite Foucauldian in nature. They determined that due to “governmentality” or the government’s control over services for individuals with disabilities, the medical model of disability was too heavily applied and reinforced. This group sought to clarify the difference between “impairment” and “disability.” The social model defined “impairment” as a physical limitation such as a missing limb or body-based deficit. Contrastingly, “disability” was defined as a government and medically imposed label designed to restrict activity or limit social integration [23]. The social model is still discussed in disability theory texts and considered an important contribution to the ontology of disability, and its lasting effects remain clear. The social model of disability stands as a decisive hinging point in which the medical model was publicly called out as portraying only one side of the story, and as lacking in personal voice and concern over the treatment of the whole person [16].

4. Path of art education: Forging inroads to the adolescent mind with ASD

Developmental art education experts Viktor Lowenfeld, W. Lambert Brittain [20], Al Hurwitz and Michael Day [17] are commonly cited in the field of student-centered art education as providing guides for understanding adolescent artistic development. It is also important to note the work of psychologists Mihaly Csikszentmihaly and Reed Larson [4] who have focused much of their research on creativity and adolescents, and have close ties to the field of student-centered art education. Art education professor Judith Burton [2] writes,

Adolescence is a time when youngsters’ ideas about self and world are often out of step with their ideas about what materials can and cannot do for them in the complex shaping of visual meaning. It is also a time when confused thoughts and feelings emerge about place-in-the-world, about self as simultaneous subject and object of contemplation (p. 50).

When contemplating artistic development for both typically and atypically developed adolescents, there are many considerations such as: how young people might express themselves through art; the construction of self and expression of ideas; and how adolescents with disabilities might participate and express themselves in, and benefit from, art-based learning.

4.1 Artistic development connects feelings and ideas, and interior-exterior landscapes of self

Adolescents are naturally searching for ways in which to express their feelings and ideas, fears and aspirations, as they explore their connections to their interior and exterior worlds. Hurwitz and Day [17] identify the sensory benefits of art making for students with disabilities, and how the touch, smell, sight, and sound of particular art materials would enhance learning experiences. As
such, these tactile properties can help adolescents make necessary connections between art materials and ideas, or trigger memories, emotions and stories that help bridge gaps between their interior and exterior lives. Manipulation of art materials would help in the further development of motor skills, a common area of need for students with special needs, as both gross motor and fine motor skills can be affected. As noted earlier, students with ASD can experience issues of gross motor clumsiness making art class an opportunity to sharpen these skills that are also a common IEP goal.

Lowenfeld and Brittain [20] have identified the interests of and developmental structure for art education for adolescents to encourage intellectual, social, and emotional growth. Their framework is one that can embrace the needs of an adolescent with ASD as it strikes a balanced approach between appealing to teenage interests, opportunities for expressive outlets, and the discussion and critique of artwork. They reinforce the need for art education to align with the adolescent mind during this stage of increased critical awareness, identity development, and formation of abstract ideas [20; 17]. Lowenfeld and Brittain [20; 17] also point to the importance of aesthetics in adolescent art education programs. The inclusion of looking at and talking about art, and its importance to the development of the adolescent mind, is an idea that can be applied to the structure of art education for adolescents with ASD. The provision of this opportunity could provide a vehicle for the increased use of verbal language, a skill identified as deficient in many IEPs for students with ASD.

4.2 Social and emotional connectivity with self and others

Csikszentmihaly and Larson [4] provide a social and emotional picture of the adolescent mind with its unpredictable and conflicted fluctuations in thinking, energy, focus and mood. This idea can also be applied to adolescents with ASD as they too experience shifts in their adaptive and social behaviors during this developmental phase. Crucial to their argument is asking educators to situate themselves in the place of the adolescent to fully comprehend the obstacles and opportunities young people encounter [4]. When working with adolescents with ASD, this theory [4] is of importance, as it helps teachers and researchers move away from the clinical model of disability by considering social and emotional needs instead of just functional needs, thereby encouraging the whole person approach.

Csikszentmihaly and Larson [4] also pay close attention to the internal and external worlds of the adolescent, which provides clues to behavior, mood and actions. Just as a typical teenager might experience internal and external social and emotional stressors, so can the adolescent with ASD. Concerns such as disability-related issues, social isolation, inability to effectively communicate, and feelings of uncertainty about the future can impact an adolescent with ASD. Lastly, they [4] discuss four types of relationships in the adolescent life. The roles of parents and siblings, friends, relation to self, and academics should all be considered for typical and atypical adolescents alike. As described earlier, students with ASD can be challenged to form bonds with their peers or follow social cues thereby making the art room a positive environment in which to foster interpersonal and intrapersonal connections.

5. Conclusions

This summary was designed to strengthen ties and commonalities between art education and special education. In an essay addressing how art teachers may already innately use many tried and true instructional strategies from special education, Beverly Gerber [13] writes, “They stress the importance of knowing the student, using the student’s own capabilities and interests, and carefully preparing and planning ahead, both for teaching and managing behaviors...carefully adapted to fit individual students on the spectrum” (p. 29). When realized, marriages of the two fields can yield successful, rewarding, and growth oriented programs for students with special needs [5; 3]. By gathering up these connective threads between student-centered art education and special education, the structural framework of a third approach to providing art experiences for students with ASD begins to emerge. This third approach begs the question, however, of what new types of learning might occur about the nature of adolescents with ASD and their verbal, emotional and social growth as seen in art making and dialogues around artworks? In addition, one might ask what new understandings could emerge about how education for students with disabilities is crafted, and how those students’ abilities and talents are documented and perceived? Only further research that considers ways in which the fields of art education and special education can be merged to create new pedagogies and curriculum
for teaching art to students with ASD can begin to respond to these and many more questions.

6. References


Session 2: Curriculum, Research and Development

Scientific Studying and Improving Learning in Specific Populations
(Author: Stanca Somesfalean)

National Center and State Collaborative Curriculum Resource Schema Intervention: Effect on Self-Determination
(Author: Stephanie D. Davis)

An Action Research Programme for Developing Inclusive Practices in Science Classrooms
(Authors: Mette Fredslund Andersen, Christine Enø Helmudt)

General Teachers’ Experience with Individual Education Plans in Mathematics
(Author: Astrid Gillespie)
Scientific Studying and Improving Learning in Specific Populations

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Abstract

Research shows that typically developing children in elementary schools who work for long periods without a recess break have an increased fidgety behaviour, and experience reduced concentration [1], [2]. Such studies conclude that children might think and work less efficiently when engaged in long periods of uninterrupted instructional time. Particularly for Attention Deficit Hyperactivity Disorder (ADHD) children, which are typically characterized by inattention, excessive motor activity, and distractibility, the shorter the time of intellectual activity (such as studying, class attendance, etc.), the more focused the attention. We propose a teaching and studying methodology that addresses this issue and capitalises on these findings.

1. Introduction

We have previously addressed in [3], [4] the question of efficiency – or rather inefficiency – of the study methodology employed by students all over the world, by proposing a studying methodology that takes the scientific self-experiment as the centerpiece method leading to the achievement of a significant increase in learning power. Through a number of experiments we conducted with typically developing middle and high-school students, we have proven that it is possible to increase one’s learning power by fifty percent in just a few months. Crucially, in our experiments, the optimal study interval – for typically developing subjects – was of only 15 minutes per subject matter. In this paper we investigate the link between our findings and the effects of applying such a methodology on specific populations such as Attention Deficit Hyperactivity Disorder (ADHD) children. Specifically, we propose that by limiting instruction time and individual studying time to very short intervals, similar to the ones determined in our experiments, learning efficiency should be considerably enhanced.

2. Scientific Studying

Scientific Studying is a studying methodology based on the scientific experiment, which holds that only through self-experimentation it is possible to determine one’s optimal way to study. We conducted a series of experiments with middle and high-school students, who studied for given periods of time using different study methodologies, and we quantified their results in terms of increase in learning power. We found that a methodology that includes, among others, subdividing the time allotted to the study activity in intervals and alternating the subject matters being studied led to an increase in learning power of fifty percent in only a few months. Furthermore, we found that the smaller the interval, such as 20-minutes or less, the better the increase in learning power.

Scientific Studying is based on the following assumptions:

i) There is a significant level of waste in the learning activity of students all over the world. By “waste” we mean that students generally study using a suboptimal methodology, which we have defined ‘Traditional Studying’, and which is often the result of a number of inputs learned unconsciously and applied mechanically since early childhood. Through personal observation, a student often emulates the way an older sibling or a classmate studies. It is extremely rare that a student without exposure to Scientific Studying would consciously plan for a number of different scientific experiments and diligently execute and document them in order to maximize his or her learning power.

ii) A scientific method can be successfully used to solve this waste. By “scientific method,” we mean a method that satisfies the requirements of being unbiased, conscious, measured and documented, and communicated.

Thus, the centrepiece of Scientific Studying is the scientific experiment. In order to be scientific, the experiment has to satisfy certain specific requirements, namely be unbiased, be conscious, be measured and documented, and be communicated. This is radically opposed to the Traditional Studying methods employed – almost automatically – by students around the world. Table 1 resumes the main
differences between Scientific Studying and Traditional Studying.

**Table 1. Comparison between Scientific Studying and Traditional Studying**

<table>
<thead>
<tr>
<th>Traditional Studying</th>
<th>Scientific Studying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>Study (the way we are used to, the way we feel, the way we naturally do, etc.)</td>
</tr>
<tr>
<td>Methodology</td>
<td>Acquired through a number of inputs learned almost unconsciously during several years, since early childhood.</td>
</tr>
<tr>
<td>Characteristics</td>
<td>Mostly unconscious and unplanned</td>
</tr>
<tr>
<td></td>
<td>Mostly unaware of the existence of waste and entropy</td>
</tr>
<tr>
<td></td>
<td>No conscious self-observation</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>None: the student is not formally exposed to “learn how to learn in a scientific context”</td>
</tr>
<tr>
<td>Separation of planning and execution of work</td>
<td>No: they are randomly mixed together</td>
</tr>
<tr>
<td>Measurements and communication of results</td>
<td>None: there are only individual isolated study methods</td>
</tr>
</tbody>
</table>

It is important to note that Scientific Studying is not about a particular methodology in and of itself, but rather about the importance of being open to scientific experimentation and allowing oneself to scientifically experiment with different methodologies in order to find the winning one. Thus, students perform a series of experiments, using methods, parameters, and implements and measure the effect on the learning power before proceeding to new experiments with modified methods, parameters and implements. While these experiments can be continued indefinitely, it is usually the case that one reaches a winning methodology that yields significantly improved results after a few rounds of experiments.

The tool kit of Scientific Studying contains:

i) Methods: One example of method is the separation of the time dedicated to study into study activity and recreational activity. Time management is a crucial element in the implementation of Scientific Studying. While the natural tendency is to mix the time dedicated to study and the time dedicated to recreation, this leads to an important loss in productivity. The way to avoid this is to appropriately plan, in writing, for a specific time segment for study and a specific time segment for recreational activity. Such detailed planning can cover the day or simply a few hours.

Moreover, as an added experiment, subdividing time provides better learning power when used in conjunction with alternating the subject matters that are being studied. In the experiments we performed, time segments of fifteen or twenty minutes yielded the best results. Thus, for instance, a student would study English for fifteen minutes, followed by History for fifteen minutes, Math for fifteen minutes, then take a fifteen minutes pause, before continuing with another round of study segments. This typically contributes, according to our results, to the efficiency and effectiveness of the study activity. A shorter time frame allotted per subject matter renders the study more focused. This is easily understandable considering that the smaller the time segment, the smaller the time wasted: in a small time segment, even a minimal waste of time will have a relative large ratio of wasted time on allocated time. For instance, five minutes' waste on a two-hour interval (120 minutes) is 5/120=4.2 or 4.2% of the overall time. However, five minutes of wasted time on a total of twenty minutes is 5/20=0.25 or 25% of the overall time, thus much larger percentagewise and therefore more visible and easier to detect and control. This is in sharp contrast to Traditional Studying, which typically consists of studying one subject matter for a prolonged period of time.

ii) Parameters: The parameters are, for instance, in the case of the subject matter alternation method, the length of the study intervals, as well as the length of the recreational activity.

iii) Implements: The implements are, for instance, a music player (i.e. studying with or without the music), markers (i.e. underlining or not important concepts, etc.), pens or pencils, and so on.

The study methodology is the sum of the methods, parameters, and implements used at a given time. The optimal methodology, which is in essence the outcome of Scientific Studying, is the combination of several methods, parameters, and implements that yield the maximum learning power to the specific student.

3. Our experiments

3.1. Design

We conducted four sets of experiments with middle and high school students over a period of eight months. Participants were given a number of methods, parameters and implements as potential study methodologies and were encouraged to customize and change them at will. Table 2 outlines some of the methodologies we first proposed to the participants.

For instance, using two methods (i. subdivision of the time allocated to study into study time and recreational time, and ii. alternation of subject matters within the time allocated to study), the students prepared a customised study plan.
Table 2. Methods, parameters, and implements proposed to participants in the four sets of experiments

<table>
<thead>
<tr>
<th>Experiments</th>
<th>Methods</th>
<th>Parameters</th>
<th>Implements</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Round</td>
<td>Clear division of study time and recreational time</td>
<td>Length of study time and length of recreational time</td>
<td>Paper on which the list of subject matters is written and where the detailed plan is also written (highly visible to the student)</td>
</tr>
<tr>
<td></td>
<td>Subject matter alternation</td>
<td>Frequency of subject matter alternation</td>
<td>Watch (highly visible to the student and close to the study plan)</td>
</tr>
<tr>
<td>Second Round</td>
<td>Introduction in the study plan of intervals to review or repeat about what was studied in the previous segments</td>
<td>Frequency and length of time segments</td>
<td>Paper on which the list of subject matters is written and where the detailed plan is also written (highly visible to the student)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Watch (highly visible to the student and close to the study plan)</td>
</tr>
<tr>
<td>Third Round</td>
<td>Listening or not listening to music while studying</td>
<td>Type of music (classical, instrumental, etc.)</td>
<td>Radio or CD player or iPod, etc.</td>
</tr>
<tr>
<td>Fourth Round</td>
<td>Undertaking or not undertaking key concepts</td>
<td>The number of different colors or Ardorithm in the underlying</td>
<td>Pencils, different colored pens, highlighters, markers, etc.</td>
</tr>
<tr>
<td>Fifth Round</td>
<td>Writing or not writing key concepts in the books being studied, with or without a hierarchical sequence</td>
<td>The number of the different hierarchical levels</td>
<td>Pencils, pens, etc.</td>
</tr>
</tbody>
</table>

For example, if a student had availability to study from 14:00 to 19:30, here is a study plan that would be drafted by the student before starting to study and then strictly followed:

<table>
<thead>
<tr>
<th>Subject Matters to Study:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
</tr>
<tr>
<td>Physics</td>
</tr>
<tr>
<td>History</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Plan:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics: 14.00 – 14.20</td>
</tr>
<tr>
<td>History: 14.20 – 14.40</td>
</tr>
<tr>
<td>Physics: 14.40 – 15.00</td>
</tr>
<tr>
<td>Recreation Time: 15.00 – 15.20</td>
</tr>
<tr>
<td>Mathematics: 15.20 – 15.40</td>
</tr>
<tr>
<td>History: 15.40 – 16.00</td>
</tr>
<tr>
<td>Physics: 16.00 – 16.20</td>
</tr>
<tr>
<td>Recreation Time: 16.20 – 16.40</td>
</tr>
<tr>
<td>Mathematics: 16.40 – 17.00</td>
</tr>
<tr>
<td>History: 17.00 – 17.20</td>
</tr>
<tr>
<td>Physics: 17.20 – 17.40</td>
</tr>
<tr>
<td>Review/ Mathematics: 17.40 – 17.55</td>
</tr>
<tr>
<td>Review History: 17.55 – 19.10</td>
</tr>
<tr>
<td>Review Physics: 19.10 – 19.25</td>
</tr>
</tbody>
</table>

Participants’ marks were recorded before the experiments and after each application of a given methodology. We measured the increase in learning power based on two factors: marks and average time dedicated to the study activity, or more specifically:

i) Average marks before the experiments, as compared to average marks after the experiments, calculated both by subject matter and by overall average. The increase or decrease in average mark was calculated through a weighting process taking into consideration the overall mark distribution in the school. For example, a 100% improvement (in terms of marks only) meant the student improved from the lowest score of all the students in the school to the highest. Since all this was subject to a weighting process, the higher the density of marks in the segment representing the absolute increase, the higher the percentage increase as compared to the absolute increase.

ii) Average number of hours dedicated to study before the experiments, as compared to average number of hours dedicated to study after the experiments.

By using both measures i and ii outlined above, we calculated an index that quantifies the percentage increase in learning power, which is directly proportional to i above and inversely proportional to ii above.

3.2. General results

The results have been strong across the 4 sets of experiments. We illustrate in Table 3 below the results of the first three sets of experiments, while the full results are detailed in [3].

Fourteen students participated in the first three sets of experiments. Eleven students completed the experiments and three dropped out. All the students who completed the experiments achieved impressive improvements of overall learning power, from a minimum of 23% to a maximum of 79%, with an average of 50% and a median of 55%. The control group performance remained approximately flat in the same period.

Table 3. Improvements in learning power (recreational time included) for the first three sets of experiments

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>Median</td>
</tr>
<tr>
<td>Overall</td>
<td>50%</td>
</tr>
<tr>
<td>Math Only</td>
<td>66%</td>
</tr>
</tbody>
</table>

While the discussion of these results is detailed in [3], our results allow us to conclude that the
application of Scientific Studying leads to significant increases in learning power, particularly in the subject matter perceived as most difficult for each subject.

3.3. Scientific Studying and the effects of physical exercise

Moreover, as detailed in [5], as a related additional methodology, in the fourth set of experiments, a limited number of students were encouraged to work out during the recreational breaks. The proposed workout was an aerobic activity workout. We executed the same rounds of methods, parameters and implements as in the other three sets of experiments, i.e. mainly subdivision of time and subject matter alternation, with the only difference being that, for the subjects that so chose, the time allotted for recreational breaks was used for working out. Two out of 23 students, student 18 (S18), and student 23 (S23) chose to experiment with this methodology. We illustrate in Table 4 the general results of the fourth set of experiments, and in Table 5 the highest increases in average marks per student.

Table 4. Improvements in learning power (recreational time included) for the fourth set of experiments

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>0.6</td>
<td>0.7</td>
</tr>
<tr>
<td>Math Only</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Table 5. Highest increases in average marks per student in the fourth set of experiments (23 students)

<table>
<thead>
<tr>
<th></th>
<th>Increase in Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>S18</td>
<td>0.2</td>
</tr>
<tr>
<td>S8</td>
<td>0.5</td>
</tr>
<tr>
<td>S22</td>
<td>1.0</td>
</tr>
<tr>
<td>S23</td>
<td>1.5</td>
</tr>
<tr>
<td>S4</td>
<td>2.0</td>
</tr>
<tr>
<td>S3</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Even though the sample of this experiment was small, the results of the students involved showed that it is possible to make a connection between working out during certain recreational segments and obtaining an increase in study efficiency. This confirms previous findings in the field of neurocognitive kinesiology that make a clear link between aerobic fitness and cognitive performance. Studies reveal that brain activity (as in a decision-making tasks) increases more rapidly following a time of intense physical activity such as running on a treadmill. For instance, in [6] it is reported that performing twenty-minute treadmill sessions improves preadolescent cognitive control of attention and school-based academic performance.

The results of our experiments in the optimization of the study activity bring further support to the powerful idea that physical exercise has a clear impact on academic performance. The Scientific Studying methodology that we are proposing integrates what we know about brain function and the results of previous studies in two ways:

i) On one side, through our proposal to alternate the study activity intervals with physical activity breaks. Scientific Studying provides students with a basic study method that allows each student to include customized physical activity breaks in his/her study plan. These active breaks will have the effect of enhancing his/her brain activity and thus lead to an increased efficiency of the next study activity interval.

ii) On the other side, through our findings indicating that shorter intervals (for both the study activity and the break) work better than longer intervals. As a matter of fact, the student who chose more frequent and shorter brake intervals with workout (S18) obtained a higher increase in learning power than the student using just one long work brake interval with workout (S23). In fact, the increase in learning power of S18 was the highest of the entire experimental group of 23 students.

The use of short rather than long study intervals is supported by studies showing that optimal classroom learning is associated with shorter instruction times. For instance, studies reported in [2] have shown that children in elementary school who are confined for prolonged periods often become more restless and experience reduced concentration.

We conclude that subdividing study/instruction time into smaller segments and alternating study activity intervals and physical activity such as aerobic activity intervals can be applied in and out of the classroom.

4. Using these findings in the design of study strategies for ADHD populations

We have seen in the above sections that the application of a scientific methodology in and out of the classroom may lead to more efficient learning.
While our studies concentrated on typically developing students, we believe that it can be successfully applied to specific populations, such as ADHD students, with potentially even greater increases in learning efficiency.

4.1. ADHD and learning strategies

ADHD is defined in the Oxford Handbook of Psychiatry as ‘a persistent pattern of inattention and/or hyperactivity that is developmentally inappropriate’. Other sources call it a neurodevelopmental disorder characterized by hyperactivity and inattention, most recently understood in the context of inhibitory control and reward processing (cf. [7]).

Recent research led to considering ADHD a spectrum disorder, characterized by the presence of domain symptoms such as inattention, hyperactivity and impulsivity, and corresponding subdomains symptoms such as failure to attend to details, difficulty sustaining attention, failure to finish tasks, difficulty in organizing tasks, avoidance of sustained effort; fidgeting, leaving seat in class, running about or climbing, motor excess; talking excessively, blurt out answers, difficulty waiting turn, interrupting or intruding. ([8]:317).

Learning strategies for ADHD children tend to be comprehensive strategies that combine learning strategies and medication. Medication seems to be fundamental in some cases. However, while “psychopharmacological treatments have been shown to improve children’s abilities to handle general tasks and demands, [...], stimulants are not associated with normalization of skills in the domain of learning and applying knowledge.” ([9]:646) Because of ADHD’s impact on multiple domains of function, combined treatments are suggested, and the complements to medication vary.

In terms of interventions targeting academic and educational results, increasingly numerous studies reveal the importance of adopting strategies that depart from the traditional models of education, of the type ‘STOP, LOOK and LISTEN’, where the ADHD child has to adapt his/her behavior – through behavior modification and/or medication – to the typically developing children in the rest of the class. Rather, it is suggested in [10] that ADHD children should be encouraged to move and explore, in other words, take advantage of the high levels of physical energy that characterize them. “Many kids labeled ADHD may, in fact, be highly developed bodily-kinesthetic learners—kids who learn best by moving, touching, building, dramatizing, and experiencing the material of the curriculum in other physical ways. As such, educational approaches based on role play, hands-on learning, and other kinds of dynamic learning may be more appropriate ways of helping ADHD-labeled kids be more effective in the classroom. It might be far better for educators to develop innovative methods to help these kids: ‘GO, LOOK, and LISTEN!’ ” [10].

Table 6. FOCUS cue card

<table>
<thead>
<tr>
<th>Memory Device</th>
<th>Intended Associations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on speaker</td>
<td>F1. Eyes and mind on the speaker.</td>
</tr>
<tr>
<td></td>
<td>F2. Resist talking to your neighbours.</td>
</tr>
<tr>
<td></td>
<td>F3. Keep your hands and feet quiet.</td>
</tr>
<tr>
<td>Open your mind</td>
<td>O1. Clear your mind of distracting thoughts. (Ignore distractions)</td>
</tr>
<tr>
<td></td>
<td>O2. Be ready to learn and remember.</td>
</tr>
<tr>
<td></td>
<td>O3. Set your mind on the subject.</td>
</tr>
<tr>
<td></td>
<td>O4. “Your brain is like a parachute. It only works when it’s open.”</td>
</tr>
<tr>
<td></td>
<td>O5. Think about what is being said.</td>
</tr>
<tr>
<td>Connect</td>
<td>C1. Try to relate what you are hearing to things that you already know and are related to the lesson.</td>
</tr>
<tr>
<td></td>
<td>C2. Create a picture in your mind of the new information.</td>
</tr>
<tr>
<td></td>
<td>C3. Listen to other students’ related comments.</td>
</tr>
<tr>
<td>Use your eyes</td>
<td>U1. Pay attention to the book, chalk board, worksheets, overheads, or other visual materials.</td>
</tr>
<tr>
<td>Select</td>
<td>S1. Select the important parts so you know what to remember.</td>
</tr>
<tr>
<td></td>
<td>S2. Say the important parts to yourself in your own words.</td>
</tr>
<tr>
<td></td>
<td>S3. Ask questions to make sure you understand.</td>
</tr>
</tbody>
</table>

Other strategies include, for instance, improving listening. [11] describes FOCUS, a mnemonic developed to outline a learning strategy for
listening. Each key word is an action verb that cues students on what to do, as illustrated in Table 6, from [11].

Other learning methods include self-talk, discussed in [10]. Incidentally, self-talk is part of the cognitive development of most young children. However, while typically developing children eventually internalize the self-talk into inner speech, some ADHD children continue to use it. Studies reveal that self-talk can often be seen as “off-task” or “disruptive” behavior in class (cf. [12]). The challenge in this case becomes one of having teachers accept self-talk as an educational tool that helps ADHD children think more effectively, rather than a disruptive behavior.

Finally, other more specific in-class strategies include, for instance, peer tutoring and class wide peer tutoring, which “have demonstrated enhanced task-related attention and academic accuracy in elementary school students with ADHD, as well as positive changes in behavior and academic performance in students without ADHD” [13], [14].

4.2. ADHD and Scientific Studying

We believe that the studying methodology that we have developed may constitute an encouraging avenue of development of study strategies for ADHD populations. Scientific Studying would respond to the drawbacks of some of the studying/learning/teaching methods currently employed in ADHD contexts, as it concurs with the conclusions resulting from recent research in the area of ADHD.

The main study methods that we have proposed and that we have demonstrated to yield a significant increase in learning power in normally developing students can be seen as targeting precisely the characteristics of ADHD students, namely:

i) The deficit in attention is addressed by the Scientific Studying methods that have given the best results in our experiments: the division of study time in smaller intervals and the alternation of subject matters being studied. By alternating the subject matters being studied at short time intervals, students maintain attention and interest at optimal levels. While this is advantageous for the normally developing children because it reduces time-waste and daydreaming, in the ADHD contexts it becomes a crucial component in maintaining students stimulated and countering the fact that their learning environment is often understimulating (cf. [10]).

ii) The physical requirement of motricity, which constitutes another characteristic of ADHD children, is addressed in the Scientific Studying framework by our proposal to alternate study/teaching time periods (whose optimal length may be determined scientifically by experimenting different lengths for different individuals) with intervals of physical exercise, such as an aerobic activity. Note however that in the ADHD context the study activity intervals themselves may be completed with physical exercise, with the goal of optimizing learning. This is because performing a physical activity is believed to allow these children to maintain the level of alertness necessary for cognitive activities. In this respect, the initiative of allowing ADHD children to attend classes while performing physical exercise such as stationary cycling has already been adopted in some schools as part of pilot projects. For instance, in a Laval school in the Montreal metropolitan area, stationary bike desks have been installed in class for the ADHD students. So far, the use of these bikes does not seem to affect the concentration of the other students, but further research is necessary to evaluate the overall impact of these desks. This type of initiative concurs with other findings in the field of ADHD, such as Mark Rapport’s, who heads the Children’s Learning Clinic at the University of Central Florida. He and his team also found that ADHD students perform better in the classroom or at tests if they are sitting on activity balls or exercise bikes. As Rapport summarizes, “the typical interventions target reducing hyperactivity. It’s exactly the opposite of what we should be doing for a majority of children with ADHD”.

iii) Other learning strategies such as the FOCUS strategy mentioned in section 4.1. above are also an integral part of the Scientific Studying methodology. In fact, one of the methods we propose is the active listening method, performed in class in order to increase the efficiency of the learning activity, by constantly reducing distractions, by making conscious efforts to link new concepts to previously known concepts, by avoiding daydreaming, by self-testing, etc. Again, while this method proved to be efficient for typically developing students, it is expected to be equally efficient for ADHD students.

5. Conclusions

The effects of ADHD are widespread, not only in terms of poor grades and increased grade retention, but also in terms of increased use of school-based services and low rates of high-school graduation and post-secondary education (cf. [9]).

Given the above, all attempts to design and implement effective teaching and effective learning strategies targeting ADHD children are bound to be beneficial for our children and for our schools. The Scientific Studying methodology is one possible strategy to be considered in the quest for improving our understanding of ADHD and for developing strategies to help students with behavioral and attention problems, as part of a comprehensive strategy. The general consensus in this field remains that a successful strategy for ADHD children is a holistic one.
6. References


National Center and State Collaborative Curriculum Resource Schema Intervention: Effect on Self-Determination

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College of Education

Abstract

Self-determination is an important measure of learning for students with significant cognitive disabilities. The purpose of this study was to determine whether the mean scores of two components of self-determination (capacity and opportunity) differed for students with significant cognitive disabilities that had taken the National Center and State Collaborative Curriculum Resource Schema Intervention. Research participants included seven students with significant cognitive disabilities, their parents, and teacher. Self-determination was measured using the American Institutes for Research (AIR) Self-Determination Assessment, which focused on capacity and opportunity. A one-group pretest-posttest design was used to collect information on the status of subjects prior to and following the intervention. The differences between the posttest and pretest means for capacity and opportunity were determined.

1. Introduction

The purpose of this study was to determine if the National Center and State Collaborative (NCSC) Curriculum Resource Schema Intervention created a difference in the self-determination of students with significant cognitive disabilities. A positive change would result in increased college, career, and community readiness for these students. There is an intensified emphasis for students with disabilities to exit high school with skills that will enable them to be college, career, and community ready. Self-determination must be an educational objective if these students are expected to achieve this measure.

Wehmeyer and Schwartz [14] reported that students who possess self-determination have a stronger chance of being successful in making the transition to adulthood. Self-determination refers to the characteristics of a person that leads the individual to make choices and decisions that are based on preferences and interests. It also allows individuals to monitor and control their actions and to be goal-oriented and self-directing [12].

The National Governors Association and Council for Chief State School Officers introduced the Common Core State Standards (CCSS) in 2010. These standards seek to prepare students for college, career, and community readiness. States are allowed to develop an alternate assessment on alternate achievement standards (AA-AAS) for students with the most significant cognitive disabilities (SCD). The U.S. Department of Education awarded the National Center and State Collaborative (NCSC) a grant to develop a new AA-AAS for students with the most SCD.

The Curriculum Resource Schema utilizes the Learning Progressions Frameworks (LPF) for use with the CCSS. The LPF describe how the understanding of core concepts in English Language Arts and Mathematics typically develop over time when students have the benefit of high quality instruction. These frameworks offer a guide to instruction and assist educators in lesson planning by linking instruction to CCSS through Core Content Connectors (CCC). The CCC pinpoint the most relevant grade-level, core academic content in English Language Arts and Mathematics found in the CCSS [10]. The implementation of the Curriculum Resource Schema is believed to allow students with disabilities to achieve at higher levels of learning and prepare for college, career, and community readiness.

Relevant research does not exist to determine if the NCSC Curriculum Resource Schema Intervention will positively impact the self-determination of students with SCD. If students with SCD are expected to leave high school with skills that enable them to be college, career, and community ready, then research must be conducted to determine if NCSC Curriculum Resource Schema Intervention produces increased self-determination.

2. Review of Literature

The educational practices for students with SCD have evolved as research has been utilized to guide
best practices. Brown, Bronston, Hamre-Nietupski, Pumian, Certo, and Gruenewald [1] challenged the field of special education to focus on age appropriate skills for students as opposed to basing instruction on the students’ mental age. In the years following, researchers and practitioners began to shift from a life skills focus to skills related to community and social interactions [13]. Next, the research shifted to academic learning [2; 3]. Finally, as educators began to incorporate standards-based instruction, an emphasis was placed on teaching grade level content skills [4; 6; 7; 8]. These findings are relevant to the implementation of the NCSC Curriculum Resource Schema Intervention because it is an approach to instruction and assessment that seeks to connect students with SCD to the appropriate grade level standards of learning.

The objective of the NCSC Curriculum Resource Schema Intervention is to ensure that students with SCD achieve higher academic outcomes that will enable them to be college, career, and community ready. Not every student with SCD will be able to achieve this goal. However, every student should have the opportunity to try. The Curriculum Resource Schema was developed to assist teachers in presenting content to improve college, career, and community readiness skills.

3. Methodology

3.1. Participants

All students within the Transitional Comprehensive Developmental Classroom (CDC) in an elementary school in rural Tennessee were eligible to participate in this study. However, only seven students agreed to take part in the research. The ages of students ranged from five to ten years. The specific disabilities included autism, developmental disabilities, intellectual disabilities, and other health impaired.

3.2. Procedures

The intervention consisted of the teacher following the guidelines of NCSC Curriculum Resource Schema [11]. Lessons were designed to maximize learning opportunities by using the LPF to link curriculum to CCSS through CCC to ensure grade-level content was being taught. This approach supported access to the general education curriculum in each grade at a reduced depth, breadth, and complexity, as necessary. This framework of the NCSC Curriculum Resource Schema was implemented as the intervention for this research study.

The AIR Self-Determination Assessment measures two broad self-determination components: capacity and opportunity. Capacity refers to a student's knowledge, abilities, and perceptions that enable him/her to be self-determined. Opportunity refers to a student's chances to use his/her knowledge, abilities, and perceptions at school and home. The AIR Self-Determination Student (AIR-S) form measures four aspects of self-determination. Two aspects (Things I Do and How I Feel) measure capacity, and two aspects (What Happens at School and What Happens at Home) measure opportunity. The AIR Self-Determination Parent (AIR-P) form measures three aspects of self-determination. One aspect (Things My Child Does) measures capacity, and two aspects (What Happens at Home and What Happens at School) measure opportunity. The AIR Self-Determination Educator (AIR-E) form measures five aspects of self-determination. Three aspects (Knowledge, Ability, and Perception) measure capacity, and two aspects (Opportunity at School and Opportunity at Home) measure opportunity. The AIR Assessments adhere to the learning theory of self-determination as presented in Mithaug, Mithaug, Agran, Martin, and Wehmeyer [9], which suggest that the necessary characteristics of self-determination develop over time as children learn skills and develop attitudes that allow them to engage in self-determined behaviors.

The research methodology utilized for this research was a one-group pretest-posttest design. This methodology involves collecting information on the status of subjects prior to and following implementation of a treatment. The treatment in this study was the NCSC Curriculum Resource Schema Intervention, which continued intermittently for nine weeks with unscheduled absences due to weather. Results of the AIR-S, AIR-P, and AIR-E were scored according to AIR Self-Determination User Scale and Guide [15] to determine if a change in capacity and opportunity for self-determination had occurred.

3.3. Instrument

The AIR-S contains 24 questions to measure students’ capacity (12 questions) and opportunity (12 questions). The AIR-P contains 18 questions that measure students’ capacity (6 questions) and opportunity (12 questions). The AIR-E contains 30 questions to measure students’ capacity (18 questions) and opportunity (12 questions).

3.4. Missing Data

Across student and parent AIR forms, there existed a small amount of arbitrary missing data. Nonresponse in this research interferes with our
ultimate goal of determining a change in capacity and opportunity. Because of the potential misrepresentative effects of not including all available data in the analysis process, a simple mean imputation [5] was calculated to replace the missing data.

4. Results

4.1. Student Responses

As indicated in Table 1, the results of the AIR-S show a pretest capacity mean score of 43.86 and a posttest capacity mean score of 45.71. The total difference between pretest and posttest means yielded an increase of 1.85 for capacity for self-determination. The outcomes of the AIR-S establish a pretest opportunity mean score of 45.85 and a posttest opportunity mean score of 52. The overall difference between pretest and posttest means yielded an increase of 6.15 for opportunity.

Table 1. Student capacity and opportunity mean scores from pretest and posttest

<table>
<thead>
<tr>
<th>Student</th>
<th>Capacity</th>
<th>Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>S1</td>
<td>40</td>
<td>52</td>
</tr>
<tr>
<td>S2</td>
<td>60</td>
<td>52</td>
</tr>
<tr>
<td>S3</td>
<td>30(1)</td>
<td>60</td>
</tr>
<tr>
<td>S4</td>
<td>48</td>
<td>43</td>
</tr>
<tr>
<td>S5</td>
<td>38</td>
<td>50</td>
</tr>
<tr>
<td>S6</td>
<td>48</td>
<td>31</td>
</tr>
<tr>
<td>S7</td>
<td>43</td>
<td>32</td>
</tr>
</tbody>
</table>

Mean 43.86 45.71 (+)1.85 45.85 52 (+)6.15

Note. (1) indicates missing data that was computed utilizing mean imputation.

4.2. Parent Responses

As shown in Table 2, the results of the AIR-P indicate a pretest capacity mean score of 16.71 and a posttest capacity mean score of 17.21. The total difference between pretest and posttest means yielded an increase of 3.38 for capacity. The outcomes of the AIR-P establish a pretest opportunity mean score of 40.57 and a posttest opportunity mean score of 49.21. The overall difference between pretest and posttest means yielded an increase of 8.64 for opportunity for self-determination. This missing data also influenced the mean scores for opportunity. The absent data constituted 43% of parental entries for the pretest opportunity mean score, 14% of the parental posttest opportunity mean score, and 29% of the difference opportunity mean score.

Table 2. Parent capacity and opportunity mean scores from pretest and posttest

<table>
<thead>
<tr>
<th>Parent</th>
<th>Capacity</th>
<th>Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>P1</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>P2</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>P3</td>
<td>9(1)</td>
<td>18</td>
</tr>
<tr>
<td>P4</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>P5</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>P6</td>
<td>19</td>
<td>23</td>
</tr>
<tr>
<td>P7</td>
<td>17</td>
<td>8.5(1)</td>
</tr>
</tbody>
</table>

Mean 16.71 17.21 (+)3.38 40.57 49.21 (+)8.64

Note. (1) indicates missing data that was computed utilizing mean imputation.

4.3. Educator Responses

As presented in Table 3, the results of the AIR-E show a pretest capacity mean score of 37.43 and a posttest capacity mean score of 57. The total difference between pretest and posttest means yielded an increase of 19.57 for capacity for self-determination. The outcomes of the AIR-E establish a pretest opportunity mean score of 29.57 and a posttest opportunity mean score of 40.71. The overall difference between pretest and posttest means yielded an increase of 11.14 for opportunity for self-determination. There are no missing scores for capacity and opportunity in the educator responses.

Table 3. Educator capacity and opportunity mean scores from pretest and posttest

<table>
<thead>
<tr>
<th>Educator</th>
<th>Capacity</th>
<th>Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>E1</td>
<td>27</td>
<td>53</td>
</tr>
<tr>
<td>E2</td>
<td>52</td>
<td>68</td>
</tr>
<tr>
<td>E3</td>
<td>47</td>
<td>66</td>
</tr>
<tr>
<td>E4</td>
<td>40</td>
<td>58</td>
</tr>
<tr>
<td>E5</td>
<td>37</td>
<td>57</td>
</tr>
<tr>
<td>E6</td>
<td>32</td>
<td>50</td>
</tr>
<tr>
<td>E7</td>
<td>27</td>
<td>46</td>
</tr>
</tbody>
</table>

Mean 37.43 57 (+)19.57 29.57 40.71 (+)11.14

5. Discussion

This study sought to determine if the self-determination components of capacity and opportunity would differ for students with SCD after nine weeks of the NCSC Curriculum Resource Schema Intervention was applied to seven students in an elementary transitional CDC classroom in a rural school district in middle Tennessee. Self-determination was measured using the American Institutes for Research (AIR) Self-Determination Assessment, which focused on the capacity and opportunity components of self-determination. Positive gains in mean scores following the nine-week intervention period provide evidence that the curriculum approach is worthwhile and beneficial for
students with SCD as a means of preparation for college, career, and community readiness.

6. Conclusion

The conclusions of this research study are very promising to educators in the field who are facing the state mandated NCSC as an alternate assessment measure. First, the design of the NCSC Curriculum Resource Schema is very user-friendly for teachers. Second, this curriculum guide assists teachers in providing instruction that focuses on the students’ current grade level. Finally, positive gains in mean scores during a nine-week intervention period could provide good evidence that the NCSC Curriculum Resource Schema approach is worthwhile and beneficial for students with SCD.

These research findings lead to more questions about the NCSC Curriculum Resource Schema and its ability to increase the self-determination of students with SCD. Additional research studies focusing on larger populations of students need to be conducted to build a body of knowledge about the research. It would also be interesting to conduct a longitudinal study to determine the effect that the NCSC Curriculum Resource Schema plays on the self-determination of students with SCD over their entire academic career and in their transition from high school to college, career, and community readiness.

6. References


An Action Research Programme for Developing Inclusive Practices in Science Classrooms

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Abstract

This action research programme investigates how science teachers can develop science teaching in form levels 4-6 to include marginalized students and enable them to become active participants in the community of practice in science classrooms. The programme consisted of two cycles. The first cycle aimed at identifying problems concerning marginalized students in science classrooms. The second cycle aimed at exploring as well as testing new approaches in inclusive practices in the science classroom. The project results pointed towards focusing on scaffolding inquiry and fieldwork as some possible ways forward.

1. Introduction

The idea of inclusive education is a high priority in the Danish primary and secondary school system in 2015. The present focus on inclusion emphasizes the discussion concerning whether teaching in various school subjects matches a diverse student population. In general, the natural sciences are presented in a manner that is not accessible or meaningful to all students [7]. It is, e.g., a well-documented fact that science classes pose challenges for many bilingual students and students from low socioeconomic backgrounds [3].

At the same time a maxim of science didactics is that science must be for everyone.

“Science for all. This phrase has been central to reform efforts in the science education community for more than a decade. But despite early attempts to raise awareness of the needs and promises of a growingly diverse student population, science seems to continue to belong to a selected few rather than all of our students.” [8]

The article “Teaching Science to Learners With Special Needs” [4] sums up some of the research in this field. According to this research, some effective avenues for students with special needs include guided inquiry, hands-on science and a multimodal teaching approach, as well as curriculum materials modified to align with students’ capacity and some alternative ways of managing student behaviour. Sarah J. Watt et al. [9] emphasize the use of a more structured inquiry approach that utilizes explicit enhancements as an inclusive practice in science education. Moreover, they indicate that providing a science education that focuses on core concepts and involves ongoing formative assessment will boost learning for students with special needs. However, McGinnis [4] concludes that

“...much remains to be studied to improve science education for students with special needs in science classrooms... Therefore, a final recommendation is that teachers of science engage in practitioner research in their practices to investigate how to meet the needs of students with special needs in their science education contexts.”

A number of researchers support this point, arguing that science education has gone wrong when it comes to students not in the mainstream [8]. The purpose of this action research programme has been to take up this challenge. Thus, the research question asks how science teachers can develop their classes to increase marginalized students’ participation in the community of practice in the science classroom. The challenge that developing inclusive practices entails for teachers is a well-known area of research [1].

2. Inclusive education and marginalization

The project focuses on how science education can respond to students who are academically marginalized. The term marginalization is connected to specific situations and is understood as a non-participation that springs from the community of practice that the teaching endeavours to uphold [10]. It expresses a situation in which the student is cut off from opportunities to participate that would otherwise point in a meaningful direction. The project aims to transcend marginalization [6] thus enabling students to move step by step from their marginal position as non-participants and thus become legitimate participants in their science classes – in other words, be included.

According to Alenkær [2] for the purposes of analysis there are two different concepts of inclusion: social and academic. In this context social inclusion encompasses when students feel they are a valuable part of the personal relational community, while academic inclusion means that students feel they are valuable and
natural contributors to the tasks involved in their school education. This project is concerned with academic inclusion, for which reason the project follows the exclusion and inclusion processes connected with the academic subject.

3. Research approach and method

The project is an action research programme that places itself within the critical utopic branch of action research, its aim being to act to change existing patterns that lead to student exclusion from science teaching and thus open up future opportunities to participate in the science education community. From this point of view action research is understood as a mutual challenge between theory and practice experience, which has been the guiding principle of the project design. The teachers involved in the programme were authorized to try out and implement new practices presumably better suited to meet marginalized students’ needs. Another goal, however, was to produce knowledge about these changes by reflecting on practice.

The project chose to collaborate with five science teachers, all of whom teach form levels 4-6, because these subjects become more abstract at this phase of education, and thus more students become marginalized. All five teachers volunteered for the project and had more than five years of professional experience. The teachers taught at four different schools in a suburb of Copenhagen where the student population is diverse. The teachers and researchers collaborated on formulating the problems and setting up the experiments worked with. Generally, the project was designed with two cycles, with the first being aimed at identifying problems and the second at seeking out and testing new possibilities. The phases of the project were as follows:

1. Expressing specific experiences from the classes in explicit narratives
2. Observing classroom situations, conducting student questionnaires, reflecting on teachers’ practice and formulating the challenges posed
3. Conceptualizing the challenges and designing a course of instruction with experiments
4. Testing and observing the experiments in practice
5. Reflecting on observations and experiences

The experiments were based on hypotheses from research literature about inclusion and science education. The researchers and teachers jointly translated and modified the theoretical knowledge so it could be interrelated with and incorporated into the local context. In fact, the teachers and researchers jointly constructed a course of instruction containing the desired innovation.

Notes taken at teacher-researcher meetings were saved. Student products from the classes were also collected and kept. The researchers conducted their first observations without participation, but participated in testing the experiments. The researchers took field notes of all observations made during and after classes. The dialogues regarding teachers’ narratives and concluding reflection were recorded in audio files. For the analysis the various data were organized according to the data collection method used, reviewed several times, commented on and grouped into themes conclusively substantiated with raw data.

As triangulation the data from observations, dialogues, questionnaires and documents were compared. The data outcome was also discussed from multiple angles, and the teachers commented on the researchers’ descriptions and themes, thus participating in validating them.

4. Findings

Two themes emerged from an analysis of the data. One concerned inquiry-based science classrooms, while the other concerned visible education. The first will be presented in this paper.

The observations of the teachers’ existing practice and their narratives showed that there was a paradox connected to fieldwork and the inquiry-based science classroom. The teachers saw an inclusive potential in the inquiry-based classroom, but in practice the activities often became exclusionary. Several students had difficulties navigating the changed structure of the inquiry, as they were disturbed by other activities, did not understand the meaning of the activities and did efficiently gain educational benefits. This led to three experiments, of which one will serve as an example.

Teacher A taught a class where she was not confident taking students on field trips because some student broke rules and did not participate academically. The teacher felt, however, that the student group would benefit from fieldwork and teaching outside the classroom, where the teaching forum was authentic and concrete. Furthermore, fieldwork is a part of science. For this reason, the teacher was interested in how fieldwork could be presented and organized in a way that enabled student participation while maintaining the academic objectives.

The experiment put an emphasis on planning, the setting of clear goals, clear class management, a clear goal for the out-of-class study and a highly structured study of the subject in the classroom. Scientific investigation outside the classroom and data-based writing in the classroom. The fieldwork was implemented in a course of instruction on the components of soil.

Initially, the students had to collect soil samples in their near surroundings as a basis for a dialogue about what soil really is. Later in the course of teaching they took a field trip to an area a few kilometres away to
collect samples of developed soil and forest soil. A code of conduct was prepared for the trip, an excerpt of which is shown below:

<table>
<thead>
<tr>
<th>Almost not to slight degree</th>
<th>Slight to average degree</th>
<th>Average to some degree</th>
<th>Average to a high degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>We walked together and stayed together in the area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We all did something and divided the work between us</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We collected soil without doing other things on the way</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We fulfilled the task</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Excerpt of schedule

The teacher went over the form with the students in detail, so they understood and knew what was expected from them outside. After the fieldwork the groups assessed themselves and gave themselves stars, which were compared with the teacher’s opinion. The first time the form was used, several students had left the group, among other faults, but there was already improvement by the second outing, and the focus points in the form of staying together and contributing to the work had become fixed points for them.

When teachers reflected on the experiment, they felt that working with the code of conduct form contributed positively to building up routines in connection with the fieldwork:

“Some of what I have taken in use is the code of conduct. That we alongside have had two parallel courses of instruction – the one about the soil, and then the one where they at first went out there (points) and then down there and then on tour .... And it is as if pointing out in detail what the expectations are somehow works to some degree or other .... I think it is something we come to neglect a little – that students have to be taught how to go on field trips – instead of our saying we cannot take them out.” (interview with teacher)

The fieldwork was thus successfully implemented in a way that involved the marginalized students. This was done by explicitly teaching students how to carry out the fieldwork and by evaluating the fieldwork on an ongoing basis.

During another experiment students were divided into groups depending on their need for scaffolding of open enquiry assignments. Three different versions of the assignments were distributed, and the ongoing scaffolding was similarly graduated. This measure was beneficial to the marginalized students most in need of scaffolding. The most independent students also benefited from this measure, whereas the intermediate group was less motivated.

5. Conclusion

All involved teachers took a positive approach and came up with ideas that can lead to progress. Experiments showed that the structural organization and scaffolding of the inquiry-based classroom are crucial factors in enabling marginalized students to participate and gain a learning outcome from the activities. Observations show and many of the marginalized students support that they benefit from the hands-on activities when it is carefully contextualized, integrated and scaffolded in the classroom as well as in the field. However, more research is required to include more students in the science classroom. There is no universal solution, but a continuous cooperation between subject-specific teachers and teachers with a special education background as regards the identification and testing of new ways of meeting marginalized students in the classroom contributes to the development of inclusive practices in science teaching.

6. References


General Teachers’ Experience with Individual Education Plans in Mathematics

Astrid Gillespie
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Abstract

This extended abstract deals with how Norwegian mathematics teachers utilize Individual Education Plans (IEP) when teaching pupils with special needs in mainstream settings. The preliminary findings suggest that although the Norwegian school authorities and school legislation states that the pupil’s IEP is a binding document that should be used when teaching pupils with special needs; the mathematics teachers choose not to make any use of the pupil’s IEP. According to the informants, the reasons for this include lack of time, considerations regarding the final exams and a wish to give all pupils access to the general curriculum.

1. Introduction

In this extended abstract I will present and discuss a few of the preliminary findings from an ongoing PhD-project concerning collaboration between Special Education Teachers (SET) and Mathematics Teachers (MT) in Norwegian secondary schools. In Norway, the most common way of providing special education services is through pull-out services. More than 2/3 of all pupils attending special education classes are subjected to this arrangement[1]. However, this only applies to a small amount of lessons over the week. Hence, pupils attending special education classes in mathematics are also attending mainstream mathematics classes. Accordingly, the MTs need to accommodate for a wide continuum of learners in the mainstream classroom, and the SETs need to have sufficient knowledge about what takes place in the mainstream classroom in order to prepare the pupils for the mainstream setting. Pupils who have an individual decision of special education are entitled to an Individual Education Plan (IEP). The plan should contain a description of goals, content, methods and organisation related to the specific subject in which the pupil is struggling. The school is advised to encourage the teachers working with the pupils to collaborate in writing the IEP and it is made clear that the IEP is to be used in all classes, not only classes classified as special education.

2. Prior research

Prior research suggests that secondary general educators to a lesser degree than elementary general educators, plan for inclusion of pupils with special needs[2]. Also, several studies have found support for the assumption that general educators find it difficult to adapt instruction to a heterogeneous group of pupil[3].

3. Method

In order to get rich descriptions of the perceived situation, and to gain an understanding of the participants life world, semi-structured interviews were conducted. The data material consists of transcribed interviews from 38 informants from 19 different schools in suburban areas around Oslo. One teacher responsible for the special education in mathematics and one teacher responsible for the ordinary mathematics education who shared the same pupils were picked as informants by the school’s headmaster/headmistress. All of the informants had achieved at least a bachelor degree in a relevant subject to teach secondary school pupils, but not all in the subject of mathematics. None of the informants had a degree in special education. The analysis was carried out with inspiration from Grounded Theory. Grounded theory aims at developing theory inductively from data[4]. Immediately after the interviews were carried out, they were transcribed in NVivo 10. Thereafter the interviews where coded in accordance with the already established codes from the interview guide. However, new categories evolved during the coding process and were added to the code tree. Thus the code tree ended up consisting of both constructed and in-vivo codes. This is comparable with the concept of Open Coding from the Grounded Theory tradition.

In order to see relations between the categories from the open coding, Axial Coding was performed. The coding paradigm of Corbin and Strauss[4] was applied. Following the axial coding procedure, core categories were developed. These were useful in the
effort trying to conceptualize the essence of the informant’s experiences.

4. Preliminary results and discussion

The preliminary findings suggest that none of the MTs claimed that they would use the IEP in the mainstream setting. Considering that this is a mandatory and legally binding document, I find this quite thought provoking. Further, none of the MTs reported that they had contributed in the development of the IEPs, despite the school authority’s clear recommendation. However when exploring the arguments and reasons for not using the IEP, a wide range of views and perceptions came to the surface regarding different sides of the IEP, which I think are important to discuss.

The better part of the informants spoke of the IEP in terms like “useless”, “not applicable”, and “not suitable for use in mainstream classes”. Several informants communicated that they regarded the IEP’s as a document mainly filed in the school archives serving as the school administration’s insurance in case the school authorities would run an unannounced inspection. Four of the informants claimed not to have any knowledge of the pupil’s IEPs at all.

I would like to put forward an utterance from one of the MTs that claimed the IEP was useless. This utterance can be seen as representative for many of the informants.

“The IEP is useless. I will not use it. In the IEP it always says that the pupil is going to do exercises that involve basic arithmetical operations. This is not compatible with what the rest of the class is doing. Am I supposed to plan for each individual pupil? Do you understand how much time that would take? And on top of it all, how am I to look the pupil in the eye when the day of the final exams arrive and he discovers that what he has been doing is far away from what the exam is about. I find it very hard to defend this in front of the parents as well. Therefore I choose to give the pupil the same exercises as normal achieving pupils. The adaption seems to consist of differentiation regarding time, and offering extra help.

7. Conclusions

Altogether these preliminary findings are in line with the findings of Schumm et.al [2]. Further they suggest that there is a need for a thorough discussion concerning the development, use and consequences of individual education plans in the Norwegian school system. The results indicate that the IEP does not serve as the pedagogical and didactical document it is intended to serve as. Further it seems as if the IEP can be characterized as a standardized, rather than an individualized document.

6. References


Session 3: Inclusive Education

Comparative Framings of the Impact of Mobile Telecommunication Services on Students' Life in South Africa and Nigeria
(Authors: Omotayo Kayode Abatan, Manoj Maharaj)

If a Sprawling Teacher Education of Special Education Needs (SEN) is the Answer, What is the Question?
(Authors: Helena Roos, Elisabet Frithiof, Ulla Gadler, Birgitta Lundbäck, Ingmarie Sandberg)

Perception of School Climate and Victimization by Peers in Secondary School Senior Years
(Authors: Rosalie Poulin, Claire Beaumont, Catherine Blaya, Eric Frenette)

Special Education Teachers Perceptions of Approaches in Implementing Inclusive Education for Pre-Schoolers with Hearing Impairment in Nigeria
(Author: Ajobiewe Anthonia Ifeoma)
Comparative Framings of the Impact of Mobile Telecommunication Services on Students’ Life in South Africa and Nigeria

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Abstract

The advancement in telecommunication network and computer based communication is of great importance in global communications, especially on young adults that constitute the sample of the study. In most mobile telecommunication services, quality is ascertained during the service delivery and not prior to the delivery of service making it to offer various services that is of interest to young people. These services are used to create and maintain social interactions while also depending on it for educational activities. This paper is based on empirical research to examine the impact of mobile telecommunications services on first-year Information Technology (IT) students at Lagos State University (LASU), Lagos, Nigeria and University of KwaZulu-Natal (UKZN) Durban, South Africa. The study enables the understanding of the quality of services required to identify students’ experiences and perceptions of mobile telecommunication services and the effect it has on their academic and social life.

1. Introduction

Mobile telecommunication is experiencing a tremendous revolution that will change the world. Mobile telecommunication network will be everywhere in such a way that computing will migrate from the traditional desktop towards consumer-oriented computing using smart wireless personal multimedia devices that will communicate with each other [1]. Mobile telecommunication services have been available since the early 1960s and its diffusion was affected by technological innovations such as transition from analogue to digital technology, competition within the industry, spectrum licensing and the harmonization to a common technical standards [2].

Mobile telecommunication technologies have developed in successive generations which includes the first generation (1G) technology, second generation (2G) or Global System for Mobile communications (GSM) technology which is massively used to date, the third generation (3G) technology that depends critically on the incorporation of multimedia services and the fourth generation (4G) technology that produce data rates of 200 Mbps, [3]. Mobile phones have become an everyday commodity for millions of people all over the world and are being used more and more in the most developed and developing countries [4].

Telecommunication has transformed the world into a global village; it has resulted in profound changes within the social structure that rivals those within the industrial revolution [5]. The role that mobile telecommunication technology has played in social relations has become increasingly important. The implementation of GSM standards has direct and indirect contribution to the global economic growth, it has contributed to the creation of new employment opportunities and has enhanced the Gross Domestic Product (GDP) of several nations [6]. These assumptions holds true for students in South Africa, Nigeria and elsewhere for that matter.

This study draws from students’ articulation of the use of mobile telecommunications services across mobile telecommunication networks in South Africa and Nigeria. Students’ narratives of their use of mobile telecommunication services for academic and social activities foreground the importance of these services in students’ lives. Therefore, the research questions are broken down into three-folds:

- What are the perceptions of first-year IT students in UKZN and LASU vis-à-vis mobile telecommunication services in Durban and Lagos?
- What effect does mobile telecommunication services have on first-year IT students’ academic endeavour?
- What effect does mobile telecommunication services have on first-year IT students’ social life?

In what follows, this paper discusses the models that serve as the theoretical anchors for the study. It then presents the research method, including the mode of data collection and analysis. Next, a general discussion of students’ use of mobile telecommunications narrows down into the description of the study’s findings in respect of first-year IT students at UKZN and LASU. The rating of the quality of mobile telecommunication services on the mobile telecommunication network. The paper then presents the limitation of the study and concludes with an argument for the integration of mobile
telecommunication services into teaching and learning as well as creating awareness of the link between the use of technology and life outcome.

2. Conceptual frameworks

Technology Acceptance Model (TAM) is the theory adopted for the study. “TAM is a theoretical model that has been used to explain and predict user’s behaviour in information technology” [7]. TAM provides a foundation for identifying the effect of external variables on the internal values, attitudes and the intention to use technology [8]. According to TAM the attitude of users determines the intention to use technology and the intention eventually influences the actual use of such technology [9]. However, Davis and Venkatesh deemphasize the significance of attitude as a determinant of the use of technology but argue that perceived usefulness and perceived ease of use are critical factors that influence the use of technology [9].

In addition to the factors mentioned above, the awareness of the availability of technology is crucial to determining the intention of using the technology and the actual use of the technology. The assumptions of TAM offer some utility to this study. Students’ behaviour in the form of their attitudes, intentions, perceived usefulness as well as perceived ease of use of mobile telecommunication services also determine the actual use of the services. Further backing to the theoretical framework adopted for this paper was from Siragusa and Dixon who stated that the theory of planned behaviour is also used to understand people’s intention to engage in a number of activities [10]. Some of the activities were described in this study which includes the use of mobile telecommunication services for academic and social activities. Therefore, the theory of planned behaviour presupposes that intentions to involve and relate with a particular programme is achieved by attitudes towards using information and communication technology, supposed social pressure to do so and by perceived control over the interaction [11].

The conceptual models (TAM and the theory of planned behaviour) are used to interpret the findings of this study. The paper essentially extrapolates the assumptions of TAM. One of such assumptions presupposes that the use of technology is a function of the awareness of the existence and usefulness of such technology by a potential or actual user. In the context of this study, the use of mobile telecommunication services by first-year IT students is dependent on the awareness about the availability of such services.

Students’ behaviour in the form of their attitudes and intentions, perceived usefulness as well as perceived ease of use of mobile telecommunication services also determine the actual use of the services. The attitudes and intentions of first-year IT students towards technology in general and mobile telecommunications in particular are reflected in their use of mobile telecommunication services for academic and social activities. The academic activities entail finding new information, information sharing, research and the use of SMS to check examination results. Some of the social activities include keeping in touch with family, keeping in touch with friends, making new friends and using data services for social networking sites i.e., Facebook.

Therefore, there is a possibility of unpacking the preferences of first-year IT students with reference to the acceptance and the usage of mobile telecommunication services through the extrapolation of the assumptions of TAM. Furthermore, the theory of planned behaviour implies that the intention to connect and relate with a programme or application has an effect on the attitudes directed at the usage of mobile telecommunications services by first-year IT students.

3. Methodology

3.1. Population and sampling

The data for this paper was generated from research conducted in 2011 amongst first-year IT students at the Westville-Durban campus of the University of KwaZulu-Natal and Ojo-Lagos campus of the Lagos State University. The population of first-year IT students in UKZN was estimated at 945 and that of LASU was estimated at 950 based on the 2011 student roll. The sample for the study was obtained through simple random technique. Simple random sampling of finite population is described by choosing elements randomly from a population one step at a time and at each step the remaining elements in the population are guaranteed that they have the probability of being selected [12]. Using this logic, a 50% simple random sample was selected by distribution of 500 questionnaires to the student cohort of each institution. A total number of 313 questionnaires were obtained out of the 500 handed out at UKZN and a total number of 310 questionnaires were obtained out of the 500 handed out at LASU.

3.2. Data collection instrument

A self-administered questionnaire was designed for the primary data collection procedure. The self-administered questionnaires consisted of structured, closed format, biographical and rating scale type of questions. The format of the questionnaire elicited information about the relevant issues on the use of mobile telecommunication services amongst first-year IT students in UKZN. The data and information collected are pre-structured according to the assumed relationship between the concepts of the models used [13]. Data analysis was elaborated using set of
4. Findings

4.1. Students’ perceptions of mobile telecommunication services - UKZN

Mobile telecommunication network operators offer a range of services through which students could satisfy their academic and social needs. Participants were asked to indicate the mobile telecommunication services that they use. Figure 1 shows the number and corresponding percentage of participants who use each service. The use of each service is measured in relation to all 313 participants at UKZN. An overwhelming majority of students (89.8%) use SMS, followed by 69.6% who use MMS. Voice call is used by 65.8% of participants while 46.6% use data services. 36.1% and 10.9% of students use GPS services and International roaming respectively. 26 students, with the lowest percentage of 8.3% use conference call.

4.2. Students’ perceptions of mobile telecommunication services – LASU

A total of 310 first-year IT students at LASU indicated the mobile telecommunication services that they use. Figure 2 shows the number and corresponding percentage of participants who use each service. The use of each service is measured in relation to all participants at LASU. The vast majority of students constituting 92.9% use SMS, followed by the use of MMS at 62.9%. Voice call is used by 59.4% of students surveyed while conference call and data services are used by 54.5% and 52.9% respectively. Global Positioning System (GPS) services and International roaming have the lowest percentage usage of 19.7% and 11.6% respectively.
First-year IT students at LASU were required to indicate the quality of each of the services offered by mobile telecommunications network operators. The same assumptions made in section 4.1 above in respect of services apply here. A number of participants (45.2%) rated the quality of data services as average while 25.3% noted that data services were of good quality and 27.8% deemed the quality of data services as very good. In the case of MMS services, 34.8% considered the services as average, 30.8% of participants indicated that the quality of MMS services was good and 34.1% noted the service quality as very good. As was the case with participants at UKZN, SMS had the highest quality rating amongst first-year IT students at LASU in which 79.1% of participants responded that SMS service quality was very good. Many participants, comprising 59.1% of those surveyed rated the quality of voice call positively in the category of very good.

Positive ratings for mobile telecommunication services were generally higher in the case of UKZN participants than their LASU counterparts. Apparently, this is attributable to the very challenging operational environment within which mobile network providers operate in Nigeria. The environment is characterized by deficient infrastructure and unstable electricity supply but a very huge subscriber base. Thus, the lower percentages of LASU participant’s vis-à-vis quality ratings in the good and very good categories may be situated in the context of Nigeria’s operational environment.

It can be seen from Table 2 that participants generally perceived the quality of mobile telecommunication services as of good quality even though the percentages were lower than those obtained from UKZN participants. The exception to the foregoing pertains to the percentage of participants who rated the quality of SMS services as very good.

Table 2. The rating of mobile telecoms services – LASU

<table>
<thead>
<tr>
<th>Services</th>
<th>Very poor</th>
<th>Poor</th>
<th>Average</th>
<th>Good</th>
<th>Very good</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference Call</td>
<td>0.5</td>
<td>1.6</td>
<td>68.9</td>
<td>11.5</td>
<td>17.5</td>
</tr>
<tr>
<td>Data Services</td>
<td>0</td>
<td>1.8</td>
<td>45.2</td>
<td>25.3</td>
<td>27.8</td>
</tr>
<tr>
<td>GPS</td>
<td>0</td>
<td>0.6</td>
<td>59</td>
<td>24.2</td>
<td>16.5</td>
</tr>
<tr>
<td>International Roaming</td>
<td>0</td>
<td>1.3</td>
<td>82</td>
<td>74.1</td>
<td>16.5</td>
</tr>
<tr>
<td>MMS</td>
<td>0</td>
<td>0.3</td>
<td>34.8</td>
<td>30.8</td>
<td>34.4</td>
</tr>
<tr>
<td>SMS</td>
<td>0.3</td>
<td>1</td>
<td>43.3</td>
<td>15.3</td>
<td>79.1</td>
</tr>
<tr>
<td>Voice Call</td>
<td>0.7</td>
<td>0.3</td>
<td>29.8</td>
<td>10.3</td>
<td>59.1</td>
</tr>
</tbody>
</table>

4.3. Impact of mobile telecommunication services on students’ life – UKZN

4.3.1. Academic life. In light of the foregoing, it is necessary to find out from participants’ perspective the impact that mobile telecommunication services have on their academic life. Figure 3 provides pertinent information on the impact of mobile telecommunication services on participants’ academic endeavour.

The description of the findings in this aspect of the study is presented according to the sequence of impact assessment as portrayed in Figure 3 below. The lowest number of participants (4.1%) described the impact of the use of mobile telecommunication services on their academic endeavour as overwhelmingly negative.

Next is another group of participants (23.7%) who described the impact as somewhat negative. It should be said that negative impact assessment is underscored by the potential and actual drawbacks related to the usage of mobile telecommunication services namely possible disruptions to academic routine and distractions as well as addiction to technology. The highest number of participants (43.7%) did not know the impact that mobile telecommunication services had on their academic endeavour. It may be said that students in this category could not or had yet to establish a correlation or interface between academic performance/outcomes and their use of mobile telecommunication services for academic purposes. The third highest number of participants (23.4%) identified the impact of the use of mobile telecommunication services on their academic endeavour as somewhat positive.

The last group of students in terms of sequence, representing 5.1% of participants indicated that the impact of mobile telecommunication services on their academic endeavour is overwhelmingly positive. For the students in these latter categories (Somewhat positive and overwhelmingly positive) there is a beneficial correlation between the use of mobile telecommunication services for academic purposes and academic performance. It is noted therefore that the use of mobile telecommunication services for academic purposes, while avoiding the potential drawbacks, may engender positive outcomes.

4.3.2. Social life. In view of the frequency of the use of mobile telecommunications for social activities, the
study considers participants’ articulation of the impact of mobile telecommunications on their social life.

Figure 4. The effect of mobile telecoms on social life - UKZN

Figure 4 describes the impact assessment from participants’ perspectives. The description of the findings in this aspect of the study is presented according to the sequence of impact assessment as portrayed in the figure below. The lowest number of participants (2.3%) described the impact of the use of mobile telecommunication services on their social life as overwhelmingly negative. This is followed by the group of participants (9.7%) who described the impact as somewhat negative. It should be said that negative impact assessment is underscored by the potential and actual drawbacks associated with the use of mobile telecommunication services namely possible impairment of interpersonal physical contact and distractions as well as addiction to technology. Another group of students representing 23.8% of participants did not know the impact that mobile telecommunication services had on their social life. The highest number of participants (49.3%) identified the impact of the use of mobile telecommunication services on their social life as somewhat positive. The last group of students in terms of sequence, representing 14.8% of participants indicated that the impact of mobile telecommunication services on their social life is overwhelmingly positive. It can be said that students in the last two categories (Somewhat positive and overwhelmingly positive) implied positive correlation between the use of mobile telecommunication services for social activities and improved social interactions.

4.4. Impact of mobile telecommunication services on students’ life – LASU

4.4.1. Academic life. Figure 5 provides relevant information on the impact of mobile telecommunication services on participants’ academic endeavour in LASU.

Figure 5. The effect of mobile telecoms on academic endeavours - LASU

It is necessary to find out the impact of mobile telecommunication services have on participants’ academic endeavour based on participants’ perceptions. The description of the findings in this aspect of the study is presented according to the sequence of impact assessment as portrayed in Figure 5 below. Only 1.3% of participants described the impact of the use of mobile telecommunication services on their academic endeavour as overwhelmingly negative. Next is another group of participants (14.4) who described the impact of mobile telecommunication services on their academic endeavour as somewhat negative. The lowest number of students with only 1% of participants did not know the impact that mobile telecommunication services had on their academic endeavour. It is said that participants in this category could not or had yet to establish a correlation between academic performance and their use of mobile telecommunication for their academic purposes. A very huge and the highest number of students with 77.5% of participants identified the impact of the use of mobile telecommunication services on their academic endeavour as somewhat positive. The last group of participants in terms of sequence, representing 5.9% of participants indicated that the impact of mobile telecommunication services on their academic endeavour is overwhelmingly positive. Putting into consideration, the students in the category of somewhat positive and overwhelmingly positive implied positive correlation between the use of mobile telecommunication services for academic purposes and academic performance. It is considered that the use of mobile telecommunication services for academic purposes produced positive impacts.

4.4.2. Social life. In the light of the frequency of the use of mobile telecommunications for social activities, the study considers participants articulation of the impact of mobile telecommunications on their social life. Figure 6 depicts the impact assessment from participants’ perspectives.
Figure 6. The effect of mobile telecoms on social life - LASU

The description of findings is represented according to the sequence of impact assessment as portrayed in Figure 6 below. A small amount of students (0.7%) described the impact of mobile telecommunication services on their social life as overwhelmingly negative. It is followed by the group of participants (3.6%) who described the impact of mobile telecommunication services as somewhat negative. Having said that negative impact assessment is underscored by the potential and actual drawbacks associated with the use of mobile telecommunication services namely possible impairment of interpersonal physical contact and distraction as well as addiction to technology. The smallest group of students representing 0.3% of participants did not know the impact that mobile telecommunication services have on their social life. The highest number of students (48%) described the impact of the use of mobile telecommunication services as somewhat positive. The last group of students in terms of sequence with 47.4% of participants identified that the impact of mobile telecommunication services on their social life is overwhelmingly positive. It can be said that participants in the last two categories (Somewhat positive and overwhelmingly positive) implied positive correlation between the use of mobile telecommunication services for social activities and improved social interactions.

5. Discussions of findings

The evaluation of research findings is done in the context of the research questions using inferential statistics mainly in the form of cross-tabulations and Chi-Square tests. These means of analysis enable the understanding of the significance of the variables and their influence on participant’s perceptions. Therefore, the responses of participants are cross-tabulated and Chi-Square tests are used to establish the significance of factors that could offer answers to the main research questions. A Cross-tabulation is the procedure with which a table of two or more category variables is produced, in order to compare the incidence of one characteristics against the other [14]. If there is no association then (p is greater than 0.05) it means there is no evidence of bias. A low p-value indicates rejection of the null hypothesis and in this case implies bias.

The overriding question that the study seeks to address is the perception of first-year IT students about mobile telecommunication services. In order to understand the perceptions, participants were asked to state the impact of mobile telecommunication services on both their academic and social life. With reference to the impact that mobile telecommunication services have on students’ academic life, a number of factors were taken into consideration. Some of these factors include the use of mobile telecommunication services for a range of academic activities. In the final analysis, participants’ assessment of the impact of mobile telecommunication services on their academic life is summed up in a few categories that may be broadly portrayed as either negative or positive. An inferential analysis of this research sub-question pertaining to the effect of mobile telecommunication services on students’ academic life is presented in Tables 3 and 4. In line with the definition of Cross-tabulation above, significance is established where p≤0.05.

Table 3. Cross-tabulation results on effect of telecom services on academic endeavours

<table>
<thead>
<tr>
<th>Location</th>
<th>Overwhelm</th>
<th>Somewhat</th>
<th>I don't</th>
<th>Somewhat</th>
<th>Overwhelm</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagos</td>
<td>12</td>
<td>70</td>
<td>129</td>
<td>69</td>
<td>15</td>
<td>295</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>114</td>
<td>132</td>
<td>306</td>
<td>33</td>
<td>601</td>
</tr>
</tbody>
</table>

Table 4. Chi-square test on effect of telecom services on academic endeavours

<table>
<thead>
<tr>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>222.584</td>
<td>4</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>262.134</td>
<td>4</td>
</tr>
<tr>
<td>Linear-by-Linear</td>
<td>84.417</td>
<td>1</td>
</tr>
<tr>
<td>Association</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>601</td>
<td></td>
</tr>
</tbody>
</table>

As can be seen from tables 3 and 4, data from both UKZN and LASU indicate a significant correlation between mobile telecommunication services and academic life. From these tables, it can be inferred that a significant number of first-year IT students of both Universities perceive mobile telecommunication services to have positive impact on their academic life. This perception is due to the usefulness of mobile telecommunication services to performing a number of academic tasks.
Still on first-year IT students’ perception of mobile telecommunication services, the other sub-question relating to the effect of mobile telecommunication services on students’ social life also engendered useful data which is Cross-tabulated and subjected to Chi-Square tests in tables 5 and 6.

Table 5. Cross-tabulation results on effect of telecom services on social life

<table>
<thead>
<tr>
<th>Location</th>
<th>Overwhelmingly positive</th>
<th>Somewhat positive</th>
<th>I don’t know</th>
<th>Somewhat negative</th>
<th>Overwhelmingly negative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagos</td>
<td>29</td>
<td>116</td>
<td>146</td>
<td>146</td>
<td>45</td>
<td>602</td>
</tr>
<tr>
<td>Durban</td>
<td>1</td>
<td>11</td>
<td>71</td>
<td>147</td>
<td>44</td>
<td>286</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>127</td>
<td>217</td>
<td>292</td>
<td>49</td>
<td>602</td>
</tr>
</tbody>
</table>

Table 6. Chi-square test on effect of telecom services on social life

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>132.082</td>
<td>4</td>
<td>.000</td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>156.594</td>
<td>4</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>97.282</td>
<td>1</td>
<td>.000</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>602</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tables 5 and 6 indicate significance of mobile telecommunication services on first-year IT students’ social life. This perception is based on the reliance of first-year IT students on mobile telecommunication services for activities such as social networking and keeping in touch with friends and family.

6. Limitations

A clear limitation in this research is its focus exclusively on first-year IT students at UKZN and LASU. This study’s findings help to understand the orientations and attitudes of first-year IT students towards an aspect of technology acceptance and use. However, the behavioural patterns and nuances presented in this study may not necessarily apply to students at higher levels of study in the same discipline or in other disciplines within the universities.

7. Conclusion

The limited use of mobile telecommunication services for academic purposes in LASU is emblematic of the general trend in Nigerian universities. As noted earlier, this problem is attributable, not to the lack of awareness or unwillingness on the part of students to use mobile telecommunications, but to an institutional factor namely the absence or inadequacy of electronic platforms in the universities. To this end, it is suggested that Nigerian universities create systems and adopt procedures conducive to the use of mobile telecommunication services for such activities as students’ registration and obtaining examination results.

Research findings suggest that many students seem not to understand the impact of the use mobile telecommunication services on their academic and social life. Therefore, attempts at integrating mobile telecommunication into teaching and learning should, by logical necessity, teach important life lessons. It is important that students understand the link between behaviours or actions and outcomes. In the context of this study, students ought to understand not just the rationale for the use of mobile telecommunication services for academic and social activities but also the consequences or the results of the use of such services. Until students are able to understand the impact of mobile telecommunication services on their academic and social life the use of such services may not hold any real significance in their consciousness. It is expected that formal teaching and learning mechanisms that specifically highlights the use of mobile telecommunication services may serve the useful purpose of creating awareness of the link between the use of technology and life outcomes.

While first-year IT students may find it expedient, beneficial or relatively easier to use mobile telecommunication services for these purposes, this may not necessarily be the case for students in other disciplines. Further research with respect to students in other disciplines will likely reveal commonalities and divergences in students’ use of mobile telecommunication services. These commonalities and divergences could, in turn, stimulate further scholarly inquiry that could engender benefits for students and academics. In addition, mobile telecommunication network operators could gain from such insights as they seek to streamline services to meet the needs of users in a changing and increasingly competitive operational environment.

8. References


If a Sprawling Teacher Education of Special Education Needs (SEN) is the Answer, What is the Question?

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Abstract

Teacher education of SEN looks different over the globe. This paper discusses the notion of SEN in the light of Swedish teacher education of SEN at Linnaeus University. An analysis of institutional documents governing the education has been made. The results show that SEN is expressed in different ways in the documents and is very much connected to needs in the education. It also shows, even though the directions has different target groups, that the notion of SEN has a common basis in facing the needs of all children and students. The differences can be seen in what kind of mission the teacher of SEN has. The results show that the mission of the special pedagogue is more on an overall level and the mission of special teachers is more connected to the learning of the individual child, even though both of the SEN teachers have much the same mission.

1. Introduction

The aim of this paper is to highlight an interpretation of SEN at both national teacher education level and local university teaching level in order to provide more in depth-understanding of the complexity of SEN. There are many differences in the understanding of SEN from one country to another [1]. Transnational understanding of SEN will enhance outcomes for children, young persons and adults with special needs as well as for both teacher education and SEN teachers in their profession.

Sweden has two different education programs for teachers focusing SEN, The Special Pedagogue Program and Special Teacher Program – the expressions special pedagogue and special teacher are used instead of the expression remedial teacher. These two programs are a further education of 90 credits. The students need to have a prior teaching degree and at least 3 years of teacher practice before entering any of these programs. When the students have finished their program studies they get a Postgraduate Diploma in Special Educational Needs alternative Postgraduate Diploma in Special Needs Training. Their new profession is Special pedagogue alternative Special teacher. Many Swedish universities run these two programs or just one of them. In Sweden Postgraduate Diploma in Special Educational Needs is given after a uniform training but Postgraduate Diploma in Special Needs Training can be given in six different directions: Learning disabilities, Mathematical development, Development of language, writing and reading, Severe speech language impairment, Deafness or hearing impairment and Visual impairment.

Our university, Linnaeus University in the south of Sweden, is a rather new one. Although young, it leans on an over century long seminary and high school tradition of teacher education. Linnaeus University exams three of the mentioned six directions for Postgraduate Diploma in Special Needs Training: Learning disabilities, Mathematical development, Development of language, writing and reading. Within both programs SEN is in focus, though from different perspectives depending on program and direction of the education. In order to promote all sorts of both wide and deep SEN understanding and further professional collaboration Linnaeus University organize both separate and common courses for all students on both of the two programs, as well as separate courses for each of our three Special Teacher Program directions.

To understand the complexity of SEN you need to make different interpretations on different levels: the area of knowledge (special pedagogy), the profession (special pedagogue alternative special teacher), and finally, the child’s rights to get opportunities for learning. If SEN need a special pedagogy, what is the special in special pedagogy? Is the special the same from these different perspectives in the education of special pedagogues and special teachers? These questions have been discussed over decades [2; 3].

Swedish researchers have made interpretations of SEN by discussing the sight on children with special needs in terms of relational pedagogy or categorical pedagogy. Relational pedagogy focus on problematizing the environment and categorical pedagogy focus the individual [4]. An individual perspective is the most durable and established standpoint, typified in definitions and descriptions of disabilities and disorders [5]. Lansheim [6] studied narratives from newly examined special pedagogues and special teachers. According to the results those teachers often used an individual perspective. In
most Swedish research SEN are regarded as a relation between the environment and the child [7].

Many special education studies put stress on normality and deviation in relation to teaching. Problematizing SEN Isaksson [8] concluded: A school class often serves as a reference when a teacher decides what are normal needs and special needs. Analyzing the increasing number of pupils in special school for children with learning disability, Swedish National Agency of Education [9] questioned how special you are allowed to be. Radically, Haug [10] questions the role of special education. If education is said to include every single child, why think about and put stress on compensatory solutions? From a relational perspective Persson [4, p.12] has made a definition of the area of special pedagogy "An area of knowledge within the discipline with the purpose to support pedagogy when the ordinary pedagogy isn’t enough to support the variation of students” (own translation).

2. Professional special education meet SEN – history and present

Like many other countries, Sweden has an educational tradition in using separate systems for SEN children, as the child so to say was the problem, from a teacher’s perspective. A special teacher taught “abnormal” children in “clinics”, in a separate room in the school building. This differentiated practice flourished in the 1960s when Sweden had exclusive special education for lots of children. There could be separate classes for children with visual impairment, classes for children with hearing impairment, cerebral palsy, learning disability or behavioral problems. Other examples were named Reading class and Support class or Outdoor and Health class for those who had or have had tuberculosis [11]. Evidently, individual needs tied to individual disorders and diagnoses caused differentiation and specialist teaching.

Coordinating ideas were spread and in the 1970s Coordinated Special Education became a concept and sort of an integration tool. Although the special teacher possessed the expert knowledge of teaching special children, special pedagogy in the 1980s started to concern every teacher thanks to generous government grants. The special teacher Program was closed by the Swedish Government and Department of Education in 1991.

A new profession replaced special teachers, special pedagogues, in order to coordinate support in a new holistic perspective on children and their needs. These efforts were related to the international Salamanca statement [12] of Inclusive Education (IE) and Education For All (EFA). The implementation of this groundbreaking statement called upon all 92 countries to educate all children in an inclusive classroom beyond disorders, disability, race, linguistic ability, economic status, gender, learning style, ethnicity, cultural and religious background, family structure and sexual orientation [2, p.13f.]

After 17 years the Special Teacher Program started again in 2008, now with six different directions (as prior mentioned): Learning disabilities, Mathematical development, Development of language, writing and reading, Severe speech language impairment, Deafness or hearing impairment and finally Visual impairment.

Again expert competencies towards different disorders and impairments were requested. Lately the Swedish Ministry of Education suggested an additional special teacher direction towards neuropsychiatric disorders. Several special education researchers strongly opposed this proposal, as it seemed to be a step towards treatment of individuals in the opposite direction of IE. According to new radical steps in Swedish educational politics it has been questioned if the Swedish school system still is an Education For All [4]. Checking the future, Farrell [5] makes an analysis. Estranging IE as an idea is an international trend.

After this short flashback, we want to stress the importance of grasping not only a linear and chronological account but also different models of and perspectives on understanding SEN, which can appear then as well as now [2]. “Historical aspects still resonate and can inform contemporary views and approaches – for example terminology” [5, p.127].

3. Methodology

To be able to track the use of the notion special education in the teacher education of SEN an analysis of institutional documents [13] has been done. In this analysis we have analyzed documents by deconstructing the text, searching for code words pointing at an interpretation of special education. By analyzing texts governing the education for special pedagogues and special teachers, and an official assessment of this education [14], we have tracked how the notion of special education is used both from an ideological perspective and as a tool. This way of analysis gives access to interpretation and use of the notion special education. Even though knowledge about how the notion actually is grasped and about how students perform their special educational work is not reachable by this method, nevertheless it provides a strong indication of how the notion is intended to be grasped and used.

The choice of sampled texts will of course affect the result image of SEN in this empirical study. We use texts from both national and local level. The documents used in the analysis are the Degree
Ordinances [15; 16] (which are decided by the Swedish government, meaning we are bound to follow these decisions), educational plans for the programs at Linnaeus University (which are based on the Degree Ordinance), and a self-evaluation of the programs, which was governed by the Swedish higher education authority [14]. These texts express and declare what we in Sweden on a national and local level express and declare about SEN. As responsible and involved in our two Special Education programs we authors of this text have sort of impact on what special pedagogues and special teacher ought to learn in order to become professional. One of the sampled texts [14] is produced by ourselves - though as a part of an ordered valuation (by the Swedish Higher Education Authority) of 6 of the goals in the two programs of SEN – in order to show what we ourselves highlight as core and quality in these programs.

4. Results and analysis

In the governing documents different words expressing special needs in the education of special pedagogues and special teachers has been identified. Below a presentation of the wording is presented.

In the Degree Ordinances [15; 16] decided by the government there are both similarities and differences in the wording regarding the two different programs for teachers of SEN. In the case of special teachers, the word development is frequently used. Together with knowledge it appears five times (development of knowledge in the different directions). Children and students in need of support are mentioned two times. Learning and development of learning environments as well as to eliminate barriers and difficulties in different learning environments is mentioned. To support children and students is mentioned and individualized approach for children and students is also mentioned as well as Human rights and ethical issues. In the case of special pedagogues the word development occurs only once, together with "of the pedagogical work". The most frequently word used in this text is learning environment, which occurs two times. Words that occur once is children and students in need of support, prevention, eliminate barriers and difficulties in different learning environments, face the needs of all children and students, analysis of difficulties at organization-, group- and individual level, human rights and ethical issues.

The Educational Plans for the programs of SEN at Linnaeus University are grounded in the Degree Ordinances. Hence the words that signal SEN is the same as described above in both of the different Educational Plans. Furthermore, in the Educational Plan for special pedagogues the words to meet students in need of support at organization-, group-

and individual level is mentioned three times and in the Educational Plan for special teachers the same words are mentioned once. Other words used in both of the Education Plans in addition to the wording in the Degree Ordinance are the integrative relationship between theory and practice and gender, social class and ethnicity.

When analyzing our own written evaluation text [14], many of the words appearing in the governing documents are also visible in these texts such as Human rights, ethical issues, support children and students, children and students in need of support, prevention, eliminate barriers and difficulties in different learning environments. The integrative relationship between theory and practice, which is highlighted in the Education Plans, is also visible in the evaluation texts for the programs as well as gender, social class and ethnicity.

In the governing texts for both programs the words to meet students in need of support at organization-, group- and individual level occurs several times. In the evaluation text the words organization-, group- and individual level is occurring, but with a subtle difference in the preceding words. In the evaluation text for the program of special teachers the preceding words are learning environment and analyze, prevent and remedy. In the program for special pedagogues the preceding words are qualified conversation partner.

The notion development occurs in both the governing texts and in the evaluation texts for both programs. In the evaluation text for the program of special teachers development is mentioned only a few times, and then in the context of the individual and knowledge. In the evaluation text for the program of special pedagogues development is mentioned more times and then in the context of learning and socialization, motivation and School development as well as the individual.

To sum up, all these SEN notions and expressions, which we found in the sampled texts, could be colored stones in a larger mosaic. If we put them together one by one, they show a detailed picture of how the empirical body of SEN could be depicted. The analysis is made in a combination of both national teacher education level and local university teaching level. This means a richer picture of this body. Let us take a look at the whole mosaic. How could we interpret and understand this larger picture with all its details? What does SEN means, painted like this?

5. Discussion

Out of this piece of research and its analysis of the governing documents we can establish that the view of SEN in the two educations oriented to SEN at Linnaeus University (special pedagogue and special teacher) signals needs in the school teaching
and school education, not needs within the individual child. This can be seen in both the governing documents and in the self-evaluation texts in wording like human rights, development of learning environments, individualized approach, prevention, eliminate barriers and difficulties in different learning environments and face the needs of all children and students. All this indicates that the program students at Linnaeus University are taught to problematize the child’s or the children’s learning environment, according to relational pedagogy [4], although an individual perspective is said to be the most durable and established standpoint when talking about SEN [5]. And these findings may possibly contradict what Lansheim [5] describes: newly examined special pedagogues and special teachers often used an individual perspective. But – and it has to be said in this context – the students at Linnaeus University as well as at all Swedish universities with special teacher education, learn to work in sort of a differentiated practice. We can find at least small pieces of similarity with those differentiated schools flourishing in the 1960s [11]. Obviously we need more and more experts in different disorders and disabilities. And we still have a special school for children with learning disability, one single disability.

Anyway, the writing in the documents also signals that the focus of the education is not on deficits or disorders, but on development of knowledge, which is mentioned several times in the governing documents, especially in the governing documents for special teachers. This indicates a desire to strive forward, not focusing flaws, but strengths. Nevertheless, in the self-evaluation text of the special teacher program the word development is not used more than twice. The reason for this can be the interpretation of the word development in the context of the different directions in the program. This can be seen in the use of words, for example instead of “development of reading and writing”, the word “literacy” is used. And instead of “development of mathematical skills” the word “mathematical literacy” is used.

The Swedish school law [16] highlights the rights of equal education for all students. This is visualized in the education for teacher of SEN in Sweden by the notions face the needs of all children and students, ethical issues and human rights. These notions, which are highlighted in both of the programs at Linnaeus University, are a common basis for teachers of SEN at Linnaeus University. Based on this common basis there are some differences in the use of SEN. These differences depend on the wording in the Degree Ordinances [15; 16] and interpretations of these words. In the special pedagogy program focus is on learning environments and development of the pedagogical practice. In the special teacher program focus is on development of knowledge in the context of the direction.

So, if a sprawling teacher education of SEN with many different directions is the answer, what can be the question? And, is SEN different things within the different directions in the education? The answer to this question also posed in the title depends on how we interpret SEN at national teacher education level and local university teaching level. In summary the results show that at Linnaeus University we do not have a sprawling view on SEN, even though there are two different programs and three different directions in the teacher education of SEN. The common basis is the same, a relational perspective [4] with focus on full participation for all students in the education. We fight against the international trend, which Farrell [5] identified when checking the future. We do not want to abandon IE, neither as an idea, nor as an educational or social reality.

6. Conclusion

As a conclusion, we have identified a need in the education to provide with SEN-knowledge from both an ideological and practical perspective. There is also a need to provide with SEN-knowledge within many different approaches, such as learning disabilities, mathematical development and development of language, writing and reading. This is difficult to accommodate within one individual’s competence, hence there is a need of both special pedagogues and special teachers with different competences in the field of SEN. This need also put demands at the organizational level, requiring knowledge of how to organize the competences in schools. Based on this, we can now provide with a question to the answer posed in the title “a sprawling teacher education of special education needs (SEN)”.

The question is: “How can we identify and meet all special educational needs and educational needs in school?” And, as individual researchers and local university teachers we prefer the notion Inclusive Education (IE) instead of Special Education. This in order to point out, declare and provide complete and full participation for all learning children and young people in educational settings where everybody is accepted and supported in a professional, respectful and sensitive way (cf. [18]).

7. References

[16] SFS 2011:186 Examensordning specialläraresexamen
[17] SFS 2010:800 Skollag
Perception of School Climate and Victimization by Peers in Secondary School Senior Years

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1. Scope

Students victimized by peers have a more introverted temperament and demonstrate less social abilities [9], [12]. Moreover, they have a higher risk of developing depressive symptoms, low self-esteem, fear of going to school, learning difficulties, school failure, truancy, etc. [2], [8]. They are also less engaged in their school progression, present low academic achievement and are more at risk of school dropout [10]. Swearer et al. [15] support that repeated aggression creates a fearful and insecure perception of school climate that, in turn, diminishes school motivation and ultimately decreases academic performance. Victimization has even worst consequences on school achievement when students suffer it at the end of high school years. It is a crucial phase when students decide to leave school or continue to reach diplomas [5]. Most scientific literature suggests to take into account the influence of school climate in the prevention of victimization and school dropout [1]; [4]. For example, in the meta-analysis realized by Steffgen, Recchia and Viechtbauer [14] the results confirm that a positive perception of school climate is significantly correlated with the decreasing of victimization in the school. In agreement with this analysis, Poulin and colleagues (submitted) suggest that specific school climate components, like perception of security, have distinctive impacts on different forms of victimization. Research also support the fact that a positive school climate can prevent psychological maladjustment related to peer victimization, school failure and dropout [3]; [7]. In concordance with the scientific literature, this communication suggests to focus on precise forms of violence endured by students, and their link to the perception of school climate.

2. Objective and Motivation

This research is the first, of our knowledge, to focus on the links between victimization by peers and school climate perception for the students in their last two years of high school. With the objective to offer vulnerable students a better chance to persevere and succeed at school, this communication aims to first explain how victimized students perceived their school climate, to then suggests knowledge and interventions that will create a more secured school environment for them. For the present research, 715 secondary four and five students answered to a self-report online questionnaire about school life (school climate, tapping four components: security, justice, interpersonal relationship and support, collaboration/participation) and peer violence endured by students (six forms: physical, verbal, psychological, material, sexual connotation and electronic). Participants were enrolled in high schools from a Quebec City area school board (Quebec, Canada). A MANOVA analysis was realized to determine the difference in the perception of school climate between victimized and non-victimized high school students. The results provided us with a better understanding of the victims’ perception of school climate. It was then possible to suggest specific interventions to school staff targeting these students, often neglected in violence prevention programs [6], and to promote school success and graduation.

3. References


Special Education Teachers Perceptions of Approaches in Implementing Inclusive Education for Pre-Schoolers with Hearing Impairment in Nigeria

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Abstract

The researcher investigated special education teachers’ perceptions to approaches in implementing inclusive education for pre-schoolers with hearing impairment in Nigeria. The perceptions of 400 participants, draw from four states across the country, was sought. Participants were administered a questionnaire titled Teachers’ Perceptions of Approaches in Implementing Inclusive Education for Pre-schoolers with Hearing Impairment (TEPAIEH). The researcher formulated three research hypotheses on the basis of gender, teaching experience, and academic qualifications. The hypotheses were all tested by the use of t-test statistical analysis method. Upon testing the hypotheses, the one the basis of teaching experience was accepted while the other two on the basis of gender and academic qualifications were rejected. Based on the findings of the study, the researcher recommended that special educators should make adaptations and accommodations to the curriculum, their instructional techniques and evaluation procedures, as well as their classroom behavior management styles in order to meet the needs of every child with hearing impairment. It was also recommended that those specialists who are already engaged in inclusive schooling must be provided with sufficient instructional resources, while at the same time encouraged to continue their efforts to reach out to all learners.

1. Introduction

In almost every country, inclusive education has emerged as one of the most dominant issues in the education of persons with hearing impairment, especially those in the pre-school years since they are still in their formative years, and this stage must be handled carefully if they are to become well-adjusted and responsible adults. In the past 40 years the field of special needs education has moved from a segregation paradigm through integration to a point where inclusion is central to contemporary discourse. Even so the concept of inclusion is not unproblematic, both conceptually and practically [8]. From the outset, it must be said that inclusive education is a complex, if not a problematic concept. Despite the internationalisation of the philosophy of inclusive education [18], [17], for a range of historical, cultural, social and financial reasons its implementation in Nigeria has been uneven [4]. It has been a particularly problematic concept in other developing countries, where resources are limited and fewer than 2% of children with disabilities receive any form of education.

Inclusive education affects not just the conceptualisation of special educational needs and the nature of education provided for pre-school children with hearing impairment, but it calls into question the broader aims of education, the purposes of schools, the nature of the curriculum, approaches to assessment, and schools’ accommodation to diversity. Inclusive education is a process of enhancing the capacity of the education system in any country to reach out to diverse learners. The basis of inclusion is that special needs pupils have a right to the benefits of a full school experience, with needed modifications and supports, alongside their peers without disabilities who receive general education. Inclusionists contend that special classes, separate schooling, or other forms of removing children with disabilities from the regular environment should occur only when the nature or severity of the disability of the child is such that education in regular classes (with the use of supplementary services) cannot be accomplished. Today, in Nigeria, special educators, parents of students with disabilities, policy-makers and other stakeholders continue to debate the benefits and challenges of this education paradigm [4]. The discussions have been shaped largely by the principle of inclusion, which stresses that ordinary schools should cater to all children and young people, regardless of their circumstances or personal characteristics.

A succinct definition of inclusive education is provided by Lipsky and Gartner [11], who described it as students with disabilities having full membership in age-appropriate classes in their neighbourhood schools, with appropriate...
supplementary aids and support services. To Antia and Gregory [5], inclusion denotes a student with a disability unconditionally belonging to and having full membership of a regular classroom in a regular school and its community. They contrasted this with ‘integration’, or ‘mainstreaming’, both of which imply that the student with a disability has the status of a visitor, with only conditional access to a regular classroom, but primary membership of a special class or resource room.

In his review of 28 European countries, Meijer described three different approaches to including pupils with hearing impairment: one-track (including almost all pupils in the mainstream), multi-track (a variety of services between mainstream and special needs education), and two-track (two distinct educational systems). Ajuwon [3] explained that in both low- and high-income countries, proponents of the policy of inclusive education are now reaffirming their commitment to education for all and acknowledging the urgency of providing education for their marginalized citizens. The momentum for the inclusive education movement derives from the United Nations Educational Scientific and Cultural Organization (UNESCO’s) proclamation that, among other things, emphasizes that “Regular schools with this inclusive orientation are the most effective means of combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all.” [18]. He stressed further that according to Article 18 of the same blueprint, advocates buttress their stance by noting that: “Educational policies at all levels, from the local to the national, should stipulate that a child with a disability should attend the neighborhood school, that is, the school that would be attended if the child did not have a disability.

This latter principle appears to be what is implied in Nigeria’s National Policy on Education [12], which tangentially references the concept of inclusive education within the broader Universal Basic Education scheme. Consequently, some vocal advocates now see inclusive education as a favoured approach to responding to the needs of all students in ordinary schools. Thus, as inclusion of pre-school children with hearing impairment into regular classrooms becomes a reality within public schools in Nigeria, it becomes imperative to determine the perceptions of special educators toward this practice. Ajuwon [3] stated that these special educators, most of whom have been trained in the country, are gradually being recognized as key stakeholders in the implementation of the strategic inclusive practices at the pre-school levels of the education system.

2. Statement of the Problem

Inclusion is seen as a way of equalizing educational opportunities for both the disabled and non-disabled children in order to achieve an egalitarian society. To achieve the goal of inclusive education for pre-schoolers with hearing impairment, special education teachers are being trained on a large scale. Ajuwon [3] stated that these special educators, most of whom have been trained in the country, are gradually being recognized as key stakeholders in the implementation of the strategic inclusive practices at the pre-school levels of the education system. Despite the strategic functions of these professionals, the researcher is unaware of any published reports in which special educators' perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment in the country have been systematically studied. It is this realization that, in part, provided the impetus for the current empirical research.

3. Research Hypotheses

1. There is no significant difference between male and female special education teachers’ perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment in Nigeria.
2. There is no significant difference between special education teachers with long teaching experience and those with shorter teaching experience in their perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment in Nigeria.
3. There is no significant difference between special education teachers who are NCE graduates and those who are University/post graduates in their perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment in Nigeria.

4. Purpose of the Study

The purpose of this study was to investigate special education teachers’ perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment in Nigeria.

5. Review of Literature

5.1. Approaches to Implementing Inclusive Education for Pre-schoolers with Hearing Impairment

As Skrtic [16] pointed out, inclusive education goes far beyond the physical placement of children
with disabilities in general classrooms. Rather, as many writers have emphasised, it requires nothing less than transforming regular education by promoting school/classroom cultures, structures and practices that accommodate to diversity [6]; [14]. In implementing inclusive education, attention should be paid to three levels: the broad society and education system, the school and the classroom.

5.1.2 School level. At this level, the key market. people being given skills to enter the labour becoming freed of ‘disabling’ content, and disabled committed to working with all children, curricula morally committed to the integration of all children into a single education system, schools becoming welcoming environments, teachers becoming committed to working with all children, curricula becoming freed of ‘disabling’ content, and disabled people being given skills to enter the labour market.

5.1.3 Classroom level. Of course, the success or otherwise of inclusive education critically depends on what takes place minute-by-minute in regular classrooms. Inclusive education does not mean the coexistence of one programme for a student with special educational needs and another for the other students. Rather, it implies changing the programme and teaching approaches for all students in a class. In this sense, inclusive education is something of an educational Trojan Horse, since it involves not only accommodating regular classroom programmes and teaching strategies to the needs of children with disabilities, but also making adjustments to meet the diverse needs of other students in the class. In general terms, this means teachers adopting student-centred pedagogy, as distinct from curriculum-centred pedagogy.

Inclusive education also requires close collaboration between regular class teachers and a range of other people, including specialist teachers, teaching assistants, therapists, and parents. Features of consultation models that have been advocated include (a) the regular classroom teacher having primary responsibility for students’ overall programmes, (b) equal professional status of the regular teacher and the specialist teacher, (c) the involvement of parents in decision-making and planning [5], (d) teaching assistants working in partnership with teachers to provide supplementary, but not the sole, input to children with disabilities, and (e) most additional support being provided in situ, rather than through withdrawal [7].

5.2 Teachers’ Perceptions of Approaches to Implementing Inclusive Education for Pre-schoolers with Hearing Impairment

In order for inclusion to work in practice, teachers and in regular schools must accept its philosophies and demands. According to Salend and Duhaney [13], in their review of studies, educators have varying perceptions or attitudes towards inclusion, their responses being shaped by a range of variables such as their success in implementing inclusion, student characteristics, training and levels of support. Some studies reported positive outcomes for general teachers, including increased skills in meeting the needs of all their students and developing an increased confidence in their teaching ability. Negative outcomes included the fear that the education of non-disabled children might suffer and the lack of funds to support instructional needs. For special educators, the benefits included an increased feeling of being an integral part of the school community and the opportunity to work with students without disabilities.

Similarly mixed, but generally positive perceptions towards inclusion were reported by Scruggs and Mastropieri [15]. About two-thirds of the US teachers they surveyed supported the
concept of mainstreaming/inclusion. A smaller majority were prepared to include students with disabilities in their own classes, their attitudes depending on the type and severity of the disability. Only one-third or less believed they had sufficient time, skills or resources necessary for inclusion, especially for students with severe disabilities. In their study of Canadian teachers’ and principals’ beliefs about inclusive education, Stanovich and Jordan found two strong predictors of effective teaching behaviour in inclusive classrooms. The strongest one was the ‘subjective school norm’ as operationalised by the teacher’s attitudes towards heterogeneous classrooms. The second major predictor was an ‘interventionist school norm’, a measure derived from a scale ranging from the idea that problems exist within students (‘pathognomonic’), at one end, to the idea that problems result from the interaction between the student and their learning environments (‘interventionist’), at the other end.

6. Method

6.1. Participants

The study subjects were 400 special educators who voluntarily participated in the study. They were recruited from various special and integrated schools from four states in Nigeria, namely: Lagos, Ogun, Oyo, and Ondo states. Four hundred questionnaires were distributed to these special educators with the help of four trained research assistants who contacted these volunteers in the different states and explained the study rationale. Each volunteer received a copy of the survey questionnaire, including a cover letter which included the Consent Form for participation and provided a definition of the term inclusive education. Each volunteer was asked to read and sign the Consent Form and to return the completed survey questionnaire in a sealed format to the research assistants upon completion. A final total of 400 questionnaires were completed, returned, and deemed usable.

6.2. Instrument

The researcher employed an instrument titled Teachers’ Perceptions of Approaches in Implementing Inclusive Education for Pre-schoolers with Hearing Impairment in Nigeria (TEPAIEH). The first section of the questionnaire was designed to elicit participant demographic and background information. These characteristics included each participant’s gender, qualification attained, teaching experience, whether the participant has been trained in inclusive education, and the state in Nigeria where the participant is currently teaching. In Section 2, participants were asked to respond to 20 Likert scale items ranging from a value of 1 (strongly agree) to 5 (strongly disagree).

7. Results

7.1. Hypothesis 1

There is no significant difference between male and female special education teachers’ perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment.

Table 1: T- test Showing the Difference in Perceptions of Male and Female Respondents

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>Df</th>
<th>Cal-t</th>
<th>Crit-t</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>10</td>
<td>49.6</td>
<td>8.54</td>
<td>39</td>
<td>2.0</td>
<td>1.9</td>
<td>Sig</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>46.9</td>
<td>10.3</td>
<td>9</td>
<td>1.9</td>
<td>1.6</td>
<td></td>
</tr>
</tbody>
</table>

The table above shows that the calculated t- value of 2.01 is greater than the critical t- value of 1.96 with 398 degrees of freedom. This means that the hypothesis did not hold, it was rejected. That is, there is significant difference between male and female special education teachers’ perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment.

7.2. Hypothesis 2

There is no significant difference between special education teachers with long teaching experience and those with shorter teaching experience in their perception of approaches in implementing inclusive education for pre-schoolers with hearing impairment.

Table 2: T- test Showing the Difference in Perceptions on the Basis of Teaching Experience

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>Df</th>
<th>Cal-t</th>
<th>Crit-t</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Exp.</td>
<td>22</td>
<td>55.6</td>
<td>5.4</td>
<td>39</td>
<td>1.9</td>
<td>1.9</td>
<td>Sig</td>
</tr>
<tr>
<td>Short Exp.</td>
<td>17</td>
<td>53.5</td>
<td>5.9</td>
<td>8</td>
<td>0</td>
<td>1.9</td>
<td></td>
</tr>
</tbody>
</table>

As indicated in the table above, the calculated t- value of 1.90 is lesser than the critical t- value of 1.96 at 398 degrees of freedom. Thus, the hypothesis was accepted. This means that there is
no significant difference between special education teachers with long teaching experience and those with shorter teaching experience in their perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment.

7.3. Hypothesis 3

There is no significant difference between special education teachers who are NCE graduates and those who are university graduates and above in their perception of approaches in implementing inclusive education for pre-schoolers with hearing impairment.

Table 3. T-test Showing the Differences in Perceptions on the Basis of Academic Qualifications

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>Df</th>
<th>Ca</th>
<th>t</th>
<th>Df</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCE Graduates</td>
<td>18</td>
<td>77.2</td>
<td>9.95</td>
<td>39</td>
<td>2.1</td>
<td>1.9</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNI Graduates</td>
<td>27</td>
<td>79.6</td>
<td>12.4</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table above shows that the calculated t-value of 2.14 is greater than the critical t-value of 1.96 with 398 degrees of freedom. Thus, the hypothesis was rejected. This means that there is significant difference between special education teachers who are NCE graduates and those who are University graduates and above in their perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment.

7.4. Discussion

Research hypothesis one stated that there is no significant difference between male and female special education teachers’ perceptions of the approaches in implementing inclusive education for pre-schoolers with hearing impairment. Table 1 shows that the calculated t-value of 2.01 was greater than the critical t-value of 1.96. The hypothesis was thus rejected. This means that there was a significant difference in perceptions on the basis of gender. The difference in the perception of males and females respondents may be as a result of differences in levels of stress tolerance by both genders. Females are believed to be stronger in their ability to manage stress than males. Therefore, female special education teachers are more prepared to cope with whatever stress any approach in implementing inclusive education for pre-schoolers with hearing impairment will bring than their male counterparts. The result of this finding is in consonance with that of Ainscow and Miles [2] who found that female respondents felt more competent to teach children with hearing impairment than did male respondents. This gender-related finding has been found in other studies, such as Hodge and Jansma [9], and Leyser and Tappendorf [10], which found that females were more supportive of and exhibited significantly more positive attitudes toward teaching children with hearing impairment than males.

Research hypothesis two sought to find out if there is significant difference between special education teachers with long teaching experience and those with shorter teaching experience in their perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment. Table two shows that the calculated t-value of 1.90 is lesser than the critical t-value of 1.96. The hypothesis was, therefore, accepted. This means that there was no significant difference in perceptions on the basis of teaching experience. This result means that whether the teachers have been in service for many years or they are relatively new in the profession, their teaching experience does not have any bearing on their perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment in Nigeria. Any approach adopted is fine by them as long as there are other incentives and motivations. Ajuwon in his study also found that old special education teachers with long teaching experience and younger ones with shorter teaching experience were alike in their perceptions. They felt that adequate resources were available to assist them with the practice of inclusion. This finding could indicate higher levels of motivation and enthusiasm on the part of the teachers.

Hypothesis three stated that there is no significant difference between special education teachers who are NCE graduates and those who are University graduates and above in their perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment. This hypothesis was also tested and the result in table three shows that the calculated t-value of 2.14 was greater than the critical t-value of 1.96. The hypothesis was, therefore, rejected. That is, there was a significant difference in perceptions on the basis of academic qualification. This means that those with more academic qualifications and trainings in higher learning are always ready and more willing to adopt whatever approach is being used in implementing inclusive education for pre-schoolers with hearing impairment in Nigeria. This may be because of their wider exposure compared to those with lower qualifications who may not have much exposure. Agbenyega [1] is also of the view that in terms of educational qualification, both a greater tolerance of potentially negative
behaviors and a greater understanding of the needs of children with hearing impairment were associated with higher formal education and training. The motivation of participants who have acquired advanced professional training may have led them to embrace new conceptualizations in the emerging field of inclusive education. This is a positive finding which underscores the necessity to provide ongoing professional development and training to special educators.

8. Conclusion

This study has looked into the issue of special education teachers’ perceptions of approaches in implementing inclusive education for pre-schoolers with hearing impairment. This study has clearly shown that to bring about inclusion, changes must take place at all levels of society. These include differences becoming positively valued, education systems becoming morally committed to the integration of all children into a single education system, schools becoming welcoming environments, teachers becoming committed to working with all children, curricula becoming freed of ‘disabling’ content, and disabled people being given skills to enter the labour market.

Different approaches in implementing inclusive education are discussed. These include: (a) the regular classroom teacher having primary responsibility for students’ overall programmes, (b) equal professional status of the regular teacher and the specialist teacher, (c) the involvement of parents in decision-making and planning, (d) teaching assistants working in partnership with teachers to provide supplementary, but not the sole, input to children with disabilities, and (e) most additional support being provided in situ, rather than through withdrawal.

9. Recommendations

Based on the findings of the study, the following recommendations are made:

1. Special educators should make adaptations and accommodations to the curriculum, their instructional techniques and evaluation procedures, as well as their classroom behavior management styles in order to meet the needs of every child with hearing impairment.
2. Those specialists who are already engaged in inclusive schooling must be provided with sufficient instructional resources, while at the same time encouraged to continue their efforts to reach out to all learners.
3. Education should be seen by the government as a basic human right and the foundation for a more just and equal society. Government should, therefore, endeavor to provide adequate funding to meet the target goals and objectives for equalizing learning for all pupils, including those with hearing impairment in our public schools.
4. Special educators experience a number of constraints that are likely to affect their perceptions and attitudes. These professionals must be given the opportunity to increase their sense of accountability for bringing about positive change outcomes.

10. References


Session 4: Assistive Technologies

Assistive Technologies to Support Independent Mobility of Visually Impaired and Blind People
(Author: Sara Jeza Alotaibi)

Symbolum – An Alternative Communication Pictographic Board for People with Inability to Communicate Verbally
(Authors: A. Gomes, C. Páris, H. David, J. Barbosa, N. Martins, A. Santos)

Teaching Basic Life Skills Using a Sound-Based Software for a Student with Multiple Impairments
(Authors: Sudharsan Iyengar, Christine Bothun)
Assistive Technologies to Support Independent Mobility of Visually Impaired and Blind People

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Abstract

Visually impaired or blind people are often dependant on the others to make a journey from one place to the other. Due to the advent of assistive technology, many tools and devices have been developed to help the blind people make displacement safely and independently. This paper presents some of these devices that are categorized as the following; electronic travels aids, electronic orientation aids, navigational systems etc.

1. Introduction

The term ‘assistive technology’ is commonly used to indicate technology that is designed for people with some kind of disability [2]. Over the years, it has been researched and concluded that the best quality about an assistive technology is that it performs the task without the person having to think about the technology itself [1]. For such a large group of people, necessary solutions should be provided to make them independent in terms of their mobility and work [3]. People who have severe visual impairments face many hurdles in accomplishing independent mobility which would be safe and reliable for them [4]. There are several good assistive technological equipments and solutions available but some have serious drawbacks [5]. These assistive technological solutions have their own advantages and limitations [8]. It has been reported that assistive technologies are highly used by blind users however some researchers have also discussed the abandonment of such devices by the users after sometime [12].

The paper is structured in the following manner; Firstly, the background of the subject is explained in Section 2. This is followed by a critical review of technologies that have been developed for the blind to provide them assistance. Then, Section 4 shows evaluation of these solutions and technologies. Finally, Section 5 concludes the paper with a summary and future work is explained in Section 6.

2. Historical Overview

Visually impaired and blind people tend to face problem while travelling alone since they do not have a visual perception and orientation of their environment. Firstly, they face problems in acquiring information for planning their journey. After they have overcome this and have initial basic information, they face difficulties in keeping track of their planned journey and judging if they are going off-track [2].

Electronic travel aids (ETAs) are most important for blind and visually impaired so that they do not have to depend on any other individual for their displacement [3]. Some of the ETAs that have been proposed over the years are Mowat sensor [15], Teletact and VigitTack [16]; these are used for assistance to avoid obstacles.

Robotic development has also taken place in this field and many tools and inventions have been witnessed. In 2004, Iwatsuka [17] invented the robotic dog; they claimed it to be a smart vision based walker which was equipped with the speech recognition mechanism. Cameras were placed at human height to facilitate the experience of a normal sighted person. Another solution that has been devised over time is the use of smart electronic canes. Canes are used by around 4 million people in US as they provide the basic biomechanical required support for being mobile [18]. Canes cannot be termed as most efficient when obstacles are involved such as stairs, and surfaces with probable friction etc [19]. For such scenarios; active guidance is required to train the potential cane users [5].

Many systems have been developed to provide information to the blind that would be useful for a comprehensive mapping of the space around them and thus generation of navigational paths [20]; some systems proposed in the past are Kaspa [21], activated audio beacon by using cell phones technology [22].
3. Other Solutions by using Technological Assistance

The technologies that have been developed for the blind to provide them assistance in being mobile can be discussed in different categories; traditional low-tech aids, ETAs [18], EOAs , assistance for navigation purposes and assistance for (specifically) mobility. One research paper has been chosen for each category that reflects a clear understanding of the subject.

3.1. Traditional Low-Tech Aids

The paper chosen for this category is [6]. The most common aid of the past has been the traditional white cane which is lightweight, inexpensive and easy to carry. Guide dogs were also used for such purposes. However the usage of the white cane requires some degree and guidance to avoid any falling [10].

3.2. Electronic Travel Aids Medium Tech (ETA)

Technological Canes: One of the papers chosen for this research is [23]; to explain the technology about intelligent canes is about “Robotic Cane”. This paper gives a comprehensive explanation regarding the working and design of their robot. There has been a lot of development in the robotics field [9]. Blind people usually use a white cane or a guide dog (which is a trained dog to navigate the way for the blind) [24]. The advantages of the traditional cane and the guide dog have been observed and have proposed an interactive robotic cane [23]. They named the robotic cane “RoJi”; it is powered with two motors so that it can guide the person with sufficient power.

There is an ultrasonic sensor driven at RC motor; mounted above the wheels. It scans the space in front of it to detect any obstacles or hazards. It scans the area ahead at an angle of (+-) 900°. Another example of Electronic cane is Smart Cane [23]; just like the robotic cane, it is also powered with wheels and sensors for obstacle detection.

Another paper chosen for ETA is the Intelligent Glasses [16] which is a new sensory substitution to a sequential time-consuming environmental scan by electronic canes. It proposes a vision similar to a 3D world on a tactile display [16].

3.3. Electronic Orientation Aids

A system has been proposed in the chosen paper [14] for orientation aid to the blind users; it is the electron neural vision system (ENVS). This paper has been chosen because it supports a portable system to give outdoor navigation incorporates by GPS. One of the main features of this innovative system is to enable the user to avoid obstacles and provide navigation in outdoors [14]. It consists of a headset with two stereo cameras, digital compass and a computer with GPS capabilities. A depth map is created by the cameras, the portable computer is used to convert the information of the depth map and obstacles. This is sent to the electronic glove TENS in the form of electrical pulses that cause sensations in the finger. “The amount of stimulation is directly proportional to the distance of the objects in the direction pointed by each finger.” [14].
3.4. Assistance for Navigation

A paper has been chosen for navigation system proposed in [13] - Tyflos; it is based on two modules - Reader and Navigator. This paper has been chosen because Tyflos proposes a unique technique of obstacle detection; it is done in x, y coordinates. The main aim of this system is to integrate different navigation technologies like wireless handheld computer, GPS sensors and text-to-speech devices so that the user is given correct navigational instructions. The output of the directions is given in a tactile display. The role of the Navigator in this system is to capture environmental data from all the sensors and deliver this information to the user in the most appropriate manner.

3.5. Assistance for Mobility

Another system is chosen from the paper [14]; it has different systems described in the paper. One of the systems in it is CyARM; they claim that the main feature of this system is to provide aid in guiding orientation and mobility. It uses the ultrasonic sensors to detect the hurdles that might be present in a way. Along with the obstacles, it measures the distance between the object and the user. This feature will help him during his mobility as he will get the exact distance between the present objects. The information is delivered to the user via the tension of a wire that is attached to him for example with his belt. High tension in the wire will indicate that he is close to an object; so close that he might be able to touch if hand is extended. Low tension in the wire will indicate longer distance [11].

4. Evaluation of Solutions

Wayfinding can be defined as a technique adapted by blind people as they move from one place to the other without being dependant on anyone [7]. It involves two categories; orientation and mobility.

Orientation is the capability of a person to be able to judge where they currently are and to judge one’s position in the environment. Mobility involves the ability of an individual to travel safely while detecting hurdles and obstacles [7]. Navigation involves the synchronized combination of both sensory and cognitive skills [20]. Spatial Perception involves the ability of the person to determine the horizontal and vertical directions in a specific space; where distracting patterns may also be present [23].

The authors of paper [6] states that canes help in immediate and surface located obstacles. However they do not address the fact that low-tech canes do not give information about the distance that the objects might be at or at what height. Another set of authors [23] analyzed the usage of canes and stated that their Robotic Cane helps the blind travelers to navigate through their journey and detect the obstacles or other hazards that might prevail in the environment. They stated that the robotic cane makes independent decisions about the path; however limitation lies when the user might want to have control over the path that he takes. That is when the normal mode must be overridden to allow the user to take control of the robot. The main difference between the two technologies of Robotic cane and another cane named- Smart Cane is that Robotic cane scans the area ahead at an angle of 90° while the Smart Cane scans it at 45°. This makes the Smart Cane more accurate and detailed in terms of detecting obstacles.

The authors for ENVS stated that training is required for the usage of canes, whereas the testing phase of ENVS concluded that the users were able to reach their destination while avoiding obstacles and with minimum training [14].

One of the things that are missing from the usage of canes has been solved by the authors of the chosen navigation system – Tyflos; the unique feature of this system is that it offers the information about the path in two-dimensional array. This is very useful to overcome the obstacles in the way. This system will inform the user about the obstacles in x, y coordinates. Therefore, the height of the object can also be known [13]. They also state that DGPS is another technique which can be used in their systems to make navigation more accurate for blind users [14]. It offers localization with a precision of around 1m [6]. Another feature which is not present in the smart cane and robotic cane is to calculate the distance with other people. The researchers who supported the system of CyARM [14] proposed a system that calculates the distance between people to make the blind person’s mobility safer.

Robotic cane and many other solutions are often equipped with audio aid of directions and obstacles, which proves futile for deaf users. The researchers who proposed IG [16] gave a very good solution for this. The system provides a quick interpretation of the environment which displayed on the tactile display so that it is quickly explored by the user (Active Touch) [15].
5. Conclusion

Displacement from one place to the other can often be considered a challenge by some blind people. In order to make this task easier for the blind people many technological solutions have been proposed over the years that are called Assistive Technologies. These tools and devices assist the blind users to make displacements from one place to place while overcoming obstacles safely.

6. Further Work

Tylos, can be termed as an evolving system and needs to adapt to the human desires, this is possible with emphasis on experiments and testing. DGPS is not incorporated in the navigation systems to a great extent, further research should be done in this area. Robotic devices should be made light weight for their increased usage.

6. References


Symbool – An Alternative Communication Pictographic Board for People with Inability to Communicate Verbally

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Abstract

The new Information and Communication Technologies (ICTs) have come to be of great importance in facilitating the communication and, subsequently, the access to information and knowledge, thereby improving the living conditions of people in general and especially those with special needs. In this project we present Symbool a tool that uses ICT to aid communication of individuals with Cerebral Palsy. Although cerebral palsy manifest itself in different ways, affecting different parts of the body, there is usually a barrier that the majority of individuals have difficulty to overcome, which is its inability to communicate verbally and written. Thus, the main objective of this project was to create an alternative communication platform whose base settles in communication through graphic symbols, called pictographic boards.

1. Introduction

The new Information and Communication Technologies (ICT) has had a great importance in communication and ease of access to information and knowledge, thereby improving the living conditions of people in general and certain groups in particular. In the context of this project the integration of ICT in supporting people with cerebral palsy will be shown. Despite the use of new technologies being able to offer recreational opportunities, in this project, they will be primarily used as a tool to aid communication for these individuals, since this is a barrier that they often have great difficulty to overcome due to their inability to communicate both in written and verbal form.

The use of new technologies can provide alternative communication facilities and may give the cerebral palsy patients the possibility of communicating with the rest of the world, and thus stimulate their internal language, that is, their thoughts, ideas, feelings and desires that are in the process of construction because of the difficulty of communication.

Therefore the main objective of this project is to create an alternative communication platform, using new technologies where the base is the communication through graphic symbols. The platform aims to facilitate and improve the communication learning of a cerebral palsy carrier in society.

In this project’s proposal several objectives relating to the factors which should be integrated in this alternative communication system were idealized. This includes the fact that it is essentially based on pictographic systems with the interface customization of the communication system, meeting the special needs of each user. The idea also included the possibility of the system integration with some current social networks. Additionally the intention was that the system would allow to store information about relevant user’s actions, as a way to constitute a history of interaction that could later be queried or sent for processing in an external program. This stored information would be related to communications made and the photos, videos, music or other media handled by each user. The ability to make notes on user interest subjects, using the alternative media, was another proposed goal. In addition to these general objectives, there was a set of generic concerns at the level of design and interaction, which would take into account not only usability aspects but also specific accessibility issues in relation to the type of specific users. Finally, this project requires some concerns related with the fact that the target users in general have mobility problems so it would be desirable the use of mobile platforms such as tablets as a way to enable a mobile interaction screen as large as possible.

2. Cerebral Palsy

Cerebral palsy does not mean that the brain is completely stopped. What happens is that the brain cannot properly control the movements, in other words, the part of the brain responsible for the functioning of muscles, for example, cannot send the
necessitate orders to the muscles, because it was damaged. Therefore, many authors consider that the term cerebral palsy is inappropriate because the individual who suffers from it does not present a state of total stagnation of motor and mental activities. Thus, currently the most widely used term for this condition is non progressive chronic encephalopathy, a term that makes it clearer that the state in which the individual is has a persistent, but not evolutionary, character.

The difficulties of sight, hearing and touch, as well as the notion of distance, right, left and space, can also be characteristics of cerebral palsy. These difficulties may be combined in different ways and with different severity scales in the same individual, depending on the area and the extent of the brain that has been damaged. Thus, depending on the location of the brain that is affected and the number of afflicted cells, paralysis decreases the operation of different parts of the body, whereby we can distinguish several degrees and topographic physiological manifestations of cerebral palsy implying several degrees of autonomy coordination and balance, because only fine motor skills are affected, presenting a good autonomy.

Patients with cerebral palsy may also have cognitive delays, visual, auditory or speech impediments, epilepsy, learning disabilities and/or attention deficit. Although patients with cerebral palsy may have cognitive delays, this does not directly imply that they have a deficit of intelligence, as they only may have learning difficulties for sensory reasons or lack of ability to interact with the surroundings. When cognitive delays involve the same deficit of intelligence, this means that parts of the brain that are affected are directly linked to reasoning and memory. In addition to the problems presented, a large proportion of patients with cerebral palsy present great difficulties in communication in their day-to-day, language does not come naturally to them and, therefore, they have great difficulty in communicating. This undermines the cerebral palsy carrier in many aspects of their life, not only how they express their will but also their capacity to socialize with others. Thus, we consider essential to have alternative means to traditional forms of communication. According to Sameshima and Deliberato [1] it is important to identify the various communication possibilities of nonspeaking individuals, in order to select the best communication strategies for these people. The literature has described different forms of communication of children and teenagers who are either nonspeaking or have communication problems [2-5]. There are several studies [1, 4, 6] calling the attention to the different forms of communication of nonspeaking people with cerebral palsy. In this sense, one theme that has been growing considerably in research and practice in recent years is that of Augmentative and Alternative Communication [7].

To overcome the communication barrier that individuals with cerebral palsy face. Alternative Extended Communication Systems have been created; which according to Glennem [8], can be defined as other alternative forms of communication to the oral language. Also according to Capovilla [9] the term "alternative and facilitating communication media" refers to any resource that can be used to encode and convey a message without requiring writing skills or vocalization. This type of communication refers, in short, any means of communication that supplement or replace the usual ways of speaking and writing. It is a feature that uses strategies and techniques in order to provide the individual independence and communication skills, and opportunities for interaction with others. As examples of Alternative Extended Communication Systems we can cite the gestural language, sign language, facial expressions, alphabet boards, pictorial symbols and the use of computer-synthesized voice, among others.

We can point out well-known systems using pictographic symbols commonly usually used by people with cerebral palsy having difficulty in communication. Bliss symbols [10], Pictogram Ideogram Communication System (PIC) [11], Picture Communication Symbols (PCS) [12], Comunique [13], LMBRain [14], ImagoVox, ImagoAnaVox, ImagoDiAnaVox[15], Plaphoon [16] are some examples.

3. Symbolum: Requirements and Development and Used Technologies

This project was begun with an analysis of the functional requirements that must be taken into account. Thus, in a first phase some work to gather information on a set of interest actions was held. After this initial analysis of the desired features, it was considered beneficial to have two applications, one for people with cerebral palsy and another one for their therapists and administrators. In Symbolum it was considered that communication would include the symbols and appropriate categories of cognition for each user, which are set by the therapist. In the first application, "Symbolum: student", it was considered of interest the possibility to include the following functional requirements: - Create messages displayed on a screen abling the communication with nearby people whenever necessary; - Post these messages on Facebook; - Create conversations ("chat") with other friends who use the same application by exchanging messages and keep a history of these messages; - Edit the profile of the logged user to personalize/customize the form of interaction and personal information.
In the second application "Symbolum: therapist" it was considered of interest the possibility to include the following functional requirements: - Create, edit and delete users; - Manage groups of students, each group associated with a therapist; - Manage students’ pictographic communication boards; - Manage the global database of symbols used by the application; - Edit user information and consult reports about the user actions.

Additionally non-functional requirements, including usability and accessibility requirements, were also defined.

Firstly the requirements related with interaction, were discussed and defined. It was evident that due to its uncoordinated movements the main characteristic common to future users of this system is the difficulty they have to point and click. We have considered that the ease of use associated to the touch screens can help to surpass this problem, minimizing the difficulties that users with cerebral palsy can have. Although it is necessary to take some care in the positioning of interface elements and their spacing, we considered this type of interaction advantageous for our users. The option for touch screen allows us to choose some less expensive equipment, which can provide access to common communication systems, facilitating communication with others. Through the idealized system, this communication can be carried out autonomously, minimizing the need for continuous help from a therapist or family member. For this, we feel that tablets are the most suitable equipment to implement this system, due to the screen size combined with the portability advantages. This system has a standard interface based on direct manipulation. The users tap on the mobile device screen to manipulate virtual objects and navigate through the system. Throughout the planning, we have made some tests with other applications in order to test specific aspects related to the accessibility of interaction areas, in particular, to its size and location. We also took into account general usability issues including the fact that the system must be developed to have an easy and efficient use. It should allow easy learning on how to interact with it and enabling the user to find what he/she needs quickly. In the interface definition, it is also important to present the content in a user-friendly way, so that the users are satisfied with the system. In addition to these considerations, several informal meetings with therapists have been conducted in order to consider the best options in terms of simplicity, intuitiveness and ease of navigation for this specific audience.

To reach the identified requirements a general architecture for the system (Figure 1) was defined.

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To reach the identified requirements a general architecture for the system (Figure 1) was defined.

The therapist application, developed for Android tablets, allows all the management of users and the configuration of the pictographic boards involved in the system. All settings are stored and made available through a server, accessible from anywhere with Internet connectivity. The student application, also developed for Android tablets, is the application used by students/children to use the system and communicate with their peers, through the server (talks) or posting directly into personal accounts on Facebook.

3.1. Android

Android is an operating system developed by the Open Handset Alliance, currently the development is led by Google Inc. The system is based on the Linux operating system and has been specially designed for mobile devices with touch screens such as smartphones and tablets. More recently, its use has been expanded to other devices, such as Smart TV, Smart Watches or even cars, with specialized and appropriate interfaces for such devices. Currently android is the most used mobile operating system in the world and, according to Google Inc., in the beginning of 2014 there were over 1 billion active users for at least 30 days. This was also a reason for choosing this operating system.

3.2. Server

Under this project, a server was created to satisfy the need to transfer data between applications of different devices over the Internet. The server is responsible for managing a common database for all devices, that is possible to be manipulated and updated on each different device, and also acts as an intermediary in sending messages between users.

The platform chosen to host the server was the Google App Engine because of its ease of use and service availability, allowing the use of a development platform and programming language that permits a better match to the developed Android applications.

Google App Engine is a Google platform that functions as a cloud computing service to host web applications on their infrastructure, these web
applications can be written in Python, Java or PHP and are kept in a security level sandbox style. Depending on the number of requests to servers and the number of required resources by applications, the App Engine automatically allocates resources in order to support the application requirements.

However, the free version of this platform has some daily traffic limitations. When a higher level of traffic is needed it can be required from Google (as a paid service), overcoming limitations.

Communication between the Android applications and the server hosted in Google App Engine is done through a Servlet API (Application Programing Interface), programed in Java language, and specifically through HTTPServletRequests directed to the server. The communications (including threads and sockets needed) are supported and managed by the Google App Engine platform.

3.3. Database

The server database is implemented with the help of JDO (Java Data Objects) API, available in the Google App Engine service, which allows to store objects persistently. This database allows storage of all relevant information to the Symbolum pointed out here: - System users (administrators, therapists and students) and definitions of their profiles; - Generic categories of symbols and their symbols; - Pictographic tables individualized for each student, their categories and symbols; - Pictographic conversation messages between different users.

3.4. Communication

Communication between the applications and the server is done using the HTTP protocol, following the Web Services model. The choice of this protocol facilitates the communication with the server even in places where there are access restrictions (behind firewalls). The HTTP works through the client-server model. A set of methods (functions) are made available that can be called by the client to access some features or information required. Among all the methods, the GET and POST are the most used. In the current project only the POST method was used. The requests made to the server are always built through an array of String tuples (pair of values) or hash map where the first is the key (parameter name) and the second is the value. The server receives these parameters in the POST method and then, based on the first value of the parameter list, it calls the appropriate function, running the command/request in question.

3.5. Facebook

Facebook is one of the best known and most used social networks currently available. Relations between the participants will be created through mutual acceptance of friendly relations (friends) or expressing interest to view other publications (followers). Facebook allows any person or entity to publish their interests or comments. These publications are available for discussion and can be commented on by all the “friends” or followers of the authors of the information. Facebook also allows direct communication between users via a chat system (Messenger). However, in this project, it is the publication and discussion of items that have a special interest, due to its asynchronous operation. This way of functioning can reduce the problem in how the amount of information available on a network like Facebook is managed, in terms of quantity and complexity, limiting the response by the target audience of this project in a timely manner. In this first version Facebook is used only to publish certain messages at the request of the user.

4. Some Utilization Examples

Next some utilization examples are presented. To note that all the options are in Portuguese. However it is the intention of the authors to have a multinational version prepared to several languages.

One of the Symbolum possibilities is the users’ management. Thus, in the "Contas de Utilizadores" (in English, “User Account”) we can add, edit or delete users. To search for a user we need to write a name in the search field and then press the search button; when pressing the search button on an empty search field all users will be displayed. The image below shows how to add a user.

![Figure 2. Adding a user](image-url)

When selecting a user from the “Lista de Utilizadores” (in English, “Users List”) all the information about the user will be shown on the right side. After selecting a user it is possible to save the changes made or even delete the selected user.
In the board-editing screen, after choosing a user, a list of all communication categories suitable for that student will be displayed. After choosing a category, a list of all respective symbols added in that communication framework will be shown. Here it is possible to edit a category, adding or deleting symbols in the selected category. It is also possible to synchronize the student board from the server and add new categories to the communication plan. The upload of a category will include the list of symbols of that category.

In “Conversas” (in English “Conversation/Chat”) it is possible to see the conversations between the user and a friend. On the left side is a list of all the friends and on the right side is shown the conversation with the selected friend.

The communications framework to write a message to be sent is shown in the figure below. The user composes a message selecting the category on the left side list and, after that, chooses a symbol on the right side. The symbols that form the message will appear at the top of the screen. With the buttons available it is possible to delete the last symbol added (button A) or send the message to the previous selected friend (button B).

7. Conclusions

As active citizens working with technologies, we cannot ignore the possibilities that they can offer to promote the inclusion of people with disabilities. In this paper we presented the Symbolum, an alternative communication system using pictographic symbols to promote the possibility of individuals not able to communicate verbally and/or writing (such as those with cerebral palsy). The Symbolum application has been the subject of some informal tests. Since the beginning of the planning process, we followed an iterative development methodology focused on users. Hence, throughout the development we focused on understanding the user, their goals and tasks as well as the environment (physical, organizational, social) around them, with permanent meetings with therapists and carrying out some observation sessions with Cerebral Palsy users. The description and results of these tests will be the focus of another paper.

8. References


Teaching Basic Life Skills Using a Sound-Based Software for a Student with Multiple Impairments

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Abstract

This paper describes our ongoing project to enable a student with multiple impairments (which includes visual, auditory, speech, motor skills, and possibly cognitive skill) to learn and use basic life skills. As traditional teaching methods using visual cues and/or oral expressions are ineffective, we use sound – as an alternative medium to teach using a custom developed software. Progressively we have used and assessed different sounds with different life skill activities – such as eating, wiping the face, drinking water, and such.

1. Introduction

Traditional methods of teaching is ineffective when individuals have multiple impairments. According to the Individuals with Disabilities Education Act’s (IDEA), multiple disabilities refers to “concomitant [simultaneous] impairments (such as intellectual disability-blindness, intellectual disability-orthopedic impairment, etc.), the combination of which causes such severe educational needs that they cannot be accommodated in a special education program solely for one of the impairments. As stated in [1] “this group may require instructors to consider more elaborate accommodations”. Students with visual impairment are taught and use Braille. They feel the Braille letters instead of looking at the printed word. Students hard of hearing learn and use sign language to communicate. But when they also have motor impairment they may not be able to use Braille or sign language effectively. So is the case when a student has visual and hearing impairments. Other techniques are required to supplement the issues posed by multiple impairments.

Students with severe cognitive and or speech language deficits but with vision use a picture system called PECS to communicate. Auditory therapy is used to achieve/seek attention and self-modulation in autistic and cognitively impaired subjects. There are many advantages to such therapy [2, 3, 4].

Simple sound or sound strings are devoid of linguistic complexities. Thus sound can be effectively used to teach elementary concepts and association. This method is shown to be effective as a Montessori Method to teach letter sounds [5]. The Montessori Method also uses basic shapes and colors to associate complex concepts as nouns, verbs, adjectives etc. when teaching language arts. The semantic concepts are associated with elementary and universally recognizable objects like sound or shapes.

Ability to identify and sort simple and regular objects is considered basic and used as a measure for pre-kindergarten screening.

Understanding this elementary human capability and engaging that to teach higher level concepts is one way we can overcome disabilities with multiple impairments [7, 8, 9]. For visually impaired it is the inability to view and consequently perceive and abstract the characteristics of the shapes. For the cognitively impaired the abstraction of the concept and the ability to associate linguistic expressions to objects, may be the factor.

Our ongoing project is to use elementary sound and sound strings to teach basic life skills to a student with multiple impairments and to study its effectiveness. Augmentative and alternative communication is advocated and prescribed when working with such students [10]. A curriculum for early intervention for infants and young children with multiple impairments can be found in [11]. Furthermore a collaborative approach in these situations is warranted [12, 13, 14].

2. Background

We are working with a student – referred to as J - with very limited vision capabilities, extremely limited limb and hand motor skills, extremely limited speech skill, and possibly cognitive deficits as well as hearing impairment, J does not communicate verbally or physically in any traditional way. J does not
respond to verbal communication or physical gestures in the traditional way. Therefore, the therapists that help her at school have not been able to communicate and receive feedback. She is now a teenager.

During one of the discussions between the authors – one a computer science professor involved in foundational artificial intelligence research and the other an occupational therapist grappling with ways to assist J – the idea to use alternate mode to train and teach J was conceived. The foundational research in AI by the first author deals with identifying cognitive primitives that form the foundational framework for higher order intelligence. One of the approaches is to identify cognitive primitives that are devoid of semantics and then superimpose domain specific semantics to use these primitives. Sound and consequently music is one such medium used in cognition but semantics is not necessary.

Thus the use of sound strings as an alternative mode of communication for J. This intervention technique is devoid of linguistic complexity and does not involve visual gestures. We first enable J to associate regular objects with regular sound strings and thus enable J to recognize and/or sort these objects. Subsequent to this we apply similar process to teach life skills.

Our project uses a very simple custom software that, upon the therapist’s selection plays sound strings for associated objects. J is trained with the assistance of the OT. After the training we observe for voluntary reaction to the sound strings to assess J’s learning.

3. The Project

The project is implemented to train and subsequently study the response, in stages as described below. Evidence of learning is monitored for the effectiveness.

We developed a prototype software (SAM) that plays selected musical strings. Associated in the UI with this selection is an object. This is used by the examiner to select an object and play the corresponding sound (that J can hear) during the training of hand-to-object by the OT or to observer J’s reaction during assessment. The system has various selection options and enables the process to be repeated without noise. The software is modified when objects and their sounds are changed during the different stages.

SAM is implemented in Java using the JFugue sound package. Sound output can be controlled and presented to J via speakers or earphones. J is trained, in stages, by the examiner/OT. Subsequently J’s response to playing a sound is observed for evidence of learning. During the assessment process upon a positive response by J a musical piece is played – as a “Good Job” reward.

The following describes the different stages of the project.

Initial stage: Teach that the sound has meaning.

Teaching Strategy: Hand under hand reach for object that matches sound sequence. The trainer will assist with hand under J’s hand and reach object that matches a sound sequence.

Assessment: Behavior that is evidence of learning: Look for intention to reach or volitional movement when J hears a sound. Indicative that J has learned that sound sequence has meaning.

Prior to this stage J listened to music. J has been listening to music passively without realizing that the sound can have meaning. The intent of this stage is to create this understanding.

Second stage: Teach specific sound to shape/object that matches sound sequence.

Teaching strategy: Hand under hand reach for object that matches sound sequence. The trainer will assist with hand under J’s student hand and reach object that matches a sound sequence.

Assessment: Behavior that is evidence of learning: Look for holding object that matches the sound played. This is indicative that J has learned that a specific sound sequence has specific matching object.

Success in this stage indicates that J is aware that sound has specific meaning. The intent of this stage is to create an understanding that a sound sequence matches a meaningful object.

Third stage: Teach different sound sequence for different objects.

Teaching strategy: Hand under hand reach an object that matches the sound sequence that is played. The trainer will assist with hand under J’s hand and reach the object that matches the sound sequence. We started with just two objects in this training process (as J has very limited reachability).

Assessment: Behavior that is evidence of learning: Look for J to reach and grasp the object that matches sound sequence played. The voluntary reach to the appropriate object is observed. The objects are placed
at the same location as during the training. Indicative that J has learned that different sound sequences have different meaning and that they match different objects. 70% more time/frequency will be close to demonstrating behavior.

By this stage J is aware that a sound sequence has specific meaning. The intent of this stage is to create an understanding that different sound sequence matches different objects.

Fourth stage: Teach sound sequence for an object sort according to the sound sequence.

Teaching strategy: Hand under hand reach, grasp, carry and release of the object that matches the sound sequence from the table to a bucket. The trainer will assist with hand under J’s hand to reach matching object and drop in a bucket.

Assessment: Behavior that is evidence of learning: J drops the correct object into the bucket. Indicative that J is able to match objects to matching sound sequences, and is able to use motor skills to drop the objects into a bucket.

Given that J has this motor skill, we know if the third stage is successful then J should be able to pass this stage. If J doesn’t pass this – it is evidence that the inability is not due to the motor skill, but due to the inability to match the sound sequence to the proper object.

Fifth stage: Teach sound sequence to sort recyclable objects.

Teaching strategy: Training similar to Fourth stage, except the objects used are a bottle and a can. Sorting this using the “Beee” and “Caaa” sound is training to teach recycling of the objects. These are two new sounds and objects.

Assessment: Behavior that is evidence of learning: J will drop the correct object into the bucket in response to the corresponding sound. Indicative that J is able to match objects to matching sound sequences, and is able to use motor skills to sort recyclable objects.

Given that J can match sound to object from Fourth stage, we use this stage to teach recycling objects. If J doesn’t pass this – it is evidence that there exists an inability to distinguish different sounds for different objects. Again 70% accuracy should demonstrate learning.

After successful completion of these stages the next steps are to teach life skills – viz. to communicate for water, food, or to be moved.

4. Sound, Shape and their Co-relation

This project involves simple co-relation between sound strings and objects. The sound strings map to a conceptual object. To begin with the number of notes (equal duration) played equals the number of sides of a shape.

A square object will have a sound sequence of four (4) notes. A sphere is associated with a single smooth note that starts at the note C goes all the way to note C at the next octave and returns back to the starting C note.

Subsequently different note strings are used for different objects. At present we use two objects at a time for training and assessment.

In order to accommodate the auditory capabilities and affinities of subjects we are using a variety of instruments with a high and/or a low pitch notes to make it comfortable. Sounds from instruments like the Violin and Cello, Flute, and Piano were used for the project.

5. Implementation and Data Collection

The study process is implemented as follows:

- Initial Stage is used for training and assessment as described. We used two or more sessions for this stage.
- There are multiple sessions of Second Stage. Each session has three steps. Step 1 is base-line assessment. Step 2 is training. And Step 3 is for assessment. Results from step 1 helps us measure if there was retention between sessions. Results of step 3 enables us understand/measure if training helped in the teaching process.
- Third Stage is training and assessment as described. Multiple sessions for this stage were also conducted as in Second Stage.
- There were multiple sessions of Forth Stage. Again, each session has three steps. Step 1 for base-line assessment. Step 2 for training. And Step 3 for assessment. Again results from step 1 help us measure if there was retention between sessions. Results of step 3 help us understand/measure if training has help in the teaching process.
- Training and assessment of the Fourth stage is used to validate ability to sort.
• Training and assessment of the fifth stage is used to validate ability to distinguish different sounds and sort recyclable objects.

Figure 1 in Appendix shows a sample user interface of the SAM software. Data during the sessions is collected during training and assessment and subsequently used during analysis. Information collected include the Subject ID, Session Description (Assessment or Training), Session Number, Date, Start and End Time, Shapes used.

The measurements are recorded on the form at least five times per session. There is also space for the examiner to include comments pertaining to the examining environment, subject response and progress as perceived by the examiner.

For each stage described above, the training/teaching is done to the satisfaction of the trainer/examiner. Due consideration is given to the duration between training and assessment. If the assessments indicate high and repetition is deemed redundant, then the study proceeds to the next stage.

6. Evaluation

The project is in its third year. We evaluate the training and assessment sessions and make changes that make the process conducive and adaptive to the J’s needs. Some of the factors that affect the sessions, and the results thereof are: J’s ability to participate – due to health or other reasons, mode of presentation of the sound strings, objects and their design, duration of the time, and frequency, of the tests. Therefore, many of the training and assessment sessions are video-taped for the sole purpose of observation, re-examination, and for proper collection of training and assessment data.

At the end of each sessions the results of the sessions are qualitatively summarized and retained by the examiner. Based on the result the sessions are repeated or the progress noted and preparations for the next session/stage is initiated.

7. Conclusion

The first thing that SAM taught J is to listen. With headphones on, a sound occurred with the presentation of an object. This way J learned that a sound symbolized an object and that sound had meaning. From this stage J has progressed towards listening to sounds to discriminate between two objects. Due to J’s physical limitations, consistent accurate physical reach is difficult. At the end of this stage, J could sort circles and squares with up to 75% accuracy. Now J is working on sorting activities where different objects go in different places. This task is more difficult due to the complexity of the motor movements to carry and release objects. When presented with a can and bottle, J can put them into separate containers providing her a vocational skill of sorting recyclables. J’s accuracy fluctuates between 60-80%.

In addition to the specific skills related to the trials, J has made additional gains. Now, J enjoys listening. J can listen and pay attention up to thirty minutes on a story. It is clear that J is listening as J expresses discontent with the person reading the story stops. J is beginning to use a communication device where J grabs an object to slide across the device to say a word. J uses this device to make choices for a drink or bite of food during snack time. Initially, J was dependent with eating with a staff person bringing the food to J’s mouth and placing it there. Now, J can bring a spoon to her mouth and pulls against her teeth to clear it. The speech and language therapist is working on mouth closure. J’s hand-washing routine has expanded to include the paper-towel dispenser. J can independently activate the paper-towel dispenser. With the sound it makes when it dispenses, J. knows to reach for the paper towel, tear the paper towel and throw it away. J continues to need support to dry hands. J consistently turns off the light when leaving an area, although may need multiple attempts due to the motor aspect of the task. J. is beginning to work on functional mobility. Although J is confined to a wheelchair and unable to operate it due to bilateral motor challenges and cortical visual impairment, J is beginning to reach for an object that symbolizes movement. So on a walk, J can let the person pushing know that J wants to go forward.

Subsequent study has helped us teach J to reach for brush to comb hair, reach for towel to wipe face, and with the use of jelly bean switch to request water or food by pressing the appropriate switch.

8. References


Appendix

Figure 1. SAM – Sample User Interface
Session 5: Inclusive Education

Perceived Impact of Stress on the Academic Achievement of Science Students in Education District IV, Lagos State, Nigeria
(Authors: Adewumi Arinade, T.A. Omomia, A.O. Omomia)

Special Education - Teacher Education in Australia: Confronting Concerns, Constraints, and Challenges
(Author: Phil Doecke)

Traditional, Online, and Blended Instruction: An Investigation of Outcomes in a Graduate Special Education Course Taught in Three Different Learning Environments
(Author: Mary Gozza-Cohen)

Expectations of Physically Disabled Students (PDS) in Science Classes in Kenya: Addressing Constraints, Prospects and POLICY
(Authors: Evanson M. Muriithi, Paul Amolo Odundo, Ruth Kahiga Mugo)
Perceived Impact of Stress on the Academic Achievement of Science Students in Education District IV, Lagos State, Nigeria

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Abstract

A student under stress can become tired and unable to concentrate. This study examined the perceived impact of stress on the academic achievements of science students in Education District IV of Lagos State, Nigeria. Descriptive survey design was used. One hundred science students were randomly selected from four schools in the district. Four research questions guided the study. A researcher-designed instrument named Stress Assessment Scale (SASS) was used for data collection. Simple mean was used for data analysis. Some of the findings were that students are stressed when science classes come up in the afternoon and at the end of the term. Students perceive stress as having negative impact on academic achievement. It was recommended that teachers should pace their work to avoid rushing students at the end of the term and science classes should come up early in the day. Also, students should be taught stress management skills.

1. Introduction

Academic achievement is the level of performance in school subjects as exhibited by an individual. It is the outcome of education, the extent to which students, teachers or institutions have achieved their educational goals [1]. It is generally regarded as the display of knowledge attained or skills developed in school subjects.

Several factors can impact on academic achievement either positively or negatively. These factors could either be intellective or non-intellective. Intellective factors refer to intelligent quotient or ability of the individual. Some of the non-intellective factors include level of mastery of foundational learning skills. Such as ability to concentrate, remember, think logically [2], amount of time spent on watching television [3], vision, organizational skills, study habits, peer pressure, passion [4], exercise, and nutritional skills [5]. Stress has also been identified as a factor that can have impact on a student’s academic performance.

Wienberg and Gould defined stress as a physical, mental or emotional tension [6]. It can be caused by both good and bad experiences. Stress describes a force that affects human beings physically, mentally, emotionally, socially and spiritually [7]. It is the body’s response to any undesirable demand. Stress also describes how people react to the demands placed on them causing them to worry and also incapacitating their ability to cope.

When people feel stressed by something going on around them their bodies react by releasing adrenaline into the blood. Adrenaline gives people more energy and strength, which can be a good thing if their stress is caused by physical danger. However this can also be a bad thing if their stress is in response to something emotional and there is no outlet for this extra energy and strength. The body does not distinguish between physical and psychological threats. When an individual is stressed over a busy schedule, an argument with a friend, a traffic jam or mounting bills, the body reacts just as strongly as if the individual was facing a life or death situation. If an individual has a lot of responsibilities and worries his emergency stress response may be “on” most of the time [8]. Long-term exposure to stress can lead to serious health problems. Chronic stress disrupts nearly every system in the body [9]. It can raise blood pressure, suppress the immune system, increase the risk of heart attack and stroke, contribute to infertility and speed up the aging process. Long-term stress can even rewire the brain leaving an individual more vulnerable to anxiety and depression [10]. Kaplan and Sadock opined that learning and memory could be affected by stress [11].

It is completely normal for secondary school students to experience stress. This is because they deal with various pressures, which cause stress. Causes of stress are referred to as stressors. According to [12] stressors do not cause anxiety or tension by
themselves instead stress results from the interaction between stressors and the individual’s perception and reaction to those stressors. The amount of stress experienced may be influenced by the individual’s ability to effectively cope with stressful events and situations.

Womble referred to stressors among students as “academic situational constraints” [13]. A study carried out by [14] identified five common stressors in secondary school students’ life as school, family, friends, relationships and community. Bolyn also added factors such as social pressures and physical appearance to the list of stressors among students [15]. Kelly, Kelly and Clanton asserted that the amount of sleep students have access to might cause stress and thus influence their academic performance [16].

David also emphasized that secondary school years should be great experience but many demands and rapid changes can make them one of the most stressful times of life. Students today face increasing amounts of schoolwork, a rapidly changing curriculum, assignment deadlines and examinations. Students worry about selecting careers and post secondary programs. They must balance schoolwork with sports, hobbies and social life [17].

In lieu of the negative effects of stressors among secondary school students, there is a need for early intervention that can help to reduce stress or enhance students coping skills. Dziegielwski, Turnage and Roest-Maeti are of the opinion that if coping skills are effective in decreasing stress and feeling of anxiety, students have greater chances for academic success [18]. The problem therefore is: what will be the impact of common stressors, the time science is taught and students’ perceived impact of stress on academic achievement? Thus the purpose of this study was to find out the common stressors among science students, time science is taught and students’ perceived impact of stress on academic achievement and suggest ways to minimize or control stress among secondary school students.

2. Research Questions

The following research questions were raised to guide the study.
1. What are the common stressors found among science students?
2. What time of the day and the term does students experience stress most?
3. What is the perceived impact of stress on academic achievement of Science students?
4. What are the ways to minimize or control stress encountered by students in secondary schools?

3. Design

The research design used in this study is descriptive survey.

4. Participants

Participants in the study were one hundred (100) Senior Secondary 2 students randomly selected through ballot method from Education District IV, Lagos State. Four secondary schools were randomly selected from this Education District. The mean age of the participants was 15\(\frac{1}{2}\) years with their age range between 13 and 18 years.

5. Instrumentation

Stress Assessment Scale for Students (SASS) was designed by the researchers and it was the instrument used to collect data in this study. The SASS is a 43-item questionnaire that assessed the perceived impact of stress on the academic achievement of Science students. The structured scale was constructed using four points ranging from strongly agree (SA) to Agree (A) to disagree (D) and strongly disagree (SD).

5.1. Psychometric properties of the Instrument

Validity: The face and content validity measure were adopted in this study. Face validation was employed to ascertain if the instrument contained the appropriate items that could be used to collect information on common stressors, time science is taught and students’ perceived impact of stress on academic achievement. Thus the purpose of this study was to find out the common stressors among science students, time of the term science students experience stress most, the perception of science students on the impact of stress on academic achievement and suggest ways to minimize or control stress among secondary school students.

Reliability: The reliability of the instrument was established using test-retest method within an interval of four weeks. Using Pearson Product Moment Correlation Co-efficient (r) formula, a correlation of 0.81 was obtained, hence the instrument was adjudged to be reliable and considered suitable for research use.
6. Results

Table 1. Common stressors found among students

<table>
<thead>
<tr>
<th>S/N</th>
<th>STATEMENT</th>
<th>$\bar{x}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Many demands, rapid changes can make science stressful subjects.</td>
<td>3.4</td>
</tr>
<tr>
<td>2</td>
<td>I usually have conflicts with my parents, friends, siblings and have to cope with unpredictable moods.</td>
<td>3.7</td>
</tr>
<tr>
<td>3</td>
<td>I am mostly concerned about my appearance</td>
<td>3.3</td>
</tr>
<tr>
<td>4</td>
<td>I am concerned about fitting in with my peer group and handle love relationships and sexuality</td>
<td>2.9</td>
</tr>
<tr>
<td>5</td>
<td>Environmental conditions such as heat, cold, excessive noise, pollution, poor housing, traffic jam increase my stress level.</td>
<td>3.6</td>
</tr>
<tr>
<td>6</td>
<td>Competition and fear of failure increase my academic stress level</td>
<td>3.6</td>
</tr>
<tr>
<td>7</td>
<td>I have financial problems</td>
<td>2.3</td>
</tr>
<tr>
<td>8</td>
<td>I usually have conflicts with my class mates</td>
<td>2.2</td>
</tr>
<tr>
<td>9</td>
<td>I am stressed by excessive school work</td>
<td>3.1</td>
</tr>
<tr>
<td>10</td>
<td>Inadequate recreational facilities at home and school cause stress to me</td>
<td>3.0</td>
</tr>
<tr>
<td>11</td>
<td>Overcrowded classes stress students</td>
<td>2.8</td>
</tr>
<tr>
<td>12</td>
<td>I place unrealistic expectations on myself</td>
<td>3.0</td>
</tr>
<tr>
<td>13</td>
<td>The contents of science subjects are too much, so students are stressed</td>
<td>2.8</td>
</tr>
<tr>
<td>14</td>
<td>I face completing time demands from my family and education</td>
<td>3.0</td>
</tr>
<tr>
<td>15</td>
<td>My parents forced me to learn sciences</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Table 2. Times of the day and of the term students experience stress most

<table>
<thead>
<tr>
<th>S/N</th>
<th>STATEMENT</th>
<th>$\bar{x}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>I experience more stress when my science classes come up late on the time table especially in hot weather</td>
<td>3.6</td>
</tr>
<tr>
<td>17</td>
<td>At the beginning of the term I experience a lot of stress because of the new learning materials introduced by my teacher.</td>
<td>3.0</td>
</tr>
<tr>
<td>18</td>
<td>I experience a lot of stress at the beginning of the term when I have not made friends</td>
<td>3.0</td>
</tr>
<tr>
<td>19</td>
<td>I am usually stressed at the beginning of the term because of my studies</td>
<td>3.1</td>
</tr>
<tr>
<td>20</td>
<td>I experience more stress at the end of the term than at the beginning of the term because of my studies</td>
<td>3.2</td>
</tr>
<tr>
<td>21</td>
<td>I am not usually stressed at the middle of the term because I would have made friends who help with my school works</td>
<td>2.6</td>
</tr>
<tr>
<td>22</td>
<td>Teachers give so many tests, assignments and notes at the end of the term which cause a lot of stress</td>
<td>3.1</td>
</tr>
<tr>
<td>23</td>
<td>I am not usually stressed at the middle of the term since I would have got used to class routines</td>
<td>2.9</td>
</tr>
<tr>
<td>24</td>
<td>I do not sleep well at the end of the term when I have to prepare for examination</td>
<td>3.3</td>
</tr>
<tr>
<td>25</td>
<td>I am most stressed at a. Beginning of the term. b. Middle of the term. c. End of the term</td>
<td>3.0 2.2 3.5</td>
</tr>
</tbody>
</table>
Table 3. Perceived impact of stress on academic achievement of science students

<table>
<thead>
<tr>
<th>S/N</th>
<th>STATEMENT</th>
<th>( \bar{X} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>An optimal level of stress enhances my learning ability</td>
<td>1.6</td>
</tr>
<tr>
<td>27</td>
<td>I find it difficult to concentrate in class when I am stressed</td>
<td>3.6</td>
</tr>
<tr>
<td>28</td>
<td>I became sick and unable to concentrate when I am under pressure</td>
<td>3.3</td>
</tr>
<tr>
<td>29</td>
<td>I am usually disenchanted with school work when I face stress</td>
<td>3.3</td>
</tr>
<tr>
<td>30</td>
<td>I perform poorly in class when I am tired and all stressed up</td>
<td>3.3</td>
</tr>
<tr>
<td>31</td>
<td>Stress makes me hopeless and this results in disengagement from my school work</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Table 4. Ways to minimize or control stress by students

<table>
<thead>
<tr>
<th>S/N</th>
<th>STATEMENT</th>
<th>( \bar{X} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>I find it easy to deal with challenging problems when I am in a relaxed state of mind and body</td>
<td>2.9</td>
</tr>
<tr>
<td>33</td>
<td>Relaxation mediation and deep breathing activates my body system by increasing the feelings of joy</td>
<td>3.3</td>
</tr>
<tr>
<td>34</td>
<td>Opting for things that are most important helps to reduce stress level</td>
<td>3.7</td>
</tr>
<tr>
<td>35</td>
<td>A cool and calm environment helps to promote thinking ability</td>
<td>2.7</td>
</tr>
<tr>
<td>36</td>
<td>Getting enough sleep helps keep the body and mind equipped to deal with negative stresses</td>
<td>3.3</td>
</tr>
<tr>
<td>37</td>
<td>Eating well helps the body get the right fuel to function at its best and so minimizes stress</td>
<td>3.3</td>
</tr>
<tr>
<td>38</td>
<td>Learning to solve everyday problems gives a sense of control that helps to minimize stress</td>
<td>3.0</td>
</tr>
</tbody>
</table>

7. Method of data analysis

Mean was used to analyze data. The mean response for each item was computed. The decision rule was that if the mean for an item is above 2.5 it shows acceptance for the item. If the mean for an item is below 2.5 it shows rejection for the item.

8. Discussion of findings

The study investigated Perceived Impact of Stress on the Academic Achievement of Science Students in Education District IV, Lagos State, Nigeria.

Table 1 revealed that respondents accepted that conflict with parents, friends, siblings, concern about their appearance, fear of failure, excessive school work, inadequate recreational facilities, overcrowded classes, the scope of science subjects are stressors found among students. These findings are in support of the assertions of [14] and [15]. They found all these factors as stressors among school students. The table further revealed that respondents disagreed with items 7 and 8. These also showed that the respondents did not accept financial problems and conflict among their classmates as stressors found among students. This finding contradicts the finding of [17] who said money is always a cause of stress among students. He also opined that conflict with peers is a cause of stress among students. A reason for this finding could be that since these students are still in the secondary school, their parents meet all their financial need and probably they have information on how to relate well with their classmates.

Science students accepted that it could be so stressful when their classes come up late in the afternoon when the weather is usually hot.
Assimilation is equally very low which could be responsible for poor academic performance. This finding is in line with the theory of temperature as stated in [19]. The theory stated that hot weather makes it difficult for students retain materials and this creates stress.

Table 2 also showed that the respondents accepted that they experience stress at the beginning of the term because of the new learning materials introduced by their teacher and because they would not have made friends. They accepted that they are most stressed at the end of the term, more stressed at beginning of the term and least stressed at the middle of the term. These findings are in support of [20] who highlighted that new students at the beginning of the term face academic demands, the need to adapt to new learning environments in term of the increased complexity of materials to be learned, the need to constantly self-regulate and to develop better thinking skills including learning to use specific learning techniques. Womble also supported that students experience most stress at the end of term since they usually sit for their examinations at this time [21]. These examinations are the most important criteria that make up their grades. Also teachers rush to finish up the syllabus for the term just before the beginning of examinations. All these make the end of the term most stressful for students.

Table 3 showed that the respondents disagreed with item 26 that optimal level of stress enhances their learning ability. The table revealed that the respondents accepted items 27, 28, 29, 30 and 31. This implies that students agreed that it is difficult to concentrate in class when they are stressed, pressure makes them feel sick, and stress causes disenchantment with school work, tiredness and stress makes students to perform poorly in class, stress leads to hopelessness that in turn results in disengagement from school work. From these findings, it is obvious that students perceived stress as a hindrance to academic performance. Womble noted that when the level of stress is high, academic performance is lower [21]. Laura supported that for students to achieve optimal academic performance they must overcome many obstacles caused by stress [22].

Table 4 revealed that the respondents agreed with all the items that addressed the research question on the ways to minimize or control stress encountered by students. Science students accepted that relaxed state of mind, doing things that are most important, getting enough sleep, eating well, optimism, having good relationship with family members, friends and peers, working sequentially, regular exercise and proper time management all help to minimize or control stress. These findings are in line with the opinion of [9] which stated that students can reduce the impact of stress by learning how to manage stress, learning how to relax, taking a stand against over scheduling, getting good night sleep, treating one’s body well, solving the little problems first and thinking positively. When students learn stress coping or reduction skills, they adjust better to school life.

9. Recommendation

The following recommendations were made from the study
• Science classes should come up in the early hours on the school timetable.
• Teachers should plan their lessons and sequentially execute their plan so that too much work is not given to students at the end of the term.
• Parents should encourage their children to sleep early enough so that their body and mind would be calm. This could enable them manage stressors effectively.
• Students should also be encouraged to do their schoolwork sequentially so that their work will not pile up at the end of the term.
• School administrators should organize seminars for students on stress management periodically.
• School administrators should also enforce the right teacher student ratio in the class.

10. Conclusion

This study has investigated common stressors found among students. It has looked at the time of the day and of the term students feel stressed most, perceived impact of stress on academic achievement and ways to minimize or control stress among students. It has been revealed that students are stressed most at the end of the term, stress is perceived to have negative impact on academic achievement. Also eating balanced diets, being optimist, having good relationship with family and friends help to minimize or control stress.

11. References


Special Education - Teacher Education in Australia: Confronting Concerns, Constraints, and Challenges

Phil Doecke
School of Education, RMIT University, Bundoora, VIC, Australia

1. Scope

This presentation provides an overview of special education teacher education (SETE) in Australia, with a focused view on one particular program: issues, attitudes and events which threatened its survival. A discussion on these events provides a commentary on views argued to be held by a large proportion of Australian society concerning education for children with additional learning needs. There is a reality gap between social and political rhetoric and promises, and the reality of support for schools, families, and the learner in Australia (Victorian Equal Opportunity and Human Rights Commission 2012). Specialist teacher education programs need recognition and support for effective growth, skills and knowledge to meet the scope of learning needs for full and authentic inclusion and learning in mainstream and special schools.

The growth in populations of learners with additional needs is compared to interest shown by prospective students considering applying for a place in a university SETE program, and with the urgent demand by schools for trained specialist teachers. Teachers and principals provide insight into their successes, and roadblocks to success, in Australian schools.

Despite this demand, and the government’s provision of new schools, universities have closed some undergraduate programs (Sobb, 2011).

The university where I work closed Disability Studies; however, our School of Education has redeveloped and now offers an undergraduate SETE program which has started well. There are some worthwhile postgraduate programs available, but these are considered in light of their usefulness as to a research focus or learner-needs focus.

There are constraints which are impediments to broad community support. Some of these are challenging and provocative. But for the provision of skilled, compassionate and successful teacher education programs these need to be confronted.

2. Objective and Motivation

It is intended to share one perspective on Special Education Teacher Education which has experienced some deep concerns, and some successes. This story can both encourage others who may be experiencing challenges in SETE, while seeking input from educators of ideas and strategies that have proved successful in their context – and may be mutually beneficial to others.

Ensuing dialogue may emerge which considers challenges and constraints in themes including but not limited to the impact of culture and cultural values; economics and perceptions of the worth of young people with disability – impact on human capital. Can deep-seated negativism be reversed?
Traditional, Online, and Blended Instruction: An Investigation of Outcomes in a Graduate Special Education Course Taught in Three Different Learning Environments

Mary Gozza-Cohen
Widener University, Chester, PA

Abstract

Nationally and regionally there are insufficient numbers of qualified special education teachers to meet current demand. Online course delivery has been proposed as one way to reach more students and increase the number of special education teachers. A meta-analysis conducted by the U.S. Department of Education reviewed the research on online learning and reported that on average, students in online learning conditions performed better than those in traditional classes [1]. However, among other issues noted in the meta-analysis, it was specified that many of the included studies did not control for curriculum materials and various aspects of pedagogy. This exploratory study investigated student outcomes in a graduate level special education course taught in three learning environments (traditional, online, and blended) by the same instructor using the same materials and activities for all three sections of the course.

1. Introduction

In the field of special education teacher preparation, the literature on online instruction is not extensive, but initial findings indicate positive outcomes for online instruction with limited outcome measures included in the studies [2, 3, 4, 5]. Since alternative delivery methods, such as online instruction, have been proposed as a way to address the chronic and increasing shortage of special education teachers available to meet the needs of students with disabilities in the nation’s schools, this study adds to existing research by reporting an investigation of a graduate special education course taught in three different learning environments [6]. This study attempted to address some of the previous methodological concerns about research on alternative learning environments in college and university courses by comparing student level of understanding of content, achievement, and opinions using multiple indicators, across three sections of a graduate-level special education course. All three sections were taught by the same seasoned professor using the same course materials, assignments, and content delivered in three different learning environments: traditional, blended, and online.

2. Research Design and Questions

This study involved a concurrent embedded strategy of mixed methods which is “identified by its use of one data collection phase, during which both quantitative and qualitative data are collected simultaneously… unlike the traditional triangulation model, a concurrent embedded approach has a primary method that guides the project and a secondary database that provides a supporting role in the procedure” [7]. The primary database in the current study is quantitative based on course grades and researcher-assigned scores on student work, and the secondary supporting database is qualitative based on students’ open-ended responses to questions on an end-of-semester course survey. Using the qualitative data to explore the experiences of the students in the three different learning environments, this method was used to gain a broader perspective. It was anticipated that the addition of qualitative data would help to explain or support some of the results of the quantitative analyses. Are there differences in level of understanding of course content among graduate students in a special education course delivered in three different learning environments?

1. Are there differences in course grades among graduate students in a special education course delivered in three different learning environments?

2. Are there differences in opinions about the course structure among graduate students in a special education course delivered in three different learning environments?

3. Are there relationships among level of understanding, course grades, and student demographic data from graduate students in a special education course delivered in three different learning environments?

2.1. Participants

The participants for the study consisted of forty-two graduate students in their final semester of a two-year special education and literacy teacher education program in a large university in the Northeast. The students completed majors or minors
in the liberal arts and sciences. The program is very competitive, accepting approximately one quarter to one third of applicants, so the students typically have strong grade point averages (GPA). The students were randomly assigned to the online and traditional sections, and the following year all students were assigned to the blended condition. Demographic data were collected from student records on file with the Special Education program and used to ascertain if there were differences in age, undergraduate GPA, and program application writing scores that might impact the results of this investigation. A one-way analysis of variance was used to analyze this demographic data and revealed no significant differences in the students in the three environments were found on the demographic data.

2.2. Course description, materials and activities

The course presented theoretical positions, assessment techniques, planning procedures, and teaching methods relevant to preparing students with severe and multiple disabilities to meet the State Learning Standards. It focused on children and adults with handicapping conditions such as severe mental retardation, severe physical and neurological disabilities, severe behavioral and emotional disturbances, autism, multiple disabilities and severe sensory problems. It emphasized how to develop effective educational programs for this population based on the alternative learning standards, ecological assessments, functional assessments, Universal Design for Learning (UDL), and the use of all available resources, including technology, adaptive equipment, and the alternative assessments, in the least restrictive settings.

The course, regardless of format of presentation (face-to-face, online or blended), had the same instructor and used the same text, readings, videos, and assignments. In addition, all students had the full PowerPoint presentations that had been developed for the course. The course activities included integrated discussions, collaborative activities, and a group project. This study used archival data; copies of students’ work on the integrated written responses to discussion prompts were retained online or collected in hard copy, and these artifacts were used, in addition to course grades and responses to a student survey, to explore if the instructional format impacted student performance.

2.3. Instruments

SOLO taxonomy. One instrument used in this study was the Structure of the Observed Learning Outcomes (SOLO) Taxonomy which has been used for a number of years to systematically assess the levels of complexity of student understanding and learning and was used in this study to rate students’ understanding of the course content as evidenced by their two individual written responses to the discussion prompts [8, 9, 10, 11, 12].

Discussion rubric. The rubric was developed by the course instructor to evaluate initial written responses to the discussion prompts; the students in the traditional section were only evaluated on the quality component since the other two categories could not be monitored, or did not apply to the face to face class. The students in both the blended and online sections were graded based on all three categories. All students had the rubric prior to doing the assignment. The rubric scores ranged from 1 = poor to 4 = excellent for each category. For grading purposes, these scores were converted to a 100% scale.

Course grades. Two grades reflective of collaboration were included in this study. The first grade was a collaboration grade assigned by the instructor after tabulating peer and self-evaluations conducted after every collaborative class activity in all learning environments. On each evaluation, this grade could range from 5-20 points; the multiple evaluations were averaged converted to a grade out of 100. The second collaboration grade was the final grade assigned by the instructor after evaluating a collaborative case study assignment that students worked on throughout the semester. The final project grade could range from 0-100. Two summary grades were also included in this study. The first was a summary grade for all discussions in the class; they were graded by the professor and combined into an overall discussion grade that could range from 0-100. This discussion grade for the students in the online and blended sections was influenced by factors not included in the traditional class grade (timeliness of posts, number of responses to other discussion group members). These factors were viewed as inherent to the learning environment and included, although these same factors were not factors in the face-to-face discussion grade. The other summary grade was the final numerical grade for the entire course; this is the average of all the weighted individual grades.

End of semester survey. An instructor developed survey provided data on student opinions about the structure and design of the course, learning activities, and student and instructor interactions.

3. Results

Archival course data was utilized in this exploratory study and included student discussions, instructor-assigned course and assignment grades and end-of-semester surveys from all three sections of a graduate-level special education teacher preparation course. Analyses of the data are discussed in the sections that follow.
3.1. Discussion-related performance

When the descriptive statistics results for the researcher SOLO and revised Rubric scores on the two discussion responses were compared with the instructor-assigned grades for the same tasks, an interesting pattern emerged. Student performance in the traditional and blended learning environments was comparable; however, the scores for the students in the online section of the course were generally markedly lower than the other two sections of the course. In general, the students in the traditional course appeared to outperform the students in the blended and online sections of the course based on the mean scores for the researcher-assigned SOLO and Rubric scores. Generally, the SOLO score averages for each section fell within the Multi-Structural and Relational levels which appears to be in line with the existing literature, though it was anticipated that graduate students would score at the Extended Abstract level [13, 14]. Further analysis of the SOLO and researcher Rubric scores for the discussions provided a more in-depth review of the findings.

Fifty nine percent of the variance in the researcher ratings of students’ level of understanding on Discussion 1 and Discussion 2 responses was attributed to the type of learning environment with statistically significant differences only found on Discussion 2 scores. If the learning environment were solely responsible for the differences in understanding, then it would be expected that statistically significant differences would have been found for both Discussion 1 and 2. There are a number of possibilities that might explain these differences; two possibilities include the format of the instruction and the learning environment.

Aspects of the format of instruction that could be attributed to the differences include the feedback received after Discussion 1, or variation in the content and prompts for Discussion 2 that may have been better structured to lead to higher levels of thinking. Biggs & Tang’s Principles of Constructive Alignment focuses specifically on what should be done to advance the learning experience for students [15]. The authors stress that teaching and learning assessments need to be “designed and written with a view to the kind of knowledge and the level of understanding intended” [15]. Verbs such as theorize, reflect, generalize, and solve have a tendency to elicit higher levels of thought versus identify, define, and name which simply involve the process of recall and a lower level of thought [15]. The instructions for Discussion 1 asked students to consider whether we should be moving in this direction and how can we prevent this in the future? (course materials). These two elements from the discussion prompt would likely encourage students to move beyond the process of recall toward a deeper level of thinking including theorizing and inventing solutions as they look toward the future. In contrast, the instructions for Discussion 2 were not as explicit; students were asked to discuss how culture and families impacted the characters or the families. This could have lead to some theorizing but it appears to be eliciting factual information based on specific events, though the expectation of the researchers was that graduate students should not require that level of prompt. Additionally, the instructor grades and researcher ratings for both discussions were consistently lowest for students in the online course, suggesting that the learning environment may have been a key factor.

The discussions for the online and blended sections of the course were held completely online requiring students to visit and respond multiple times for each discussion in order to keep up with the ‘conversations’. For both Discussion 1 and Discussion 2, the initial responses from the students in the traditional section of the course were generally longer, more detailed, and written more like a paper versus a response to begin a conversation with peers. The initial responses created by the students in the blended and online sections of the course were often more discussion-like in contrast to the responses made by the students in the traditional class; however, the students in the blended section had a tendency to create more detailed responses than the online students. Some students in the online and blended sections of the course did elaborate more in follow-up posts, but those responses were not included in the analyses for this study since there was no comparable artifact for the traditional section of the course. One possible explanation for better performance by the students in the blended section is that these students benefitted from the face-to-face interactions where further clarification of the instructions was possible. There is some evidence from the student surveys that suggest this may have been the case. For example, one student mentioned there was “too much time spent on online housekeeping”. While students in the online section of the course had opportunities to pose similar questions, not everyone in the class would necessarily see or have access to that information since all communications were in a written format.

This is a potential problem that is unique to online learning environments.

Additionally, there is evidence from the student surveys that the students in the online section of the course struggled a great deal with the discussions stating that “online discussions were confusing and time consuming” and “multiple postings were intimidating and frustrating” and “asynchronous postings were frustrating and time consuming”. In contrast, the comments from the students in the blended section suggested they were generally
satisfied with the online discussions. For example, two respondents stated that they “enjoyed online discussion – groups talked and elaborated more” and “discussion participation and quality [was] very good”. The comments from students in the online and blended learning environments support the statistical evidence that suggests the learning environment may be responsible for the differences in student understanding and performance related to the discussions.

3.2. Instructor-assigned grades

A pattern similar to the one found for the discussion responses also emerged for the instructor-assigned group Collaboration Grade and the Final Course Grade, but interestingly, not for the Group Project Grade where the grades were similar across all three learning environments. One possible explanation for the similarities in the Group Project Grade is that the work of multiple students influenced grades received on the project, whereas the Collaboration Grade was based on individual performance within the group. Of course, the Final Course Grade is directly influenced by all other grades received in the course. Of interest is the variability of scores within the online environment on Collaboration; the range of scores was 75 to 100 whereas the lowest score in the other two sections was 90. One possible explanation for the differences in scores is that the instructor could see the level of participation in the online section of the course; therefore, it would be more difficult for students in the online section of the course to inflate the collaboration scores on the activities for the group project.

While assimilation of the course content was necessary (primarily materials from readings and textbook information), the group collaboration process involved negotiation and creation of an end product. It required more sustained effort and continuous problem solving on the part of the group members with multiple iterations of the product before it was complete. The group project was more task-oriented whereas the group discussions are more conceptually-based. The results of the analyses suggest that collaboration in a fully online environment tends to be more difficult than in traditional and blended learning environments. The Collaboration Grade related to the Group Project activities; some students in the online section of the course reported having difficulties with collaboration and suggested “more individual versus group projects”, “reducing or combining some activities”, and one student said s/he “would recommend others take [the course] on campus”. This is further supported by similar comments made by some students in the blended section of the course which included “more in-class time with group”, “less online discussions”, and “difficult to keep track of so many components”, suggesting that online collaboration might be more problematic than in the traditional face-to-face learning environments. Of interest is that the students in the blended section of the course were also afforded the opportunities to collaborate during in-class sessions, yet some still described online work as problematic. However, students in the blended section did not meet on campus every week since part of the ‘class time’ was spent online. The issues raised by the respondents in the traditional section of the class related more to the amount of work and the inclusion of more details and examples for the project. Fewer issues were mentioned regarding collaboration likely due to the fact that students met each week and had the opportunity to collaborate in class on a regular basis.

To increase student satisfaction and improve performance, online collaborative activities likely need to be restructured, perhaps with opportunities for synchronous interactions through chat rooms and video conferencing.

3.3. Student understanding, grades and demographics

The researcher assigned SOLO and Rubric scores for the two discussions were significantly correlated for both the online and blended learning environments, meaning when the score on one went up, the score on the other did as well. The correlations in both sections and high power results from the blended section might relate to the reliability of the instruments, indicating that the SOLO was well-aligned with the portion of the instructor-designed discussion rubric related to the quality of the response. However, this does not explain why there was no significant correlation for the same measures used in the traditional learning environment. This may be the result of the overall higher scores with less variance in the traditional environment than the online and blended environments. For example, the range in scores for the traditional environment on Discussion 1 for the SOLO was 3-5, whereas the range in the other two environments was 2-5. A further detailed analysis of the scores by individual might help to explain the lack of correlation SOLO and Rubric scores for the traditional environment.

In both the traditional and blended environments, the Group Project and Final Course grade were positively correlated which would be expected as the Group Project is an integral part of the course. However, in the online environment, it was the Collaboration Grade that was correlated with the Final Course grade. One possible explanation for this difference is that student’s collaboration assessments in the online environment were submitted in the private assignment section online; this may have
resulted in more honest peer assessments. Additionally, the instructor was better able to monitor participation in collaborative activities in the text-based, asynchronous environment online. However, it does not negate the fact that collaboration is more difficult in online learning environments, perhaps primarily due to the time waiting for others to respond.

4. Conclusion

Unlike the existing literature on online instruction in the field of special education, the findings in the exploratory study indicate that student performance was notably different in the traditional versus online sections of this course with students in the traditional course outperforming the students in the online version. However, the results for the blended and traditional learning environment comparisons indicate that students in both sections performed equally as well which supports other similar studies [16, 17]. Some researchers suggest that students in blended learning environments may outperform students in traditional settings; however, that did not hold true for this study which suggests student performance in the traditional and blended learning environments were very similar and student performance was the lowest in the online learning environment on the majority of the measures. The student survey data in this study suggest that the structure and design of the course might be a serious consideration and provide a possible explanation for the differences.

An important lesson learned in this study is that while the same content and activities can be utilized in the same course taught in three different learning environments, the content and its presentation, teaching methods and requirements for demonstrating understanding may need to be adapted based on the learning environment. Discussions, although not easily monitored by the instructor, are less time-consuming for students in face-to-face settings than they are for students in online classes. Online discussions are typically scrutinized more by instructors and often include penalties for timeliness and depth of responses. Perhaps the type and amount of collaborative activities and discussions should be considered for this and similar online courses along with grading criteria modifications.

5. Implications for practice

Hammond conducted a review of curriculum design, assumptions about teaching and learning, and conditions for using online discussions in a sample of case studies that used asynchronous online discussions in higher education [18]. The author including issues related to course design, what instructors should do, what learners should know, and what technology should offer. Many of the positive attributes described by Hammond were already a strong part of the course in the current study including, providing formative peer assessment, summative assessment of group products, explicit learning outcomes for group work, summative assessment of process and credit for participation, requirements for minimum level of participation, setting explicit tasks, review of group work process, and rotating roles within groups [18]. However, two issues raised by Hammond that may have been missing key elements in the online course design were the adjustment of the workload to allow time for discussions and collaboration and student learning preferences. Fink also proposed factors and processes required to design significant learning experiences for students [19].

The first part of the recommended process by Fink is to conduct an in-depth analysis of situational factors to define constraints and opportunities for learning including, for example, the content to be taught and the characteristics of the learners and instructor [19]. The second step in the design process involves the development of learning goals that focus on significant learning, not just ‘understand-and-remember’ type of activities; these must include educative feedback and assessment with opportunities for students’ self-assessment using clear criteria and standards. Fink recommends that teaching and learning activities engage students in experiential and reflective learning while integrating and aligning all of the major components of instruction, including situational factors, goals, feedback and assessment. The situational factors, in part, refer to the characteristics of the students, when, where, and how the course will be delivered, and the pedagogical challenges [19].

Workload and time factors were frequently cited issues of concern for the students in both the blended and online sections of the course but were most prevalent for the students in the online course. If online discussions are going to be scrutinized and penalized for quality of content, and frequency and timeliness of posts, students will need to spend more time creating thoughtful responses and visiting the discussions. This may require the reduction or reorganization of the workload. This is in line with the research of Chickering & Gamson and Chickering & Ehrmann who emphasized time on task by allowing adequate time for teaching and learning, as well as communicating high expectations, and respecting diverse talents by allowing opportunities for students to show their talents and learn in ways that work for them [20, 21]. This can only be accomplished through thoughtful planning of course structure, design and expectations.

Lastly, workload, time, student experience, and
student learning preferences are some of the factors that were not explored in this study nor were they considerations when students were assigned to the various sections of the course. These important factors warrant further evaluation during the planning and implementation stages of the course design processes.

6. References


Expectations of Physically Disabled Students (PDS) in Science Classes in Kenya: Addressing Constraints, Prospects and POLICY

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Abstract

The study focused on the expectations of physical disability students (PDS) in the learning of science subjects in Kenyan special secondary schools. The subjects included physics, chemistry, and biology. A survey design was used. A questionnaire based on the five point Likert scale was used such that the respondents strongly agreed, agreed, were not sure, disagreed or strongly disagreed. An interview was conducted with the heads of the institutions and the heads of science departments. The expectations of different groups i.e. male and female teachers and boys and girls at different class levels were compared using the x2 technique. Three aspect of the science were investigated; learners’ expectations of learning context, who should learn the sciences and the importance of sciences. Each aspect was analyzed and discussed separately. The findings showed no significant differences in expectations between boys and girls, male and female teachers and form 2 and form 4 students. Preference in learning context was in order laboratory, field, classroom, home and the office. Science was important as it helps in career choices, general awareness and for problem solving. The study also revealed that the students with physical disability expect to learn the sciences just like their able bodied colleagues. It was concluded that these students should be treated just like their able bodied colleagues.

1. Introduction

Concern for the needs of the disabled individuals surfaced during the Renaissance. However, social reforms directed towards improving the quality of life for the disabled did not begin until the nineteenth century [9]. World Wars I and II provided the impetus to develop rehabilitation programmes to improve the functions of disabled persons. Focus on upgrading the opportunities for the physically disabled became a reality in the 1960s. In America, for example, a national effort to provide school and community services for all the physically disabled persons began with the Rehabilitation Act of 1973 [8]. The legislation mandated appropriate educational programmes and opportunities to participate in intra - murals and inter - scholastic sports for the physically disabled citizens of school age [6].

In Kenya, special education programmes for the PDS began around the 1940s, particularly to cater for the victims of the Second World War and in particular those who had become blind and crippled in the course of their duties. Prior to independence, special education was mainly in the hands of individuals, missionaries and volunteer organizations which concentrated on the provision of health services, rehabilitation services and material support for those with physical impairments. The services were in the form of custodial care, using the model seen in Europe. In the post-independence era the government has shown great concern in the provision of education services to improve the welfare of the disabled. The Government’s effort has then led to the creation of two kinds of schools; regular schools which cater for students who are perceived as “normal” and special schools which offer special care for the physically disabled students. Special education is a sub - system of regular education and its purpose is to provide appropriate educational experiences to students who are perceived as being different from other students in some way.

Regular education teachers may find a “culture gap” between special and regular education [9]. Special education has developed an educational sub-culture of techniques, behaviors, language and perception of students. Martin calls for the assimilation of the special education sub - culture into the regular education. He contends that special education should view the learners as having strength as well as needs, realize that some “deficits” do not need immediate remedy, group students flexibly rather than by labels, and rely on professional judgement as well as the test results. He suggests that regular educators and special educators assess individual needs, select materials in response to students’ characteristics, and adapt these materials accordingly. The cultural gap between special and regular schools could have some impact in the teaching and learning of the sciences [2]. The researcher therefore felt the need to address this gap by looking at the expectations of the physically disabled students and their teachers in the teaching and learning of science subjects in the Kenyan situation.
2. Statement of the Problem

Many studies have been done on the teachers’ expectations [11], [7]; on problems affecting both teachers and students [1] and the factors affecting the teaching and learning of science subjects [12]. However, there exists a gap; no study has been done in Kenya to explore the expectations of the physically disabled students and of their teachers in the learning of science subjects. Resulting from this gap, there might be difficulty in implementing the science curriculum to the physically disabled since no special consideration of their special needs has been made. This study contended that the gap was to be addressed with reference to academic and professional background of the science teachers, the role of the students in the learning of sciences, the role of the teachers in the teaching of sciences, content and context of Sciences, students’ and teachers’ image of a scientist and gender differences.

3. Research Questions

The study endeavored to establish the expectations of the physically disabled students and their teachers in the learning and teaching of science subjects in Kenyan special secondary schools. It specifically attempted to answer the following questions.

i. In what conditions do the physically disabled students prefer to be taught science subjects?

ii. What expectation do the physically disabled students have on who is learns the sciences?

iii. What expectation do the physically disabled students have on the importance of the sciences?

4. Research Methodology

The study applied a survey design to investigate the expectations of the physically disabled students on the areas of learning context, who learns the sciences and its importance from their perspective. The population of the study comprised all science teachers (physics, chemistry and biology) and their students in special secondary schools for the physically disabled.

The sample specifically consisted of science teachers, form two and from four students in the only two special secondary schools for the physically disabled learners in Kenya. Questionnaire and interviews were used in data collection. The questionnaires, with a five point Likert scale, were administered to both students and their teachers so that their views could be compared. The questionnaire covered the three thematic areas under study. The responses were then analyzed and discussed under the three areas.

5. Findings

5.1. Expectations on the Learning Context among the PDS

The expectations of the physically disabled students on where they need to be taught the sciences was analyzed and summarized in Table 1. The highest mean score of 5.0 indicates maximum expectation of 100% while a mean score of zero indicates no expectation.

Table 1: Students’ and Teachers’ Expectations of Science Learning Context $\chi^2$

<table>
<thead>
<tr>
<th>Area of Preference</th>
<th>Form Two</th>
<th>Form Four</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom</td>
<td>4.10</td>
<td>3.154</td>
<td>3.598</td>
</tr>
<tr>
<td>Laboratory</td>
<td>4.90</td>
<td>3.388</td>
<td>4.584</td>
</tr>
<tr>
<td>Field</td>
<td>2.90</td>
<td>3.586</td>
<td>3.918</td>
</tr>
<tr>
<td>Home</td>
<td>4.20</td>
<td>3.378</td>
<td>4.140</td>
</tr>
<tr>
<td>Office</td>
<td>3.40</td>
<td>2.923</td>
<td>2.988</td>
</tr>
<tr>
<td>Special School</td>
<td>4.90</td>
<td>4.000</td>
<td>4.197</td>
</tr>
<tr>
<td>Ordinary School</td>
<td>2.33</td>
<td>3.154</td>
<td>2.778</td>
</tr>
</tbody>
</table>

CV = 5.991; p = 0.05 and CV refers to Critical Value

In all cases, the value of the $\chi^2$ calculated was less than the critical value of $\chi^2 = 5.99$ at .05 level of confidence at 2 degrees of freedom. This implies that the expectations of both girls and boys in terms of learning context were not statistically significant at both levels. It was found that on average for form two students, the order of preference of the learning context was the laboratory, classroom, office, home, and finally field. The first preference is the laboratory, just like other students implying that they need to be treated and viewed just like other students. From the interviews with the head teachers, it was noted that fieldtrips were rarely undertaken due to financial constrains. This may explain why this context was least preferred.

5.2. Teachers Preference of the learning context among the PDS

The male teachers preference for learning context was laboratory ($x=5.00$) field ($x = 4.00$), office ($x = 1.750$) while that of female teachers was laboratory ($y = 4.750$), field ($y = 3.750$), classroom ($y = 3.25$) and office ($y = 1.000$) in both cases. Teachers preferred to teach sciences in the laboratory. This is encouraging since science learnt best in the
laboratory if the goals of teaching sciences are to be achieved [3]. It is in the laboratory that all the process skills can be incorporated. Teachers gave preference to the field after the laboratory and not the classroom as in the case of students. This might explain why their mode of preference in teaching method is practical which is best done in the laboratory followed by discussions which could be done in the field where applicable. It is in the field where students go to see science in real life in its natural setting. Teachers see the laboratory as the most suitable environment for teaching science. Given that teachers in other schools indicate the same, then the preference might have little to do with physical conditions of the learners but the context in which it is taught. They also indicated that the physically disabled students are more suited being in special schools than in ordinary schools. This is because in special schools, the students’ difficulties are understood, accepted and allowed for.

5.3. Expectations of PDS on who should learn sciences

This section analyses and discusses the students’ and teachers’ expectations on who should learn sciences. A summary of the analyses is presented in Table 2 below.

Table 2. Who Should Learn Sciences

<table>
<thead>
<tr>
<th>FORM 2</th>
<th>FORM 4</th>
<th>TEACHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td></td>
<td>1.710</td>
<td>1.900</td>
</tr>
<tr>
<td>Boys only</td>
<td>1.710</td>
<td>1.900</td>
</tr>
<tr>
<td>Girls only</td>
<td>1.710</td>
<td>1.900</td>
</tr>
<tr>
<td>Boys &amp; Girls</td>
<td>4.150</td>
<td>4.850</td>
</tr>
<tr>
<td>Average students only</td>
<td>2.357</td>
<td>3.278</td>
</tr>
<tr>
<td>Non-physically disabled students only</td>
<td>1.000</td>
<td>1.000</td>
</tr>
</tbody>
</table>

When asked whether science should be learnt by both boys and girls, the results indicated strong agreement that sciences should be done by both boys and girls where $x^2 = 4.500$, $y^2 = 4.650$, $x^4 = 4.350$ and $y^4 = 5.000$ for form 2 boys, form 2 girls, form 4 boys and 4 girls respectively. This implies that both boys and girls should be treated equally by the teachers when learning sciences.

The calculated value of $\chi^2$ for both girls and boys was 0.000 for form 2s and 2.325 for form 4s. This is very low compared to the critical value of 5.991 at 2 degrees freedom at .05 confidence level meaning that the difference in expectations of both boys and girls at the two levels (form 2 and 4) are not statistically significant. In all cases the mean value was less than three (3) when the students were asked whether sciences were to be learnt by physically disabled students only. This implies that both boys and girls expect that sciences should be learnt by all students, irrespective of being physically disabled or not.

When asked if science is meant to be learnt by above average ability students only, all the answers given had a score of less than three (3). This shows attachment to the value of sciences i.e. that even if one may be considered as being below average; one should still learn sciences either for general awareness or for future application in daily life.

Their calculated value of $\chi^2$ for teachers’ expectations was 1.000 which was below the critical value of 5.991 at .05 level of confidence at two degrees of freedom. Good, Skykea and Brophy demonstrated that the differential disapproval of students on the bases of their sex does not does not depend on the sex of the teacher. This seems to be the trend in special schools. Hence teachers’ influence on the students’ expectations is the same as in regular schools. Teachers expect sciences to be learnt by both boys and girls, though they have high preference for above average students. This might be because the performance of the teachers is measured by what the students achieve in the examination and so most teachers will prefer students who will perform well in the examination and thereby boost their morale and status.

5.4. Expectations on the Importance of Science

Table 3 gives the summary of the importance of science to physically disabled students and their teachers.

Table 3. Importance of Learning Science

<table>
<thead>
<tr>
<th>FORM 2</th>
<th>FORM 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>Girls 2</td>
</tr>
<tr>
<td>3.400</td>
<td>3.375</td>
</tr>
<tr>
<td>3.150</td>
<td>4.700</td>
</tr>
<tr>
<td>4.600</td>
<td>3.000</td>
</tr>
<tr>
<td>x 0.05</td>
<td>1.000</td>
</tr>
<tr>
<td>x 0.05</td>
<td>1.000</td>
</tr>
<tr>
<td>x 0.05</td>
<td>1.000</td>
</tr>
</tbody>
</table>

CV = 5.991

5.4.1. Career Choice. In both cases, the expectations of both boys and girls were not statistically significant. The calculated value of $\chi^2$ was 1.033 for Form twos and 1.143 for Form fours. This was quite low compared to the critical value of 5.96 at .05 level of confidence implying that both boys and girls should be treated equally when being given
advice on career choices. In form two, the boys agreed that sciences are taught to help in career choices, but the girls disagreed. Both boys and girls in Form four agreed that science is for career choice, their mean being 3.667 and 4.222 respectively. This probably shows that the students are not exposed to career choices at early stages of secondary education. Form twos could still be carrying over the primary school notion that the teachers know what is best for them and whatever is taught is beneficial in the long run. This notion could be avoided by advising the students on the importance and application of whatever they cover in the syllabus. Form fours were very keen and both boys and girls agreed that science should be for career choice. This is probably because their mental orientation was on what they were about to do once they left school. The issue of career choice was paramount and so they learnt whatever they considered likely to be useful later on in life. The best four preferred career choices for boys are Computer Analyst, Lawyer, Engineer and Doctor in that order. Three of these need a scientific background. The career choices for girls are secretarial work, teaching, doctor and lawyer in that order of preference indicating that only one of these career choices (doctor) requires a scientific background. This may imply that in special schools, boys have more preference for scientific careers than girls.

Teachers also expect sciences to be taught for career purposes, their mean being 4.000 and 4.250 for male and female teachers respectively. The calculated value of $\chi^2$ is 1.500 and this implies that both male and female teachers have almost the same expectations. This is encouraging since they are likely to advise the students in career matters accordingly in view of the substantial evidence that teachers make a difference in students’ achievement, attitude formation and aspirations [12].

5.4.2. Problem Solving. There was general agreement between both boys and girls that science is for problem solving. The only exception was Form two girls whose mean score was 2.692 showing a disagreement. The calculated value of $\chi^2$ was 6.958 for form twos at .05 level of confidence. This was statistically significant when compared to critical value of 5.93. It therefore means that both boys and girls value the importance of science differently at low stages of their secondary life. This could be explained since it is known that informally boys have more exposure to science related experiences than girls at early stages [12]. Since boys are more “outgoing”, then they are in a position to appreciate the role of science more than girls.

It is also known that teachers interact with boys and girls differently in a process which is mainly directed by the teachers’ cognitive, expectations (which is an instructional dimension) and normative expectations based on social control [12]. In the environment of learning science, however, teachers have been known to pay more attention to boys than girls. Good, Sikes and Brophy, (1985) have demonstrated that the differential disapproval of students on the basis of their sex do not interact with the sex of the teacher. That is, both male and female teachers show more disapproval of the behaviors of boys than of girls in social contexts. In the final analysis, girls often “gain” on social issues, but “lose out” in academic interactions where the boys enjoy a lot of approval from the teachers. This seems to be the trend in special schools. With more exposure of science subjects, girls start appreciating the importance of science just as much as the boys. Hence there is general agreement between boys and girls in form 4 that science is for general awareness. Their means are 4.500 and 4.566 for boys and girls respectively.

Both male and female teachers had high expectations that science should be for problem solving, their mean being 4.500 in both cases. Hence, it is expected that this positive aspect is likely to be reflected in their teaching method, putting more emphasis on the application aspect. Both male and female teachers’ expectations were not statistically significant, the calculated $\chi^2$ being 0.000 at .05 level of confidence.

5.4.3. General Awareness. The calculated value/mean for Form two boys, Form two girls, Form four boys and girls were 4.100, 3.140, 4.250 and 4.667 respectively. This shows that in all cases the students expect to learn science for general awareness purposes. In both cases, the calculated value of $\chi^2$ was less than the critical value i.e. it was 1.000 for both Form twos and form fours, significant difference in the expectations of Form twos and Form fours.

From Table 3, the means for teachers’ expectations were 4.600 and 4.000 for male and female teachers respectively. This implies that teachers take the teaching of science seriously even when they feel that students are not likely to take science related careers. It was therefore not surprising that most teachers preferred to use practicals when teaching sciences. This is encouraging especially if teachers can transfer those expectations to their students. Woolnough and Alsop [14] support this by suggesting that seeing science subjects in real life helps in demystification of science.

5.4.4. Students’ and Teachers’ Expectations on the role of Examinations. Assessment occupies a big portion of the students’ and the teachers’ time in school. What feelings do the physically disabled students and their teachers have towards examinations and the way they are done particularly
with reference to science subjects? Do the class levels and gender affect the expectations students have on examinations? The data analysis and interpretation below send more light on this. From Table 3, the mean score for Form two boys, Form two girls, form four boys and girls were 3.165, 2.308, 2.434 and 2.000 respectively. Apart from Form two boys, all the other students don’t expect sciences to be taught for examination purposes.

Most of these students are physically disabled and so unable to handle the apparatus. Yet they are expected to get at least a credit in the final examination, the Kenya Certificate of Secondary Examination (KCSE). This expectation could have killed their morale. Another reason behind the low score could be the importance examinations hold in people’s lives. Examinations are used for of higher education, employment and professions. Most people therefore see examinations as a necessary evil, hence the low expectations shown by the people who were surveyed. Many know that the positions in life, (high or low) will depend on their examinations.

Teachers also have very low expectations in examinations, their mean being 1.000 and 2.000 for male and female teachers respectively (Table 3). This Low expectation is likely to affect not only their teaching methods but also their influence on the students’ expectations. Once pupils enter secondary school, they might find the teaching of sciences “dry” and boring and so there is need to use the teaching methods that demystify the learning of the sciences [4].

Teachers had the same expectations as those of the students, where their preference was science for general awareness, for problem solving and for the career, but few of them expect sciences to be taught for examination purposes.

6. Conclusion

It was noted that the students’ preference of the learning context are laboratory, field and classroom. Most students are fairly comfortable being in special schools and are not willing to move to regular schools. This is impressive considering the disability of the learners who would be experimenting with difficulty in the laboratory if they were to compete with able - students colleges. Students and teachers expect science to be learnt for Career choice, problem solving, and general awareness and not for examination purposes.

7. Recommendations

1. It was found that most of the students in special schools prefer their type of schools and not regular schools. This was especially emphasized by the girls who felt strongly that they need not be taken to regular schools where they may not be understood, especially considering the fact that they may not be able to cope with the challenges from their able bodied colleagues. Girls put more emphasis on their physical outlook and this may explain why they would not want to be compared to other students. There is the need therefore for the government to consider setting up more special schools and also integrate some non- handicapped students into these schools with a view to socializing the handicapped students with the non handicapped ones. The construction of more schools will not only help many students to pursue secondary school education but also help the government to fulfill the Unesco’s requirement to have education for all (Unesco, 1974).

2. The findings indicated that most students do not expect to take sciences for examination purposes. The fact that they have to pass in practicals so as to get at least a credit pass in each science subject makes them feel disadvantaged in this area. Since they are physically handicapped, the process of handling the apparatus is tedious to them. Again it was noted that these students get tired very fast because of their sitting positions. This discourages them further during national examinations which take long to finish. Hence the Kenya National Examination Council (KNEC) should consider giving more emphasis to the Continuous Assessment Tests (C.A.Ts) as recommended in Session Paper No. 6 of 1988.

3. The handicapped students prefer to learn the sciences in the laboratories for practical work and also go for field work. Unfortunately these schools do not have equipped laboratories and school vans to take them for field work. Hence they are disadvantaged due to lack of these resources. The laboratories to be constructed should be spacious enough to take care of their varying needs and should have movable benches which can be adapted for various uses by different students with varying degrees of handicaps. The government and donors should therefore consider channeling their funds to the construction and equipping of laboratories and classrooms and also availing school vans/trucks for use in field work. Special equipment like wheelchairs and crutches is useful so as to solve the problem of their mobility.

8. References


Session 6: Special Education

Catering for Students’ Special Needs in Mathematics Learning  
(Authors: Andrea Peter-Koop, Thomas Rottmann)

A Systematic Review of the Use of iPads for Communication and Academic Purposes with Students with Autism  
(Authors: Ohoud Alhajeri, Jeffrey Anderson)

A Comparison of Self-Presentation Tactics between Visually Impaired and Sighted Students  
(Author: Mohammad Y. Safhi)

Empowering Written Expression: Exploring the Effectiveness of Metacognitive Knowledge, Motivation, and Authoring Techniques with Students in Junior High with Learning Disabilities  
(Author: Frederick French)
Catering for Students’ Special Needs In Mathematics Learning

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Abstract

This paper introduces a conceptual framework that is used in a university based intervention project to assist primary school students that experience severe learning difficulties in mathematics. The model draws on four key phases, which have proven to be important for the development of calculation strategies beyond counting that focus on the use, verbalization and finally the gradual removal of manipulatives. Data of a case study is provided that illustrates perspectives for future research and classroom practice.

1. Introduction

Children with severe mathematical learning difficulties frequently struggle from early on with the development of basic computational ideas. We argue that our intervention strategies developed for students with special needs (e.g., students with dyscalculia) are beneficial for all students when learning concepts such as place value and addition/subtraction strategies. In particular, we focus on the use of manipulatives to foster the understanding of mental operations required to solve problems such as 7+8 or 15–8 beyond the application of counting strategies. These teaching approaches apply to both intervention programs for children with dyscalculia and classroom teaching in order to prevent long-lasting learning difficulties with whole number arithmetic.

2. Aims and foci of the intervention

Students invited to participate in the intervention program predominantly struggle in three areas. They have not yet managed to develop

- a deep understanding of place value [10], e.g., the majority of them up to Grade 4 cannot tell the difference between the numbers 34 and 43 and frequently claim that they are “the same”, because they involve the same digits,
- derived-fact strategies for addition and subtraction [6], i.e., they solve respective problems with varying counting strategies, such as count all, count on and countdown [5], [6], [7],
- operational insight and basic ideas, so called “Grundvorstellungen” [12], that enable them to understand the concept of addition and subtraction (e.g., addition as taking together quantities and subtraction as taking away a quantity from another) including changes between different modes of representation.

Hence, the intervention focuses on these three domains aiming to help the children understand place value, use this concept for calculations, and to offer calculation strategies beyond counting that are based on insights in part-whole schema [9] and knowledge of respective number facts (i.e., 8=7+1, 8=6+2, 8=5+3, 8=4+4), so that tasks such as 7+8 can be solved as 7+3+5.

3. The role and choice of manipulatives for the development of mathematical understanding

The intervention is based on manipulatives that model the strategies to be ultimately developed on a cognitive level. However, it has to be acknowledged that all manipulatives and visualizations that are used to illustrate mathematical concepts need to be learned and understood before they can be drawn on in developing mathematical understanding. Hence, only two specific materials were chosen that best lead to the respective mathematical concepts and internal models.

Figure 1. Multibase Arithmetic Blocks (MAB)
In order to enhance children’s understanding of place value we use “Multibase Arithmetic Blocks” (MAB), see Figure 1, also called “Dienes blocks” [10], which stress the cardinal understanding of number. The arithmetic rack (see Figure 2) is used to foster the replacement of counting-based calculation strategies with derived-fact strategies.

Figure 2. Arithmetic rack

The use of the arithmetic rack helps to visualize any number up to 100 quasi-simultaneously and the derived fact strategy 23+7+2=32 can be modeled without having to count all single objects.

4. Conceptual framework for both intervention and classroom instruction

The conceptual framework underlying the intervention program is based on basic ideas and related individual images of a mathematical concept, such as addition or subtraction – so called “Grundvorstellungen” [12]. This means that concrete actions or pictures can be rebuilt according to mental operations and mental images by using suitable manipulatives.

Children, who are extremely vulnerable with the learning of whole number arithmetic, tend to use the material as a sole counting aid and/or do not manage to develop strategies beyond the use of the concrete objects [11]. Frequently, they cannot describe their actions, which can be interpreted in a way that they do not understand what they do and how this relates to a computation strategy other than counting. Gervasoni [8] states, that “through experience, we learn to simulate the action of using and seeing mathematical models to calculate without actually moving or seeing” (p. 2). Hence, the intervention program follows a Four-Phases-Model [13] that acknowledges the need for verbal descriptions when using concrete objects/manipulatives as well as a transition phase from manipulating with material to mental operations that activate a mental concept which allows the child to imagine the actions required in order to solve an addition/subtraction problem.

The Four-Phases-Model is based on ideas of Bruner and the Swiss psychologist Aebli. Bruner [2] distinguished three types of representational systems: the enactive, the iconic and the symbolic representation. While the enactive representation is based upon actions, the iconic representation comprises both, pictures and mental images. The symbolic representation involves mathematical symbols (as written numbers or operation symbols) as well as language. Bruner strongly links learning processes to translations of one representational system into another. In addition, Aebli [1] describes gradual internalization processes from enactive to mental actions, which focus on the transition from one representation to another.

With emphasis on verbal descriptions of enactive and mental actions, the Four-Phases-Model stresses the relevance to assist the development of mental images by a gradual and systematic removal of the manipulatives.

Drawing on Bruner and Aebli, four phases have been identified that support the development of basic computational ideas:

**Phase 1: Concrete use of manipulatives and respective verbalization of operations**

Teacher and child actively use the material and verbally describe their operational actions and their meaning. When the child is confident in working with the material, the child takes over and verbalizes his/her actions.

**Phase 2: Verbal description of the imaginative use of the manipulative in sight**

With the manipulative in sight, the child describes the actions on the manipulative to the teacher or a fellow student who performs the according actions following the child’s descriptions.

**Phase 3: Verbal description of the imaginative use of the covered manipulative**

With the manipulative covered by a screen or shield, the child describes his/her imaginative actions on the manipulative to the teacher or a fellow student who performs the according operations following the child’s descriptions.

**Phase 4: Verbal description of the mental operation**

The child verbally describes the operations without the manipulative being present in any form other than the child’s imagination. The tasks are given in a symbolic representation.

It is important to understand how much time an individual learner requires to get ready to move on to the next phase. As soon as problems occur, one would move back to the previous stage and continue from there. During the intervention program it usually takes a minimum of 10 to 12 weeks (most frequently even longer) before the children attain the final stage (Phase 4).
5. The case of Ole

Ole was in Grade 2 after he was relegated to Grade 1 the year before, when his parents enrolled him in the intervention program. Even in his third year in primary school he showed severe difficulties with counting backwards and solving addition and subtraction problems with numbers up to 20. He did not show any use of derived-fact strategies, but used his fingers or the arithmetic rack for counting. He was unable to solve tasks like $15 - 14$ without counting by ones using manipulatives such as a bead string or the arithmetic rack. The intervention started in October 2012. First, the focus of the intervention was on learning to use the manipulatives (in this case the arithmetic rack) and developing an understanding of its structure (e.g., subitizing and displaying numbers by using bigger subunits). The overview of the different phases of the solution processes during the entire 13-week intervention (see Table 1) focuses on addition and subtraction tasks of the type ‘2-digit number plus/minus 1-digit number’. The intervention seeks to enable the children to successfully apply the strategy „bridging tens“ (e.g., $28+6$ by $28+2=30$ and $30+4=34$), which is a universally applicable and hence an appropriate strategy for those types of addition/subtraction problems [4].

Through the course of the intervention, Ole learned to describe his use of the arithmetic rack (Phase 1, week 4 of the intervention). In order to foster the development of mental images, Ole was asked to verbally describe the use of the arithmetic rack without performing the actions himself. The concrete manipulation was replaced by observing the teacher’s manipulations (Phase 2, week 5 of the intervention).

<table>
<thead>
<tr>
<th>Week of intervention</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>% Success rate in phase</th>
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<tbody>
<tr>
<td>1</td>
<td>3/0</td>
<td>1/2</td>
<td>0/2</td>
<td>2/0</td>
<td>93</td>
</tr>
<tr>
<td>2</td>
<td>2/1</td>
<td>1/0</td>
<td>3/2</td>
<td>2/2</td>
<td>89</td>
</tr>
<tr>
<td>3</td>
<td>2/0</td>
<td>5/1</td>
<td>5/5</td>
<td>5/5</td>
<td>63</td>
</tr>
<tr>
<td>4</td>
<td>4/0</td>
<td>2/0</td>
<td>8/2</td>
<td>3/5</td>
<td>4/0</td>
</tr>
<tr>
<td>5</td>
<td>12/0</td>
<td>4/0</td>
<td>8/3</td>
<td>6/1</td>
<td>80</td>
</tr>
<tr>
<td>6</td>
<td></td>
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<td>8/5</td>
<td>4/0</td>
<td></td>
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<tr>
<td>7</td>
<td></td>
<td></td>
<td>8/3</td>
<td>1/1</td>
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<td>8</td>
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<td>2/0</td>
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<td>9</td>
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<td>13</td>
<td></td>
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</tr>
</tbody>
</table>

Obstacles in the transition from one phase to the next are mainly caused by a premature progress to the next phase before the current stage is sufficiently mastered. Ole showed problems at the beginning of Phase 3, because he had not yet deepened his understanding of part-whole relationships and therefore did not subdivide the second addend into appropriate components in cases when the manipulative is fully covered (transition from Phase 2 to Phase 3, week 5 of the intervention).

Moving back to Phase 2 was necessary before Ole was finally able to visualize the respective operation and to describe it without direct view of the arithmetic rack (Phase 3, week 5 of intervention). At the end of the intervention Ole successfully built up a mental model of the operation and was able to activate it when solving an addition/subtraction problem (Phase 4, week 13).

6. Implications for the classroom

The Four-Phases-Model has been successful in assisting the learning of whole number arithmetic for students like Ole, who experience severe difficulties in their mathematics learning. However, while this method is used in one-on-one sessions during the intervention, it can easily be transferred to regular mathematics classrooms to be used with the whole class. A classroom-based study in an inclusive setting that is adopting the Four-Phase-Model in Grade 1 commenced at the start of the current school year. This study takes into consideration that it is important that:

a) the classroom teacher acknowledges that each student requires an individual amount of time and practice at each phase,
b) the teacher ensures that each student is provided with sufficient time and opportunity for practice to enable deep understanding.
c) especially in Phases 2 and 3 students can work in pairs in a way that one student (typically the more advanced one) executes, monitors and checks the verbal descriptions of his/her partner and provides feedback.

7. Implications for further research

While the Four-Phases-Model described in this paper originally provided the background for the planning, implementation and evaluation of an intervention program for primary school students experiencing severe learning difficulties in basic arithmetic, it also offers research perspectives with respect to the longitudinal evaluation of the intervention. With respect to the monitoring and analysis of the effect of intervention programs based on the Four-Phases-Model further (research) questions arise: What kind of verbal interaction supports internalization processes effectively? Are there examples for the successful skipping of single phases? More detailed analyses that focus on the transition from one phase to another as well as the verbalization of the enactive and the mental use of manipulatives seem to be of crucial importance for the further development of intervention programs for students with special needs learning primary school mathematics.

8. Conclusion

As Butterworth [3] has stressed, compared with dyslexia, dyscalculia has been the focus of relatively little research: “For dyslexia there is now widespread agreement about criteria, good evidence about the brain systems implicated (…), and indications of the genes that might be involved” (p. 465). He quite rightfully argues that for a comparable understanding of dyscalculia, there is a need to establish agreed upon diagnostic criteria, to discover differences in the structure and function of brains of humans with dyscalculia, and to identify genes that could lead to these differences. In addition we need to extend our knowledge on how to effectively support students with dyscalculia. The case of Ole (and he is only one representative example from our intervention program within the last decade) demonstrates that these children can understand and learn part-whole schema [9], basic computational strategies (and number facts) as well as develop an understanding of place value. Hence, we should acknowledge that the quality and effectiveness of mathematics instruction for students with severe learning difficulties (may they result from developmental dyscalculia or not) in early arithmetic is a crucial aspect the needs further research as well.

9. References

A Systematic Review of the Use of iPads for Communication and Academic Purposes with Students with Autism

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Abstract

This systematic review of the literature was conducted to investigate the use of iPads in the classroom to facilitate communication between teachers and students with autism, including those who require augmentative and alternative communication (AAC). The primary intention of this review was to identify and inform evidence-based practices in the use of iPad-based instruction in one-on-one and group interventions within schools. The review included 14 studies published between 2011 and 2015, covering two domains: communication and academic engagement skills. The 14 studies involved a total of 40 participants, ranging from 3 to 17 years of age and having a diagnosis of autism. Results of this review were largely supportive, indicating the usefulness of iPads as an effective communication and educational tool for teaching requesting skills and enhancing academic engagement in both literacy and math. Implications and future research were addressed.

1. Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder of brain development that is identifiable in early childhood, affecting communication, social interactions, sensory systems, and can include repetitive and restrictive behaviors, interests, and activities [1]. Many students with autism have little or no functional speech [2] and hence experience significant communication difficulties in interacting with others [3]. Students with autism can also have difficulty learning literacy and math skills due to corresponding language impairments [4]. The use of iPads can assist teachers to expand the communication and social skills of students with autism [5]. In addition, using iPads can promote language and literacy development [6], [7] and increase academic engagement and participation [8], [9].

This systematic review of the literature investigated the use of iPads in schools as a potentially effective educational tool to overcome communication challenges between teachers and students with autism in one-on-one and group interventions within the classroom setting. A secondary aim was to identify gaps in existing research as a basis to encourage future research. Research questions included: 1) Is the use of iPads effective in promoting communication competence? 2) Is the use of iPads an effective tool to enhance academic engagement? 3) What is the quality of the research designs used in existing studies?

2. Method

Of 32 identified studies that were published between 2011 and 2015 and identified from a comprehensive strategic search, 14 studies met the predetermined inclusion criteria, including seven that included AAC users. The 14 studies next were summarized in terms of (1) description of participants, (b) skills taught using an iPad and application(s), (c) dependent variable(s), (d) study results (effectiveness of using iPads), and (e) quality of evidence rating of the study. Studies were then coded as providing either conclusive or inconclusive evidence depending on the methodological quality.

3. Results

Results indicated that the use of an iPad with the Proloquo2Go app [5], [7] as a speech-generating device was specifically used most often for communication skills when the academic objective was teaching requesting skills. The use of iPad-based instruction was effective in enhancing engagement in both literacy and math for academic purposes. The majority of the studies reviewed reported positive outcomes and 78.6% met the quality standards to be considered as conclusive evidence.
4. Conclusion

Regarding communication skills, the use of an iPad-based intervention appears to be effective for students with autism, who require AAC. Using an iPad-based speech-generating device (SGD) helps students to request effectively the continuation of toy play. Using the iPad with Proloquo2Go app appears to provide an effective intervention to request preferred items [5] and to perform requesting and social communication sequences. Another effective communication intervention is use iPads with the SonoFlex app to increase communication skills in class activities [3]. It also appears that iPad interventions were only implemented to teach requesting skills for students with autism and further research is needed to examine teaching other communication skills.

In regard to engagement in literacy and math for academic purposes, using an iPad with video self-modeling appears effective. This review found that participants increased their frequency of providing correct unprompted academic responses, completing comparison tasks, and/or checking the spelling of words. Two students achieved 76-100% correct responses on a task analysis when provided the video modeling intervention with an iPad. Using iPad-based video modeling also appeared to provide an effective intervention for increasing students’ abilities to identify and write numbers from one to seven. Using an iPad with Proloquo2Go app as a speech-generating device helps students to discriminate between pictures symbols and to increase correct matching [7]. iPad interventions also effectively increased levels of play dialogue, when using an iPad play story. The use of iPads with systematic instruction and GoTalk Now app helped students increase the number of independent correct responses on a shared story task analysis (Spooner et al., 2014) and increased learning and independent levels [9].

Finally, using an iPad with apps increased academic engagement and reduced challenging behavior [8]. Taken together, the evidence that iPads offer effective communication and instructional tools appears to be emerging. Moreover, the evidence-base related to the practice of iPad-based instruction in both one-on-one and group interventions within the classroom setting for students with autism is growing.

5. References

A Comparison of Self-Presentation Tactics between Visually Impaired and Sighted Students

Mohammad Y. Safhi
King Khalid University

Abstract

The purposes of this study are: 1) to examine the behavioral differences between visually impaired and sighted students on Arabic version of Self-Presentation Tactics (SPT) scale and 2) to explore gender and degree of disability differences in visually impaired individuals’ scores. To investigate the first purpose, a study was conducted to obtain data from two groups of sighted students in Asir region of Saudi Arabia. The first group consisted of 114 students (61 males and 53 females) from middle school, their ages were (15.95 ± 1.14) years, the second group, consisted of 153 students (93 males and 60 females) from secondary school, their ages were (17.25 ± 0.85). To examine the second purpose, a separate study was performed to gather the data from two groups by applying SPT scale. The first group consisted of 85 (46 males and 39 females) visually impaired students, their ages were (17.15 ± 1.12) years. The second group consisted of 95 (50 males and 45 females) sighted students, their ages were (16.88 ±1.13) years. Confirmatory Factor Analysis (CFA) and item-total correlations were used to check the psychometric properties of the Arabic version of SPT scale. ANOVA was applied to assess the differences in SPT scale on both studies.

The results of the study indicated that Arabic version of SPT scale has good psychometric properties. The sighted students got significantly higher scores than visually impaired students in defensive self-presentation tactics (DSPT). In addition to that visual impaired males had significantly higher in assertive self-presentation tactics (ASPT).
Empowering Written Expression: Exploring the Effectiveness of Metacognitive Knowledge, Motivation, and Authoring Techniques with Students in Junior High with Learning Disabilities

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Abstract

This presentation will provide an overview of an ongoing study being conducted with students in grades 6 – 8 who have learning disabilities and are encountering difficulties with written expression. A mixed methods approach combining both qualitative and quantitative information to help understand the effectiveness of selected techniques, strategies and pedagogical approaches to improve written expression was used. Hooper, et. al.[1] have pointed out that executive functioning is important in written expression in areas of initiating, sustaining, set shifting and stopping, a problem solving process. This process is enhanced by active monitoring, planning, memory, reading and language generation, and as noted by Bereiter [2] by being goal directed. Persons with learning disabilities have been found to have difficulty with planning, drafting, revising and publishing as well as simply not thinking through their message in a coherent composition [3]. As noted by Hooper, et.al. [4], expert writers do more than attend to the details in organizing text. Expert writers attend to the communication of meaning and use the knowledge of the topic, the audience and the goals of the task to increase clarity in their writing. This recursive process is seen to be critical to fostering improved written expression.

Twenty students in a middle school in Nova Scotia are involved in a 12 week program in five groups of four which will be complete in June, 2015. The study which is part one of a longitudinal study with a larger sample of students is designed to provide further understanding of the impact of metacognitive awareness, motivational and specific authoring techniques in the recursive process as it is utilized by youth with learning disabilities. Researchers work in small groups with learners who have moderate learning disabilities for two 45 minute sessions each week to address specific strategies and techniques. These techniques are then reinforced in the regular classroom by their teachers who have received specific professional development by the researchers and are supported by researcher mentors. Critical to this process is the support provided to students and teachers. Graham & Perrin [5] and Mason, et.al. [6] have concluded that dialogue, scaffolded instruction and collaboration are critical to the authoring process. As well, mentoring students on how to learn, teaching content, supporting teachers who are struggling with diverse learning communities in their classrooms, and building a focus on higher order executive skills as well as on lower level spelling and punctuation skills is essential to changing interest and skill in effective written expression. Findings will be summarized and explored from the research study and an overview of the program being utilized will be provided. Participants will be engaged in a discussion of the
effectiveness of a process designed to build not only metacognitive knowledge but content, procedural, strategic and self knowledge important to written expression.

References

Session 7: Inclusive Education

Teacher Role in Emotional Balance of Pre-school Children Aged 4-6 with Disability in Nairobi County, Kenya: Safety, Actualization and Independence
(Authors: Ganira Khavugwi Lilian, Paul Amolo Odundo)

ReadSpeaker TextAid – Literacy Support for Inclusive Learning Goes ON-LINE
(Author: Niclas Bergström)

The Social Constructed of Gifted Education
(Authors: Gillian Parekh, Robert S. Brown, Karen Robson)

Development, Validation and Utilization of Giftedness Identification Inventory for Children
(Author: Clementina Ifeanyichukwu Nwahunanya)
Teacher Role in Emotional Balance of Pre-school Children Aged 4-6 with Disability in Nairobi County, Kenya: Safety, Actualization and Independence

Ganira Khavugwi Lilian, Paul Amolo Odundo
University of Nairobi, School of Education, Department of Educational Communication and Technology

Abstract

Teacher management of individual’s physical and psychological wellbeing of learners tend to deliver them from pessimistic and traumatic life threatening circumstances in which children with disabilities (CWD) find themselves particularly between ages 4-6 in Early Childhood Education (E.C.E) centers. The pessimistic and traumatic episodes creates emotional imbalance in children with disabilities particularly navigating around their safety, self actualization and independence in participation in school and community-based activities. Targeting emotional balance through meeting safety needs, creating environments that stimulate self actualization and independence boosts learner confidence and raise learner achievement. Although teachers are instrumental in developing and creating positive relationships necessary for effective participation of CWD, Safety, actualization and independence is often not addressed resulting in frustration, neglect and negative perception which lower inclusion in the learning process. This study investigated teacher role in emotional balance of children aged 4-6 with disability in Nairobi County, Kenya, addressing Safety, Actualization and Independence. Descriptive research design was used to gather data. Target population was 153 pre-school teachers, 102 head teachers and 150 pre-school with CWD. Purposive and simple random samplings were used for this study. Analysis was obtained through editing, coding classifying and tabulation. The study found inadequacies in emotional stability of CWD. The study recommends the government to take into account the principles of CRPP and CRC, as well as address barriers to effective participation as well emotional adjustment of CWD.

1. Introduction

Feeling a sense of personal self worth stimulates learning, growth, participation as well as enhancing overall well being and quality of life for children with disabilities (CWD) to effectively participate in society. Teachers’ role in providing emotional balance of safety, self actualization and independence is a major component of meeting developmental milestones for CWD to lead productive lives from childhood to maturity. By supporting emotional assurance for CWD, educationists, policy makers and governments aid in providing indispensable foundation needed for CWD to grow into prosperous productive adults. Additionally, emotional well-being of CDW is associated with higher school engagement, less troublesome behaviour, enthusiasm and positive friendship. Boyd et al. [3] asserts that emotional balance influences decision making along with daily learning experiences for CWD. As a result, CWD who experience emotional confidence have a greater likelihood of becoming economically productive and engaged citizen equipped to fully participate in school and in society. Consequently inadequate attention to emotional stability of CWD may translate into frustration, aggression and anxiety which in turn reduce effective participation in school and in society.

In spite of potential significance of emotional stability for CWD, the Convention on the Rights of Persons with Disabilities, during United Nations Treaty Collection in 2007, revealed that far too often CWD are among the last in line for resource allocation and are viewed as objects for pity, discrimination and abuse. In support of this view World Health Organization [25] and, Mont [17] indicates that globally people with disabilities are treated with little respect and recognition, a scenario that immensely impedes realization of effective participation as well as emotional reassurance. Further still Kvan [14] observed that CWD constantly experience abuse such as (physical, emotional, sexual, violation of rights and neglect) which inhibits enjoyment of basic human rights and inclusion in society. In regard to increasing effective participation of CWD and decreasing their segregation from curricular, cultures and communities, Salamanca Statement and Framework for action [24] upholds that inclusion and participation are vital to human dignity. Thus emotional stability for CWD must be addressed in an inclusive environment for effective participation to be achieved.
While the situation for CWD is changing for better, there still exist gaps in policies and planning that thwart achievement of emotional confidence as well as full participation in school and in society. According to Chavan et al. [4], barriers in providing emotional stability are evident in both developed and developing countries. Drawing from this, Scheer et al. [21] maintains that to overcome gaps and barriers such as ignorance and prejudice surrounding disability, education and awareness is necessary for realization of effective participation for CWD. In such circumstances, unless social, cultural, attitudinal and physical barriers are eradicated then CWD will constantly lag behind in realizing emotional balance and effective participation. With this in mind the Government of Kenya ought to act with haste to remove barriers to effective participation through addressing: policy and legislation, barriers to financing and affordability, barriers to service delivery, human resource barriers, as well as filling gaps in data and research. Additionally components of emotional assurance such as (confidence, security, stability, self-reliant self-fulfillment, autonomy, decision-making, goal-setting and self-management) should be addressed fully in an inclusive environment for CWD to gain self-assurance in effective participation.

In support of the rights of CWD, the Convention on the rights of persons with disabilities (CRPD) [5] and the Convention on the Rights of the Child (CRC) [6] all point towards overcoming discrimination and recognizing the right to full participation of CWD in the home, in school, in services, in recreation activities and in all aspects of life. However, in spite of the conventions, frequently CWD are excluded from participating fully in life in the society, as indicated by National Coordinating Council on Disability (NCCD) [19]. In addition CWD are not recognized along with being thought to have little contribution to the society. To this effect continuous exclusion reduces opportunities for CWD to learn, grow and develop, hence contributing to diminished probability of emotional stability and participation. According to Barnett et al. [1] responding to emotional balance of CWD in inclusive preschools requires government responsibility to protect the rights of CWD under its jurisdiction. This entails focusing not only on disability, but on investing in removing physical, cultural, economic, cultural and communicational barriers that impede realization of emotional confidence and effective participation for CWD.

Besides, studies by Ganira et al. [9] on impact of social needs on participation of CWD, pointed out that preschool-teachers are not conversant with various needs of CWD, a scenario that encumber effective participation. Further studies by Ganira, et al. [10] on effects of emotional needs on participation of children with learning disabilities found out that diverse types of disabilities posts a challenge to preschool teachers owing to insufficient training in handling needs of CWD. Given that teachers are key elements in CWDs’ learning, expanding teacher training and professional development on emotional balance for CWD is vital to achieving success in effective participation as well as balanced learner needs. Consequently, Dessemontet [7] opined that effective classroom management leads to increased academic achievement and decreased problem behaviors of learners. With this in mind, classroom management should be considered as a powerful cluster of techniques in creating meaningful learning experiences for CWD and tapping on intellectual and learner needs. It is in this context that the study assessed teacher role in emotional balance of CWD in pre-schools in Nairobi County, Kenya.

2. Safety and participation of CWD

Building a sense of confidence, security, and stability is a natural way of protecting CWD from harm, thus maintaining emotional balance. Fitzsimons [8] emphasizes that CWD feel safe when they know no harm will befall them whether physical, sexual, emotional, psychological abuse, or neglect. As soon as CWD are protected from any form of harm, they are likely to feel free to reach out to others and explore the environment for effective participation in schooling. According to Shutts et al., [22] every child including CWD have a right to live full productive life in an environment that builds confidence, friendship, security and happiness, irrespective of disability or background. Furthermore, Article 11 of Convention of the Right of persons with disability requires nations to ensure safety of persons with disabilities including children.

While providing emotional stability is dependent on effective pre-school surroundings, a safe and secure childhood environment provides the best chance of achieving a healthy well adjusted adulthood that translates into assured participation, as highlighted by National Association for the Education of Young Children [18].

2.1. Self actualization and participation of CWD

Development of skills and social competence is essential for the wellbeing and success for CWD to develop self reliance, self-fulfillment, autonomy, personal growth, and personal potential in life. Every individual including CWD has a natural tendency to emotionally fulfill their potential in all aspects of life. According to Birney et al. [2] CWD are eager to undergo new experiences, learn new ideas and skills and try out new things as well as feel complete and
Furthermore, emotional competences for CWD are rights in addition to destroying them emotionally. Recognition inhibiting enjoyment of basic human rights are treated with little respect and discrimination and abuse, lowering self esteem and poor life circumstances while reducing them to passive participants. Consistent with this is the reality that self-actualization helps in improving quality of life and considerably reduces risk of adverse impact of challenging life experiences for CWD, to attain emotional confidence Gilbody et al. [11].

2.2. Self independence and participation of CWD

Building a foundation of independence achieves effective participation for CWD in all aspects of social life. Leithwood and Mascall [15], Points out that when CWD share power and responsibility for decision making, effective learner participation is likely to be achieved as they also realize emotional balance. This entails fostering skills, knowledge and opportunities that contribute to independence to CWD such as (giving CWD a chance to make decisions, helping CWD to set goals for their future, and teaching self management skills). In harmony with these findings, Studies by Reading et al. [20], affirmed that CWD can flourish if they are encouraged to be more independent and try out new skills which builds confidence. To this effect, teachers should provide opportunities during group work for CWD to use leadership skills in participating in a range of activities that permits discovery of new areas of interest along by allowing CWD to speak for themselves rather than someone else representing. Further still, analysis by Sinclair (2004) showed that CWD require opportunities in making autonomous decisions, be involved in decision making and be listened to by adults and peers to assure confidence, build self esteem and achieve emotional stability. In order to achieve this, teachers should provide guidance to sensitize communities on independence for CWD to realize emotional balance at school and at home. While children are increasingly involved in decision making, growth has been slow in respect to involving CWD who are inadequately involved and challenged to participate in social activities [23].

3. Statement of the problem

The CWD are among the last in line for resource allocation and viewed as objects for pity, discrimination and abuse, lowering self esteem and emotionally disparaging them. The WHO [25] and Mont [17] indicates that globally people with disabilities are treated with little respect and recognition inhibiting enjoyment of basic human rights in addition to destroying them emotionally. Furthermore, emotional competences for CWD are not recognized along with CWD being thought to have little contribution to the society further lowering the desire to realize sustained emotional growth. More still, gaps in policies and planning delay provision of essential emotional stability to CWD. Sadly, Chavan et al. [4] observed that barriers in providing emotional assurance is evident in both developed and developing countries; where abuses, derogatory remarks and limited attention reduce them to social misfits lowering their ability to adjust to the demands of schooling and community learning. Regardless of CRPD and CRC emphasizing equality frequently CWD are excluded from participating fully in life in the society as indicated by National Coordinating Council on Disability (NCCD) [19]. Based on this, the study assessed teacher role in emotional balance of children aged 4-6 with disability in Nairobi County addressing safety, actualization and independence.

3.1. Purpose and objectives

The purpose of this study was to examine teacher role in emotional balance of pre-school children in Nairobi County. The exercise was intended to provide useful information that could facilitate improvement of pre-schools’ management of emotional stability and participation of CWD. The objective of the study was to examine teacher role in emotional stability and participation of CWD in school and in society. The study purposefully raises awareness to the Ministry of Education, and the entire society on the significance of emotional adjustment for CWD.

4. Theoretical framework

The study adopted the theory of Abraham Maslow’s hierarchy of needs [16] which emphasized that most needs are emotional. In hierarchy of needs, physical needs are at the bottom implying that once these needs are met, emotional assurance become most significant and achievable. However, in instances where CWD experience emotional imbalance, frustration and anxiety yields. When CWD experience emotional stability, fewer problems are encountered in learning at all levels. To this effect, attention to emotional stability may well predispose CWD to increased levels of participation, improved confidence and stability. Accordingly, emotional reassurance should be delivered in an environment respectful of cultural protection and participation rights of CWD in school and at home. Skills such as; confidence, security, stability, self-reliance, self-fulfillment, autonomy, decision making, goal setting and self-management are integral to achieving emotional balance and effective participation.
4.1. Conceptual framework

A conceptual framework details possible outcomes of action to represent preferred approach to an idea by explaining teacher’s role in emotional balance and participation of CWD in school. Since emotional stability determines physical and psychological well being of CWD, safety, actualization and independence are vital in participation and realizing emotional assurance in the learning process. The CWD need an inclusive environment which advocates for confidence, security, stability, self-reliance, self-fulfillment, autonomy decision making goal-setting and self – management in order to achieve inclusion and emotional reassurance in school and in community.

5. Data and Methodology

This study employed a descriptive research design to gather data. Simple random sampling technique was used to identify 150 pre-schools. Purposive sampling and simple random sampling were then used to obtain a target population of 102 head teachers, 153 pre-school teachers and 150 pre-school CWD aged 4-6. Instruments for this study were questionnaires, interview schedules and observation guide. A questionnaire was administered to teachers and it dealt with teachers’ familiarity with emotional balance of CWD. An interview schedule was used to obtain information from head teachers on views concerning emotional balance for CWD. An interview schedule was used to obtain information from head teachers on views concerning emotional balance for CWD. Further still, Interview schedule was used on CWD to obtain views on emotional stability.

Table 1: Years of Service and Academic Qualification of the Respondents

<table>
<thead>
<tr>
<th>Years of Service</th>
<th>No. of Teachers</th>
<th>Frequency %</th>
<th>Academic Qualification of Teachers</th>
<th>No. of Teachers</th>
<th>Frequency %</th>
</tr>
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<tbody>
<tr>
<td>1 year</td>
<td>20</td>
<td>13.27</td>
<td>Certificate in E.C.E</td>
<td>46</td>
<td>30.06</td>
</tr>
<tr>
<td>2 years</td>
<td>30</td>
<td>19.93</td>
<td>Diploma in E.C.E</td>
<td>39</td>
<td>25.49</td>
</tr>
<tr>
<td>3 years</td>
<td>40</td>
<td>26.20</td>
<td>Bachelors degree in E.C.E</td>
<td>10</td>
<td>6.54</td>
</tr>
<tr>
<td>4 years</td>
<td>40</td>
<td>26.20</td>
<td>None</td>
<td>5</td>
<td>3.33</td>
</tr>
</tbody>
</table>

According to Jackson [13], descriptive research design is commonly represented by use of frequency charts, bar graphs and pie charts to tabulate the information gathered appropriately. Data collection for this study was obtained through editing, coding and tabulation procedures.

6. Study findings

The study sought to examine academic qualifications of Pre-school teachers. From Table 1, Cumulatively 10(6.54%) out of 153 Pre-school teachers had between 1-2 years of experience, 39 (25.49%) had between 2-5 years of experience, 46(30.06%) had between 5-9 years for experience while majority 58(37.91%) had more than 10 years for experience signifying that they were well trained and equipped with prerequisite knowledge that enabled them to handle CWD. Additionally out of 153 teachers 14(9.15%) had taught for between 1-2 years in same station, 29(18.95%) had taught between 2-5 years in the same station, majority 61(39.87%) had taught between 5-9 years in the same station while 49(30.03%) had taught over 10 years in the same station. These findings indicate that majority of the teachers having taught in the same station had acquired much experience in handling CWD. More findings revealed that 92(60.13%) of the teachers had Certificate in E.C.E, 39(24.49%) had Diploma in E.C.E, 22(14.38%) had Bachelors degree in E.C.E. and none with masters in E.C.E. This depict that all the 153 teachers had training in E.C.E a prerequisite for providing emotional balance for CWD. This is in line with Harris, (2002) who showed that expanding staff training and professional development opportunity on emotional balance of CWD is essential in learner participation. Similarly, educational and professional qualification is an essential aspect towards providing emotional confidence to CWD.

Table 2: Teacher’s familiarity with emotional needs of CWD

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes Frequency</th>
<th>Yes %</th>
<th>No Frequency</th>
<th>No %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>15</td>
<td>10.00</td>
<td>86</td>
<td>56.67</td>
</tr>
<tr>
<td>The CWD are confident</td>
<td>148</td>
<td>97.38</td>
<td>6</td>
<td>3.80</td>
</tr>
<tr>
<td>The CWD engage socially</td>
<td>148</td>
<td>97.38</td>
<td>6</td>
<td>3.80</td>
</tr>
<tr>
<td>The CWD are emotionally stable</td>
<td>148</td>
<td>97.38</td>
<td>6</td>
<td>3.80</td>
</tr>
<tr>
<td>Self actualization</td>
<td>142</td>
<td>93.05</td>
<td>13</td>
<td>7.95</td>
</tr>
<tr>
<td>The CWD require self- different decisions</td>
<td>140</td>
<td>91.80</td>
<td>13</td>
<td>7.95</td>
</tr>
<tr>
<td>The CWD can make decisions</td>
<td>130</td>
<td>85.57</td>
<td>23</td>
<td>14.43</td>
</tr>
<tr>
<td>The CWD can make decisions</td>
<td>147</td>
<td>96.15</td>
<td>6</td>
<td>3.85</td>
</tr>
<tr>
<td>The CWD can make decisions</td>
<td>121</td>
<td>79.80</td>
<td>29</td>
<td>18.95</td>
</tr>
</tbody>
</table>

The study sought to examine teacher’s familiarity with emotional balance of CWD. From Table 2, the study found that 55 (35.94) out of 153 teachers...
reported that CWD have confidence especially in handling dangerous situations, such forms of abuse suggesting adequacy in emotion balance, while 98 (64.05) did not, implying presence of emotional imbalances. This depicts that majority of teachers are not dedicated to providing safety needs of CWD, a situation that is likely to expose CWD to insecurity and emotional imbalance, yet findings by Fitzsimons [8] indicates that CWD feel safe when no harm befalls them, an indication of emotional stability. Similarly 150 (98.03) discouraged teasing and bullying for CWD to develop emotional reassurance, while 3 (1.96) did not due to ignorance of emotional security for CWD. The three teachers lamented that CWD should be treated like the rest of the children in class. Additionally, 61 (39.86) had constant routine for CWD to gain emotional stability necessary for learner participation while 92 (60.13) did not, due to inadequate knowledge on emotional balance for CWD. In one incident a teacher lamented...These CWD overcompensate for their own insecurities by aggressiveness, I don’t allow anyone to get away with these behaviours. Do not expect me to concentrate on a few CWD when I have such a large class. These findings suggest that most teachers jeopardize potential success for CWD to achieve emotional stability by failing to provide skills necessary for CWD to acquire emotional assurance.

Findings revealed that, 142 (92.81) teachers offered CWD tips for self reliance such as allowing CWD to make choices and solving own problems, however 11 (7.18) did not. Additionally, 149 (97.38) paired CWD with peers without disability for realization of self fulfillment and emotional encouragement while 4 (2.61) did not. More findings revealed that 87 (56.86) assisted CWD to understand and face consequences for behaviour to achieve autonomy and emotional adjustment, while 66 (43.13) did not, indicating lapse in emotional adjustment. Thus, focusing on improving CWD’s ability to self-actualization is the best way in treating personality disorders and achieving emotional balance.

Further findings indicated that, 133 (86.92) teachers allowed CWD to make own decisions while 20 (13.07) did not hence, increasing emotional imbalance for CWD. Similar findings by Shier (2001) points out that when CWD share power and responsibility for decision making effective learner participation is likely to be realized, which in turn leads to emotional stability. Further still, 147 (96.07) teachers gave CWD opportunities to set own goals, suggesting emotional confidence. However 6 (3.92) did not, implying emotional instability. Finally 151 (98.69) permitted enough time for CWD to complete classroom tasks for achievement of emotional assurance while 2 (1.30) did not, even though studies by Reading et al., confirmed that CWD can flourish if they are encouraged to be more independent and try out new things for emotional balance to be realized. These findings indicate that most teachers initiated independent skills to CWD a requirement for emotional reassurance.

Table 3: Head teacher’s level of understanding emotional stability for CWD

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes Frequency</th>
<th>%</th>
<th>No Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>26</td>
<td>17.33</td>
<td>124</td>
<td>82.66</td>
</tr>
<tr>
<td>There is adequate security for CWD</td>
<td>24</td>
<td>15.96</td>
<td>128</td>
<td>84.04</td>
</tr>
<tr>
<td>Teachers should have a strong policy supporting staff</td>
<td>124</td>
<td>82.66</td>
<td>28</td>
<td>17.33</td>
</tr>
<tr>
<td>Teachers should not give CWD the responsibility for decision making</td>
<td>128</td>
<td>84.04</td>
<td>24</td>
<td>15.96</td>
</tr>
<tr>
<td>Teachers should not give CWD the responsibility for decision making</td>
<td>128</td>
<td>84.04</td>
<td>24</td>
<td>15.96</td>
</tr>
<tr>
<td>Teachers should not give CWD the responsibility for decision making</td>
<td>123</td>
<td>82.03</td>
<td>30</td>
<td>17.97</td>
</tr>
<tr>
<td>Teachers should not give CWD the responsibility for decision making</td>
<td>123</td>
<td>82.03</td>
<td>30</td>
<td>17.97</td>
</tr>
</tbody>
</table>

The study sought to find out head teacher’s level of understanding of emotional balance of CWD. Findings from Table 3 revealed that, cumulatively 3 (2%) out of 150 head teachers had training on safety needs and first aid, while 147 (98%) did not, signifying that safety needs were not given priority by the head teachers therefore diminishing emotional stability for CWD. Further findings showed that 26 (17.33%) reported schools having safe and enclosed outdoor areas for pre-school children implying emotional confidence while 124 (82.66%) did not. Inadequate safety reduces CWDs’ functioning significantly, implying emotional instability. More findings revealed that 12 (8%) had provision for nap schedules during afternoon for emotional adjustment while 138 (92%) did not, suggesting that CWD experienced emotional imbalance. When asked about inadequate safety of CWD, one head teacher lamented…I want to prioritize supporting safety needs of CWD but do I use money designated for other children to support CWD? There is no extra funding for inclusive schools. No resources are allocated for CWD yet parents have refused to support schools financially. Based on findings head teachers should have a strong policy supporting staff in providing emotional security for CWD.

Other findings revealed that 137 (91.33%) head teachers reported having supported CWD’s self reliance by allowing CWD to make choices, solve problems, complete tasks successfully and rotating chores daily and weekly. Conversely 13 (8.67%) did not, implying reduced emotional adjustment. Similarly, 21 (14%) reported having enhanced self fulfillment skills for CWD such as accepting own talents, strengths and limitations while 129 (86%) did not, owing to inadequate skills in emotional balance. However learner centred pedagogy raises

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self-actualization, a pre-requisite for emotional security. Furthermore, 19 (12.67\%) confirmed having professional training in enhancing autonomy in CDW, while 131 (87.33\%) did not, demonstrating emotional imbalance for CWD. Thus expanding staff training and professional development opportunities on emotional confidence for CWD is essential for learner participation.

In addition, 139 (92.67\%) reported having provided opportunities for decision making, however 11 (7.33\%) did not, advocating for emotional insecurity for CWD. More still 123(82\%) allowed CWD to participate in co-curriculum activities such as music and drama for emotional stability, while 27(18\%) did not, pointing to inadequacy in emotional security for CWD. Additionally, 107(77.67) stated that CWD are capable of making own decisions in daily school activities such as types of clubs to join, while 41 (27.33\%) did not, denoting emotional imbalance and reduced learner participation.

Table 4: Children with disabilities view on emotional stability

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes Frequency</th>
<th>%</th>
<th>No Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>142</td>
<td>94.67</td>
<td>8</td>
<td>5.33</td>
</tr>
<tr>
<td>I experienced adequate security</td>
<td>82</td>
<td>51.33</td>
<td>58</td>
<td>48.67</td>
</tr>
<tr>
<td>The school offers adequate stability</td>
<td>120</td>
<td>77.33</td>
<td>37</td>
<td>22.67</td>
</tr>
<tr>
<td>Self actualization</td>
<td>101</td>
<td>66.67</td>
<td>46</td>
<td>33.33</td>
</tr>
<tr>
<td>Self management</td>
<td>101</td>
<td>66.67</td>
<td>46</td>
<td>33.33</td>
</tr>
<tr>
<td>The school offers self management skills</td>
<td>101</td>
<td>66.67</td>
<td>46</td>
<td>33.33</td>
</tr>
<tr>
<td>I am involved in decision making</td>
<td>120</td>
<td>75.33</td>
<td>37</td>
<td>24.67</td>
</tr>
<tr>
<td>I can set my own goals</td>
<td>113</td>
<td>75.33</td>
<td>37</td>
<td>24.67</td>
</tr>
<tr>
<td>The school offers self management skills</td>
<td>89</td>
<td>59.33</td>
<td>41</td>
<td>40.67</td>
</tr>
</tbody>
</table>

The study examined CWD’s understanding of emotional stability. Findings from Table 4 illustrates 142 (94.67\%) out of 150 CWD reported having confidence in crossing busy roads, denoting emotional security while 8 (5.33\%) did not due to fear, suggesting emotional imbalance. Further, 92 (61.33) reported having adequate security in school, while 58 (38.67), did not, meaning emotional insecurity. Additionally, inadequate stability was reported by 129(86\%) due to teasing and bulling in school while 21(14\%) did not; suggesting that safety needs for CWD was not a major concern in many schools, hence emotional imbalance and reduced participation. However, in an environment where autonomy, hope, and confidence prevail, CWDs’ are likely to transform into effective participants, a requirement for emotional assurance.

Additional findings revealed that, 102(68\%) were self-reliant in competing daily school tasks successfully, symbolizing emotional assurance, while 48(32\%) were not. More findings revealed that 140(93.33) were taught self-fulfillment skills such as acting responsibly, attending to new challenges, and setting realistic goals, while 10(6.67) were not, resulting into emotional imbalance. Finds on autonomy revealed that, 99(66\%) CWD were good at self-feeding, independent dressing and grooming, hygiene and toileting as well as helping with daily chores, resulting in emotional confidence, while 51(34\%) were not, denoting emotional instability. Equally important, CWD who experience supportive and long lasting relationships tend to feel more independent and connected. In consequence emotional re-assurance is achieved.

In addition 126(84\%) reported having made own decisions for example classroom rules, solving own problems, in addition to choosing co-curriculum activities, therefore enhancing emotional confidence, while 24(16\%) did not due to inadequate confidence. More still 113(75.33\%) CWD were involved in goal setting for instance selecting own learning materials, recognizing own talents and interests, sharing own experiences while 37(24.67) did not, due to inadequate skills, resulting in emotional instability. More still 89(59.33\%) managed their own life through self-control, exhibiting confidence, good time management and managing anger, demonstrating emotional adjustment while 61(40.67\%) were not due to laxity in teachers recognizing and understanding the need for emotional balance. Though CWD experienced self-independent they lacked safety and self-actualization. These findings indicate that CWD lacked skills for independence, situation that lowers emotional assurance and effective participation.

7. Conclusions

The findings highlight the significance of teacher role in emotional balance of CWD. The CWD ability to learn and function as contributing members of society rests entirely on safety, self-actualization and independence. Understanding of emotional balance enables CWD meet demands of everyday life, lower destructive behaviour, cope with stress as well as focus on personal growth to live more authentically. Teachers’ pursuing emotional stability permit CWD in experiencing healing from stress anxiety, depression and transform into helpful patterns of thinking, feeling as well as gain confidence in life. Given daily stressors faced by CWD, promoting emotional stability is likely to build positive relationships, promote pro-social behaviour, academic success and effective participation in class and in society. If school learning environments are improved to support inclusion and emotional balance, CWD are likely to experience connection to school and reduced emotional distress.

The study found inadequacies in identifying and providing emotional stability to CWD. Irrespective
of disability, CWD have skills that can be developed for realization of effective participation only if emotional competences of safety, actualization and independence are accorded in the correct manner. Implication of this evidence is that supporting teachers in developing emotional balance for CWD should be the major focus of Early Childhood intervention services. To achieve this, Early Childhood interventions need well developed skills in engaging and building partnership with parents as well as knowledge of strategies and programs for building positive relationships with CWD as well as promoting emotional well being of CWD in school and in society. Thus, classroom management should be improved as teachers learn to regulate emotional balance for CWD.

8. Recommendations

These recommendations derive from the study findings and they include some of the suggestions put forward by the respondents:

- Teachers should focus on programmes that anchor on skill development such as technology enthusiast, innovativeness, commitment, preparation tolerance and strategies such as; daily schedule for CWD, an orderly classroom management, respect for CWD, and clear open communication between learner and teacher, consistent with emotional stability of CWD, as well as link to community resources beyond school.

- Teachers should supplement core practices with interventions such as providing culturally relevant curriculum that reflects experiences for CWD to experience love, joy, acceptance and optimism. This should include demonstrating appropriate pedagogy, caring, and concern for CWD and establishing and maintaining positive relationships with CWD.

- Teachers should implement school programs and approaches for creating healthy inclusive learning environments that promote emotional stability through comprehensive educational and professional development emphasizing importance of emotional reassurance for CWD.

- The Government of Kenya should align its policies and programs with those of CRPD and CRC in order to enhance equal opportunities for effective participation. This will cater for special needs of CWD in education as well as equal access to education and facilities that are integrated into society to the extent compatible with emotional security of CWD.

- Education laws in Kenya should be monitored to identify features that limit CWD from enjoying equal educational opportunities. Distribution of resources should promote synchronization of efforts in meeting emotional demands of CWD in inclusive environments, hence, avoiding escalation of emotional imbalances. Other key players such as local authorities, parents and communities also should take up responsibilities of meeting emotional security of CWD.

- The Ministry of education should ensure that policies, structures and processes are inclusive both in philosophy and practice, since insufficient understanding, data and information about disability impacts negatively on participation, creating emotional imbalances to CWD. To ensure visibility of all groups of CWD in relation to attendance, completion and attainment in education it is vital that data are disaggregated by disability, economic status, and geographical status to promote harmony in addressing emotional needs of CWD.

- To date there has not been extensive studies on emotional needs of children with disabilities. Most studies focus on reducing disability and treatment. Based on the experiences of this study, the researcher recommends need for more research on emotional balance of children with disabilities. An inclusive intervention program should address discrepancies in the area of emotional security of children with disabilities. Thus future studies should explore ways of making emotional awareness and mindfulness to supporting well being of CWD.

9. References


ReadSpeaker TextAid – Literacy Support for Inclusive Learning Goes ON-LINE

Niclas Bergström
Founder and CEO ReadSpeaker
Sweden

1. Scope

TextAid is a new innovative and fully web based application where students can get help both with reading longer texts and documents as well as get some easy to use writing and research tools right in their web browser. We have developed SaaS (Software as a Service) solutions for increasing the accessibility to text for millions of people since 1999. By using and developing advanced text-to-speech technology and utilize it in user centric supportive applications normally only found in “computer installed”-software, we can provide help for students who struggles with various reading-, writing- or concentration difficulties. TextAid is a web based tool that can be easily reached in any web browser at any time and can also be integrated in most of the popular LMS (Learning Management System) platforms to provide campus wide access easily.

When a using TextAid, the student can paste any text into the dedicated reading area and have it read out aloud using high quality computer generated speech. It is possible to select between different presentation settings such as fonts, text sizes and colors both for the text itself and also for the synchronized highlighting of the text that is being read.

It is also possible to translate the text and have it read in different languages which make the tool ideal also for self-study language learners. There are also other tools present such as screen masking, reading ruler, talking calculator as well as providing the possibility to save and load texts and documents in many different formats.

Special institutional features include user- and group management, OCR, upload and sharing of documents to users or groups of users. Research about Bimodal presentation will be presented and its benefits in improving word recognition skills and vocabulary, reading comprehension, fluency, accuracy, and concentration.

2. Objective and Motivation

The objective is to demonstrate a brand new and powerful web based application that has features traditionally only found in installed assistive technology software. I will talk about the advantage of using a Bimodal presentation which refers to the act of reading text while hearing the words at the same time, such as when using speech synthesis software, or reading the text, hearing the words, and having the words (and/or sentences) highlighted at the same time, such as when using text-to-speech software with integrated highlighting.

I will talk about the different benefits for different user groups and present the outcome of our end-user testing recently performed on students with different reading-, writing- and language disabilities. There will also be a Q&A session and discussion.
1. Scope

This paper explores the social construction and process by which many students are identified as Gifted and the advantages this identification affords them. Drawn from the extensive database at the Toronto District School Board, this analysis unpacks the disproportionate representation of class, race, and gender within the student population identified as Gifted. Using a statistical analysis of TDSB Parent and Student Census responses merged with student program information, we were able to accurately develop a portrait of the Gifted population. Results from the TDSB uncover that students identified as Gifted are disproportionately male, white, and economically advantaged. Employing a theoretical deconstruction of intersecting and relational identities (Gorman, 2013; Erveilles & Minear, 2010), discussion of the results frame various forms of advantage as a multi-pronged construction of student identity, reified by institutional access and opportunity.

2. Objective and Motivation

Critical pedagogues have been long discussing how the primary use of public education is to serve as a mechanism for social and economic organization, one that is critical to the preservation of a capitalist society (Giroux, 2013; Duncan-Andrade & Morrell, 2008). Based on a meritocratic system guided by constructions of normative ability, students are often organized into structured pathways and trajectories consistent across their academic tenure. Along with the organization of the student population based on conceptions of achievement, disproportionate representations of gender, racial, and class identities emerge across congregated sites. While deconstructing disproportionate representation related to programs for and identifications of students with perceived impairments is frequently taken up in the academic literature (Ferri, & Connor, 2005; De Valenzuela, Copeland, & Park, 2006; Reid & Knight, 2006), less attention is paid to the highly advantaged identification of Giftedness and its relationship to whiteness, economic privilege, and masculinity.
Development, Validation and Utilization of Giftedness Identification Inventory for Children

Clementina Ifeanyichukwu Nwahunanya
Abia State University, Uturu, Nigeria

Abstract

The instrument giftedness identification inventory (GII) is a likert type inventory developed by the researcher. The purpose is to develop, validate and utilize an inventory for identifying giftedness in children. It is developed to measure some characteristics of giftedness such as general behavior characteristics, learning characteristics, creative characteristics. Giftedness is defined as extraordinary intellectual and academic ability and high performance capability in creativity, the arts and leadership. The practice of identifying gifted children in schools typically centre’s on assessing intellectual and academic abilities. The instrument Giftedness Identification Inventory (GII) goes ahead to x-ray some essentials of giftedness such as ability to go into minute details, associate correlates, abstract reasoning, and accuracy in problem solving. The procedure for developing an instrument was followed. The instrument was developed based on the general characteristics of giftedness, certainty, arts and leadership.

1. Introduction

Education is an enterprise which sets out to instill values, attitudes and skills in members of the society. It is a process of personal development, a veritable means of developing human resources. There has been a global trend toward educational reforms to include human resources development, as a function of education and human capital formation. Human capital formation refers to the process of acquiring and increasing the number of persons who have the skills, education and experience for the economic growth and development of a nation [1].

Human development is an umbrella term used to describe the quantity and quality of life that is sustained over time. It can also imply an increase in the capacity of persons within a community to contribute to a variety of areas of life; social, economic, political, bureaucratic, and technological [2]. While it in true that every human being engages in activities for development, there seems to be very little to show for the efforts particularly in African countries. The complexities of societal values, together with daunting inequalities between communities and cultures even within the same country, have a negative impact on developmental efforts. Nations are beginning to wake up to the fact that proper development must guarantee and respect the rights of all citizens to information and knowledge. Therefore the plea for formal and non-formal education as tools for sustainable educational development for all cannot be more apt than now. The reforms in education in Nigeria in recent times focused on the primary and junior secondary education sub sectors which are known as universal basic education (UBE) program. It covers a period of nine (9) years, from primary one to junior secondary three (3). Emphasis should be out on the Jomtein declaration on education for all [4]. This can be used as a veritable tool to eliminate poverty and promote participatory political, social and cultural life.

Furthermore, the United Nations Millennium Summit held in New York in September, 2000 declared the eight millennium development goals (United Nations, 2005). The declarations from these international conferences recaptured Nigeria’s strong belief in education as an instrument par excellence, thus affecting revision of the national policy on education.

Education in Nigeria is an instrument “par excellence” for effecting national development [5]. In other words, education shall continue to be highly rated in the national development plan, because it is the most important instrument of change. Any fundamental change in the intellectual and social outlook of any society has to be preceded by educational revolution. In recognition of the role of education in individual development, the [5] states that, educational activities shall be centered on the learned for maximum self development and self fulfillment, the education of the individual starts from the early childhood education or primary education.

Primary education is the formal education given in institutions for children aged six (6) years to eleven (11) years. Since the rest of the education system is built upon it, the primary level is the key to the success or failure of the whole system. For this reason, the [5] set some goals for primary education. These goals include to

a) inculcate permanent literacy and numeracy and ability to communicate effectively.
b) lay a sound bases for scientific and reflective thinking,

c) give citizenship education as a basis for effective participation in and contribution to the life in the society,

d) mold the character and develop sound attitude and morals in the child,

e) develop in the child the ability to adapt to the child’s changing environment,

f) give the child the opportunities for developing manipulation skills that will enable the child function effectively in the society within the limits of the child’s capacity, and

g) provide the child with basic tools for further educational advancement, including preparation for trades and crafts of the locality.

In pursuance of these goals, the FRN made primary education tuition free, universal and compulsory and also restated its interest in special education. This is to the special care of the pupils with special needs, such as pupils with various impairments or disabilities and the gifted [5].

Some of the problems of the educational system seem to be lack of planning for the gifted children in our primary schools, and ignorance. This may be as a result of not knowing the number of the gifted due to lack of identification instrument. The FRN seems to address the problem when it states that, among other objectives, special education is the provision of opportunities for exceptionally gifted children who develop their talents or natural endowments/trait at their own pace in the interest of the nation’s economic and technological development. Unfortunately, this objective has remained on paper and has not been translated into practical terms in our primary schools unlike the developed nations. A report from [6] states that early childhood educators are uniquely portioned and equipped to recognize support and care for many gifted children before they are admitted to more formal learning program.

2. The Concept and Nature of Giftedness

Several definitions of giftedness conceptualize as extraordinary intellectual and academic ability. Giftedness entails high performance capability in creativity, arts and leadership ability [7]. Also [8] conceive giftedness as possessing potential abilities that can be demonstrated and which must give evidence of high performance capability in areas such as intellectual, creative, specific academic and leadership ability. [9] defined the gifted child as one who possesses potential abilities that can be demonstrated and which must give evidence of high performance. Gifted children are exceptional and unique children because they manifest very high cognitive ability and creativity in thinking and productivity. It denotes inherent potentials which are naturally endowed and are demonstrated in high performance capability in school and out of school. From another perspective [1] states that the gifted have different emotional intensities and combinations of what he called “over excitation”. He further stressed that over excitability is the usual intensity of the gifted as well as the several ways in which they look and behave oddly, when compared to norms. [1] also identified five areas of high manifestation to include, physical expression, imagination, sensual, or high sensory, intellectual and emotional intensity. [6] asserts that Giftedness is asynchronous development in which advanced cognitive abilities and heightened intensity combine to create inner experiences and awareness that are qualitatively different from the norm. This asynchrony increases with higher intellectual capacity. The uniqueness of the gifted renders them particularly vulnerable and requires modification, teaching and counseling in order for them to develop. The implication of this is that these gifted children develop in an uneven manner which significantly differs from that of their peers. In this respect a gifted child could be one whose skills and abilities make him stand out above others in school and out of school tasks. He exhibits high level of proficiency in all areas of endeavor. In this regard for those in school they need an enrichment or modification in the normal educational programs for their maximum development. Succinctly put, gifted children are on a developmentally different schedule from infancy. This places the gifted children out of the expected developmental stages internally and externally. Programs which anticipate limited powers of concentration and break complicated subjects into simple pieces for children to understand, may stress gifted children. Sequences may be too simple for minds which thrive on complexity and challenge. They are able to process huge quantities of information rapidly. Gifted children may find nothing of interest to engage them in regular programs and may act out along this line. Stephanie Tolan, author and gifted advocate, presents a wonderful analogy for this process. She likens it to

Feeding an elephant with grass, one blade at a time. Not only will the elephant die of malnutrition, before you can get sufficient food (grass) into him, he is unlikely to realize that you are trying to feed him at all. That single blade of grass is simply too small for him to notice.

The above analogy in very important, if the future of the gifted children is not truncated through normalization of regular primary school programs. Both teachers, parents and adults even their peers, who are unable to understand the process of gifted children, often discredit their abilities and the way they do their things. Quite
often the gifted are forced to work and solve problems in a way that is alien to them. They are not comfortable at times working in a fashion or manner many people are used to. Their peers and teachers may accuse them falsely because they are unable to understand the behavioral patterns of the gifted and this may cause the gifted children to shutdown in an attempt to become “normal”.

General characteristics of gifted children, their distinguishing features, become apparent from an early age. [10] provided a useful generalization of the intellectual and associated personality characteristics of the gifted children. Not all of these features are exclusive to gifted children but such children possess them to a greater degree.

Table 1: Characteristics of Gifted Children

<table>
<thead>
<tr>
<th>INTELLECTUAL TRAITS</th>
<th>PERSONALITY TRAITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Exceptional reasoning ability</td>
<td>Insightful</td>
</tr>
<tr>
<td>• Intellectual curiosity</td>
<td>Need to understand</td>
</tr>
<tr>
<td>• Rapid learning rate</td>
<td>Need for mental stimulation</td>
</tr>
<tr>
<td>• Facility for abstraction</td>
<td>Perfectionism</td>
</tr>
<tr>
<td>• Complex thought processes</td>
<td>Need for precision / logic</td>
</tr>
<tr>
<td>• Vivid imagination</td>
<td>Excellent sense of humor</td>
</tr>
<tr>
<td>• Early moral concern</td>
<td>Sensitivity/ empathy</td>
</tr>
<tr>
<td>• Passion for learning</td>
<td>Intensity</td>
</tr>
<tr>
<td>• Powers of concentration</td>
<td>Perseverance</td>
</tr>
<tr>
<td>• Analytical thinking</td>
<td>Acute self-awareness</td>
</tr>
<tr>
<td>• Divergent thinking creativity</td>
<td>Non conformity</td>
</tr>
<tr>
<td>• Keen sense of justice</td>
<td>Questioning rules/ authority</td>
</tr>
<tr>
<td>• Capacity for reflection</td>
<td>Tendency to introversion</td>
</tr>
</tbody>
</table>

(Silverman. 1993, p. 53)

Not all the characteristics of gifted children are seen as positive. [11] listed the following negative characteristics that gifted children may display. These are often exhibited by gifted underachievers with a learning disability.

- Stubbornness
- Non-participation in class activities
- Uncooperativeness
- Cynicism

- Sloppiness and disorganization
- Tendency to question authority
- Emotional frustration
- Absentmindedness and
- Low interest in detail

Varying patterns of characteristics are found in individual children because they differ in intellectual level, specific abilities and degree of mental activity [10]. The more highly gifted children tend to show more intensity and energy [12]. Not all students will display all these characteristics, all the time. Many criteria are required to identify gifted children because of their diversity.

Six profiles of gifted children have been identified [13]. These are the high achiever, the challenger, the underground child, the dropout, the double labeled and the autonomous learner. In any case, this research is concerned with only the high achievers.

Realizing the need for earlier identification of the gifted children, it is observed that numerous young gifted children experience difficulty when entering formal school. He stressed that observation of their early behavior is extremely helpful for proper identification and creation of appropriate learning programs for these out of step, asynchronous learners. He also warned that failure to identify, recognize and meet their needs may lead to some of them becoming argumentative, clinically depressed, among a wide range of other behaviors.

According to [14] most gifted children make everything complicated and are “too” everything: too sensitive, too intense and too much for other people. He cautioned that their cognitive variability makes them not to fit in with others [15]. Giftedness is found in both boys and girls, because it is naturally endowed on people by God. According to [16], giftedness is color blind, is found in equal proportions, and is distributed across all socio-economic levels. In this regard giftedness is found in all races irrespective of color, gender and affluence. The basic concern is the ability to identify giftedness where it occurs. Unfortunately our primary schoolteachers lack the nitty-gritty and the instrument for identifying giftedness in children. The instrument often used or thought of is the pupil’s academic report cards; yet these report cards or examination result scores often lack credibility.

4. Gender Issues

Gender issues need to be considered when identifying gifted children. A high weighting given to ability test may result in more boys than girls being admitted to a program [17]. The criteria used in teacher assessment may favour...
girls or boys being admitted to a program, depending on the criteria used. An emphasis on presentation in assessment schedules may skew selection towards girls. Other considerations in selecting students for extension programs are that girls are more likely to conceal their ability as they approach adolescence [12] and some boys are likely to shun academic ability and hide their intellect [18].

5. Early Identification of Giftedness

Early identification of a gifted child will facilitate an appropriate educational pathway and provisions. Giftedness can be identified outside the school environment; it is not dependent on a child being able to complete academic tasks. A young gifted child can be identified by investigating his/her level in the developmental stages of child development. Since the gifted child sees the world differently because of the complexity of their thought processes and emotional intensity, it is necessary for them to be identified early in life. It is time we take gifted children out of the closet of normal school program and separate them entirely from the average intelligent children [19] and [20]. We ought to recognize, value and nurture them in the schools and the society for self-reliance and national development.

It is based on this that the researcher deemed it necessary to develop, validate and utilize giftedness identification inventory, which teachers, parents, peers, educators and even the children themselves can readily adapt or adopt for selecting gifted children for special programs.

6. Purpose of Study

The study is aimed at developing, validating and utilizing Giftedness Identification Inventory (GII) for primary school children. Specifically, the purpose of this study is to:
1. Develop a Giftedness Identification Inventory (GII) for primary school children.
2. Validates the inventory.
3. Try out the utilization of GII
4. Determine the stability of GII with respect to gender

7. Research Questions

To facilitate the study, the following research questions were generated:
1. What is the validity of the GII?
2. What is the reliability of the GII?
3. What is the influence of gender on the GII?

8. Hypotheses

The study was guided by one hypothesis tested at 0.05 level of significance.
Ho1. There is no significant influence of gender on children response to the GII

9. Research Method

The study adopted an instrumentation research design. The population of the study comprised of all primary three (3) pupils in the 1,059 public primary schools in the three education zones of Abia State in Nigeria. These primary three pupils number forty one thousand and forty six (41,046). This is made up of Aba Education Zone with 450 schools with 7,792 males and 7,922 females, and a total of 15,714 pupils; Ohafia education zone 329 schools with 5,166 males, 5,922 females and a total of 11,087 pupils and Umuahia education zone with 280 schools 7,124 males, 7,121 females and a total of 14,245. This summed up to 1,059 primary schools, 20,082 males and 20,964 females (Source: Abia State Universal Basic Education Board, ASUBEB, 2014). Primary three pupils were selected because they were within the appropriate age level, 8 years plus as recommended by the Wechsler, pre-school and primary scale of intelligence (WPPPSI). Equally, primary three is the last stage of the Junior Basic Education and a transition class to Upper Basic Education.

10. Sample for the study

The initial sample for the study comprised of 41,046 primary three pupils drawn from primary schools in the three Education Zones in Abia State, Nigeria. The final sample (after preliminary identification of the gifted) came down to 1,148 pupils. A check list was used for preliminary identification of pupils who showed signs of giftedness.

11. Instrument Development

The instrument used for data collection was the Giftedness Identification Inventory developed by the researcher. It was developed along the line of the different levels or characteristics of giftedness.

12. Simple Checklists and Nomination Forms

Nomination forms and checklist are also developed and used as part of the identification
program, modified as required for the individual group and school. These forms are weighted and given to parents/caregivers and children who are not grounded yet in English language.

The nomination forms are used to elicit knowledge that the teacher did not expect of the child. The nomination form contains a list of the traits to be identified and questions or statements that will elicit this information. For example, statements or questions such as outside school hours, what does your child do? Could reveal a student’s interests, curiosity, advanced knowledge or sense of justice. Nomination also tailored towards the child’s age and stage. For example, at what age did your child start to read and when did your child first show an understanding of numbers?

As a first step in the development of the GII, a number of existing local and international standardized tests inventories in giftedness identification were reviewed. Also, questionnaires in published studies such as “Development validation of giftedness identification test for primary schools” by [8]; “Policy and implementation strategies for the education of gifted and talented students support package” [21]; “Career interest inventory manual” [22]; “A guide to the development and use of the Myers Briggs type indicator” were read, analyzed and used. The instrument has two parts, parts one and two. Part one sought information on the background of respondents while part two consisted of 70 items of Likert type, arranged to test all aspects of giftedness. In all a total of seventy items were developed.

After the development of the GII, which had a total of 70 items it was presented to a team of test experts drawn from some universities. The team scrutinized and edited or validated the items. The outcome of the exercise was the reduction of the items from 70 to 60 items. The GII was at these stages also sent to two experts in test and measurement and one in science education. These experts worked independent of each other. At the end of the exercise, the three experts agreed with the opinion of the team of experts in the choice the items and the use of the GII in identifying giftedness.

The reliability of the instrument was checked by giving it to ten (10) primary three children from Imo state Nigeria. Their teachers were trained as assistants who guided them by reading the instructions clearly. They also guided them to observe test administration rules. This administration was repeated after an interval of two weeks. The items were marked and Pearsons Products Moment Correlation was used for analysis and a coefficient of 0.88 was got. This is an indication that the instrument was reliable.

13. Data Analysis

Research Question one was analyzed using factors analysis while research question two was analyzed using Cronbach Alpha. Research question three was answered using mean and standard deviation. The hypothesis was analyzed using t-test at 0.05 level of significance for the nomination forms for parents, teachers, peers and self respectively).

14. Analysis of the Nomination forms

The nomination forms are four (4) for parents, teachers, peers and pupils themselves. The parents whose children have already attempted the giftedness inventory were given the nomination forms. These forms are in two sections A and B section. A in analyzed using mean and mean of means and sections B is analyzed using Chi square.

The nomination forms by teachers are analyzed using simple percentages the peer nomination forms are analyzed with simple ranking. Finally the nomination by the children themselves are analyzed with Chi square analysis.

15. Results

This is a presentation of the results of data analyses and analyses based on the research questions and hypotheses. The results are presented in tables, research question after research question, and the hypothesis.

15.1 Research Question 1

What is the validity of the items of the Giftedness Identification Instrument for Nigeria Primary Schools (GIINPS)?

Table 1: Factor analysis of the items of the GIINPS

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Factors 5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.02008</td>
<td>.00961</td>
<td>.05059</td>
<td>-.12247</td>
<td>.00534</td>
<td>.02092</td>
</tr>
<tr>
<td>2</td>
<td>.00285</td>
<td>.4979</td>
<td>.00296</td>
<td>.06099</td>
<td>.5906</td>
<td>.05559</td>
</tr>
<tr>
<td>3</td>
<td>.00566</td>
<td>.0602</td>
<td>.07993</td>
<td>.03018</td>
<td>.06488</td>
<td>.08629</td>
</tr>
<tr>
<td>4</td>
<td>.07556</td>
<td>.08572</td>
<td>.08782</td>
<td>.16126</td>
<td>.43017</td>
<td>.14080</td>
</tr>
<tr>
<td>5</td>
<td>.02313</td>
<td>.30973</td>
<td>.11159</td>
<td>.05494</td>
<td>.40733</td>
<td>.05258</td>
</tr>
<tr>
<td>6</td>
<td>.17727</td>
<td>.20205</td>
<td>.10155</td>
<td>.0555</td>
<td>.0455</td>
<td>.71446</td>
</tr>
<tr>
<td>7</td>
<td>.07085</td>
<td>.30174</td>
<td>.04574</td>
<td>.05222</td>
<td>.42208</td>
<td>.07208</td>
</tr>
<tr>
<td>8</td>
<td>.20301</td>
<td>.30222</td>
<td>.11698</td>
<td>.03012</td>
<td>.37749</td>
<td>.07410</td>
</tr>
<tr>
<td>9</td>
<td>.08020</td>
<td>.30966</td>
<td>.06588</td>
<td>.42236</td>
<td>.00109</td>
<td>.07521</td>
</tr>
<tr>
<td>10</td>
<td>.76972</td>
<td>.20773</td>
<td>.01226</td>
<td>.05585</td>
<td>.45353</td>
<td>.01154</td>
</tr>
<tr>
<td>11</td>
<td>.22006</td>
<td>.09720</td>
<td>.07287</td>
<td>.02175</td>
<td>.00304</td>
<td>.02285</td>
</tr>
</tbody>
</table>
The GIINPS has seven sub scales. They are Verbal Ability (VA), Quantitative Ability (QA), Perceptual Ability (AP), Creative Ability (CA), Leadership Ability (LA), Visual Ability (VA) and Psychomotor Ability (PA). Test items factor analysis was used.

A summary of the item analysis shown in table I shows that a total eleven (11) items out of the sixty (60) items were dropped, and the remaining forty nine (49) items were retained. The forty nine items are items number

2, 3, 4, 6, 7, 8, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, and 60.

15.2. Research Question 2

What is the reliability index of the Giftedness Identification Instrument for Nigerian Primary Schools (GINPS)? The giftedness identification instrument for Nigeria primary schools were subjected to test of internal consistency using the Cronbach Alpha. The seven subscales were all subjected to a test of reliability.

Table 2: Reliability analysis of the Giftedness Identification Instrument for Nigeria Primary Schools

<table>
<thead>
<tr>
<th>Subscales 1: Verbal Ability Test (VAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics for scale: mean variance Std Deviation</td>
</tr>
<tr>
<td>Item Mean</td>
</tr>
<tr>
<td>Alpha = 0.6454 for this subscale, the reliability index is 0.64</td>
</tr>
<tr>
<td>This indicates that the instrument in reliable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subscales 2: Quantitative Ability Test (QAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics for scale: Mean Variance Std Dev</td>
</tr>
<tr>
<td>Item Mean</td>
</tr>
<tr>
<td>Alpha = .9321</td>
</tr>
<tr>
<td>For this sub scale, the reliability index is 0.93 which implies a high reliability index.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subscales 3: Perceptual Ability Test (PAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics for scale: Mean Variance StdDev</td>
</tr>
<tr>
<td>Item mean &amp; variance</td>
</tr>
<tr>
<td>Alpha =0. 7993</td>
</tr>
<tr>
<td>This subscale yielded an alpha of 0.79</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subscales 4: Creativity Ability Test (CAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics for scale: Mean Variance Std Dev</td>
</tr>
<tr>
<td>Item Mean</td>
</tr>
<tr>
<td>Alpha = 0.9321</td>
</tr>
<tr>
<td>The items in this subscale yielded a reliability index of 0.93 which implies a high reliability.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subscales 5: Leadership Ability Test (LAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics for scale: mean variance Std Dev</td>
</tr>
<tr>
<td>Item mean ∝ variance</td>
</tr>
<tr>
<td>Item variance</td>
</tr>
<tr>
<td>Alpha = 0.9619</td>
</tr>
<tr>
<td>For this subscale, the instrument yielded a reliability index of 0.96 which is also high.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subscales 6: Visual Ability Test (VAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics for scale Mean Variance Std Dev.</td>
</tr>
<tr>
<td>Item mean</td>
</tr>
<tr>
<td>Item variance = 0.8494</td>
</tr>
<tr>
<td>Alpha =0.9857</td>
</tr>
</tbody>
</table>
The instrument for this subscale yielded a reliability index of 0.98 which shows a high reliability.

**Subscale 7: Psychomotor Ability Test (PAT)**

Statistics for scale: Mean Variance Std Dev.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Variance</th>
<th>Std Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25.0958</td>
<td>41.4069</td>
<td>6.4348</td>
</tr>
</tbody>
</table>

Item mean = 2.7884
Item variance = 0.8520
Alpha = 0.6454
For this scale, the instrument yielded a reliability index of 0.91

**15.3 Research Question 3**

What is the influence of Gender on the giftedness identification instrument for Nigeria primary schools (GIIPS)?

The scores of male and female pupils or the GIIPS were separated and subjected to a simple descriptive analysis summary of this is presented in Table 3.

Table 3: Mean and standard deviation of male and female scores in each item of the GIIPS

![Table 3](image)

Table 3 above shows the influence of gender on the mean scores of the pupils in the giftedness identification inventory for primary schools (GIIPS) was observed in fifteen items. These are items 5, 8, 9, 11, 23, 29, 30, 42, 43, 44, 45, 46, 47, 48 and 49. For these items, males have a higher mean than females. This result further reveals that the females have slightly higher mean than the male in item 2, but of equal standard deviation. Male had a mean of 3.00 and SD of 0.97 while female had a mean of 3.11 and SD of 0.97.

**16. Hypothesis**

Ho: there is no significant influence of gender on children’s response to the GII the scores of male and female pupils on the giftedness identification inventory was means of independent samples as shown in table 4 below.

Table 4: t-test of significance of difference on the GII

<table>
<thead>
<tr>
<th>Items</th>
<th>Gender</th>
<th>Mean</th>
<th>SD</th>
<th>DF</th>
<th>Sign level</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Male</td>
<td>631</td>
<td>2.44</td>
<td>.87</td>
<td>1146</td>
<td>significant</td>
<td>0.320</td>
</tr>
<tr>
<td>Female</td>
<td>517</td>
<td>3.00</td>
<td>.97</td>
<td>1146</td>
<td>.043</td>
<td>0.320</td>
</tr>
<tr>
<td>2. Male</td>
<td>613</td>
<td>3.00</td>
<td>.97</td>
<td>1146</td>
<td>.043</td>
<td>0.320</td>
</tr>
<tr>
<td>Female</td>
<td>517</td>
<td>3.11</td>
<td>.97</td>
<td>1146</td>
<td>.043</td>
<td>0.320</td>
</tr>
</tbody>
</table>

Summary of data analysis in table 4 reveals that there is significance difference in the mean scores of male and female pupils in items 1, 3, 17, 20, 21, 25, 28, 34, 36, 50, 53, 56, 57, 59 and 60. This suggests that gender significantly influenced pupils' responses to those items of the GII. On the other hand, the remaining items were not significantly influenced by gender.

Analysis of data on the nomination forms. In the course of analyzing data on the nomination forms, the parents’ nomination was analyzed with mean and percentage the teacher itself nomination forms were analyzed by ranking being a nominal data. Eventually, sixty-seven children were nominated as gifted.

**17. Conclusions**

Results presented in the work reveal that:
1. Out of the sixty (60) items of the GIIPS, forty-nine (49) items survived the validity process and were retained, while eleven (11) items dropped.
2. The valid GIIPS sub scales have reliability coefficients as follows:
   - Verbal Ability Test (VAT) has 0.64
   - Quantitative Ability Test (QAT) has 0.89
   - Perceptual Ability Test (PAT) has 0.79
   - Creativity Ability Test (CAT) has 0.93
   - Leadership Ability Test (LAT) has 0.96
   - Visual Ability Test (VAT) has 0.98
   - Psychomotor Ability Test (PAT) has 0.91
   - Gender has a significant influence on the pupils response to fifteen out of the forty-nine items
   - From the nomination forms sixty-seven of the pupils were found to be gifted.
18. Recommendations

Based on the outcome of this instrumentation exercise, the following recommendations were made. Schools, researchers and research institutions should take advantage of this study by utilizing the instrument in the identification of gifted children at the primary school stage. Instrumentation researchers should take a follow-up study on the suitability of this instrument across cultures.

Early identification of giftedness should be integrated in the nation’s education policy and be implemented or carried out on primary three which is the end of lower basic education in the nation.

Government and donor agencies such as UNICEF should sponsor seminars and workshops where the application of the instrument for identifying giftedness in pupils should be taught to the teachers and education managers.

This instrument could be further developed, standardized and normed by other researchers and used as a standardized instrument for giftedness identification.

19. References


Session 8: Accessible World

Evaluating Web Accessibility and Usability: A Case Study of Learning Management Systems
(Author: Sara Jeza Alotaibi)

Enhancing Nutrition, Food Security And Public Health In Nigeria Through Insects Consumption
(Author: George Omoniyi Ayenigbara)

Teaching Computing Subjects Accessibly: The Educator and Student Viewpoints
(Author: Donal Fitzpatrick)

Practicing what we preach: Using Universal Design for Learning (UDL) Principles to Teach UDL to Pre-Service Special Education Teachers
(Author: Mary Gozza-Cohen)
Evaluating Web Accessibility and Usability:
A Case Study of Learning Management Systems

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Abstract

In the modern world, every learning organisation needs to be equipped with the latest trends of technology and system so as to ensure they are adept at competing with the rest of the world. Whilst keeping this notion in mind, a new approach for evaluating accessibility and usability for current Learning Management Systems (LMSs) has been proposed. This has been done by presenting various imperative methods for evaluating accessibility and usability for such LMSs. As a case study, this paper provides an attempt at investigating and evaluating the accessibility and usability of the Blackboard System as an example of evaluating LMSs.

1. Introduction

The invention of the internet and the World Wide Web is one of the most revolutionary of the century. The internet has changed lives, and continues to do so with new technologies being introduced all the time. A new concept that has emerged from the World Wide Web is that of education delivered on the web, referred to as e-learning [1], [2]. E-learning has provided students the opportunity to learn even after school hours. Through such platforms, individuals are able to interact with their teachers and fellow students [3]. In specific consideration to Saudi Arabia, the country has directed its efforts to the field of e-learning, and is being used in several schools and universities [6], [7], [8].

The following figure details the results of a study carried out by Al-Nuaim [11], in which students have been compared on the basis of their performance when some of them were taught the same content face-to-face and some were taught online.

It is obvious from the figure that, in some instances, students who were taught online outperformed other students for many reasons. One of the popular reasons is applying the accessibility and usability for different users with different needs.

Several problems have been identified through research over the years concerning accessibility and usability evaluations [4]. Later, some tools and methods have been highlighted and proposed by different organisations in an effort to make websites and software applications more accessible and usable. Sloan et al. (2002) [4] proposed a variety of diverse accessibility and usability evaluation methods that have both advantages and disadvantages. Most of these methods cover all accessibility and usability guidelines, established by The World Wide Web Consortium (W3C), Web Access Initiative (WAI), as well as Section 508 guidelines. The W3C Guidelines determined three conformance levels of Web Content Accessibility Guidelines 2.0 (WCAG 2.0), which are A (lowest), AA and AAA (highest) [5][6]. The evaluation for LMSs included the three levels detailed above, and tested the web pages that users are more likely to use in these systems.

This paper is structured in the following manner: Background and Literature Reviews for the current Learning Management Systems (LMSs) are described in Section 2. The various methods of evaluation for follow-up study are listed in Section 3; and the review process, results and discussion are available in Section 4 and Section 5 below.

1Priority A: disabled users will find it impossible to use some pages
2Priority AA: disabled users will find it difficult to use some pages
3Priority AAA: disabled users will find it somewhat difficult to use some pages

Figure 1: Comparison of performance of online and face-to-face student in ACCT 102 [11]
2. Background and Literature Reviews for Current LMS

2.1. Overview of LMSs

The following points mention a number of the existing LMSs:

2.1.1. Virtual Class Room CENTRA System. CENTRA is one of the main instruments of the concept of distance education. It is an open interactive medium in which students attend the virtual lectures from the vicinity of their homes or anywhere else, and which accordingly enables direct communication with the instructor. This system is also deployed at East Carolina University [15].

2.1.2. Electronic Management Educational System (EMES). EMES is a Learning Management System (LMS), which also aims at enhancing the communication between the faculty and students, thereby promoting collaborative learning and providing course material [12]. Many universities use a similar system around the world, namely University of Leeds [13] and University of Texas [14], for example.

2.1.3. Model. This is a Course Management System (CMS), as well as a Virtual Learning Environment (VLE). Moodle is able to replace both EMES and CENTRA since it effectively manages CMS and VLE. Faculty staff can easily add their lectures online by converting existing content into XML and publishing it through the Moodle system [16]. This provides a platform to communicate and collaborate with others, and further enables e-learning accessibility for people with disabilities [16], such as Assignment Submission, Chatting, Surveys, Forum for group discussions, Glossary for courses, Content and assessing learning patterns, Online quizzes, Uploading content, Incorporation of SCORM packages in the courses, Wiki/Blogs/Forums and other tools for peer reviews, E-Assessment, Library resources, Mobile learning, and Audio and video conferencing [17].

Many universities around the world use Model. One of them is University of Saskatchewan, which created an engineering lab course on Moodle. The purpose of this platform was to enable students to collaborate and develop genuine ideas with the help of instructors and different sources of information. A survey was carried out in order to garner students’ feedback about the platform; 67% agreed or strongly agreed with the good performance of Moodle, whilst 30% were neutral and only 4% disagreed [20]. In addition, NC State University had the vast majority (89%) of their students register on Blackboard for at least one course. They decided to migrate their whole e-learning system to Moodle so that their students could benefit from a greater range of functions and modules. Their students and teachers provided commendable feedback after using Moodle [21]. Importantly, the Moodle System is also deployed at Indian Institute of Technology Bombay [18] and Athabasca University of Canada [19].

2.1.4. Blackboard. Blackboard is an e-learning environment providing a secure and stable platform for communication between teachers and students. It facilitates online collaboration between people present on the platform [21], and offers hundreds of Assessment tools, Mobile learning tools and Plagiarism-detection tools, all complaint with Web 2.0 and providing unique access to course materials and other content [21]. However, applying the Blackboard system is very expensive for institutions, and it contains various operational limitations in course development and the displaying of marks [23]. The Blackboard system is deployed at most Saudi Universities [10], North Carolina Community College System [21] and Blue Ridge Community College [22].

3.2. Selecting an LMS as a Case Study

According to the recently published Distance Education Survey Results (2014) by the Instructional Technology Council (ITC), Blackboard acquisitions have overshadowed the Learning Management System (LMS) market over the past nine years (see Table 1). Note that, in the main, those surveyed were the Director of Distance Learning of one of the 345 ITC member institutions or the 1,200 members of the American Association of Community Colleges [24].

<table>
<thead>
<tr>
<th>Table 1: Learning Management System Usage [24]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
</tr>
<tr>
<td>Blackboard</td>
</tr>
<tr>
<td>Blackboard WebCT</td>
</tr>
<tr>
<td>Blackboard Angel Learning</td>
</tr>
<tr>
<td>Angel Learning</td>
</tr>
<tr>
<td>Blackboard Angel Learning</td>
</tr>
<tr>
<td>Moodle</td>
</tr>
<tr>
<td>Instructure Canvas</td>
</tr>
</tbody>
</table>

Moreover, following a thorough analysis of the features of LMSs in discussion, it can be concluded that Blackboard seems to be a better choice, offering many more features than other VLEs [10]. Therefore, this paper opts to utilise the Blackboard system as a case study for evaluating Accessibility and Usability.
3. Designing a New Approach of Evaluation Accessibility and Usability

Conformance evaluation of web accessibility and usability requires a combination of semi-automated evaluation tools, manual evaluations by experienced reviewers, and studied experience of how people with different disabilities interact with websites by gathering quantitative and qualitative data from representative users performing specific tasks [25]. The following figure shows evaluations tools that are based on all of these methods, and were conducted on March 15, 2015. The Blackboard system applied in Taif University may have changed since this time.

![Figure 2: A new approach of evaluation accessibility and usability](image)

3.1. Automatic Validation and Evaluation Tools

A large number of evaluation tools are available on the W3C Website [26]. The evaluation ‘Designing to Standards Evaluation—Online Validation Service’ is used by using all applicable validators (only ‘Homepage’), which are W3C Link Checker, HTML/CSS Validators, Accessibility Check and AccessColor [26].

3.2. Manual Evaluation

There are several steps to performing a manual evaluation, as discussed in the following subsections.

3.2.1. Web2Access Checklist. Web2Access is an interactive website, which has many features, tools and checklists for completing manual evaluations easily [29]. Referring to the Web2Access11 checklist, which is based on WCAG 2.0, Web Accessibility Group, JISC TechDis and WebAIM [27], this checklist examines the websites under various settings and conditions, such as:

- Disabling images for alternative text
- Disabling audio for equivalent content
- Disabling scripts, style sheets, frames
- Changing font sizes to ensure readability
- Reducing colour saturation
- Using keyboard only
- Applying different screen resolutions
- Testing text and voice browsers to check equivalent content of graphical browser.

3.2.2. Usability Checklist. Studying the usability of any LMS (only ‘Homepage’) by testing —Top Ten Guidelines for Homepage Usability [28], this checklist evaluates whether or not the text on the web system is simple, easy and clear for the web system audience.

3.2.3. Compatibility Evaluation. Browsers Shot Website is a website providing screenshots for web pages for different browsers and operating systems [30].

3.3. Accessibility and Usability Testing for People with a Disability

Testing can be carried out using online survey software to gather qualitative data that analyses accessibility and usability issues for a broad range of users who are members of these web systems. This survey is divided into two parts and contains a total of seven questions. The first part includes three questions relating to disability and assistive technologies. The other questions test the level of accessibility and usability.

4. Evaluation Accessibility and Usability for Blackboard System at Taif University

The Blackboard system applied on the Taif University website is a perfect platform aiming to serve university students and faculty members to communicate with one another easily and quickly. It serves approximately 70,000 students and 3,000 faculty members [10].

The tool provides services to faculty members and students, some of which are allowing students to submit their duties, and providing a good communication environment between students and faculty members for each course. Furthermore, faculty members can upload course content, publish
announcement messages, receive and evaluate students’ assignments and establish sessions for communicating with students.

4.1. Review Process

This section explains the automatic, manual evaluations by using Web2Access and Usability Checklist.

4.1.1. Automatic Evaluation. As shown in Figure 3, there is 1 problem in Priority A and 5 problems in Priority AA, most of which use ‘bgcolor attribute’, with most of the web pages not detailing a <title> tag. A deprecated ‘bgcolor’ attribute is a tag that is no longer supported as part of W3C’s latest HTML standard; this means that browsers and assistive technologies are under no obligation to provide support in future versions, thus potentially rendering its contents inaccessible. It is worth noting that many elements and attributes are deprecated solely on the grounds that they cause accessibility problems.

The <title> element is an essential ingredient of usability; it is the only means of recognising a page in a list of search results and bookmark lists, and on the task bar when a browser is minimised. For blind student, it is absolutely crucial because it is recognised as the only reliable means of identifying a webpage from others.

![Figure 3: Accessibility Check Results](image)

AccessColor report shows both colour difference and colour brightness do not meet the recommended standard for 24.62% of the total text. The results of the W3C Link Checker show that Accessing links has been disabled in link-checker because those entering the Blackboard system need a username and password. There are no errors in CSS according to W3C CSS Validator; however, W3C Markup Validator illustrates that there are 6 errors and 4 warnings, as shown in Figure 4. Most of these errors are recognised as invalid attributes and tags.

![Figure 4: W3C Markup Validator](image)


<table>
<thead>
<tr>
<th>Test</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built in accessibility checks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Main menu system responds to build in AT</td>
</tr>
<tr>
<td>Application works with External Assistive Technologies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Failure with external AT e.g. screen reader, keyboard only input, colour changes.</td>
</tr>
<tr>
<td>Text or other alternatives for image elements.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alternative text offered but only as an alternative to main interactions and not encouraged in other areas such as when loading an image into a document.</td>
</tr>
<tr>
<td>Keyboard / Alternative input with focus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Keyboard access reaches information screens or dialog boxes, keyboard tab order are good, and focus is clearly visible with good descriptions.</td>
</tr>
<tr>
<td>Labels for objects, fields or controls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No labels to guide the screen reader user.</td>
</tr>
<tr>
<td>Audio alerts have visual cues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alternatives for audio alerts offer and support show sounds or sound sentries.</td>
</tr>
<tr>
<td>Alternatives for Video / Animation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No alternatives</td>
</tr>
<tr>
<td>Media events offer user control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The odd /poorly designed controls but keyboard accessible.</td>
</tr>
<tr>
<td>Textual Information for screen reader</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All aspects of the application are accessible and announced by the screen reader.</td>
</tr>
<tr>
<td>Keyboard shortcut keys offered</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Some instructions available and shortcut keys work well with standard keyboard shortcuts and assistive technology.</td>
</tr>
<tr>
<td>Save user preferences for style and zoom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Possible to change font size, style and colour as well as overall zoom within the program.</td>
</tr>
<tr>
<td>Timed events can be altered</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Option to change times but poor notification.</td>
</tr>
<tr>
<td>Change colours and contrast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Some changes can be made to the content when working with the application but no interface</td>
</tr>
</tbody>
</table>
4.1.3. Manual Evaluation (Usability Checklist). Table 3 shows a summary of Usability Checklist.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A One Sentence Engine Included</td>
<td>Yes/No</td>
</tr>
<tr>
<td>2. Well Visible Window Title in search Engines and Blackboard Lists</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Group Corporate Information in One Distinct Area</td>
<td>No</td>
</tr>
<tr>
<td>4. Emphasize Site's High Priority Tasks</td>
<td>Yes</td>
</tr>
<tr>
<td>5. Include a Search Input Box</td>
<td>Yes</td>
</tr>
<tr>
<td>6. Show Real time Content Examples</td>
<td>Yes</td>
</tr>
<tr>
<td>7. Most Important Key Words as Links</td>
<td>Yes</td>
</tr>
<tr>
<td>8. Easy Access to Recent Homepage</td>
<td>Yes</td>
</tr>
<tr>
<td>9. Dont Over-format Critical Area (like Navigation Area)</td>
<td>Yes</td>
</tr>
<tr>
<td>10. Use Meaningful Graphics</td>
<td>Yes</td>
</tr>
</tbody>
</table>

4.1.4. Manual Evaluation (Compatibility Evaluation). The Blackboard system has the same results as most browsers and operating systems except Dillo 2.1.1 Browser (with Ubuntu27 Operating System), which shows an error in rendering the top navigation menu [30]. Moreover, there is a problem if the dimensions of the screen are 800x2084 pixels, in which case users should use the horizontal scrollbar to read page contents.

4.1.5. Testing People with a Disability. A questionnaire was generated for the purpose of gathering feedback from students with special needs concerning the levels of accessibility and usability of the Blackboard System at Taif University. The user survey questionnaire comprised 7 questions, and was made available online. The questionnaire was structured in two parts. Part 1 contains ‘Demographic Factors’, where the first few questions ask the individual about the type of description he would give himself, i.e. ‘person with disability’ or ‘others’. This question was important in terms of gathering insight regarding the technologies used by people with some disability. Subsequently, a question is asked regarding the level of experience of participants on the internet to judge whether he is a new or experienced one. Part 2 focuses on the criterion of the research study, which are accessibility and usability. This questionnaire tests each area by asking 4 questions, selected according to the theories and guidelines in the respective areas. All of the 4 questions adopted the Likert Scale. The Likert scale is a commonly used approach in questionnaires, concerned with measuring participants’ opinions and attitudes regarding a certain statement [9].

A total of 11 people responded of a possible 30. These participants varied in terms of disability. Owing to the shortage of time, opportunity sampling was adopted as the primary technique to gather participants, i.e. ‘whoever was available at the time of the study was included in the sample’[9]. This helped to maximise the number of respondents and thus increase the validity of the findings. This questionnaire is distributed to students who are blind or have low vision in different departments of Taif University with the objective to evaluate the accessibility and usability of the Blackboard System.

The results of the questionnaire show that approximately 100% of the participants were students with a disability. A total of 50% of them used assistive technologies, such as Jaws, Screen Magnifier and Screen Reader. The results of the level of experience of participants show that 30% were experienced, 50% had intermediate experience, and only 20% were new on the web. The second question on the questionnaire was a very important one, which helped to evaluate the usability of the Blackboard System. The results show that the highest rank on the sample found that the Blackboard system is difficult to use; however, most of them agree that the Blackboard System had all the information they look for. The last questions inquired into accessibility evaluations, with the results showing that 45% of the sample finds the Blackboard System accessible by using a form of assistive technologies; however, the same percentage had no opinion regarding the colours and visual design of the system. The results of questions 6 and 7 are given below.

5. Discussion

This section discusses the accessibility and usability evaluations based on the previous sections.

5.1. Accessibility Evaluation

All of the above methods and tools assist with determining the ways in which the Blackboard System does not pass sections of the WCAG Guidelines, which are as follows:

- WCAG1 AA 13.1, WCAG2 A 2.4.4, WCAG1 A 1.1, Section 508 (a), and WCAG2 A 1.1.1 because some tags do not have a link text or an ALT tag, meaning screen readers have nothing to read and therefore have to read out the URL.
instead. Furthermore, this does not satisfy WCAG2 A F25 because some pages have the same title; therefore, the title cannot be used to distinguish pages.

- WCAG1 A 12.3 and WCAG2 AAA 2.4.10 because each section of content should begin with a heading tag (H1, H2, H3); however, some pages have no heading tags. On the other hand, there are some pages that use headings incorrectly; for example, H2 appears before H1, which does not follow WCAG1 AA 3.5 and WCAG2 A 1.3.1.

5.2. Usability Evaluation

The Blackboard System has various usability issues, including font styles with a lot of mistakes, such as in the case of underlining to highlight text, which simply makes it confusing for the user as it looks like a link. Therefore, users become frustrated when the ‘link’ does not work. Moreover, it uses a font size smaller than 12 point. Furthermore, the system uses background images that continuously change colour; as a result, it is difficult for users to read the text in the foreground.

6. Conclusion

This paper has provided an introduction on learning organisations, discussing the importance of following the usability and accessibility guidelines. It shows a new approach for the evaluation process for learning management systems, and applies these steps of the evaluation process in regard to the Blackboard System utilised at Taif University, considering usability and accessibility. Based on this evaluation, the Blackboard System adopted at Taif University does not meet Accessibility and Usability Guidelines. More details concerning the evaluation will be presented at the conference. This study can be carried out in consideration to other LMSs.

7. References

[24] Instructional Technology Council (ITC). *2014 Distance Education Survey Results*, 2014.


Enhancing Nutrition, Food Security and Public Health in Nigeria through Insects Consumption

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Abstract

Worldwide particularly in the developing nations including Nigeria more than half of the population are caught in a vicious cycle of ignorance, poverty, malnutrition, disease and early death. Approximately, one third of a life is spent as a result of a struggle for food. A conservative estimate places the daily toll from malnutrition at 10,000. A figure indicates that between 800 million and one billion persons suffer from some degree of Protein-Energy Malnutrition (PEM) alone. The resultant effect of malnutrition is illness, poverty, reduced work capacity, wars, among others. Malnutrition and its effect could be mitigated in Nigeria through insect’s consumption. Insects are the most successful, biologically, of all the groups of arthropods, and they abound in great numbers in Nigeria because of the large forest and grass land areas, fresh water and wide coastal regions which supports the existence of insects. Insects supply high quality protein, carbohydrate, fats and oil, vitamins and mineral salts, and they are abundant, cheap, easy to harvest, and are available throughout the year. Therefore, this paper, after reviewing the availability and the nutritional values inherent in insects, recommend that insects be produced and consumed to ameliorate the deleterious consequences of malnutrition in Nigeria, and indeed in the developing nations, in line with National capacity building Strategy for sustainable development and poverty alleviation.

1. Introduction

Adequate nutrition goes beyond mere provision of food items to people in Nigeria. Food should be available in the key areas of components of a balanced diet, such as carbohydrate, protein, fat and oil, mineral salt, vitamins and water. Ideal diet should include the high quality of nutrients such as unsaturated fats, essential amino acids, potable water, all of which must be available all the year round.

Availability of nutrients are not enough, they must reach the table of consumers in sufficient quantities, and at affordable prices bearing in mind the religion and culture of the people. Preservation of food and its nutrients is also imperative, storage facilities and unhindered transportation of food items from production to consumers, though indispensable, are problems in Nigeria. Also important, but a problem is method of food preparation where most of the nutritive values are lost due to ignorance in Nigeria.

To enhance the nutritive value and food security, consumption of insects may have some roles to play in mitigating the effects of malnutrition in Nigeria. Nigeria is a country with large forest and savannah area, it has a wide coastal area with fresh water that supports the existence of large numbers of edible insect species which are available throughout the year.

Also, insects are the most widely distributed population of living organisms in the world with the ability to survive in harsh environmental conditions. The insects according to [1], are the most successful, biologically, of all groups of arthropods. They have been conservatively estimated to number over 800,000 species, with probably many more to be discovered and classified. Although, a relatively few insect species are marine, they are abundant in freshwater, soils, forests deserts and wastelands. These features make insects abundantly available in Nigeria to complement nutritional deficiencies when consumed.

2. Edible Insects

Insects are consumed worldwide. The type of insects consumed varies from one part of the world
to the other, depending on the culture, belief, availability, and the socio-economic status of the individual.

However, twenty-one (21) insect species from six different orders have been recorded with potential for consumption among the three major ethnic groups (Yoruba, Hausa and Ibo) in Nigeria (see Table 1: Edible Insects in Nigeria).

Table 1: Edible Insects in Nigeria

<table>
<thead>
<tr>
<th>Science name</th>
<th>Common name</th>
<th>Order</th>
<th>Family</th>
<th>Plant/food Host</th>
<th>Season occurrence</th>
<th>Consumption stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macrotermes nigeriensis</td>
<td>Termite</td>
<td>Isoptera</td>
<td>Termitidae</td>
<td>Timber woods</td>
<td>May-June</td>
<td>Winged adult, queen</td>
</tr>
<tr>
<td>Macrotermes bellicosus</td>
<td>Termite</td>
<td>Isoptera</td>
<td>Termitidae</td>
<td>Timber woods</td>
<td>May-June</td>
<td>Winged adult, queen</td>
</tr>
<tr>
<td>Macrotermes natalensi</td>
<td>Termite</td>
<td>Isoptera</td>
<td>Termitidae</td>
<td>Timber woods</td>
<td>May-June</td>
<td>Winged adult, queen</td>
</tr>
<tr>
<td>Brachytrupes membrannaces</td>
<td>Giant African cricket</td>
<td>Orthoptera</td>
<td>Gryllidae</td>
<td>Yam</td>
<td>July-September</td>
<td>Adult</td>
</tr>
<tr>
<td>Gymnognoryllus lucens</td>
<td>Cricket</td>
<td>Orthoptera</td>
<td>Gryllidae</td>
<td>Yam</td>
<td>July-September</td>
<td>Adult</td>
</tr>
<tr>
<td>Cytacanthaxis naeruginosus</td>
<td>Short horned grasshopper</td>
<td>Orthoptera</td>
<td>Acrididae</td>
<td>Grasses</td>
<td>May-October</td>
<td>Adult</td>
</tr>
<tr>
<td>Zonocerus variegates</td>
<td>Grasshopper</td>
<td>Orthoptera</td>
<td>Pygomorphidae</td>
<td>Cassava</td>
<td>November-April</td>
<td>Adult</td>
</tr>
<tr>
<td>Gryllotal Africana</td>
<td>Mole cricket</td>
<td>Orthoptera</td>
<td>Gryllotalpidae</td>
<td>Rice</td>
<td>Year round</td>
<td>Adult</td>
</tr>
<tr>
<td>Analeptes trifasciata</td>
<td>Stemgirdler</td>
<td>Coleoptera</td>
<td>Cerambycidae</td>
<td>Cashew</td>
<td>October-February</td>
<td>Larva</td>
</tr>
<tr>
<td>Oryctes monoceros</td>
<td>Rhinoceros Beetle</td>
<td>Coleoptera</td>
<td>Scarabaeidae</td>
<td>Coconut tree</td>
<td>June-July</td>
<td>Larva</td>
</tr>
<tr>
<td>Aphodius Rufipes</td>
<td>Dung beetle</td>
<td>Coleoptera</td>
<td>Scarabaeidae</td>
<td>Cow dung</td>
<td>June-July</td>
<td>Larva</td>
</tr>
<tr>
<td>Rhychophorus Phoenicis</td>
<td>Palm weevil</td>
<td>Coleoptera</td>
<td>Curculionidea</td>
<td>Oil Palm</td>
<td>December-May</td>
<td>Larva</td>
</tr>
<tr>
<td>Heteroligus Meles</td>
<td>Yam beetle</td>
<td>Coleoptera</td>
<td>Dynastidae</td>
<td>Yam</td>
<td>November-March</td>
<td>Larva</td>
</tr>
<tr>
<td>Nezara viridula</td>
<td>Stink bug</td>
<td>Coleoptera</td>
<td>Hemiptera</td>
<td>Soya bean</td>
<td>May-October</td>
<td>Adult</td>
</tr>
<tr>
<td>Apis mellifera</td>
<td>Honey bee</td>
<td>Hymenoptera</td>
<td>Apidae</td>
<td>Flowering Plants</td>
<td>Year round</td>
<td>Egg, larva Pupa</td>
</tr>
<tr>
<td>Anaphe Venata</td>
<td>African Silkworm</td>
<td>Lepidoptera</td>
<td>Notodontidae</td>
<td>Obeche tree</td>
<td>July-September</td>
<td>Larva</td>
</tr>
<tr>
<td>Anaphe Infracta</td>
<td>African Silkworm</td>
<td>Lepidoptera</td>
<td>Notodontidae</td>
<td>Obeche tree</td>
<td>July-September</td>
<td>Larva</td>
</tr>
<tr>
<td>Anaphe recticulata</td>
<td>African Silkworm</td>
<td>Lepidoptera</td>
<td>Notodontidae</td>
<td>Obeche tree</td>
<td>July-September</td>
<td>Larva</td>
</tr>
<tr>
<td>Bunaea alcicne</td>
<td>Emperor moth</td>
<td>Lepidoptera</td>
<td>Saturnidae</td>
<td>African Mahogany</td>
<td>June-July</td>
<td>Larva</td>
</tr>
<tr>
<td>Lepidoptera litoralia</td>
<td></td>
<td>Lepidoptera</td>
<td>Isoberlina</td>
<td>August-September</td>
<td>Larva</td>
<td></td>
</tr>
<tr>
<td>Cirina forda</td>
<td>Pallid emperor</td>
<td>Lepidoptera</td>
<td>Saturnidae</td>
<td>Shea butter tree</td>
<td>June-August</td>
<td>Larva</td>
</tr>
</tbody>
</table>

Sources: [5, 9, 13, 14, 15, 12]
For example, Yam Beetle (heteroligus meles) and Grasshopper (Zonocerus variegatus) are commonly eaten by some people in the Benue and south eastern Nigeria, and some parts of Benue State. While Grubs of the Palm Weevil (Rhynchophorus phoenicis) are eaten in several parts of Oyo, Ondo, Ogun, Lagos (western Nigeria) and in Delta and Edo States [2],[3]. The Larva of Oryctes monoceros is consumed in the Niger Delta regions [13].

The population of Variegated grasshopper (Zonocerus variegatus) is high during the dry season in South Western Nigeria, and has been reported eaten in the Akoko area of Ondo State [4]. The winged Termites are known locally in various parts of Nigeria by different names such as “Aku” in Ibo, “chine” in Hausa and “Esunsun” in Yoruba, and are regarded as traditional delicacies [5]. Macrotermes nigeriensis and Macrotermes bellicosus are enjoyed in all parts of Nigeria, probably because it is present at the onset of the rainy season when livestock is thin, new crops have not yet produced food, and store produced from previous season is running low [5],[6].

Also, African silkworm larva (Anaphe venata) are commonly found and consumed in Western part of Nigeria [7]. Cirina forda, Bunaea alcinoe, Macrotermes natantilus and Brachytrapes membranaceus are all marketed and, consumed in different parts of Benue State [8]. The larva of Cirina forda are consumed among the Yoruba and Nupe tribes of Kwara and Niger States respectively [5]. In addition, the Dung Beetle (Aphodius rufipes) has been reported as a traditional delicacy of the Gbagyi people in Niger State [9]. The Caterpillar of Bunaea alcinoe, popularly called “Ego” is consumed by the Igbo speaking tribe of Eastern and Southern parts of Nigeria [10],[11]. And the larva of Lepidoptera litoralia is common and consumed in the North Central of Nigeria especially in Plateau State [12].

3. Nutritional Values of Edible Insects

Edible insects provide essential nutrients required for optimum growth, repair and development of the body. Insects have higher protein content, on a mass basis, than other animal and plant foods such as beef, chicken, fish and maize [14]. Proteins, being the basis of all organisms’ activity, constitute many important materials such as enzymes, hormones, and hemoglobin. Protein is an important component of antibodies as it bolsters the immunity function of the body. It has the only material to produce nitrogen for maintaining acid and alkaline balance, transforming genetic information and transporting important materials in the human body. As a nutritive element that produces heat, it can supply energy. The nutritional value of food largely depends on the quality of the protein that it contains. This in turn, is determined to a great extent, by the amino acid composition. In the majority of edible insects, either tryptophan, or lysine is the first limiting amino acid [15]. However, the presence of lysine has been reported in rhychophorus phoenicos [3] and eryptohan in Oryctes monoceros [13]. The inclusion of these insect species, in diet could be of immense benefit complementing lysinepoor meals.

Vitamins are one group of organic compounds that are necessary for metabolism in human bodies. As vitamins cannot be synthesized in the human body, they must be supplied constantly through food. Edible insects contains appreciably high amounts of vitamins B7 (riboflavin) and Vitamin C. The termite (M. nigeriensis) has also been reported with appreciable amounts of vitamin B3 (niacin) and Vitamin B1 (Thiamine) in addition to Vitamins A and C [6]. Vitamin C maintains blood vessels flexibility and improves circulation in the arteries of people, including smokers. One of the most important benefits derivable from vitamin A and C is their role as antioxidant, oxygen free radical scavengers, while that of the B Vitamins is their role as co-enzymes in several enzymes systems of the body [16]. The high Vitamins content of edible insects present them with a highly potential good source of food supplement for malnourished people.

Minerals are known to play important metabolic and physiologic roles in the living system. Iron, zinc, and copper play physiologic role in the immune system as antioxidant enzymes cofactors [19]. Similarly, magnesium, zinc and selenium prevent cardiomyopathy, muscle degeneration, growth retardation, impaired spermatogenesis, immunologic–dysfunction and bleeding disorder [17]. Iron deficiency is a major problem in women’s diet in the developing world, particularly among pregnant women; and especially in Africa [18]. Vegetarians everywhere are at risk of zinc deficiency. Magnesium is needed for more than 300 biochemical reactions in the body. It helps to maintain normal muscle and nerve functions, keeps heart rhythm steady, support a healthy immune blood; and regulates blood sugar [20]. Therefore, since these minerals are present in insects, their consumption can supply these necessary nutritive elements for human body functions and could be consumed along with other animal food rich in other essential minerals to further complement the diet.

Carbohydrate and fats are important nutritive elements in the human body. They are the main energy source, can reduce consumption of protein and help detoxification. The termites (M. nigeriensis) is rich in Oleic acid, palmitic acid and linoleic acid, an essential fatty acid but poor in myristic acid, lauric acid and palmitoleic acid [6], the total unsaturated fatty acids is 60.64% with acids PUFA making 7.57% only. It is noteworthy that saturated fatty acids are not good for human consumption because they have complications in certain
cardiovascular disorders such as atherosclerosis, cancer and aging [21, 22, 23, 24] and [18]. Therefore, the low saturated fatty acid of edible Insects and high desirable unsaturated fatty acid contents of M. nigeriensis and other insects may be considered an important component for people generally, and particularly, for those who have high blood cholesterol content, and probably at a risk of cardiovascular diseases.

4. Conclusion and Recommendation

Consequent upon literature review, and the fact that malnutrition, particularly Protein-Energy-Malnutrition (PEM), is a major problem in Africa, including Nigeria, this paper concludes that efforts be made to ameliorate the problem through insects consumption. This paper further concludes that since insects are found abundantly in Nigeria all the year round, its consumption will not only enrich the diet but may also supply the high quality nutrients needed for proper growth and development. Insect consumption may further enhance nutrition, food security and public health in Nigeria. Therefore, this paper recommends as follows:

1. Public nutrition education should be carried out, through available opportunities, to emphasize the nutritional advantages inherent in insects consumption.

2. Efforts should be made, through health education, to debunk the obnoxious superstitions, taboos and age long views against insects’ consumption by Nigerians, particularly the rural dwellers.

3. Nigerians should be encouraged to breed, produce and harvest insects in commercial quantities in their communities, for consumption to complement the quality of their diets.

5. References


Teaching Computing Subjects Accessibly: The Educator and Student Viewpoints

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Abstract

The move towards blended or exclusively online learning has been both a blessing and a curse for both educators and students who are blind. Whilst in theory the presence of learning resources in digital formats should facilitate greater inclusion, the lack of accessibility inherent in both the learning objects themselves and the repositories or virtual learning environments (VLEs) in which they are stored makes accessing courses more difficult than one might think. This paper explores some ideas for ensuring the accessibility of both the learning resources, and the underlying platform in the context of teaching subjects on undergraduate computing degrees at Dublin City University. Aspects of accessibility are described from both the educator and student viewpoints.

1. Introduction

Over the past two decades the increased presence of affordable personal computers has led to tremendous changes in how people carry out many daily tasks not the least of which is learning. A significant number of schools and 3rd level institutions now, as a matter of course, base much of their offerings on Virtual Learning Environments (VLEs) such as Blackboard or Moodle. For many people the increased availability of learning resources has improved access to courses of study, however for many blind people the move to VLEs has been less than satisfactory.

Much of the material which forms part of courses in STEM (Science, Technology, Engineering and Mathematics) does not readily lend itself to inclusion in VLEs in a manner which is accessible. A significant amount of information is highly visual in nature, such as mathematical equations and diagrams which can prove difficult for the blind student to navigate. For a sighted student the workflow to access such material looks thus:

1. Go to the course page;
2. Locate the information they desire;
3. Examine it.

For the blind student there are additional layers of complexity. Firstly, given the linear nature of the presentation provided by a Screenreader, such information as a mathematical expression does not readily lend itself to non-visual perusal. Secondly, how can, or should, the diagrams be conveyed? Traditionally on the web, and more recently in documents prepared using standard word-processing or presentation software, it has been the norm to add alternative textual descriptions to images. This solution works reasonably well for situations where the image is simple (say a logo) but is, in this author's opinion, insufficient for conveying complex material.

From the viewpoint of the blind educator, the problems lie in a different direction; namely including resources in the courses they have been designated to teach. Let us take yet another example. A blind educator is teaching a course on web design and wishes to add a multiple-choice quiz. The educator navigates to the relevant page (often through layers of submenus) only to discover that the user-interface used to add the questions and answers is wholly inaccessible. What then, is the educator supposed to do? From the student perspective, once the quiz has been added, it is distinctly possible that it may be successfully completed using a Screenreader, however from that of the educator, it is not possible to create the quiz, meaning that no student (blind or sighted) can take it.

The remainder of this paper describes ongoing work at Dublin City University (DCU) which aims to teach modules on the Computer Applications and Enterprise Computing degrees in a manner which is accessible to both the educator and the student. The courses used as exemplars here are based around the theory and practice of web design and Human Computer Interaction (HCI). Whilst these two courses lack the visually complex components alluded to in previous paragraphs, it is felt that they form an ideal basis on which to construct a prototype web application and workflows to illustrate that courses such as these can be taught and studied in a manner which is universally accessible.
2. Guiding Principles

Ensuring that the diverse aspects which comprise a modern digitally-delivered course are universally accessible depend on, and are underpinned by, a need to conform to standards and/or guidelines. For the purposes of the work described here, three areas were identified, namely Universal Design for Learning, Platform accessibility, and content (or document) accessibility.

“Universal design for learning (UDL) is a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn.”[1] Following this precept was a core goal of this work. Whilst it is outside the scope of this paper to dwell at length on differences in learning style, it would be remiss not to comment (however briefly) on the impact that disability can have on learning. Providing alternative modes of acquiring course content should guide the design of any course. Congenitally blind students may need information presented in a different manner to those who have residual vision, or who have lost sight later in life. Thus, as is described below, various modes of presenting material were used to assist learners in apprehending information in a manner that aided them in completing the course.

In order to ensure the accessibility of the platform the Web Content Accessibility guidelines (WCAG2.0) [2]. By adhering to these guidelines, a site which was usable by all was produced. As aspects of the site required user interaction, a decision was taken to, where necessary, enhance forms with appropriate ARIA [3] markup. This ensures that appropriate semantics are conveyed to those using a Screenreader when, for example, a form field is required, or when a dialog box is used.

Though the material found in [1], [2] were of use in ascertaining the learning and technical needs for our system, the primary goal was to convey content. On this basis, significant effort has been made to ensure that the learning materials themselves met the highest standards. Though the checkpoints in [2] were useful in the sense that they provided indicators of what should be done, it proved necessary to delve into the realm of document accessibility. Such matters as adding alternative textual descriptions to images used in slides (or other documents), or how to correctly (and semantically) produce tables to guarantee that they could be navigated efficiently by Screenreader users was, it was felt, an essential aspect of the system. In [4], [5] the authors demonstrated various aspects of document accessibility in a manner which provided invaluable assistance, as the condensed practically-oriented presentation made it possible to implement the recommendations in the materials used in both the HCI and Web Design courses respectively.

3. The Platform

The most popular VLEs in use today (EG. Blackboard [6] and Moodle [7]) have made attempts to incorporate accessibility, much effort still needs to be made. It was decided to focus the development effort for this work on the Drupal [8] Content Management System (CMS). The reasons for this were simple. Firstly, of all CMS available on the market today, Drupal (in this author's experience) pays particularly good attention to accessibility. It is a core value of the development effort that the Drupal platform be accessible and usable by all. Secondly, much of the functionality required for this effort was available in the form of third-party plugins. Whilst in some cases certain aspects of the user interfaces of these plugins needed to be tweaked, nothing insurmountable was discovered.

The aim of the project was to produce a software platform, which was based on Drupal, which could be easily used by all students and educators irrespective of whether they had a disability or not. For the purposes of prototype development, it was decided to focus on providing accessible solutions for those with a visual impairment and those who did not. This decision was not intended to exclude others; rather it was a limitation imposed by time and budgetary constraints. Thus, the remainder of this discussion should be viewed in this light.

4. The Student Viewpoint

The main objective for students undertaking any course of study is to attain the highest marks possible. To this end, they engage in several related activities:

- Accessing materials provided by the individual teaching the course;
- Accessing assignment or other project briefs;
- Submitting assignment or other project work;
- Carrying out online examinations.

It is essential that, from the student perspective, each of these elements is universally usable or accessible. The following sections outline decisions which were made in course design to ensure that the various components could be accessibly used by the students.

4.1. Accessible Course Materials

Insofar as was feasible, notes were provided in formats which are accessible. For example, whilst slides were presented in either MS. PowerPoint or Adobe PDF in lectures, HTML versions were uploaded to the website. This ensured that, using the regular assistive Technology (most likely a Screenreader) and web-browser, the blind students could access the materials in the same manner as
their sighted peers. Based on feedback obtained from students who undertook the various courses, it was decided to implement course-related podcasts. The reason for this was that students can take the materials with them in small bite-sized chunks. As this was audio-based, blind students did not find accessing content in this form difficult. It should be noted that students who had difficulty hearing the content had access to transcripts of any materials produced exclusively in audio.

The technical details of how the notes were translated into HTML may be of interest to some readers so a brief description is given here of how this was done. Notes were presented in lectures using PowerPoint or PDF and, as stated previously, were translated into HTML for publication on the course websites. Each set of slides was translated into Drupal books [9] which enabled internal navigational capabilities. This also provided the facilities to go beyond the (necessarily brief) treatment provided in lectures and either expand on, or provide alternative treatments of, the concepts delivered. All audio and video was included using [10] as it provided the most seamless integration with Drupal, and also included all functionality needed.

4.2. Accessible Assignments

There are two parts to any assignment; namely the description (or brief) and the student submission. Ensuring that both components were accessible was of paramount importance, as the grade for the course was dependent on successful completion of the Continuous Assessment (CA) element. It should be said that this portion of the course design posed no difficulties whatsoever. The assignment brief was provided via the website an analogous manner to that in which course notes were provided (described above), and was thus universally accessible. Care was taken to ensure that the deliverables (which in our example courses took the form of a completed website, a presentation and a prototype user interface respectively) could all be completed by students in the class group.

In an ideal scenario, the project submission would have been included in the course websites as an accessible form. However, as this was the first year that this approach had been followed, not all of the infrastructure was in place. Therefore, and alternative solution was adopted; namely submission by email. Once again, this negated the necessity of using VLEs with complex workflows which have proven difficult for students in the past. No student had difficulty with the submission process and it was again universally accessible.

4.3. Accessible Exams

Though no online examination formed a part of the assessment of this course, methods for incorporating their delivery has been factored into the design. In the case of multiple choice questions, no serious difficulty is envisaged once the relevant WCAG2.0 [2] guidelines are adhered to. Indeed, in an informal pilot study carried out in July 2014, several blind users (albeit with considerable computer experience) had no difficulty completing sample online multiple choice questions.

Somewhat more challenging is the incorporation of examinations based on freeform questions, or those based on programming tasks. Here, the system must ensure that all necessary visual feedback is delivered in a manner which can be conveyed textually, and which can be interpreted by the Screenreader. It is our belief that setting up such a system is a self-contained project and warrants further consideration beyond the term of this project. Though ideas have been formulated, and the system designed in a manner which would readily lend itself to expansion in the future, it is not possible at this time to carry out examinations based on this type of question.

5. The Educator Viewpoint

As is quite rightly the case, the main focus of work in the domain of special needs education has been based on students who need extra considerations by virtue of their disability. But what of the educator in similar circumstances? Purely anecdotal evidence gleaned from informal exchanges with various blind educators would suggest that much of the course management side of VLEs remains inherently inaccessible. In the case of accessible course management, the following aspects need to be taken into account:

- Can the educator upload relevant course materials accessibly?
- Can the educator create an assignment brief, receive submissions, and enter grades accessibly?
- Can the educator create online examinations and grade them accessibly?

5.1. Accessible Creation of materials

As was previously described, HTML was chosen as the format for the presentation of materials. The reason for doing so was outlined from the perspective of the student, however much of what was said in that context also applies to the educator. In addition the fact that HTML readily lent itself to accessible creation of content was one of the most important reasons for the choice.
5.2. Accessibility of Assignments

The preparation of the assignment brief posed no problems for the reasons described in the context of other course materials. The submission process, relying as it did on email, again posed no issues. However this solution is less than ideal and will not be used in future. VLEs provide mechanisms for the control of submission deadlines and any accessible course platform needs to have such a system in place. Whilst work has been carried out on this aspect of course management, it was not deemed to be either reliable or secure enough for use in this iteration. The grading of assignments was carried out outside the course management software. Various spreadsheets were constructed which facilitated the entry of grades for individual assessment components and their subsequent calculations to produce the overall result. Whilst both the grading and dissemination of the results was carried out in a manner which was accessible, it was not ideal. Once again, the course management software needs to be expanded to facilitate this aspect taking place inside the platform.

5.3. Accessible Creation of Online Examinations

Though no online examination formed a part of the assessment of this course, thought has been put into how accessible creation of examinations may be achieved. In the case of multiple choice questions, no serious difficulty is envisaged once the relevant WCAG2.0 [2] guidelines are adhered to. The educator should be presented with a form which enables the question text, and appropriate answer-choices to be entered. Indeed, in an informal pilot study carried out in July 2014, a blind educator was able to create an online examination. It is in no way intended to suggest that this represents a scientific proof of the efficacy of this method, it is merely anecdotal evidence to support future work in this aspect of accessible course management.

6. Conclusions

What has been briefly outlined here is a prototype web application which facilitates the delivery of, and participation in, courses prepared with the needs of all participants (students and educators) uppermost in mind. What remains is the incorporation of more advanced course materials such as screencasts, video, and accessible diagrammatic content. It is also essential that more work be carried out on the course management side to ensure the educator can accessibly provide the course to the students.

One of the core values underpinning this work is a belief in providing a platform and course materials based on web and other relevant standards. It is our belief that if a standards-based approach is taken, then more universally accessible courses will become feasible thus ensuring that both students and educators with and without disabilities can equally and actively participate in the learning process.

7. References

**Practicing what we preach: Using Universal Design for Learning (UDL) Principles to Teach UDL to Pre-Service Special Education Teachers**

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**Abstract**

Universal Design for Learning (UDL) involves using multiple and flexible means for: presenting content, engaging students with the content, and allowing students to demonstrate their understanding through expression and apprenticeship. Learning preferences, general strengths and interests, and areas of need are considered for all students, including students with disabilities. This is done, in part, to maximize student engagement and ultimately student learning. Learning is doing. Teaching pre-service special education teachers about UDL by incorporating UDL principles in the design and instruction of teacher preparation courses would, ideally, facilitate a better understanding of these guiding principles. This proposed study would examine the attempts made to incorporate UDL principles during a previously taught course. Additionally, the proposed study would utilize the 'lessons learned' from the first course to improve UDL methodologies and student assessments for one or more courses taught during the following semester.

1. Introduction

Current U.S. legislation, such as No Child Left Behind (NCLB) [1] and the Individuals with Disabilities Education Act (IDEA) [2], includes high expectations for student learning outcomes and for educators to adequately teach children from varying cultures and with differing abilities (students with and without disabilities and second language learners) and learning preferences (e.g., auditory, visual, tactile). Effectively teaching in an inclusive classroom requires skills that go beyond content knowledge and traditional pedagogical practices that are primarily effective for a core group of students who would learn regardless of the methodology. The principles of Universal Design for Learning (UDL) can address a variety of learning preferences, interests and student needs [3].

UDL aims to reduce the barriers to learning that currently exist in many classrooms by assisting teachers in their understanding of how students learn and how today’s digital technology may provide support or challenging opportunities for students who may otherwise be disengaged. [3]. The ultimate goal is to increase student engagement and successful learning. The U.S. Department of Education’s Office of Special Education Programs (OSEP) recognized the need to support educators and has funded a number of initiatives that specifically address UDL.

The OSEP initiatives involving UDL include the Center for Applied Special Technology (CAST), the ACCESS Project through Colorado State University, Center for Implementing Technology in Education (CITEd), Ensuring Access Through Collaboration and Technology (EnACT), and the National Instructional Materials Accessibility Standard (NIMAS) [4]. Another OSEP funded initiative is the IRIS Center at Vanderbilt University in Nashville, TN, and Claremont Graduate University in Claremont, CA [5]. This web-based initiative was created specifically for preservice teacher preparation and professional development on evidence-based teaching practices, including UDL. The IRIS Center module on UDL was the fourth most visited module in 2014 yielding 50,437 visits with “75.3% of all colleges and universities with a special education option using the IRIS resources” [5].

Faculty in preservice special education teacher preparation programs are challenged to use a variety of resources to teach effective, evidence-based practices. Higher education faculty are continuously seeking innovative ways to prepare future educators to meet the educational needs of the diverse learners they will likely encounter one day when they have a classroom of their own [6]. Ideally, higher education faculty would be able to incorporate UDL methodologies while teaching the teacher preparation courses necessary for accreditation and teaching licensure.

2. Special education teacher preparation

Evans, Williams, King and Metcalf (2010) described UDL implementation in three undergraduate special education teacher preparation courses [6]. The authors described the course activities that related to the UDL principles and methods in which they demonstrated them in their own teaching. For example, for some of the content the students viewed a video or digital demonstration of a UDL/direct instruction lesson plan being implemented in a classroom and discussed what
worked and what did not to assess how the lesson might be changed in the future [6]. Students also completed UDL lesson plans or units that required the inclusion of low tech and high tech methods and materials and the identification of barriers and related solutions [6]. This particular study did not report student performance measures and studies in higher education reporting such measures are limited. Edyburn, when discussing the implementation of UDL in K-12 settings suggests: “statements such as ‘UDL is just good teaching’ serve to preserve the status quo, which marginalizes low-performing students. We must find ways to define and measure implementation of UDL in order to discern when it is being implemented and when it is not” [7].

One might argue that defining and measuring understanding and implementation of UDL principles in preservice special education teacher preparation programs might be equally as important [6]. New teachers’ in-depth understanding of UDL principles is essential if they are expected to implement these practices in the future. There are a number of ways to assess the depth of student understanding that should ultimately deepen over time. For example, during the freshman year of a special education teacher preparation program, the lowest level of understanding is all that might be expected of the students.

3. Methods of assessment

There are multiple methods for assessing student learning. Traditionally, multiple choice and short answer/essay tests are used for assessment purposes. In teacher preparation courses, lesson plan development, implementation and presentations are also used, but the evaluation of courses for evidence of UDL practices may be more difficult to assess. Possibilities for assessing student learning and UDL course development and implementation are presented.

3.1 Journals and assignments

The assessment of private journal entries or individual assignments that involve initial thoughts about a new topic, participation in a related activity or series of activities and ending with a follow up reflection is one way of assessing student understanding of content. The assignment/journal prompts need to be carefully crafted in order to elicit higher order, more complex thinking. Evaluating the responses can be done using UDL specific rubrics or taxonomies such as the SOLO Taxonomy.

3.2 The SOLO Taxonomy

The Structure of the Observed Learning Outcomes (SOLO) Taxonomy has been used to systematically assess the levels of complexity of student understanding and learning and may be useful for evaluating written assignments [8,9,10]. The SOLO Taxonomy is one method to rate students’ understanding of the principles of UDL over time. As students learn, their responses become increasingly more complex: the SOLO Taxonomy evaluates understanding and learning both quantitatively (i.e., the number of correct points made) and qualitatively (i.e., whether the points made inter-relate) [9]. The SOLO taxonomy is not content-dependent and consists of five levels with each student artifact scored from 1 to 5 using the following hierarchy [11]:

1. Prestructural – the student misses the point and shows understanding at the individual word level, repeats information, uses different words to say the same thing, does not add substance;
2. Unistructural – Meets only one part of the task and misses the other part(s), adds a little more on pre-structural;
3. Multi-structural – Does not understand/address the key issues, presents facts in an unstructured manner, knowledge telling with no connections, sees the trees but not the woods;
4. Relational – Student no longer lists facts, the paper/artifact addresses the point, does some conceptual work, but stays with what is given; and
5. Extended Abstract – Goes beyond what is given, uses higher level of abstraction, gives a perspective that changes what we think about the topic, takes the argument into new dimension.

3.3 Constructive alignment for course development

To assess and plan courses for evidence of UDL practices and opportunities to teach about UDL, Biggs and Tang’s Constructive Alignment could prove to be useful. Constructive alignment involves the identification of Intended Learning Outcomes (ILOs), Teaching/Learning Activities (TLAs) and Assessment Tasks (ATs) [11]. Constructive alignment requires that the ILOs contain “statements…indicating the level of understanding and performance they are expected to achieve as a result of engaging in the teaching and learning experience” [11 p. 55]. TLAs are “The verbs the students need to enact” and ATs are “…the evidence for the achievement of the ILO’s” [11]. Aligning ILO’s, TLA’s and AT’s with the principles of UDL would ensure the use of the principles while constructing meaningful course activities and assessments with the desired learning outcomes. If
thoughtfully designed, a Constructive Alignment course table might be useful for accreditation reporting purposes as well.

4. Proposed study

The inspiration for this study was a course taught during the 2014-15 academic year on technology integration and UDL. After the course had started, the instructor informally assessed special education preservice teachers’ understanding of UDL after several discussions and two brief assignments. Unsatisfied with the assessment, the instructor sought to deepen student understanding using additional resources and activities with good results. After reflecting on the overall success of the course, the instructor concluded that some fundamental changes could be made to improve the course in general and, specifically, as it relates to teaching with and about the UDL principles. An analysis of the current course and student success would be conducted as the first phase in the proposed study.

The course documents and student work to be analyzed for the proposed study involve an undergraduate special education teacher preparation course. The course utilized an eTextbook, private electronic content-related journals, other electronic documents, websites, videos, individual and small group work, class discussions, and the IRIS Center module titled: Universal Design for Learning: Creating a Learning Environment that Challenges and Engages All Students [12].

The proposed study seeks to evaluate the course for evidence of effective implementation of UDL principles by the course instructor. Additionally, it seeks to evaluate the instructors’ methods to teach the UDL principles and evidence of student learning. Finally, the outcome of this study along with the completion of a Constructive Alignment assessment will serve to inform the instructor on effective methods of implementing and teaching about UDL UDL practices in this and other future courses.

5. Conclusion

Universal Design for Learning is not as simple as learning about and demonstrating good teaching practices. UDL also involves a knowledge of student interests, strengths, needs and preferences for learning and knowing how to effectively meet the needs of all students in the most effective manner. It may be most advantageous for preservice special education teachers to develop the knowledge and skills necessary to effectively implement UDL in their future teaching if they are taught using these principles in their preparation program. Additionally, if preservice teachers are assessed on their depth of understanding throughout their program, the assessment data could be used to inform higher education faculty teaching practices each semester. Incorporating UDL practices in all courses will allow faculty to practice what we preach and become facilitators of student learning.

9. References


Session 9: Special Education

Sexual Abuse Prevention: A Training Program for Special Educational Needs Students and Teachers
(Authors: Verlinden, Karla, Urbann, Katharina)

What is Not Always Seen: The Experiences of University Learners with Visual Impairments
(Author: Christopher Ostrowski)

Special Education in Saudi Arabia: The Effort of the Ministry of Education
(Author: Zaed M. Bin Batal)

(Author: Fang-Yu Liu)
Children with disabilities are at higher risk for child sexual abuse than children without disabilities. But there is a lack of prevention programs for those, who work with these children. Results of the German evaluation study of prevention training on sexual abuse of children and adolescents with disabilities are presented. The study was conducted at three points of measurement (pre, post and follow up) for an intervention and control group of students of Special Education and Teachers of Special Needs Schools. The results of the intervention group with a total of 200 students and 160 teachers show changes in knowledge, attitudes, myth acceptance and awareness of sexual abuse. The present results indicate positive effects of the prevention training.
What is Not Always Seen: The Experiences of University Learners with Visual Impairments

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Abstract

University can be a challenge for learners with visual impairments, and they often rely on academic accommodations to succeed. This study will examine how the visually impaired use assistive technologies to support learning. Current assistive technology provisions are often unavailable in a timely manner, expensive, and of inconsistent quality. These difficulties have caused some visually impaired learners to feel restricted to certain study programs, delay program completion, or withdraw entirely. Assistive technologies can be vital for visually impaired learners to succeed, making it critical to understand how they are being used to ensure they are adequately responsive to learner needs. This study will use in-depth interviews to conduct a narrative inquiry into the lived experiences of Canadian university students with visual impairments. The findings of this study will highlight the strengths and weaknesses of current learning supports and provide institutions with actionable advice to improve instructional practices, design, and policies.

1. Introduction

Affecting over 3500 postsecondary learners in Canada, visual impairment and blindness are a consideration that can be easily overlooked by instructional practices [30, 32]. Learners with visual impairments (those who are blind or have low vision, which cannot be remedied with corrective lenses) in university face unique challenges that may not be well understood and are underrepresented in literature. Many of these learners use assistive technologies (AT), such as screen readers, refreshable braille displays, dictation software, and screen magnifiers, as academic accommodations to support learning, but little is known about their experiences using these technologies. With varying ranges of awareness and instructional supports, many learners with visual impairments must take extraordinary measures to obtain support and accommodations. Courses that are not designed to be accessible compound the issue by forcing instructors to make ad-hoc course modifications to meet student needs. These are some of the long standing issues, and with the number of postsecondary learners with exceptionalities (for example, disabilities and impairments) continuing to rise [22, 19], it is increasingly necessary to understand their learning approaches, needs, preferences, challenges, and successes [24]. This research study emerged from a desire to better understand how university learners with visual impairments use technology for learning.

2. Statement of the Problem

Contemporary learning environments are equipped with a number of learning technologies, but without adequate awareness and knowledge, the potential to support learners may be seldom realized. Instructional design frameworks typically stress considering the needs of a target audience [1], but in a university environment with a continuous flux of learners, courses, and instructors, designing for one particular audience can be pragmatically unfeasible. Another approach is to incorporate technology using universally accessible design frameworks to support the diverse and unique needs of all learners (for example, Universal Design for Learning) [18]. Unfortunately, many postsecondary institutions have not implemented accessible design frameworks, in part due to a lack of training, knowledge, and resources [7, 26]. Traditionally, learners with exceptionalities have relied on accommodations such as assistive technologies, additional time for exams, or aide workers to be successful which can be costly, time consuming, and cumbersome to implement [7, 22]. Consequently, difficulties in obtaining accommodations have caused some learners to feel restricted to certain programs of study [2], delay graduation or withdraw entirely [27]. There is a strong prevalence of learning technologies in modern classrooms, but there continues to be implementation challenges, which highlights the need for further study.

There are limited first-hand accounts from learners with exceptionalities on their challenges, approaches, strategies, and needs available in literature. Studies that only identify which supports are used or available, but not how they are used [8,
fail to illuminate the nuances of how learners are being successful or if current supports are adequate.

Often the greatest desire for learners with exceptionalities is to simply 'fit-in' and have the same opportunities as their non-exceptional peers [20]. Exceptional learners do not want to be met with awkwardness by peers or instructors that are uncertain how to approach them. Some learners with visual impairments have called on institutions to improve instruction by mandating disability awareness training [20]. Despite the challenges, it is estimated that over 80% (compared to the national average of 86%) of learners with visual impairments are able to complete their studies [27, 31].

The purpose of this study is to explore the lived experiences of university learners with visual impairments, and gain insight into their challenges, successes, learning approaches, and strategies. These findings can be valuable for institutions, instructors, learners, disability service providers, or organizations towards the improvement of instructional practices, course designs, availability and quality of assistive technologies, retention, and program completion times. This inquiry privileges the voice of learners and shares their lived experiences in their own words.

3. Significance

Since universities often rely heavily on visual media for instruction, assessment, and social interaction, learners with vision difficulties can easily be disadvantaged. Learning technologies can play a vital role in helping those with visual impairments overcome these challenges, making it pertinent to better understand the meaning and significance of technology to them.

In terms of practical significance, the findings of this study can support the design of accessible courses and programs. This can include considerations for course materials, technology use, activities, classroom layouts, and locations. Additionally, this research can contribute to scholarly knowledge and support instruction by bringing awareness to the learning technology needs, preferences, and approaches of learners. This study has an opportunity to give voice to learners with vision difficulties, and describe the role of technology to support their learning. Understanding how learners use technology for learning is critical for informing the design and delivery of accessible courses that address student needs, preferences, and learning approaches.

This study seeks to answer the follow research question: What are the experiences of university learners with visual impairments using technology to support their learning?

4. Literature Review

4.1 Learners that are Considered Exceptional

Learners that are considered exceptional face many barriers that can significantly impact academic opportunities. Their program completion rates trail behind their typically achieving peers, and retention is an ongoing difficulty [11]. Many learners entering university for the first time must adapt to a new environment, but learners with exceptionalities have the additional task of familiarizing themselves with university disability service providers and the processes (for example, forms and policies) for obtaining academic accommodations. These learners must take responsibility and advocate for their own needs, which can be an intimidating and cumbersome endeavour [11, 19]. Having legislation and institutional policies in support of exceptional learners is only part of the solution. There also needs to be comprehensive programs in place to implement supports and to help exceptional learners develop self-determination skills, to teach self-management, to provide exposure and training for assistive technology, and to promote career development [11]. Moreover, negative experiences with supports and programs can have substantial long term effects, causing some learners to become discouraged from pursing particular programs and career paths [2]

4.2 Instruction

Some studies indicate disability awareness training can benefit instruction by promoting the creation and delivery of accessible courses to support all learners [11, 19, 20]. Many instructors are supportive and willing to attend such training, but few do so in part due to lack of availability and resources [7]. There is often a dichotomy of instructional viewpoints on university learners that are considered exceptional [4]. One group considers exceptionalities to be individually self-contained and learners need to be treated differently depending on the category they fit, while the other embraces a social constructivist perspective where exceptionalities are not self-contained and all learners are part of a continuum [4]. A lack of general awareness and knowledge of the legal rights and responsibilities of learners and instructional practices can be a major hurdle in supporting learners [4]. This is further complicated, when the power dynamic between instructors and learners is considered, where exceptional learners may be apprehensive about approaching instructors to arrange accommodations for fear of being an inconvenience or placing burden upon them [2]. In turn, this often forces learners to rely on disability service providers to mediate between student needs
and instructional practices, which is not always efficient or effective [6].

4.3. Statistical Data and Policies

Around the world, postsecondary attendance by exceptional learners is growing. In the United States, and the United Kingdom attendance has approximately doubled within a decade [13, 21, 25]. In 2006 it was estimated that there were 31,631 exceptional learners (aged 15-24) in Canada [14]. It was also reported that 16.1% of this group (aged 15-24) attending a Canadian institution (not exclusively postsecondary) abandoned their education because of their impairments [14]. Furthermore, almost 30% of these learners were forced to reduce their course load (due to additional time required to access and use accommodations, and funding limitations), resulting in delayed program completion. Exceptional learners have greater expenses than their non-exceptional peers, due to the cost of specialized AT and services, the need to attend institutions outside of their home communities because of their exceptionalities, and extended program length due to a reduced course load [22].

The educational system forces some university learners with exceptionalities to exert extraordinary efforts just to gain access to academic accommodations with no guarantee that their needs will be fully met [2]. As the demand for accommodations continues to grow [4, 22], there can be additional strain on support providers and funding agencies. A significant difficulty for some exceptional learners is obtaining employment, thus it is paramount for them to have access to higher education to maximize employment opportunities [3]. Furthermore, with increased employment opportunities, exceptional learners can improve their likelihood of generating income (or supplementing from external sources) to cover costs of living, and allow them to function with greater independence.

Legislation exists to provide learners with exceptionalities with accommodations [22], but the processes in place to access them are themselves a barrier [19]. Funding limitations, inconsistent availability and quality of accommodations, extended program completion times, extensive paperwork, and higher than average expenses are a few of the challenges facing exceptional learners.

4.4. Learners with Visual Impairments

In university, the heavy reliance on textbooks, whiteboards, print materials, and other visual media, learners with visual difficulties can be particularly disadvantaged. Even admission processes can be difficult, as recruitment methods and materials are often not designed to be easily accessible for learners with vision difficulties [27].

To complete their programs, some learners with visual impairments rely on academic accommodations and specialized support. Social participation inside and outside of the classroom is also an important factor towards program completion, but it is often a forgotten consideration when organizing supports, making it difficult for visually impaired learners to readily participate in group activities [2, 27]. Another challenge is access to print materials in high quality alternative formats, which is compounded by inconsistencies in training, availability, and general AT support [15].

The needs of learners with visual impairments can vary from person to person, making it difficult to predict individual supports based on a diagnosis alone [8]. Each learner is unique and the use of specific supports is a personal choice. In one example, Lusk and Corn [17] found learners used a combination of media to read different materials, and often used different combinations of media depending on the context and purpose of the reading task. In another example, D'Andrea [8] reported that for learning the mechanics of writing (for example, spelling, grammar, and syntax), some learners with vision difficulties preferred traditional braille, while using more modern screen reading technologies to take advantage of portability and speed.

Some learners with visual impairments struggle to obtain course materials in alternative formats or are provided equipment that frequently fails [2]. In turn, poor quality support and unresponsive institutions can deter learners with visual impairments from continuing their studies. Byrne [2] also found great variability in support practices at different institutions. Some institutions grouped learners with cognitive difficulties and physical difficulties, which have vastly different needs, together into specialized courses. This caused some learners to feel discriminated against and inadequately supported. Throughout the literature, a lack of adequate awareness, training, access, choice, quality, and consistency are reported as some of the ongoing difficulties facing visually impaired learners. With positive experiences representing only a minority of cases, there is a need for continued research into ways that all learners can be better supported towards attaining their educational goals.

4.5. Assistive Technology

Assistive technology for learning is any “technology that increases, improves, or maintains the functional capabilities of students with disabilities” [28:508]. AT can include high-tech electronic devices such as screen reading software and haptic feedback devices, or be as simple as a magnifying glass to make reading easier for learners with low vision. To overcome barriers, some learners with vision difficulties rely on AT to accomplish
day-to-day tasks and support their learning. Advancements in AT have created many opportunities for learners [12, 15], but there continues to be difficulty in training, access, and implementation [27]. Moreover, without awareness of AT and how learners use them, courses can be accessibly designed and use materials that do not readily interface with AT (for example, digital course materials that are compatible with screen reading software). Often, instructors are generally supportive of improving accessibility for all learners, but are limited by available resources and training [7].

Assistive technology can help level the playing field for all learners. Despite the wide spread use of AT by exceptional learners, there continues to be a lack of systematic scholarly rigour in the advancement of educational technology, which often relies on trial-and-error methods [9]. It is reported that in 2006 nearly 30% of people in Canada (ages 15 and over) with vision limitations were not having their needs fulfilled with assistive devices [14], implying further research is still needed to improve the efficacy of these technologies.

Although AT exists, there are still pragmatic barriers preventing some learners with visual impairments from using it. Course textbooks in alternative formats such as braille, large print, or audio form are frequently unavailable or access is delayed, leaving learners without primary resources for at least part of their courses [15]. Even with access, materials of poor quality (for example, scans of printed text) may not be compatible with AT such as screen readers. Another challenge is inconsistent access to AT at home and school. Often, institutional AT is out of date, lacks technical support and training, or unavailable, making it difficult for learners to take advantage of those devices [10]. Also, devices tend to be in fixed resource rooms, which are of little use to learners in other areas of an institution (for example, lecture halls, laboratories, and libraries). Fortunately, mobile devices have been able to alleviate some of these issues by giving learners increased portability at school and home.

Of the computer based AT available, screen reading software, followed by scanners and optical character recognition software are the most used by learners with total blindness, while screen magnification and proofreading software are the most used by learners with low vision [10]. Tactile representations of graphics, images, and charts are informative and useful in a broad range of contexts, but as with braille, high costs and production times typically deter learners from gaining access to these resources [25]. Overall, some visually impaired learners find their needs are being met, but there continues to be issues with access, availability, quality, training, awareness, and support.

To effectively implement AT, the context specific needs of the end-user must be considered. There is an inherent relationship between the technology and user specific characteristics [16], which can dictate the possibilities and outcomes that can be realized. The significance of what AT can afford is learner specific, for example, screen-reading software can be critical for learners with very low vision or blindness by enabling the ability to read [23]. Conversely, a learner without vision difficulties may also benefit from screen-reading software, but they can still read without the software. Understanding the relationship between users and technology is important for implementation, but it can also feed back into AT development. The advancement of AT is dependent on understanding the possible benefits and limitations of technology, and its relationship to the authentic needs, strategies, and approaches of users. University learners and course designers must consider the relationship between the conceptual underpinnings and tools of visual impairment to establish a common ground of understanding, and to maximize the realization of potential benefits [16].

5. Methodology

Narrative inquiry is a way of understanding experiences [5] and developing a perspective on a phenomenon. If it is assumed that people lead storied lives and are in a perpetual state of telling and retelling stories, than narrative researchers serve to collect, inquiry into, and retell stories. As a minority, learners who are visually impaired represent a population whose stories may be seldom heard, yet their uniqueness may offer rich insight not found elsewhere. A narrative inquiry can engage with these stories to allow key issues to emerge organically from the lived experiences of participants.

5.1. Three-Dimensions of Narrative Inquiry

At the forefront, narrative inquirers are concerned with making sense of lived experiences [5], which requires the consideration of contextual factors that shape the inquiry. In narrative inquiry, three commonplaces must be considered: temporality, sociality, and place [5]. These commonplaces define the three dimensions of narrative inquiry and must be attended to simultaneously. The first dimension, temporality, attends to the past, present, and future of people, places, things, and events (for example, the age when participants first became impaired, when they first started using technology, and present age).

The second dimension, sociality, is concerned with personal and social conditions such as the people and cultural contexts where events occur (for example, participants’ relationships with friends,
family, peers, and instructors). The third dimension, place, refers to the literal physical location or sequence of locations where the inquiry takes place [5]. This dimension attends to the place of the inquiry as well as the places described in participants’ lived experiences (for example, which institution they attend, and where they use technology).

5.2. Conducting a Narrative Inquiry

This study will use an in-depth interview [29] approach and will focus on moments that participants consider being significant towards the successes and challenges of learning. The inquiry will explore their school experiences prior to university, their choice of study program, their use of technology, their challenges, their successes, and their approaches to learning. The inquiry will also explore the meaning and significance of technology, and how it has impacted their future academic and career prospects.

Participants will be recruited by approaching organizations for the visually impaired (for example, the Canadian National Institute for the Blind) and university disability service offices. The study will recruit undergraduate learners from several Canadian universities using purposeful sampling to achieve maximum variability [29].

5.3. Data Collection

The participants will take part in three semi-structured in-depth interviews [29]. The interviews will explore participants’ past and present experiences, as well as future academic and career prospects. The final narrative account will be the result of a negotiated effort, which will provide accountability between the analyzed data and the participants’ narratives.

5.4. Narrative Analysis

The analysis will involve looking for emergent themes and linking elements (for example, places, actions, people, technologies, and moments of tension) within each participant’s narrative account. The linking elements will then be narratively coded to create a narrative thread that forms relationships between patterns, themes, and tensions. After shaping the narrative thread of each participant, it will become possible to look across narrative accounts and inquire into resonant threads [5].

5.5. Potential Benefits and Implications

Participants may benefit by learning about themselves and others through sharing their experiences, which in turn could improve their own university learning experiences. The findings of this study could highlight the strengths of available resources and provide institutions with actionable advice for improving accessibility. The findings could also inform disability awareness training that targets visually impaired learners to improve instruction. Funding agencies and disability support providers could benefit from knowing which technologies valuable to learners and if current financial provisions are adequate. Additional implications could include contributions to policy reforms, improved quality and availability of accommodations, reductions in graduation times, and generally more positive university experiences.

6. Conclusions

Some learners with visual impairments face many barriers to accessing a university education. There are ongoing difficulties with availability, training, awareness, funding, and quality of supports. Legislation and institutional policies exist to support learners, but there is inconsistency in efficacy and implementation. Some visually impaired learners are forced to go to extraordinary measures to gain access to necessary resources, causing learners to be restricted to certain programs and take longer to graduate. Advances in assistive technologies are promising, but a better understanding of learners’ lived experiences is needed to improve instructional practices and policies.

7. References


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Special Education in Saudi Arabia: The Effort of the Ministry of Education

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Abstract

Saudi Arabia is a developing country located in the southwestern part of Asia. It is the world’s largest producer and exporter of oil. The modernization of Saudi Arabia has increased dramatically during the last decades as a result of producing and exporting oil; therefore it is interesting to examine how special education practices in the kingdom have developed. This paper describes the emergence, development, and present status of Special Education in Saudi Arabia. It is limited to the efforts of the Ministry of Education, for it is the major service provider. The expansion of services to include non-traditional areas of exceptionalities and service delivery models is discussed. The principle factors contributing to the growth of the field are identified.

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Abstract

Over the past twenty years, neuroscientists have studied the process of musical activity in the human brain. With experiments using functional magnetic resonance imaging (fMRI) and positron emission tomography (PET), there have been a number of empirical studies exploring how different neural pathways are evoked by music. Studies have shown that musical and nonmusical behaviors share overlapping neural networks in the brain. Through this point of view, researchers believe that musical behaviors may reveal a potential mechanism of therapeutic change in the brain, which means nonmusical behaviors may be facilitated through music behaviors.

Children with Autism Spectrum Disorder (ASD) are known for having deficits in social communication and interaction. This population may have difficulty in verbal and nonverbal communicative behaviors, as well as difficulties maintaining relationships during social interaction. A number of studies report that this impairment in social interaction may relate to atypical brain structures and functions.

Recent studies have revealed that certain brain regions play an important role in regulating the behavioral and physiological state during the process of social interaction. The major brain regions such as the amygdala, hippocampus, prefrontal cortex, orbitofrontal cortex, temporal cortex, cingulate cortex, and somatosensory cortex can be activated during the complicated process of social interaction. Similarly, it has been reported that music activities can activate certain brain regions such as the amygdala, nucleus accumbens, hypothalamus, orbitofrontal cortex, temporal cortex, and cingulate cortex.

In terms of the neurodevelopmental conditions of individuals with ASD, a number of articles pointed out that individuals with ASD may have abnormality in brain structures and functions such as the amygdala, hippocampal formation, cerebellum, medial frontal cortex, superior temporal sulcus, and fusiform gyrus. That is to say, due to the shared neural pathways in the brain, musical activities may lead to positive effects on facilitating social interaction for children with ASD.

This abstract reviews and discusses three topics: 1) the brain structures and functions involved in processing music activities, 2) the brain structures and functions
involved in social interaction of individuals with ASD, and 3) the applicable music activities facilitating social interaction.

After a review of the literature, the suggested outline of music activities for children with ASD is presented. The purpose of the music activities is to facilitate social interaction in children with ASD.
Session 10: Learning / Teaching Methodologies and Assessment

Physical Education and Self-regulation: Enhancing Learning and Success for Students with Intellectual Disabilities
(Author: Joann Anokwuru, Aloysuis Anyichie)

School Dropouts and the Conditions of the Possibility for Transformation of their Relation to Knowledge
(Author: Jean-Marie Weber)

Single Parenting as Correlate of Academic Performance and Achievement Motivation of Students in Unity School in South East Geo-Political Zone in Nigeria
(Author: Anyakoha Christiana Ijeoma)

The Collaboration among Parents, Teachers, and Psychologists
(Author: Joanne A. Udaze)
Physical Education and Self-regulation: Enhancing Learning and Success for Students with Intellectual Disabilities

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Abstract

Taking a walk around the gym during a floor ball activity class, students were engaged in this new activity that had the same fundamental movement skill like hockey. At the corner of the gym, was a student standing, enthusiastic expression to be part of the game, but excluded due to some militating factors that was recognised by the team.

Research has shown that Adapted Physical Activity (APA) provides “physical activities that are modified according to the physical, mental and emotional needs of children with a diagnosed disability. This regular physical education program makes real and constant efforts at individualizing instruction and is beneficial in supporting students with learning disabilities (Gallahue & Donnelly, 2003 p.149-150). The learning of these students could also be enhanced by applying the theoretical notion of self-regulation strategies in inclusive Physical Education context. Self-regulation or (Self-regulated Learning- SRL) is the ability of a learner to control thoughts and actions to achieve personal goals and respond to environmental demands (Zimmerman, 2000). Models of SRL involve defining task, setting goals and planning, learning, and adaptation (Winne and Hadwin (2008).

This abstract critically examines the broad conception of APA and how the models of self-regulation engage students to become motivated, actively involved thereby, enhancing the cognitive, psychomotor and affective domains of learning. Physical activity can contribute implicitly to the learning potentials of students with intellectual disabilities. This can enforce the interest to perform various skills, tactics, techniques, fundamental movements, and strategies through self-regulated practices. Thus, SRL brings to offering the necessary response of the physical environment and activities within the adapted physical activity program that would invite the interests, abilities and preferences of the student.

The methodology used in this study is based on the phenomenology of students with disabilities in physical education. Through social constructivism, the students tend to experience the understanding of their interests and ability in physical education through SRL strategies such as, self-monitoring, self-instruction, goal-setting, and self-reinforcement.

In summary, the students with intellectual disabilities are able to co-construct the meaning of a task such as, game situation by going through the self-regulated learning model and forging interactions with other team members and classmates.

The intent of this abstract is to open up or further provoke discourses in the field of adapted physical activity and self-regulation. The possibilities for physical educators to envisage physical education through a lens of responsive and emergent pedagogy using self-regulated practices and to facilitate fundamental movement expression of all forms in students with intellectual disabilities.

The session highlight adapted physical education and self-regulation as separate components. How a combination of both can facilitate the learning domains for students with intellectual disabilities in physical education. Participants are invited to consider the notion and ways of APA and SRL are juxtaposed in this context.

References


School Dropouts and the Conditions of the Possibility for Transformation of their Relation to Knowledge

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Abstract

The aim is to understand from a psychoanalytical point of view, which these dropouts are, what the relation to knowledge and learning [3] is they have developed within the confines of their social connections and in response to the discourses and desires of their parents, educators, peers and teachers. As the transmission of knowledge is always a question of connection, in a psychoanalytical approach of transference and countertransference, it seems to be of vital importance to also analyse the relation to knowledge and to students of teachers and trainers. Starting from these analyses, the objective is to discover from a psychoanalytical perspective the "conditions of possibility" for the accompanying of adolescents in order to support the transformations of the relation to knowledge [4].

1. Scope

We hypothesize

• that dropping out of school constitutes a last step in the development of a relation to knowledge where the desire for knowledge has been blocked by transgenerational prohibitions and/ or the refusal or incapacity of living with lack, with frustration as a condition for the desire of knowledge.

• that school dropouts are to be considered as a symptom addressed as their surroundings, that is to say as a means of situating oneself as subject.

• that transformations of the relation to knowledge take place thanks to a social connection wherein the adolescent is treated as a subject together with his or her symptom, and wherein he or she is better able to become aware of his or her desire by means of exchanges put in place in the Ecole de la deuxième chance.

2. Methodological approach

This research project proposes to analyze the students’ and teachers’ subjective “relation to knowledge”. Given that the subjective relation always comprises subconscious constituents, a crucial concern of this research project is to ask the relevant epistemological and methodological questions regarding how, in a psychoanalytical sense, to approach the unconscious by means of research interviews. The present investigation is anchored in the field of qualitative research. Narrative-episodic interviews thus constitute an appropriate research instrument, since by way of and beyond their content they allow for the analysis of the protagonist’s relation to knowledge. Through the speech (parole) of protagonists we progress toward the singular relation to knowledge determined by desire, fear and resistances as the passion of ignorance.

Interviewees are students as well as teachers/instructors in the Ecole de la deuxième chance, offering school dropouts to go back to school and finish their secondary education. Both are interviewed several times. This allows to investigate various aspects of the relation to knowledge and to discover a development in the discourses on the various topics. This multiple interview approach engenders a dynamic of narrative construction and deconstruction of identity and of the subject’s position. It allows for intermittent phases in which protagonists can continue to work on the topic, even if they subsequently decide to obfuscate. It enables researchers and participants to explore any additional thoughts and feelings about or reactions to a first interview in a later contact.

The analysis orients itself on Lacan’s primacy of the signifier and the understanding of signifying chains and of speech acts (enunciations) and their relation to desire [2]. For Lacan we construct us as subjects in and through language. As Mark Bracher [1] says: “our assumption of in identity in language entails powerful desires to promote, protect, defend and actualize our identity-bearing master signifiers and the other signifiers, including entire systems of knowledge or belief, that accompany and promote this signifiers.” The human being defends and promotes his master signifiers because they constitute and consolidate his identity, his ego ideal. Therefore we find these master-signifiers in our speech, in narrations and in personal writings. We use them to assimilate other values, ideas and knowledge. “Often however, promotion of our master signifiers involves not assimilating or accommodating alien signifiers but avoiding and
defending against them, particularly when they are antithetical to the primary master signifiers constituting our ego ideal.” [1]. And so certain words, clichés, representations, whole discourses can serve repression because they are used by the ego’s desire to reinforce an image of our selves through the repetition of a master signifier dominant in our discourse. In other words the unconscious is a product of us as speaker. The “unconscious is the effect of the signifier on the subject, in that the signifier is what is repressed and what returns in the formations of the unconscious (symptoms, jokes, parapraxes, dreams, etc.) The analysis of metonymies and their structures in narration are from a Lacanian perspective indications of the desire (to know, to learn, to teach) of the subject. Metaphors, for their part, are rather manifestations of the stabilisation of discourses or of subconscious resistances. Both thus constitute valuable tools for the analysis and interpretation of narrative research interviews.

Our interest is thus not only in the superficial statements of the interviewee (what has been said?), but chiefly in the question: why has something been said in this way/at this point? Where are the breaks in narration, where are contradictions? How can those be interpreted?

This investigation design allows us to focus on changes and development in the relation to experiences with knowledge, the developing “relation to knowledge”, and the professional future. In addition, this approach facilitates identifying the interaction of individual and society, of internal and external factors, of subject and the consumer culture.

For this research project, interviews are to be considered relational space and thus as biographically significant moments that may influence the development of student teachers and teachers. This also concerns the transcripts of the discussion groups. What is of particular importance here is to analyse the transferences on the instructor-researcher who animates these groups, as well as potential implementations.

3. References


Single Parenting as Correlate of Academic Performance and Achievement Motivation of Students in Unity School in South East Geo-Political Zone in Nigeria

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Abstract

The study examined Single parenting as correlate of academic performance and achievement motivation of students in unity schools in South East Geo-political zone of Nigeria, it is a correlational and an ex-post facto survey. The population was 476 (212 male and 264 female) senior secondary school students in the twelve (12) unity secondary schools in South East Geopolitical zones of Nigeria which formed the sample size, classroom Academic Performance Scores, Achievement Motivation Questionnaire (AMQ) and Single Parenting and Academic performance of students Questionnaire (SPAPSQ) were the instruments used for data evaluation. Three research questions were asked to guide the study and three null hypotheses were formulated and were tested at 0.05 level of significance. The reliability indexes of the instruments were 0.81 and 0.77 respectively using Pearson “r” formula. Mean score, z-test and Pearson product moment correlation coefficient statistic were employed for data analysis. It was found out among others that despite the financial status of single parent, they support and assist their children educationally, the study also reveals that male and female students of single parenthood did not differ in terms of influence of educational status on their academic performance. Based on these findings, it is recommended among others that, school counselors, sociologists of education and psychologists should assist students to improve more on their academic performance, effort should be made to find out the type of homes the children come from. The counselors should counsel the parents of students especially those from single-parent homes.
The Collaboration among Parents, Teachers, and Psychologists

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Abstract

There is a need for an increased and equal partnership between school professionals and parents. Collaboration will help parents and school professionals to understand one another. Natural environment teaching and routine should be incorporated into the intervention strategies that address the needs of the children diagnosed with autism. When parents and school professionals are trained with the proper skills to address their children’s needs, children diagnosed with autism will be able to generalize learned skills to different settings such as playground, at home, and at school.

This qualitative study sought to investigate how applied behavioral analysis usage by parents, teachers, and psychologists, parenting education in applied behavioral analysis provided by schools, and collaboration among parents, teachers, and psychologists impact the behavioral, academic, social, self-help, and communicative performance of the children diagnosed with autism spectrum disorder.

Furthermore, this study examined how teachers, parents, and psychologists compare in their description of applied behavioral analysis usage, parenting education in applied behavior analysis provided by schools, and collaboration efforts about applied behavior analysis among parents, teachers, and psychologists and their impact in the lives of children diagnosed with autism spectrum disorder.

The participants in the study are special education teachers, school psychologists, and parents who have children with autism and works with students with autism. The participants are from New York state public suburban school district that serves pre K to 8th grade levels. One high need school and one low need school was selected.
Session 11: Special Education

Assessing Pragmatic Communication in Children with Down Syndrome
(Authors: Liz Smith, Kari-Anne Naess, Chris Jarrold)

Attitudes towards Reading Expressed by Turkish Elementary School Students with Learning Disabilities
(Authors: Orhan Cakiroglu, Macid Ayhan Melekoğlu)

A Test Development Project for Oral Reading Skills and Reading Comprehension of Turkish Students with Specific Learning Disabilities
(Authors: Macid Ayhan Melekoğlu, Orhan Çakıroğlu, H. Gülsen Erden)

Forecasting the Future Anxiety through Academic Achievement Motivation And Academic Specialization Among a Sample of Students From The Special Education Department at King Khalid University
(Author: Emad A Alwan)
Assessing Pragmatic Communication in Children with Down Syndrome

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Abstract

Pragmatics refers to the ability to communicate appropriately, depending on different social contexts. This ability is crucial for successful social interaction and impacts upon children’s inclusion in mainstream school. Children with Down syndrome generally experience communication difficulties, but less is known about their pragmatic profile, particularly during the early school years. The current study explored the pragmatic profile in a group of 29 six year old children with Down syndrome, assessing the degree of communication problems experienced in the areas of 1) inappropriate initiation, 2) scripted language, 3) context and 4) nonverbal communication, as reported by children’s parents via the Children’s Communication checklist-2 (Bishop, 2003).

Performance on all pragmatic subscales was significantly poorer than typically developing norms. A pragmatic profile was observed in those with Down syndrome with significant differences between the subscales. Context scores were significantly lower than scripted language, initiation and nonverbal communication scores. Nonverbal communication was a strength relative to children’s scores for the other areas of pragmatics assessed. Some specific components of nonverbal communication: expression and eye contact, were particularly strong, relative to other aspects of children’s nonverbal communication. Previous research studies citing relative social pragmatic strengths in those with Down syndrome report appropriate use of social smiling, and use of eye contact; the current study fits with these findings but further indicates that there is a bigger picture of strengths and weaknesses regarding nonverbal communication in Down syndrome.

The extent to which the four areas of pragmatic communication were related to vocabulary, non-verbal mental ability and social functioning was also explored. Increases in expressive vocabulary were related to more instances of inappropriate initiation. Higher scores regarding prosocial behaviour were related to less difficulties understanding context, and higher scores (i.e., more difficulties) on the Pediatric Evaluation of Disability Inventory (PEDI), were related to more difficulties understanding context. However, the factor most strongly and significantly related to pragmatics was children’s scores on the strengths and difficulties questionnaire (SDQ), whereby increases in difficulties (emotional, conduct, hyperactivity/attention and peer relationship problems), correlated with more difficulties regarding inappropriate initiation, scripted language and understanding context. Thus, supporting children in the areas of emotion, conduct, attention and peer relationships, may be the best approach to improve their overall pragmatic communication.
Attitudes Towards Reading Expressed by Turkish Elementary School Students with Learning Disabilities

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The present study uses the Elementary Reading Attitude Survey (McKenna & Kear, 1990) to describe Turkish elementary students' diagnosed with learning disabilities attitudes toward academic and recreational reading and to compare their attitudes with those expressed by their non-disabled peers in Turkey. Student attitude was assessed by means of the Elementary Reading Attitude Survey, or ERAS (McKenna & Kear, 1990). The ERAS is a 20-item, 4-node, pictorial rating scale based on the cartoon character Garfield. Its two subscales address attitude toward recreational reading and attitude toward reading for school-related (academic) purposes. Each item is scored on a 1-to-4 (weak-to-strong) basis so that scores on each subscale can range from 10 (most negative attitude) to 40 (most positive attitude). The text of all 20 items appears in the Appendix. The instrument is nationally normed on Grades 1-6. Its reliability has been estimated by means of Cronbach's alpha, which ranges from .74 to .89. With the exception of first grade, this coefficient exceeds .80 at all grade levels for both subscales. Numerous validity studies were reported with the publication of the ERAS. They included factor analyses and hypothesis testing within the norming population of over 18,000 children. Factor analysis strongly supported the psychological distinctness of the two constructs measured by the subscales. In addition, all of the hypotheses tested were confirmed. The survey was translated into Turkish by Cakiroglu and Palanci (2015). All the analysis were indicated that the survey is valid and reliable to use with Turkish students. A total of 300 students with and without learning disabilities completed the Elementary Reading Attitude Survey developed by McKenna and Kear (1990). The findings of the study indicated that students with learning disabilities presented lower reading attitude scores compared to their non-disabled peers. The findings also indicated that students with learning difficulties present lower attitudes towards academic reading. Potential explanations for these findings will be presented during the presentation. Additionally, cross-country comparisons will be conducted between Turkish and U.S. students during the presentation.
A Test Development Project for Oral Reading Skills and Reading Comprehension of Turkish Students with Specific Learning Disabilities

Macid Ayhan Melekoğlu, Orhan Çakıroğlu, H. Gülsen Erden

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Abstract

Learning how to read is an important academic skill that needs to be well acquired early in elementary school. In fact, being equipped with strong reading skills is critical for success in various academic areas including social studies and mathematics. Additionally, good readers in elementary school generally tend to become successful in their future education including college. Therefore, having strong reading skills in early grades is critical for prospective education and successful adult life. However, many individuals, especially students with specific learning disabilities, may experience reading problems in school. Reading problems are first observed in early grades, and students with significant reading problems at younger ages lag behind their peers and continuously struggle with reading problems at older ages. Consequently, struggling readers encounter more academic challenges in upper grades compared to good readers, and high school students with reading difficulties are more likely to drop out of school. In fact, reading consists of different aspects such as, word recognition, reading speed, vocabulary knowledge and comprehension, but most of the reading problems are observed in reading fluency, defined as fast and accurate reading, and those reading problems negatively impact reading comprehension, which is the fundamental goal of reading. Especially within the elementary school age children, whether nor not diagnosed with specific learning disabilities, are reading problems frequently observed. Furthermore, reading problems are witnessed among students with specific learning disabilities in Turkey. However, in the process of screening and evaluating of children with reading problems, and planning, monitoring, and evaluating reading improvement interventions for those children, standardized reading tests are usually not used in Turkey. The purpose of this presentation is to delineate and discuss current status of a project about the development of a standardized oral reading test for assessment of reading and comprehension development of children with specific learning disabilities between ages 7-14 in Turkey. The project is supported by the Scientific and Technological Research Council of Turkey (TÜBİTAK; Project Number: 113K310). Currently the data collection procedure has been completed and the process of aggregation and analysis of data will be completed in the near future.
Forecasting the Future Anxiety Through Academic Achievement Motivation And Academic Specialization Among a Sample of Students From The Special Education Department at King Khalid University

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Abstract

This study aimed to: (1) determine the level of future anxiety and the level of academic achievement motivation of special education undergraduate students at King Khalid University, (2) to understand if the level of future anxiety has an effect on the academic achievement motivation, and (3) to find out whether the type of specialization has an impact on the level of achievement motivation and level of future anxiety. The sample consisted of (87) students who study in levels third to sixth. The study used both the scale of future concern (Ghalib.2009) and achievement motivation scale (Hamed, 1996). By using One Sample T Test, the results showed that none of the five dimensions of Future Anxiety Scale reached the sufficiency level, and there was no difference in the level of anxiety among students due to the different specialization. The T Test results showed that the academic achievement level is low \( t = 84.05 \) and did not reach the sufficiency level \( t = 130 \) and there is no difference in the level of motivation due to specialization. The result of regression analysis revealed that only one of the dimensions of future anxiety scale which is the psychological manifestations predict academic achievement motivation. The study concluded that there are other reasons that cause the general reduction in the level of academic achievement motivation which need to be investigated.
Session 12:  Inclusive Education

Development of Creativity through a Foreign Language in Gifted and Non-Gifted Students
(Authors: Tais Crema Remoli, Vera Lúcia Messias Fialho)

The Importance of Learner Support for Distance Students in E-learning Mode in South Africa
(Author: Baloyi Gezani)

Availability And Utilization Of Instructional Resources for Teaching Special Needs Children in Bende And Ohafia Local Government Areas Of Abia State, Nigeria
(Authors: Theresa Nnennaya Kanno, Jane A.E Onyeachu)

Perceptions of Students with Disabilities in Access and Amenities in Qatar’s Public Higher Education
(Authors: Batoul Khalifa, Ramzi Nasser)
Abstract

This is a work-in-progress study that aims to evaluate and report if the creativity of gifted students can be better developed through a study carried out with a foreign language. The study involves a group of gifted students and a control group with non-gifted ones. The first group was previously identified in a master degree research conducted in 2013. Both groups consist of 2nd to 5th graders, studying in the same place and having the same foreign language (English) classes offered after regular hours and not as part of the school program. Children will be evaluated by using pre and post-tests, having their creativity analyzed (through TTCT) in order to verify whether there were significant changes when comparing pre and post-tests and possible differences between the two groups. From the analysis of the obtained data, the central questions that guide this paper will be answered: "Is it possible to enhance the development of creativity through a foreign language? Does this process occur more effectively in the group of gifted students?"

1. Introduction

This ongoing study aims to present a master's degree research project with the main objective to evaluate and report the results obtained in regarding the development of creativity through a foreign language (English in this case) whose target audience is composed of students with and without giftedness. Giftedness has been currently studied with great interest by many countries. In Brazil, the subject has been studied more frequently lately, and research and results have been publicized especially through the actions of the Brazilian National Council for Giftedness (CONBRASD), which promotes conferences and events related to this area of study.

Gonçalves and Fleith draw attention to the fact that about 15-20% of the world population is estimated to have giftedness characteristics [1]. However, according to them, Brazilian Census Research (conducted in 2008) identified only 3,676 gifted children among the students who attend the Brazilian Basic Education program.

Gifted individuals have a high ability to create and learn with great speed and accuracy [2]. Therefore, it is important that parents and educators have the ability to identify children with giftedness in order to stimulate them and allow the full development of their capabilities.

The main hypothesis of this study is to verify if learning a foreign language will increase creativity levels among the students who are part of this study. Better results are expected among the students who are part of the gifted children group than among the students who are part of the control group, since the first group often has high linguistic and creative abilities [3].

Other similar studies, intending to expand the creativity of students with giftedness beyond conventional classes, for example, in an extracurricular way, are being developed by some other researchers. A great example of them is the research from the Faculty of Education in Turkey, published by Centikaya, who has worked with Science [4]. The researcher had a group of students with giftedness and a control group, both having the creativity level measured by the Torrance Test of Creative Thinking - TTCT (pre and post-tests). After analyzing the results of the eight-day meeting with the group of students, the findings indicated that the Science Program had contributed to increase gifted children creativity levels.

It is hoped this research using the English language achieves the same results of the one previously quoted, which is to expand the creativity of the students who are participating in the study, particularly the group of students previously assessed with giftedness.

In order to research in depth if the learning of a foreign language contributes to the development of creativity (especially of students with giftedness in a Brazilian reality), this study is mainly focused on answering the following questions: "Is it possible to enhance the development of creativity through a foreign language? Does this process occur more effectively in the group of gifted students?"
2. The research methodology

This research will observe two groups of students in the same classroom: a group of gifted students and a control group with non-gifted ones. The first group was previously identified in a master degree research (entitled "Identification of students with high abilities/giftedness by a multimodal evaluation" in 2013). The other group (control) is composed of students with the same characteristics of the first one (gender, age and school level), and was invited purposefully to be part of the study. Both groups are composed of six students (3 boys and 3 girls) from 2nd to 5th grades, studying in the same place and having the same foreign language (English) classes offered after school hours.

In order to present more concrete results regarding the evaluation of creativity of both groups (with and without giftedness) that will be analyzed in this research, the Torrance Test of Creative Thinking (TTCT) will be applied in each member of the groups before and after the English classes program.

Among the seven subtests of the Torrance Test of Creative Thinking, those selected for this research are the verbal ones of form A, evaluating three characteristics of creative thinking: fluency, the number of responses and different solutions provided by students according to a problem situation; flexibility, the number of different categories of ideas or different ways of facing a problem situation; and originality, the ability to produce rare or unusual ideas through unique and statistically infrequent answers [5].

3. The research procedures

English classes will be held weekly and after school with a group composed of students already evaluated as gifted and non-gifted through entertaining classes, aiming to expand both the language skills and students' creativity. The classes must be two hours long on average and the activities must be diversified. They will be divided into three stages: warm-up activity in English such as songs, conversation recalling the main points of the previous classes, box of surprise themes and questions etc., new content according to the language goals aimed for their age and a foreclosure activity involving the creative productions of the students from the worked content, such as students work with scrap metal/plastic and clay, posters with cutouts and drawings, preparation of masks and games etc.

Students’ performances in both groups will be recorded so that the development can be compared. Creativity will be assessed by using the Torrance Test of Creative Thinking (TTCT), verbal forms, evaluating the following characteristics of creative thinking: fluency, flexibility and originality [5].

The results will be presented in tables and evaluated quantitatively through the analysis of the obtained data from the aforementioned pre- and post-tests. There will also be a contrastive analysis from the results obtained as well as the students’ responses received before and after the English classes in order to verify possible changes in the development of their creativity. The data from both groups, students with giftedness and group control, will be compared in order to test the hypothesis about the possibility of expanding creativity through a foreign language, especially in the first group mentioned.

The parents of students in both groups have attended to a meeting regarding this project and have authorized their children to be part of this research through the clarified term of consent.

The school staff where the participants of this study take classes is very engaged and excited about this research, so the principal has allowed the English classes to be there. They will take place after regular classes on Mondays from 5p.m. to 7p.m. from August to December, 2015). Twelve meetings are planned to happen following the school calendar and respecting the Brazilian holidays.

4. Conclusions

This ongoing research aims to expand the literature related to the development of creativity by a foreign language in students with and without giftedness, which is scarce not only in Brazil but also in all the world, according to research conducted in the Web of Science and Scope databases.

The main goal of this study is to find different ways to improve creativity and language skills. The data obtained will be analyzed and disclosed through a master's degree thesis as well as future presentations at events in this field intending to encourage other studies about the same target audience.

5. References


The Importance of Learner Support for Distance Students in E-learning Mode in South Africa

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Abstract

Student support using new technologies is topical in today’s societies. Moreover, Open Distance and eLearning (ODeL) is an effective tool in extending participation to students from less privileged social groups who are unreachable due to geographical location or who cannot access higher education due to diverse factors, such as financial constraints or domestic arrangements. The researcher drew a random sample of 400 students (n = 400) from a total number of 1 808 students enrolled for the Higher Diploma in Adult Basic Education and Training. A quantitative research approach was employed to investigate the research questions. A literature study identified the Community of Inquiry (CoI) model proposed by Garrison, Anderson and Archer [4] as useful in this context, and the model will be used as a conceptual framework for the empirical inquiry.

1. Introduction

The University of South Africa (Unisa) is one of the largest and dedicated Open Distance and eLearning (ODeL) institution in South Africa and global communities. The institution has embarked on the online learning route since 2011. The institution has been mandated to register diverse students so as to widen participation. Unisa introduced online courses so as to reach out the multitudes of the students who are even in the rural areas. Student support became a focal point at this pointing time. Learner support has frequently been identified as particularly important for student success in open distance and elearning context. In the words of Simpson (2002), Tait [8] and Thorpe [7], learner support is a broad term referring to the services provided to distance learners so that they can overcome barriers to learning and complete their studies successfully. According to Brindley, Walti & Zawacki-Richter [10], learner support is defined in different ways in the distance and online learning literature. The concept might cover learning materials, teaching and tutoring and non-academic elements, administrative aspects, guidance and counselling. In this research paper, learner support is described as holistic support to distance students in their study journey. Dzakiria [11] and Kelly and Mills [12] add that learner support has frequently been identified by open learning institutions as being of particular importance for student success in ODL. The scholars reviewed above are of the opinion that for students to succeed with their studies, learning should be learner centred. The students should take initiative and be active of their own learning, however, supporting students using Information Communication Technology (ICT) and other computer facilities sometimes offer challenges to lecturers and students. Unisa has put in place systems and structures to support student in the elearning journey. Therefore the paper seeks to find out views and experiences of student support using computer facilities.

In 2008, Unisa introduced an ODL policy which changed the focus of tuition to include technology and multimedia interaction. In responding to the global call, Unisa uses various technologies to reach out to its students and provide them with opportunities to learn through the various technologies. The e-learning model was introduced in 2013 to strengthen the policy and to continue to reach out to the majority of students. However, a number of challenges face Unisa lecturers and students in using the learner-support systems to reach out one another. Anderson [2] and Aluko, Fraser and Hendrikz [1] argue that ICT can enhance traditional learner-support systems.

According to Chen and Chen [11], it is widely recognised that distance education through technology has the potential to provide access at reasonable cost by sharing the quality education resources developed and used in the major cities. In preparation of the elearning journey as stated previously, the policy changed the focus of tuition to include technology and multimedia interaction. In responding to student’s learning needs, Unisa uses various ICT and various learning technologies to reach out students who are scattered all over the country and the global communities. Seemingly there are challenges that face students to access online learning in their environment.

In the words of Jung [6] maintains that a variety of ICTs can facilitate not only delivery of instruction, but also the learning process itself. Moreover ICT can promote international collaboration and
networking in education and professional development. There is a range of ICT options, from videoconferencing through multimedia delivery to web sites, which can be used to meet the challenges teachers face.

These and other views presented, influenced the researcher to conduct the research paper.

2. Conceptual Framework

Research without a theory is just a futile excise. In this paper, the researcher used the online learning theory to frame the study. The Community of Inquiry (CoI) by Garrison, Anderson and Archer [4] relates well with Unisa’s elearning journey. The theoretical framework uses three presences, namely, teaching, social and cognitive presence. The paper will only focus on the social presence and look at how students experience learning. In the South African higher education context elearning is relatively new, despite the White Paper on eEducation that was passed in 2003. Therefore elearning is common practice with which South African students are beginning to familiarise themselves with it. Since 2011, Unisa academics work in the context in which learning is at the centre stage. The students will reflect on their experiences of teaching and learning

This is a typical case study of adult education in the College of Education at Unisa. According to Burton & Bartlett [13] the case study approach is not a method as such, but a research strategy in which the researcher aims to study one case in depth. Yin [9] defines a case study as an empirical inquiry that investigates a contemporary phenomenon. In this paper, the researcher looks at the student support using technologies and how learners experience learning in their teacher training programme.

In this quantitative component the researcher surveyed students’ opinions and the challenges faced by them while learning using elearning. The random sample of 400 students (n= 400) from a total number of 1 808 students in adult education were sampled. Because of the financial constraints, large number of students could not be sampled to take part in this project. The researcher has sampled the diverse student body from the department, for example, Africans, Coloureds, Indians, and Whites. The questionnaire was closed and questions were related to myUnisa, student support and other computer technologies. The questionnaire was mailed to the students with an enveloped stamp to return to the researcher.

3. Discussion and Data Analysis

Jung [6] maintains that a variety of ICTs can facilitate not only delivery of instruction, but also the learning process itself. Due to nature of its flexibility, learning using new technologies can promote international collaboration and networking in education and professional development.

Even though Gulati [5] argues that a review of 150 distance education programmes in Sub-Saharan Africa has concluded that traditional paper-based means of distance learning continues to be more reliable, sustainable and widely used than online and web-based methods of learning. Advances in e-learning in developing countries have been reported and several determinants may influence e-learning success in these countries.

The findings are contextualized and written up so as to give insight to student support systems and structures. The majority of respondents (48, 6%) agreed, and (12, 8%) strongly agreed that communication with other students gave respondents a sense of belonging. However, some of the respondents (16%) disagreed, and (19, 5%) disagreed strongly on this item.

Most respondents (45, 1%) agreed, and (12, 1%) strongly agreed about getting to know other participants enrolled in the module, while only (23, 3%) disagreed and (17, 1%) strongly disagreed on this item.

The majority of respondents (45, 9%) agreed, and (13, 6%) strongly agreed about the role of myUnisa as a portal for social interaction. However, some respondents (20, 6%) disagree and (16, 3%) strongly disagreed on this item.

The majority of respondents (50, 6%) agreed, and (14, 8%) strongly agreed that they felt comfortable communicating on myUnisa portal. However, a minority (16%) disagreed, and (15, 2%) strongly disagreed about the comfort with which they communicate on myUnisa.

Most respondents agreed (47, 9%), and (18, 3%) strongly agreed about comfortable participation in the module discussions. However, small percentages disagree (17, 1%), and (13, 6%) strongly disagreed about the ease of participating in the module discussions.

The majority of respondents (47, 5%) agreed, and (10, 5%) strongly agreed about feeling comfortable interacting with other module participants on myUnisa. However, some respondents disagreed (22, 2%), and (17, 5%) strongly disagreed about interaction on myUnisa portal with other participants.

Just over a third of respondents (35%) agreed, and (8, 2%) strongly agreed about differing in opinion with other module participants on myUnisa while still maintaining a sense of trust. However, a large proportion of the respondents disagreed (33, 5%) and (19, 8%) strongly disagreed about this issue.

Further (46, 3%) agreed, and (7, 8%) strongly agreed about participants’ acknowledging each other’s opinion on myUnisa portal. However, a considerable portion of the respondents disagreed (28, 4%), and (15, 2%) strongly disagreed about this
issue.

Just over half of the respondents (41.2%) agreed, and (9.7%) strongly agreed that the discussion on myUnisa stimulated a sense of collaboration. However, an equal portion of respondents (26.1%) disagreed, and (19.5%) strongly disagreed that online discussions on myUnisa helped to develop a sense of collaboration.

Most respondents agree that myUnisa is a learning management which offers flexible learning. However, they have shown some of the flexible learning that the leaning management presents to them, for example, learning anywhere and anytime. The students are able to form a community of practice and belong together. During the group discussions in myUnisa, students collaborate and facilitate learning on their own. The students are able to interact with the lecturers, that is, there is a student to student and student to lecturer communications.

4. Validity

The alpha coefficient of the 9 items is .941, suggesting that the items have relatively high internal consistency. The scale reliability and Cronbach Alpha coefficients validating the internal consistency reliability of the constructs investigated in respect of social presence and learner support in ODeL, were calculated. Since a Cronbach alpha coefficient in the region of 0.7 and greater is indicative of internal consistency, it can therefore be concluded that the constructs in the survey questionnaire could be deemed reliable. The findings from the data collected were compared and integrated to achieve the aim of the paper.

The results of the paper suggest that the instrument was valid, reliant and efficient measure of the social presence of community of inquiry.

5. Conclusions

When distance education institutions fail to plan for the provision of appropriate learner-support services, systematic learning support is adversely affected and the most likely outcome is that distance learners will drop out of their programmes.

Illiteracy rates are higher in rural areas than in urban areas where the majority of students are mainly coming from. There is also a great number of people in rural areas who have not attended school.

Enrolments sometimes have an effect on learning resources owing to the large number of students who need support in rural areas. However, it is important for the institution to cope with the challenges that students are facing.

5. Recommendations

Unisa has an excellent learning management tool called myUnisa which offer flexible learning to its diverse student body. The learning management offers opportunity of students to learn anywhere and anytime. Therefore Unisa has to address the challenges of connectivity, that is, students who do not have access to internet accessibility. In the context of the paper, Unisa has to address internet connectivity to its student body so that majority of its rural students should not be left out to teaching and learning activities. The student is always at the centre of what the university or ODeL institution should do. Therefore, Unisa should move to the next level and discontinue outdated pedagogical practices. The Unisa ODeL policies aim to see students embark on the new culture of learning. The college of education has to seriously consider other forms of learner support, such as group discussion, tutorials and radio. The video conferencing, which is still under-utilised, presently could be used to address challenges raised by the students and the lecturers. eLearning will bridge the transactional distance between the students and the institution if used properly by the university.

6. References


Availability and Utilization of Instructional Resources for Teaching Special Needs Children in Bende and Ohafia Local Government Areas of Abia State, Nigeria

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Abstract

This abstract focuses on availability and utilization of instructional resources in teaching Special Needs children in Bende and Ohafia Local Government Areas of Abia State, Nigeria. A list of twenty-item check list was employed for data collection while percentage was used for analysis. Finding revealed that 40% of the approved resources was availed while of same was not. This implies, inter alia, that effective utilization cannot go beyond 40%. It is, therefore, recommended that all relevant resources should be availed to teachers and pupils. Equally, it is advised that all categories of Special Needs children, namely, deaf, dumb, dawn syndrome, autism should not be clustered into one classroom with non specialist teacher teaching them.

1. Introduction

Instructional resources are indispensable for effective teaching and learning in all institutions for all categories of learners. They (instructional resources) facilitate and enhance learning process. This, therefore, underscores the need to make instructional resources available to all groups of learners especially the physically challenged who because of one handicap or the other cannot function effectively without special facilities in the classroom. Since such resources make teaching and learning easy and interesting they also serve as complementary channels of effective communication in the classroom.

This paper explores the availability and utilization of instructional resources for teaching Special Needs children in Bende and Ohafia Local Government Areas of Abia State, Nigeria, by focusing on the following sub-headings:

1. Importance of Instructional Resources in Teaching Special Needs Children

2. The Need for Availability and Effective Utilization of Instructional Resources.

3. Some Instructional Resources Required and their Degree of Availability.

4. Conclusion and Recommendations.

2. Importance of Instructional Resources in Teaching Special Needs Children

Instructional Resources simplify teaching and learning especially for Special Needs children who have one type of physical cum mental challenge or need. Iwuama [4] affirmed that “education of children and adults who have learning difficulties because of different sorts of handicaps should be done with adequate and relevant instructional resources”. Ikpeazu and Onwuama [3] equally emphasized that for effective education of the hearing impaired, there is need for the provision of adequate instructional resources for teaching. Some resources include hearing aid, mirrors and charts showing demonstrations of mouth and tongue positions. Ikpeazu and Onwuama further emphasized that when hearing aid is introduced early for instance, it will enable the impaired (Special Needs) acquire basic communication skills. This fact underscores the need to make sure that instructional resources are available and at the same time utilized.

In order to enhance and facilitate learning for learners with special needs, the school environment has to be conducive and thus the task of providing instructional resources becomes imperative if not mandatory. This is because relevant resources are very important and instrumental to improved performance. The key providers and utilizers of these instructional resources are the teachers. It is a well known fact that an effective teacher is, inter alia, a competent and efficient professional who always strives to attain all stipulated objectives within a given classroom despite the peculiar challenges of the learners. Hence, an effective teacher should be trained in the provision of emotional support for learners, prudence in time
management and production of results as he/she matches curriculum contents with learner’s ability. These can easily be achieved through the actualization of the importance cum production and utilization of instructional resources, especially as they concern Special Needs children.

Emphasizing the importance of availability and utilization of instructional materials for teaching Special Needs children, Masoodi and Ban [6] opined that employing instructional materials and good instructional strategies is one of major ways of encouraging the Special Needs children to learn. Hence, resourceful teachers place optimal priority on the importance of resources.

Focusing on the same issue, Association of America [2] upheld the view that activities for children with different handicap should be made activity oriented using viable, colourful and problem solving instructional resources. These resources are very important because, learning-disabled-youngsters have inherent difficulty in learning abstract terms and concepts.

The Association advises that with reading problems one should use text books on tape, available through recording for the Blind and Dyslexic will improve their performance in the classroom. Hence, text books on tape are of necessity and of great importance for teaching the Special Needs (blind).

A clear look at the importance of availability and utilization of instructional resources underscores the need for this study. This is because persons with special needs which include all Special Needs children are entitled to be provided with special educational services in order to enable them learn effectively. These special services definitely include provision of instructional resources.

3. Need for Availability and Utilization of Instructional Resources

Instructional Resources especially for teaching children with special needs cannot be over emphasized. America Red Cross (2012) duly stressed the need for sign language textbooks and sign language pictures and diagrams. To them, [1] “sign language is a form of language used by people who are deaf or who have hearing impairment concepts and ideas are represented through the use of manual signs, finger spelling and symbols. On that note, sign language textbooks are indispensable resources for effective teaching. Their availability, adequacy and utilization are very necessary.

Learning difficulties experienced by Special Needs children are worrisome whether they are mainstreamed, integrated or segregated in the classroom. There is need to employ relevant useful resources which will enhance effective teaching and learning. The problem of the availability, adequacy and effective utilization becomes of great concern.

To that regard, this study, therefore, explores availability and utilization of instructional resources for teaching Special Needs children in Bende and Ohafia Local Government Areas of Abia State, Nigeria, as indicated earlier. Specifically, the study seeks to determine:

i. The extent instructional resources are available to teachers for effective teaching of Special Needs children in Bende and Ohafia Local Government Areas of Abia State, Nigeria.

ii. The extent teachers utilize instructional resources in teaching Special Needs children in Bende and Ohafia Local Government Areas of Abia State, Nigeria.

iii. The extent teachers teaching Special Needs children are trained in the use of available instructional resources.

The findings of this study are expected to provide information on the need to provide needed instructional resources for effective teaching of Special Needs children. The findings are equally expected to provide information on the extent teachers teaching Special Needs children benefit from teachers’ professional development programmes meant for improving the performance of teachers’ skills focusing on special education.

They (findings) are also expected to provide information which will help stakeholders in education to create more training opportunities for the teachers teaching Special Needs children. It is also believed that the findings will provide useful guide to the teachers on the relevant instructional resources for teaching Special Needs children and equally enable them to appreciate the need for greater teacher effectiveness. It is further expected that parents and guardians of children with special needs will draw insights from the thrust of this paper. Researchers may also wish to explore the availability, adequacy and utilization of instructional resources in other localities and schools.

Finally, the findings of the study will provide information to the society at large on the various ways of teaching the Special Needs instead of allowing them to waste in the society.
Table 1: List of Instructional Resources and Availability

<table>
<thead>
<tr>
<th>S/No</th>
<th>Instructional Resources</th>
<th>Approved</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Auditory Aids</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2.</td>
<td>Joy of Sign Language Book</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3.</td>
<td>Mathematical Sets (Shapes)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Fractional Shapes (Square, Triangle, etc)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Flash Cards</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Alphabetical Chart</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>American Sign Language Alphabet (Chart)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>8.</td>
<td>Computer Set</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>TV Set/DVD</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Sign Language Films</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>11.</td>
<td>Counting Sticks</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>12.</td>
<td>Bricks Block</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Ruler Set</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>14.</td>
<td>Clock face for teaching time</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Toys</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Exercise Books</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>17.</td>
<td>Pencils/Bros</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>18.</td>
<td>Crayons</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Wall Charts</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>20.</td>
<td>Maps</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

4. Some Instructional Resources Required and their Degrees of Availability

A list of twenty item approved instructional resources was generated by the teachers teaching children with special needs. They, equally, indicated the availability or otherwise of each item (See Table 1).

The findings of the study revealed that out of twenty instructional resources expected to be in special education classrooms, eight (8) were available. This represents 40%. That means that 40% of the resources were available in the school. Teachers confirmed that the available resources are being effectively utilized. They also confirmed that they (teachers) are trained on the effective utilization of those instructional resources. They, however, requested for more regular workshops and seminars on Special Needs Education for continuous update of knowledge.

It was equally revealed that pupils taught with instructional resources learn better than those taught without instructional resources. This is evident in their cheerful looks on their (learners’) faces when interacting with resources availed to them. A case in point was their delight in watching themselves in the I-pad recording used during the conduct of this study. However, in some schools, children with special needs are in the same classroom with other children, most times with a non specialist in Special education being the classroom teacher.

Equally, even though, resources may be available, all children with special needs are grouped together in one class. Thus, in that same class, the deaf, dumb, dawn syndrome, autism, etc stay together. There is need, therefore, to group them accordingly and in line with their peculiar special needs.

Teachers affirmed that pupils taught using sign language textbooks and picture of signs performed better than those taught in integrated classroom where the Special Needs children are taught together with vocalized words without instructional materials. This affirmation is a clear indication that relevant instructional resources are indispensable in teaching the Special Needs children. Their degrees of availability, adequacy and effective implementation become sine qua non in yielding expected result in pedagogy.

5. Conclusion and Recommendations

The study notes that for effective teaching of children with special needs, variety of instructional resources should be provided in all schools meant for training them. All hands should be on deck in providing adequate instructional resources for teaching the Special Needs children. It is therefore recommended that:
1. All stipulated instructional resources should be availed to schools for effective teaching of Special Needs children.

2. Teachers should utilize all availed instructional resources effectively in teaching in order to obtain maximum result.

3. Federal and State Government should frequently organize seminars, conferences and capacity building workshops for teachers teaching children with special needs.

4. Parents and other stakeholders in education should assist in providing instructional resources by ensuring safe manipulation of such resources especially when their children/wards are at home doing one Home Work or the other.

5. Teachers and their pupils should, equally, provide instructional resources available within their immediate environment in order to complement the efforts of Government in that regard.

6. References


Perceptions of Students with Disabilities in Access and Amenities in Qatar’s Public Higher Education

Batoul Khalifa, Ramzi Nasser
1Qatar University, Doha, Qatar
2Supreme Education Council, Doha, Qatar

Abstract

The purpose of this study was to explore students’ access and services for students with disabilities. The study compares students with disabilities to those without disabilities on their perception of amenities and services in Qatar’s higher education. The study took place at the only comprehensive post-baccalaureate higher education institution in Qatar. The study drew on experiences of students’ access to higher educational programs and experiences; reasons for undertaking access; challenges to include students with disabilities, and satisfactions. Data was collected from all students with disabilities and a sample of students without. Two surveys were used; the first one for assessing services and accessibility for students with disabilities at this public university and the second assessed students’ academic experiences and their satisfaction with the services. The researchers will use descriptive statistics and inferential statistics to assess differences between students. The comparison is made to explore the extent students’ perceptions of access and amenities for the disabled and students with disabilities. Knowledge of access reflects the extent to which students’ knowledge and awareness of the existing access and possible policies reflecting the functions of access in higher learning continuous improvement.
Session 13: Professional Development and Leadership

Stage of Professional Development toward Reforming Secondary Schools in Ondo State Nigeria
(Author: Jolly Dojo Kukuru)

Counselling Intervention Strategies for Sustainability and Development: The Role of Women Scientists
(Authors: Nwokolo Chinyelu, Nwokolo Somti)

An Updated Prevalence-Based Projection Model for Estimating the Need for Additional Qualified Adapted Physical Education Teachers
(Author: Jiabei Zhang)

Evaluation of Selected Physical Fitness Variables of the Nigerian Police Force Lagos Nigeria
(Author: Adedugbe Benjamin Oluwole)
Stage of Professional Development toward Reforming Secondary Schools
in Ondo State Nigeria

Jolly Dojo Kukuru

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Abstract

Professional development is presented by experts as a major avenue for improving curriculum and renewing secondary schools. Professional development may be perceived as measures toward acquiring basic training, skill, high level of education, or building on basic training, skill, or high level of education. This article dwells on “Stage of professional development toward reforming secondary schools in Ondo State, Nigeria” and it is the product of a survey research. All supervisors of secondary schools in Ondo State, Nigeria, formed the population. Twelve (12) out of the eighteen Local Government Area supervisors and the central supervisor (1) in the Ministry of Education, formed the sample. A Likert type of questionnaire as instrument, was used to obtain required data. It yielded “r” : 0.10 as construct validity and 0.98 as test re-test reliability indices. Two hypotheses were generated and tested after analyzing obtained data. Findings showed that research consumption and application by supervisors and teachers, and degree of integration or sustenance of staff in the teaching profession through professional development in Ondo State, Nigeria secondary schools, were both high. These results imply that the stage of professional development is high. Notwithstanding, there is need for critical investigations on certain features of professional development for precise pictures and teachers should be included in subsequent investigations for balanced views. This research, consequently, advocates for more investigations.

1. Introduction

“Professional development” may also be referred to as staff development, in-service training, professional learning, and continuing education (Sparks and Loucks – Horsley, [17]; Mizell, [12]). It focuses on the processes which improve job-related knowledge, skills, or attitude of school employees. The ultimate intention is improvement of students’ learning through enhanced teacher performance. A major implication of this point is that the teacher learns through professional development. Approaches to professional development include individual reading/study research; study groups among peers; teachers observing other teachers; coaching; mentoring; team meetings to plan lessons, solve problems, improve performances, and or learn a new strategy; faculty grade-level or departmental meetings; online courses; college/ university courses; workshops; conferences; whole school improvement programmes; proprietary programmes by private vendors (Tanner and Tanner, [18]; Loucks-Horsley, [17]; Guskey, [5]; Penuel et al., [16]; Webster-Wright, [20]; Mizell, [12]; Nagel, [14]; Israel, [8]; and Hardman et al., [6]). Some of these measures are noted as more effective than others. For example, Nagel [14] observed that:

1. Professional development requires continuity and should be executed over time rather than being “presented in one-day workshop”.

2. Professional development should be conducted in the context of a teacher’s subject area/content.

3. Peer coaches and mentors were found to be highly effective in helping teachers implement a new skill.

Professional development hovers round certain individuals or groups of individuals. Some of them are: school board members, central office administrators, principals, teachers, supervisors, non-certified staff, and people in a district (Guskey, [5]; Sparks and Loucks-Horsley, [17]; Tanner and Tanner, [18]; Mizell, [12]; Nagel, [14]; Hardman et al., [6]; and Israel, [8]). Observations from the literature portray three individuals as central, namely, supervisors, principals, and teachers, but
teachers are undoubtedly most central.

It is visible from this picture that key organs responsible for professional development include district where a school is, principal of a school, and faculty/department in a school. The school is still most central. On leadership, since the school is the most central, at the secondary level, the leadership hinges on the principal; but the schools are under education administrators as supervisors. Since current emphasis is on learning of subject matter by teachers, curriculum specialists or their directors become vital. All these issues are embedded in the last paragraph.

2. Literature Review

The Literature on professional development depicts it as vital toward improving schools/education or teachers. Besides the authors already referred to above, other authors who support this position include: Borko [3], Mouza [13], Amuseghan [1], Hill et al. [7], Teaching Tolerance [19], and Loughran [11].

It is evident that the ultimate goal of professional development is improved student learning/performance through enhanced teacher learning that should show in performance of the student with a positive significant difference. Other issues in the literature on professional development include funding, determining the value and results of professional development by a school, and roles of school board, state government, provincial government, and federal government. These issues would not be delved into following the limited scope of this article.

Critical to this article are the overwhelming evidences which portray professional development as crucial to developing schools/education or the teacher who is the hub of the school. Besides, it is equally apparent that the process of professional development should be on-going. Consequently, it becomes necessary to look at efforts locally (Nigeria) toward improving schools/education or teachers through professional development, especially as a developing nation.

Three relevant empirical articles were found online on this issue. One was written by Iyunade [9]. The article advocated for adequate pre-service professional training and continuing in-service professional education. Another article was authored by Oluyemi [15]. It showed that teachers participated in particular professional development programmes, namely sandwich and distant learning. It was found that the programmes enhanced the teachers’ teaching skills. The third online source is that of Ememe et al. [4]. The findings were that teachers undertook continuing professional development mostly in traditional approaches of workshops and seminars that had been found as ineffective. Perhaps due to commitment to their field as adult educators, they advocated for distant learning. Apparently, their suggestion runs counter to school based professional development. It should be added that these three researches were conducted in three out of the thirty-six states, besides the Federal Capital Territory, in Nigeria, and the states are: Bayelsa, Osun, and Lagos States, respectively. Two hard copies at the disposal of this author on researches on professional development in Nigeria are those written by Kukuru [10] and Amuseghan [1]. Kukuru’s article was on scope of in-service education and its implication in Nigeria. It depicts in-service education as a broad system of communication covering teachers, administrators, research workers, curriculum development specialists, and teacher trainers especially university teachers. This view is basically in line with those presented above, from outside Nigeria. It was a theoretical paper which stressed the need for all the units to be in touch with one another. Amuseghan [1] was also a position paper and its main emphasis was the need for continuous professional development of teachers to update their skills due to modernization process and improve the quality of education. It should be added that the authors of these two hard copies are from Ondo State.

The picture on professional development in Nigeria with respect to research is that there are few of them. In Ondo State, only two researches are at disposal and both of them were theoretical. Two measures are required to stem the tide: many empirical researches are needed and the efforts should be maintained.

3. Statement of the problem

It is visible from the fore-going that professional development is vital, to enhance teachers’ performances and in turn improve students’ performances which would ultimately result in improvement of schools. Moreover, professional development should be on-going, to up-date staff members, following the endless process of man’s evolution. The main medium for determining whether this vital process is going on or not is by empirical research. Sequel to the evidences presented above, empirical researches are extremely few in Nigeria on this subject and none in Ondo State. Consequently, the problem of this research is: stage of professional development toward reforming secondary schools in Ondo State, Nigeria.

4. Purpose of research

The purpose of this research is to:

1. Verify key organs that are responsible for
professional development at the secondary school level.

2. Identify persons that are involved in in-service education at the secondary school level.

3. Determine people that form leadership in in-service programme at the secondary school level.

4. Measure research consumption/application by supervisors and teachers in secondary schools in Ondo State, Nigeria.

5. Determine the degree to which the professional development process in secondary schools in Ondo State, Nigeria, integrates or sustains staff in the teaching profession.

4.1 Research questions

Answers would be empirically sought, for the following questions in this research:

1. What are the key organs that are responsible for professional development in education at the secondary school level?

2. What group/s of persons is/are involved in in-service education at the secondary school level?

3. Which people form leadership in in-service programme at the secondary school level?

4. To what extent is research consumed or applied by supervisors and teachers in secondary schools in Ondo State, Nigeria?

5. To what degree does the professional development process in Ondo State, Nigeria, integrate or sustain the staff in the teaching profession at the secondary school level?

4.2 Research hypotheses

Two hypotheses were formulated for this research as follows:

1. Research consumption or application by supervisors and teachers in secondary schools in Ondo State, Nigeria is low.

2. The degree to which professional development process in secondary schools in Ondo State, Nigeria, integrates or sustains staff in the teaching profession, is low.

Research questions 1, 2, and 3 did not require testing of hypotheses due to the focus of this research.

5. Significance of the research

This research will increase the small number of empirical researches that are available in Nigeria, on professional development. The research will also provide empirical data on the subject for teachers, principals, supervisors of schools, research workers, curriculum development specialists, and teacher trainers especially university teachers in Nigeria and beyond. It may also act as trigger to empirical researches on professional development in Ondo State and enhance efforts in other states of the nation.

6. Research methodology

This is a survey research. A Likert kind of questionnaire was the instrument that was utilized in the process of obtaining required data. All supervisors of secondary schools in Ondo State, Nigeria, formed the population of this research. Ondo State, Nigeria has a total of eighteen Zonal/Area Education Officers, one Officer being in charge of each Zonal/Area Education Office in each Local Government Area. Since supervisors form one key leadership group in professional development and they supervise the principals and teachers in secondary schools, the researcher decided to start his empirical investigations on professional development, with the supervisors. Twelve (12) out of the eighteen Area Education Officers were involved in the research. Moreover, the over-all supervisor who is based in the Ministry of Education was involved; thus the total sample was thirteen (13) and it quite represented the state: 66.7% for the supervisors and 100% for the Ministry of Education or 72.2% generally.

The sampling process was purposive, to involve four Local Government Areas from each of the six, in the three Senatorial Districts. The Likert kind of instrument was developed by the researcher. It contains fourteen items which spanned five units, namely, key organs responsible for professional development (guided items 1-3), persons that are involved in in-service education (guided items 4 and 5), leadership in in-service programme (guided items 6-9), research consumption or application by supervisors and teachers (guided items 10-12), and degree to which professional development process integrates or sustains staff in the teaching profession (guided items 13 and 14). The items were informed by authors including Guskey [15], Sparks and Loucks-Horsley [17], Tanner and Tanner [18], Webster-Wright [20], Mizell [12], Nagel [14], Hardman et al. [6], and Israel [8].

Curriculum and test and measurement specialists validated the instrument with respect to face and content concerns. On construct validity, the instrument was established through test of
The instrument was administered to four principals and eight teachers in two secondary schools in Akure South Local Government Area. The instrument was also administered to the same number of Principals (four) and teachers (eight) in two secondary schools in another Local Government Area: Akoko South West. Simple percentage results of the two separate administrations of the instrument were: 81.58 against 18.42 and 84.17 against 15.83 for Akure South LGA and Akoko South West LGA respectively. It was obvious enough that the results satisfied convergence. However, conclusive analysis was sought; thus the two results were subjected to Pearson Product Moment Correlation and a coefficient index “r” 0.10 was obtained: perfect construct.

Test re-test procedure was employed to obtain degree of reliability of the instrument. The questionnaire was administered to twelve (12) education professionals: four principals and eight (8) teachers in Akure South LGA twice, at interval of two weeks. Simple results showed percentages: 81.58 against 18.42 for first test and 79.75 against 20.25 for second test. Conclusive analysis was effected through Pearson’s Product Moment Correlation which yielded an “r” of 0.98. The result indicated that the instrument is highly reliable.

A letter of introduction of the researcher was issued by his Dean, Faculty of Education, Adekunle Ajasiun University, Akungba Akoko, Ondo State, Nigeria, to enable him formally approach respondents. On the ground that the sample is small by number, although representing the whole state, it was necessary to collect each copy from each Zonal/Area Education Officer across the length and breadth of Ondo State and the Ministry of Education; all copies (13) were ultimately collected. The obtained data were analyzed using frequencies, percentages, and Chi-Square (X²) statistics as the data obtained did not require further probing.

Table 1: Frequencies and percentages of all responses to the questionnaire administered

<table>
<thead>
<tr>
<th>SERIAL NUMBER</th>
<th>UNITS</th>
<th>SA+D</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
<th>D+SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Key officers responsible for professional development</td>
<td>10</td>
<td>93</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Persons involved in in-service education</td>
<td>11</td>
<td>84</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Leadership in in-service program</td>
<td>11</td>
<td>84</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Research Consumption Application</td>
<td>11</td>
<td>84</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Degree of integration of staff in the teaching profession</td>
<td>11</td>
<td>84</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: SA+D means Strongly Agree plus Agree, D means Disagree, SA means Strongly Agree, SD means Strongly Disagree, A means Agree, D+SD means Disagree plus Strongly Disagree
Table 2: Summary of (Table 1) of all responses to the questionnaire administered

<table>
<thead>
<tr>
<th>SN OF UNIT/GROUP OF ITEMS</th>
<th>UNIT/GROUP OF ITEMS</th>
<th>TOTAL SCORE</th>
<th>AVERAGE SCORE SA+A</th>
<th>PERCENTAGE</th>
<th>TOTAL SCORE</th>
<th>AVERAGE SCORE D+SD</th>
<th>PERCENTAGE</th>
<th>SAMPLE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Key organs responsible for professional development (items 1-3)</td>
<td>34</td>
<td>(34/3) 11</td>
<td>84.62</td>
<td>5</td>
<td>(5/3) 2</td>
<td>15.38</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11+2</td>
</tr>
<tr>
<td>II</td>
<td>Persons that are involved in in-service education (items 4 &amp; 5)</td>
<td>16</td>
<td>(16/2) 8</td>
<td>61.54</td>
<td>10</td>
<td>(10/2) 5</td>
<td>38.46</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8+5</td>
</tr>
<tr>
<td>III</td>
<td>Leadership in in-service programme (items 6-9)</td>
<td>32</td>
<td>(32/3) 11</td>
<td>84.62</td>
<td>7</td>
<td>(7/3) 2</td>
<td>15.38</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11+2</td>
</tr>
<tr>
<td>IV</td>
<td>Research Consumption/Application (items 10-12)</td>
<td>44</td>
<td>(44/4) 11</td>
<td>84.62</td>
<td>8</td>
<td>(8/4) 2</td>
<td>15.38</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11+2</td>
</tr>
<tr>
<td>V</td>
<td>Degree of integration/sustainability of staff in the teaching profession (items 13 &amp; 14)</td>
<td>21</td>
<td>(21/2) 10.5</td>
<td>80.77</td>
<td>5</td>
<td>(5/2) 2.5</td>
<td>19.23</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.5+2.5</td>
</tr>
</tbody>
</table>

Note:
SA+A means Strongly Agree plus Agree
D+SD means Disagree plus Strongly Disagree

Table 3: Result of Chi-Square ($X^2$) comparison on summary scores on research consumption

<table>
<thead>
<tr>
<th>Unit/Group of Items</th>
<th>Average Score of Strongly Agree + Agree</th>
<th>Average Score of Strongly Disagree + Disagree</th>
<th>Percentage of Average Score of Strongly Agree + Agree</th>
<th>Percentage of Average Score of Strongly Disagree + Disagree</th>
<th>$X^2$ Value</th>
<th>Degree of Freedom</th>
<th>Table Value</th>
<th>Significance Level</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research consumption/application by supervisors and teachers</td>
<td>11</td>
<td>2</td>
<td>84.62</td>
<td>15.38</td>
<td>49.040</td>
<td>1</td>
<td>3.841</td>
<td>.000</td>
<td>Significant</td>
</tr>
</tbody>
</table>
Table 4: Result of Chi-Square ($X^2$) comparison on summary scores on degree to which professional development process integrates or sustains staff in the teaching profession

<table>
<thead>
<tr>
<th>Unit/GROUP of ITEMS</th>
<th>Average Score of Strongly Agree + Agree</th>
<th>Average Score of Strongly Disagree + Disagree</th>
<th>Percentage of Average Score of Strongly Agree + Agree</th>
<th>$X^2$ Value</th>
<th>Degree of Freedom</th>
<th>Table Value</th>
<th>Significance Level</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of integration/sustainability of staff in the teaching profession</td>
<td>10.5</td>
<td>2.5</td>
<td>80.77</td>
<td>19.23</td>
<td>38.44</td>
<td>1</td>
<td>3.841</td>
<td>.000</td>
</tr>
</tbody>
</table>

7. Answering of Research Questions

The questions that guided this research are hereby answered.

Research question 1: What key organs are responsible for professional development in education at the secondary school level?
Responses for the first three items on Table 1 which form the first unit as summary on Table 2 provide data to answer this question. The average percentage of agree plus strongly agree show 84.62%; it implies that key organs responsible for professional development include: district where a school is, principal of a school, and faculty/department in a school.

Research question 2: What group/s of persons is/are involved in in-service education at the secondary school level?
Responses on items 4 and 5 on Table 1 which form the second unit as summary on Table 2 provide data to answer this question. Although the summary data on Table 2 shows 61.54% for agree plus strongly agree, the two items were not considered the same. Thus the true interpretation is that according to the sample of the research, the respondents consider the entire professional staff of a school as being involved in in-service education but did not regard people in the district as considerably involved.

Research question 3: Which people form leadership in in-service programme at the secondary school level?
Responses on items 6, 7, and 8, on Table 1 which form the third unit as summary on Table 2 would enable answering of this question. Since all the three items have high percentages with respect to agree plus disagree: the least being 69.23%, it can be safely concluded that: leadership in in-service programme involves principal, director of curriculum, and supervisors of schools.

Research question 4: To what extent is research consumed or applied by supervisors and teachers in secondary schools in Ondo State, Nigeria?
Responses on items 9, 10, 11, and 12 on Table 1 which form the last but one column as summary on Table 2 would enable answering of this question. A look at agree added to strongly agree figures on individual items shows that, the least percentage is 61.54. Consequently, it can be safely concluded that the extent to which supervisors and teachers in secondary schools in Ondo State, Nigeria, consume or apply research is high.

Research question 5: To what degree does the professional development process in Ondo State, Nigeria, integrate or sustain staff in the teaching profession at the secondary school level?
Responses on items 13 and 14 on Table 1 which form the last column and summary on Table 2 provide answer to this question. The summary percentage for the two items on Table 2 is 80.77 and because the lower individual percentage on the two items is high (79.62), it can be conveniently concluded that the professional development process in Ondo State, Nigeria, integrates or sustains the staff in the teaching profession at the secondary school level, to a considerably high level.
7.1. Testing of hypotheses

The two hypotheses that were formulated for this research are hereby tested.
Hypothesis 1 states that: Research consumption or application by supervisors and teachers in secondary schools in Ondo State, Nigeria, is low.

Data provided on Table 3 enables testing of this hypothesis. The table presents summary responses on combined agree and combined disagree, and the Chi-Square (X²) value for their comparison is 49.040, at .000 levels of significance. This result portrays that responses on combined agree are significantly different from responses on combined disagree, which implies that research consumption or application by supervisors and teachers in secondary schools in Ondo State, Nigeria, is low. Consequently, hypothesis 1 is rejected.

Hypothesis 2 states that: The degree to which professional development process in secondary schools in Ondo State, Nigeria, integrates or sustains staff in the teaching profession, is low. Information provided on Table 4 forms basis for testing this hypotheses. The table displays statistical comparison between combined agree and combined disagree; their Chi-Square (X²) value is 38.440 at .000 levels of significance, which implies that responses on combined agree are significantly different from responses on combined disagree. This result implies that the degree to which professional development process in secondary schools in Ondo State, Nigeria integrates or sustains staff in the teaching profession is high. In effect, hypothesis 2 is rejected.

8. Discussion of findings

The first finding from this research is that key organs which are responsible for professional development include district where a school is, principal of a school, and faculty/department in a school. This finding agrees with existing literature. Notable among the authors are Tanner and Tanner [18], Guskey [5], Sparks and Loucks-Horsley [17], Mizell [12], and Israel [8]. It was noted under introduction in this article that the school is the most/over-all central organ. The district is relevant because the school is ecologically located in it and the principal is functional, because the school is available with staff especially teachers and students. Thus without the school is without the principal.

Second finding is that the entire professional staff members of a school are involved in in-service education but people in the district are not as considerably involved. This findings is also generally in line with observations of authors on professional development. They include Sparks and Loucks-Horsley [17], Mizell [12], Nagel [14], and Israel [8]. Mizell for example, observed that although some schools and community agencies may provide training for parents of school age children, or parenting education, schools generally prefer providing professional education to improve students’ education. People in the district then require certain basic types of education rather than professional education. The involvement may in another sense imply that, improvements in the school at least indirectly benefit the district people, even as their children as students get improved performances through enhanced performances of teachers in the schools of such district.

The third finding is that leadership in in-service programme involves principal, director of curriculum, and supervisors of schools. This finding is supported by literature (Tanner and Tanner, [18]; Mizell, [12]; Nagel, [14]; and Israel, [8]). Professionally, it is obvious that these three groups of people are leaders. The school is the hub of professional development, and since the principal is the head (leader) at the secondary school level, he/she naturally gets involved. Curriculum translates finally to subject matter which is the focus of learning. Consequently, the curriculum specialist or director becomes a necessary leader. Since schools require supervision to ensure efficiency/effectiveness, supervisors of schools automatically assume leadership position. It may be observed that the director of curriculum is a more invisible leader, in more abstract disposition, compared with the supervisor of schools. Rather, the supervisor is more visible, in more tangible atmosphere. Thus the supervisor of schools wields more practical influence than the director of curriculum, and the principal is subject to the supervisor. By implication, the supervisor of schools exerts most concrete leadership influence among the three leaders.

Research consumption or application by supervisors and teachers in secondary schools in Ondo State, Nigeria was found to be high, is the fourth finding. This picture on the periphery is commendable because it is the expected situation as portrayed by authors on professional development (Borko, [3]; Mouza, [13]; Tanner and Tanner, [19]; Penuel, et al., [16]; Webster-Wright, [20]; Hill et al., [7]; Loughran,[11]; Teaching Tolerance, [19] and Hardman et al., [6]). This process of consumption or applications of research will up-date skills of supervisors and teachers with the ultimate result of improved student performances which would in turn reform schools.

The final finding is that the degree to which professional development process in secondary schools, in Ondo State, Nigeria integrates or sustains staff in the teaching profession is high. Here also, this is the expected situation [6, 8, 12, 14, 18, 19, 20]. Improved performances become motivation for the professional staff to remain in the teaching profession. The process makes staff current and
relevant. They are kept busy meaningfully and productively. Combining these two last findings especially, it would be concluded that the stage of professional development toward reforming secondary schools in Ondo State, Nigeria is high. These positive results notwithstanding, there should be check/balance from the empirical researches that were reported under introduction from Nigerian researchers, namely, Iyunade [9], Oluyemi [15], and Ememe et al. [4]. Approaches to professional development identified from these Nigerian empirical researches were sandwich, distance learning, workshops, seminars, and conferences. Although none of the three empirical researches were conducted in Ondo State, there is doubt if the situation in Ondo State could be considerably different. Thus, if the positive picture in Ondo State was based on traditional approaches generally, as in those three states, the findings in this research then, would be seen as more superficial than real. Accordingly, several empirical researches are required for a clearer picture. Such empirical researches should focus on vital features of professional development, orientation for beginning and newly transferred teachers, problem solving devices, and service teachers’ relations with student teachers. Tersely, this research calls for more researches.

9. Conclusion

This research has shown that the stage of professional development in secondary schools in Ondo State, Nigeria is high. But this conclusion requires several other investigations for confirmation.

10. Recommendations

Two major recommendations seem obvious based on the outcome of this research:

- Several empirical investigations should be conducted to confirm the high level of professional development process that was found in secondary schools in Ondo State, Nigeria.
- Teachers should form part of the sample in subsequent investigations to make for balanced views/responses.

11. References


Counselling Intervention Strategies for Sustainability and Development: The Role of Women Scientists

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Abstract

Science is the bedrock for any sustainable development. This is because science is an inevitable tool and its mastery is a basic condition for Sustainability and Development of any emergent world. In Africa and with reference to Nigeria, despite the fact that science is a veritable tool women are still under represented in science related disciplines. This may be attributed to some factors including; attitude, culture, beliefs, parental factors, societal norms and low self concept. It is for the above reasons that counselling intervention strategies are needed from the women scientists themselves so that our young ones will have a better chance of changing the society through science. It is against this backdrop that the study was carried out. The study adopted the descriptive study design. The study was carried out in the south east states of Nigeria. The south east is made up of five states; namely Anambra, Abia, Ebonyi, Enugu and Imo. The population comprised all the women scientists who are members of organization of women scientists in a developing world (OWSD) in their various states in the south east, Nigeria. The population of the women scientists in the south east is 125. There was no sample due to the fact that the population is small. The instrument for data collection was a researcher designed structured questionnaire. The instrument was face and content validated by three experts from Guidance and Counselling Department of Nnamdi Azikiwe University, Awka, Anambra State, Science Education Department of Ebonyi State University, Abakiliki, Ebonyi State and Department of Computer Science, Federal University of Science and Technology Owerri, Imo State. The reliability of the instrument was done using test-retest method. Also five trained research assistants were used in the administration of the questionnaire. Findings from the study indicate that attitude, low self concept, culture, beliefs, and societal norms among others play significant role in influencing students’ choice of science subjects. The study agrees that a sustainable development needs science to back it up. Women scientists’ participation in all sectors is critical and goes a long way towards achieving sustainable development. Recommendations include that the counsellors in conjunction with the OWSD members in the south east should counsel the young girls on attitudinal change, assertive social skills, self-concept and interest among others.

1. Introduction

Science has become a critical factor of economic and social development that life without it can no longer be contemplated. Unfortunately, Nigeria including South-east States is still lagging behind in respect of women education in science based disciplines. This situation is worrisome because science has become inevitable for the sustainability and development of the nation. This is because science has the power to inspire people, women and girls inclusive towards having big thoughts and dreams. For instance through science a nation develops her main power in such critical areas as agriculture, medicine and other science based professions. According to Nwosu [20] science is an organized learning or knowledge obtained by objective and empirical study of natural phenomena and it helps in discovery of concept that promotes national development. A current biting issue in the developing world such as Nigeria is striving to resolve the wastage of potential female talents particularly in the area of science. According to FRN [9] there should be a lot of science students in our schools and they should be taught science in a manner to promote in them the appreciation of practical application of basic ideas. The big question then is – where are our girls in science based disciplines?
2. Girls in science

Traditionally the sciences have been perceived as a masculine domain while the arts have been perceived as a famine at school level Njoku, [17]. However, the above observation implies that science subjects are ascribed higher status than art subjects. This is due to the societal understanding that the sciences has traits of rationality and objectivity as against the art which possesses traits of emotion and subjectivity. Unfortunately a mere observation in our schools reveal that the number of science students (girls) are lower than the science students (boys) Njoku, [15]. This disparity may be due to some factors such as attitude, cultural belief, parental factors, social norms and low self concept as noted by Jegede [12]. For Nwosu and Nnabueyi [21] it hinges on girls inability to grasp the concepts, for Nwosu [19] it is lack of female scientists role models. UNICEF [25] in their study found out that girls generally develop fear of sciences. Confirming the above Osuafor and Okoli [23] asserted that with respect to science disciplines, research reports indicate low percentage of women participation in science based disciplines for instance in Anambra State, Nigeria there are about 50% educated women but only 11% are in science related disciplines. Also girls involvement in science has for decades recorded low interest, their rate of increase in science disciplines is very low and their interest decreases as they get older (Ezeliora, [8]). Stan [24] attributed the phenomena of paucity of girls into science to social influence during growth and development and social experience including cultural belief. Also the study of Longbap and Nok [13] revealed that the attitude of girls play significant role in influencing female students choice of science based subjects and concluded that the low representation of females in science is a function of negative attitude and fear of these subjects.

According to Enweani [6] there are several factors that influence low representation in science of women and girls in South East States, these include policy factors, academic factors, cultural factors and societal expectation. Eriba [7], Longbap and Nok [13] also noted that beliefs, attitudes, lack of assertive skills and low esteem contribute to this. Furthermore, Osuafor and Okoli [23] attributed this low representation of women in science based courses to masculine image of textual materials, sex bias in teacher – student class, poor family economic conditions, stereotyped gender roles and marginalization of females in employment opportunities.

In his own study Njoku [15] found out that science teachers males and females alike interact more with boys during classroom discussions, question and answer sessions, practical activities, excursion and field trips, they allow the boys to dominate activities by overtly expressing more confidence in them. They always give the boys leadership positions as well as more challenging tasks, thus the females experience a lot of discouraging conditions that deter them from achieving well in science hence the low representation. Njoku [17] opined that since female science teachers are involved in discouraging the girls, then something must be done fast to stop this ugly trend. Little wonder Acker and Oatley [1] suggested a reframing programme for all science teachers. When these teachers especially the females among them motivate the young girls then the young girls will see them as role models who are willing to mentor them, thus they will be motivated to excel in sciences and beyond. Also Offiah [22] observed that scientists especially teachers have little to offer due to the fact that the laboratories for science practical are not well equipped so they simply teach without demonstration. As a result the young girls in these schools tend to see the science subjects as being difficult as righted noted by Whyte and Kelly, [26].

3. Role of women scientist

The era in which human society move now is a period that is characterized by tremendous change towards modernization and advancement. This implies that development should be greatly desired and one essential means to development is the study and practice of science. In fact science when properly harnessed in our schools will play a great role in our national development. According to Iloputaife [11] a nation with scientifically uneducated citizenry cannot expect to make any reasonable, socio-economic and political decision. Unfortunately, Nigeria women have not risen to an appreciable height in the study and utilization of science and unless serious efforts are made to ensure effective science education among our girls in schools, the vision of sustainability and development in Nigeria may remain an illusion. Maduabum [14] also noted that it is almost impossible to live with little or no knowledge of science. According to the world commission on environment and development WCED [27] development is not sufficient unless it is sustainable. Adekunle [2] defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. For Hart and Roger [10] sustainable development is development that cannot only generate economic growth but distribute its benefits equitably that it regenerates the environment rather than destroy it, that empowers people rather than marginalize them.
4. Statement of the problem

The established low ratio and thus low representation of female students in science related disciplines in the study area is the problem of this study. This is attributed to the negative attitude of female students towards science studies which leads to the general decline in their choice of science subjects. Influence of tradition has transcended into a problem, which has become a myth to the extent that some female students have consciously or unconsciously come to accept science as man’s own and the exclusive reserve for the males.

It thus appears that cultural beliefs and self-concept create a mental spectrum about which course and occupation are best suited for boys and girls thus polarizing the students from the onset to which subject they should choose for study based on their gender and not cognition or psychomotor capabilities. The female students concede science courses to male students simply because they hear that science subjects appear difficult, therefore suitable for the male who are perceived as intellectuals. This implies that female students appear to lack confidence, concentration and interest in these subjects. These allusions are then products of a weak will to excel. The paucity of female students into science subjects is indeed a problem which motivated the researchers to empirically establish that the women scientist have a role to play in motivating the girls to do science subjects for the sustainability and development of science in South-East, Nigeria. It is against this background that the researchers were motivated to empirically counsel women scientists using intervention strategies. Therefore the main objective of the study is to proffer some counselling intervention strategies through the women scientist themselves who will in turn counsel the girls in order to bring about increase of girls in science based discipline. Two research questions and one hypothesis guided the study.

i. Research Questions

1. What are the causes of low representation of females in science based disciplines in South-east, Nigeria.
2. What are the counselling intervention strategies for sustainability and development as perceived by women scientists.

ii. Hypothesis

1. There will be no significant difference in the mean ratings of secondary school women scientist (teachers) and women scientist (non teachers) on the counselling intervention strategies for sustainability and development of women scientists.

5. Method

The study adopted the descriptive study design. This design is considered appropriate for this study which investigated the use of counselling intervention strategies for sustainability and development, the role of women scientists. The study was carried out in the south east states of Nigeria. The south east is made up of five states; namely Anambra, Abia, Ebonyi, Enugu and Imo. The population comprised all the women scientists who are members of organization of women scientists in a developing world (OWSD) in their various states in the south east, Nigeria,. The population of the women scientists in the south east are shown below, Anambra State-35, Abia Stat-28, Ebonyi State -10, Enugu State-20, and Imo State-32. On the whole 125 women scientists were used. There was no sample due to the fact that the population is small.

The instrument for data collection was a researcher designed structured questionnaire that has a total of items on the causes of low representation of women scientist for sustainability and development and items on women scientists motivating questionnaire (WSMQ). The (WSMQ) has two sections, A and B. Section A sought information on personal data of the respondents and Section B
sought information relevant for answering the research questions and hypotheses. The response format of the WSMQ is the 4 point rating scale of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD). The instrument was face and content validated by three experts from Guidance and Counselling Department of Nnamdi Azikiwe University, Awka, Anambra State, Science Education Department of Ebonyi State University, Abakiliki, Ebonyi State and Department of Computer Science, Federal University of Science and Technology Owerri, Imo State. The experts scrutinized the instrument and made some useful corrections which were effected before the final copies were produced. The reliability of the instrument was done using test-retest method. Within two weeks interval 50 women scientist (OWSD members) from South-West were administered the instrument. The scores of the two tests were collated and Pearson product moment correlation coefficient of 0.82 was obtained and this was considered good for the study. Also five trained research assistants were used in the administration of the questionnaire. These research assistants were assigned to one State each. All the distributed questionnaire copies were retrieved. The research questions were answered using Mean. The decision was that any Mean above 2.50 was regarded as agreement while any mean of 2.5 and below were regarded as disagreement. Also the hypothesis was answered using z-test at 0.05 level of significance.

6. Results

In line with the research questions, the data were presented in tables and analyzed below.

Table 1: Mean scores on the causes of low representation of females in science based disciplines as perceived by women scientists

<table>
<thead>
<tr>
<th>s/no</th>
<th>Items</th>
<th>X</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Societal understanding of female folk</td>
<td>3.12</td>
<td>Accepted</td>
</tr>
<tr>
<td>2</td>
<td>Girls' inability to grasp concepts</td>
<td>2.15</td>
<td>Not accepted</td>
</tr>
<tr>
<td>3</td>
<td>Lack of female role models</td>
<td>3.70</td>
<td>Accepted</td>
</tr>
<tr>
<td>4</td>
<td>Relative attitude of the girls themselves</td>
<td>3.00</td>
<td>Accepted</td>
</tr>
<tr>
<td>5</td>
<td>Cultural belief of girls' place in the society</td>
<td>3.20</td>
<td>Accepted</td>
</tr>
<tr>
<td>6</td>
<td>Girls' fear of science</td>
<td>3.10</td>
<td>Accepted</td>
</tr>
<tr>
<td>7</td>
<td>Girls' low interest due to cultural belief.</td>
<td>2.90</td>
<td>Accepted</td>
</tr>
<tr>
<td>8</td>
<td>Girls' low concept of themselves</td>
<td>3.30</td>
<td>Accepted</td>
</tr>
<tr>
<td>9</td>
<td>Lack of assertive skills by the girls</td>
<td>2.80</td>
<td>Accepted</td>
</tr>
<tr>
<td>10</td>
<td>Masculine image of text materials</td>
<td>2.90</td>
<td>Accepted</td>
</tr>
<tr>
<td>11</td>
<td>Sex bias in teacher-student class</td>
<td>2.70</td>
<td>Accepted</td>
</tr>
<tr>
<td>12</td>
<td>Poor family economic condition</td>
<td>3.10</td>
<td>Accepted</td>
</tr>
<tr>
<td>13</td>
<td>Stereotyped gender roles</td>
<td>3.40</td>
<td>Accepted</td>
</tr>
<tr>
<td>14</td>
<td>Marginalization of female in decision making process</td>
<td>3.30</td>
<td>Accepted</td>
</tr>
<tr>
<td>15</td>
<td>Low female representation in leadership position</td>
<td>3.50</td>
<td>Accepted</td>
</tr>
<tr>
<td>16</td>
<td>The girls ascribing themselves “weaker sex”</td>
<td>3.20</td>
<td>Accepted</td>
</tr>
<tr>
<td>17</td>
<td>Promotion of male dominance by the culture</td>
<td>3.20</td>
<td>Accepted</td>
</tr>
<tr>
<td>18</td>
<td>Lack of proper insight into the future by the girls</td>
<td>3.30</td>
<td>Accepted</td>
</tr>
<tr>
<td>19</td>
<td>The girls concede sciences to boys because they feel that sciences are difficult.</td>
<td>3.00</td>
<td>Accepted</td>
</tr>
<tr>
<td>20</td>
<td>Lack of confidence and concentration on science subjects by the girls.</td>
<td>2.90</td>
<td>Accepted</td>
</tr>
<tr>
<td>21</td>
<td>Girls belief that they are too weak to excel</td>
<td>2.35</td>
<td>Not accepted</td>
</tr>
<tr>
<td>22</td>
<td>Early marriage</td>
<td>2.40</td>
<td>Not accepted</td>
</tr>
</tbody>
</table>
Table 1 revealed that only items 2, 21 and 22 obtained mean ratings below 2.50 while the remaining 19 items obtained mean ratings above 2.50. This is an indication that all the other listed causes are generally accepted by all the women scientists as causes.

**Table 2:** Mean scores on the perception of women scientists on the counselling intervention strategies.

<table>
<thead>
<tr>
<th>s/no</th>
<th>Items</th>
<th>X</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Organizing and executing programmes in schools e.g giving science talks</td>
<td>3.50</td>
<td>Accepted</td>
</tr>
<tr>
<td>2</td>
<td>Giving pre-optimal career education to girls in junior secondary school (JS3) before going to senior secondary school (SS1).</td>
<td>3.20</td>
<td>Accepted</td>
</tr>
<tr>
<td>3</td>
<td>Formation of girls science clubs in schools.</td>
<td>3.30</td>
<td>Accepted</td>
</tr>
<tr>
<td>4</td>
<td>Organizing programme of road show where the girls are shown women in “men” world of work.</td>
<td>3.20</td>
<td>Accepted</td>
</tr>
<tr>
<td>5</td>
<td>Shooting film shows where females are excelling in science professions.</td>
<td>3.10</td>
<td>Accepted</td>
</tr>
<tr>
<td>6</td>
<td>Mentoring the young girls in science based subjects.</td>
<td>3.50</td>
<td>Accepted</td>
</tr>
<tr>
<td>7</td>
<td>Organizing seminars and workshops where the women scientist will speak to girls and their parents on the importance of science based subjects.</td>
<td>3.00</td>
<td>Accepted</td>
</tr>
<tr>
<td>8</td>
<td>Inviting the girls to conferences organized by women scientists.</td>
<td>2.90</td>
<td>Accepted</td>
</tr>
<tr>
<td>9</td>
<td>Encouraging girls through giving scholarships for science based courses.</td>
<td>3.60</td>
<td>Accepted</td>
</tr>
<tr>
<td>10</td>
<td>Giving extra moral classes in science based subjects to the girls during holidays.</td>
<td>3.10</td>
<td>Accepted</td>
</tr>
<tr>
<td>11</td>
<td>Counselling the girls to foster positive self concept.</td>
<td>3.40</td>
<td>Accepted</td>
</tr>
<tr>
<td>12</td>
<td>Counselling the girls to discover their potentials, abilities and capabilities.</td>
<td>3.50</td>
<td>Accepted</td>
</tr>
<tr>
<td>13</td>
<td>Motivating the girls through inter-school science debate.</td>
<td>3.20</td>
<td>Accepted</td>
</tr>
<tr>
<td>14</td>
<td>The women scientists should persuade the ministry of education to supply new and current science equipment to enhance the teaching and learning of science based subjects in schools.</td>
<td>3.40</td>
<td>Accepted</td>
</tr>
<tr>
<td>15</td>
<td>Women scientists should endeavor to let authors of text books know the importance of being gender sensitive in their textbooks.</td>
<td>3.30</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Table 2 above revealed that all the items obtained mean ratings above 2.50. This is an indication that all the listed strategies are generally accepted by all the women scientists.

**Table 3:** Z-test summary of mean rating of the women scientists

<table>
<thead>
<tr>
<th>Perception</th>
<th>No</th>
<th>X</th>
<th>SD</th>
<th>Z-Cal</th>
<th>z-crit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers</td>
<td>51</td>
<td>3.01</td>
<td>0.77</td>
<td>1.02</td>
<td>1.96</td>
</tr>
<tr>
<td>Non Teachers</td>
<td>64</td>
<td>3.17</td>
<td>1.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P=0.05

Result presented in table 3 showed that z - value calculated of 1.02 is less than the critical value of 1.96 the hypothesis is therefore accepted, the conclusion is that there is no significant difference in the mean ratings of secondary school women scientist( teachers) and women scientist (non teachers) on the counselling intervention strategies.

**7. Discussion**

The study investigated the counselling intervention strategies of women scientist for sustainability and development of science based disciplines among young girls in south east States of Nigeria. Findings from the study indicated that the causes of low representation of girls in sciences include societal understanding of female folk, lack of female role models, negative attitude of girls themselves, cultural belief, low interest, low concept of themselves, poor
family economic conditions, lack of proper insight into the future, lack of confidence, stereotyped gender roles, seeing science as difficult, non-inclusion of girls in decision making in homes and schools, among others.

The finding is not surprising because each of these items responded to by the respondents are all part of the cause of low representation of girls in science based disciplines in Nigeria including South East states. This study confirmed the findings of Njoku, [16], Longbap and Nok, [13], Osuafor and Okoli, [23] and Ezeliora, [8] who earlier listed some factors like cultural belief, parents economic condition and poverty, stereotyped gender roles, beliefs and attitudes, low self esteem and low interest among others. It is also surprising to observe that the respondents notes that early marriage are girls inability to grasp concepts, girls belief that they are too weak to excel not the cause of low representation of girls in science based causes. This is contrary to the findings of Yusha’u and Umar [28] who found a positive relationship between low representation and early marriage. According to them, parents generally prefer giving out their daughters for marriage at tender age.

The study also reveals that the enumerated roles of women scientist for sustainability and development of science among young females include giving science talks in schools, giving pre-optimal career education to girls in Junior Secondary Schools, formation of girls science clubs. Providing video and shooting films where females are excelling in science professions, mentoring the young girls in science based subjects, inviting girls to conferences organized by women scientist, encouraging girls through giving of scholarship for science based courses, giving extra moral classes to the girls, counselling young girls to foster positive self-concept, counselling young girls to discover their potentials, abilities and capabilities among others. These findings are welcome developments because they show that the women scientist appreciate the fact that their roles in science educational endeavours make them important participants in the fight against low representation of women in sciences based courses. Therefore, much is expected from women scientists in providing interactive group and individual counselling to young girls through the use of the established intervention strategies to probe into their learning problems. These would finally help in mentoring young girls to develop positive attitudes towards science related subjects. The finding is in agreement with Nwosu [19] who listed eliminating all forms of gender stereotyping at home, society and school, bringing in more women scientist in policy making bodies for effective implementation, training and encouraging career counsellors in schools to promote gender equity in sciences, use of girl friendly instructional materials, forming friendly science clubs, sensitizing science teachers to be girl friendly in content delivery and learner centered instructional approaches as strategies for breaking gender differences in science based courses. The performance of these roles however requires that the women scientist be provided with support from Government, parents, and other women themselves. This is because for sustainability and development of any nation especially in the area of science, there must be collaborative efforts from all and sundry as rightly noted by Nnaka., [18]

Furthermore the study revealed that there is no significant difference between the mean scores of female scientist (teachers) and female scientist (non-teachers). This may be due to the fact that the women scientist irrespective of where they work are now very much willing to imibe and implement these roles for all round sustainability and development of our girls in science.

8. Conclusion

One of the major factors for measuring the sustainability and development of any nation is through scientific breakthrough. The study focused on counselling intervention strategies for sustainability and development the role of women scientist. The findings indicate that the female scientists are all willing to carry the girls along through the application of the given strategies. More so counselling by women scientists will continue in the future in order to create and sustain the needed awareness in producing more women scientist because women and sustainability in development are two sides of a coin.

9. Recommendations

Based on the findings the following recommendations were made:

1. The organization of women scientists in a developing world (OWSD) members in south east should visit schools where they can talk to the girls and motivate them through incentives like scholarships to go in for science based courses.

2. The science teachers should have opportunities for workshops, seminars and conferences to expose them to the new innovations in the teaching of science that will attract the young girls to science.

3. The women scientists (OWSD) members in the south east should organize a workshop
where the young girls will be exposed and motivated to venture science.

4. The counsellors in conjunction with the OWSD members in the south east should counsel the young girls on attitudinal change, assertive social skills, self-concept and interest among others.

5. The counsellors together with the OWSD members in the south east should organize a science quiz in each state for all young girls where the winners will be rewarded immensely.

6. Science teachers should be dedicated, royal and gender sensitive to all activities and operations that will enhance effective study of science especially in girls schools.

7. Government, in collaboration with non-Governmental organizations and the general public should provide adequate resources and facilities that will encourage sound science education in our schools.

10. Reference


[18] Nnaka, C.V. Enhancing female students participation in STM Education through Gender fair


An Updated Prevalence-Based Projection Model for Estimating the Need for Additional Qualified Adapted Physical Education Teachers

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Western Michigan University, USA

Abstract

The prevalence-based projection model commonly used in the adapted PE field is needed to be updated because the number of fully certified adapted PE teachers hired was not reported as in an independent category in the IDEA Annual Reports anymore since 2006. The purpose of this research was therefore to propose an updated prevalence-based projection model for estimating the number of additional qualified adapted physical education teachers using the data from the combined category with the number of fully certified adapted PE teachers and recreational therapists in the IDEA Annual Reports and the proportion of fully certified adapted PE teachers in the total of two categories in a state or in the nation as estimated in this study.

1. Introduction

The prevalence-based projection model [1][2][3][4], \( N = \frac{E}{104} - H \) (where \( N \) is the number of additional qualified adapted PE teachers needed; \( E \) is the number of students with disabilities requiring adapted PE service enrolled; 104 is the adapted PE student-teacher ratio found in a national survey; and \( H \) is the number of fully certified adapted PE teachers hired), has been used for estimating the need for additional qualified adapted PE teachers for many years. With this model, one was able to use both data, \( E \) and \( H \), available in a corresponding IDEA Annual Reports to estimate the number of additional qualified adapted PE teachers needed in a year before 2006.

Starting at 2006, however, one could not find \( H \) in the IDEA Annual Reports since the number of fully certified adapted PE teachers hired was not reported as in an independent category anymore [5]; instead, the number of fully certified adapted PE teachers hired was reported as in a combined category with the number of fully certified recreational therapists together. Based on this combined category, how should an adapted PE professional use the original prevalence-based projection model to estimate the number of additional qualified adapted PE teachers in the latest year?

The purpose of this research was therefore to propose an updated prevalence-based projection model for estimating the number of additional qualified adapted PE teachers using the data available in the latest IDEA Annual Report.

2. Body of Knowledge

The updated prevalence-based projection model proposed in this study is \( N = \frac{E}{104} - (C \times P) \), where \( N \) and \( E \) are defined in the same way as in the original model; 104 is the same adapted PE student-teacher ratio found in a national survey; \( C \) is the combined category with the number of fully certified adapted PE teachers and recreational therapists; and \( P \) is the proportion of fully certified adapted PE teachers in the total of two categories in a state or in the nation.

Both \( E \) and \( C \) included in this model are available in the latest Annual Report (e.g., the 36th Annual Report, USDE, 2014), while \( P \) must be identified through the research activity. The \( P \) of the nation or the state of Michigan was identified in this study.

All IDEA Part B’s personnel data over years 1992-2005 from the 17th to the 30th Annual Reports available online were used as the data sources [6]. From these data sources, two categories of the data, the number of fully certified adapted PE teachers and the number of fully certified recreational therapists, were retrieved.

The total of two categories and the mean of each category were first calculated, and the proportion of fully certified adapted PE teachers in the total of two categories was then identified for the nation and for the state of Michigan (e.g., the \( P \) for the nation is 0.98 and the \( P \) for the state of Michigan is 0.94 as presented in Table 1 and Table 2).

To estimate the number of additional qualified adapted PE teachers needed using the updated model, \( N = \frac{E}{104} - (C \times P) \), an adapted PE professional needs to find the \( P \) for his or her state, uses the \( P \) for the nation identified in this study, and employs both \( E \) and \( C \) available in the latest Annual Report, and then place these data into an updated
prevailence-based projection model for estimating the number of additional qualified adapted PE teachers.

Table 1. Proportions (Ps) of the Certified Adapted PE Teachers Therapeutic Recreational Specialists based on the Raw Data in USA over Years 1992-2005

<table>
<thead>
<tr>
<th>Number of IDEA Annual Reports</th>
<th>Years</th>
<th>Certified Adapted PE Teachers</th>
<th>Certified Therapeutic Recreational Specialists</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>2005</td>
<td>7638</td>
<td>333</td>
</tr>
<tr>
<td>29</td>
<td>2004</td>
<td>7749</td>
<td>377</td>
</tr>
<tr>
<td>28</td>
<td>2003</td>
<td>6912</td>
<td>551</td>
</tr>
<tr>
<td>27</td>
<td>2002</td>
<td>6363</td>
<td>407</td>
</tr>
<tr>
<td>26</td>
<td>2001</td>
<td>5785</td>
<td>415</td>
</tr>
<tr>
<td>25</td>
<td>2000</td>
<td>5803</td>
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<tr>
<td>24</td>
<td>1999</td>
<td>5432</td>
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<td>23</td>
<td>1998</td>
<td>5681</td>
<td>319</td>
</tr>
<tr>
<td>22</td>
<td>1997</td>
<td>5512</td>
<td>279</td>
</tr>
<tr>
<td>21</td>
<td>1996</td>
<td>5432</td>
<td>283</td>
</tr>
<tr>
<td>20</td>
<td>1995</td>
<td>5610</td>
<td>299</td>
</tr>
<tr>
<td>19</td>
<td>1994</td>
<td>5236</td>
<td>321</td>
</tr>
<tr>
<td>18</td>
<td>1993</td>
<td>4971</td>
<td>256</td>
</tr>
<tr>
<td>17</td>
<td>1992</td>
<td>5283</td>
<td>389</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>83407</td>
<td>4934</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>5958</td>
<td>352</td>
</tr>
<tr>
<td>P (proportion)</td>
<td></td>
<td>0.94</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Table 2. Proportions (Ps) of the Certified Adapted PE Teachers Therapeutic Recreational Specialists based on the Raw Data in Michigan over Years 1992-2005

<table>
<thead>
<tr>
<th>Number Of IDEA Annual Reports</th>
<th>Years</th>
<th>Certified Adapted PE Teachers</th>
<th>Certified Therapeutic Recreational Specialists</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>2005</td>
<td>74</td>
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<tr>
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<td>2004</td>
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<td>0</td>
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<td>28</td>
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<td>27</td>
<td>2002</td>
<td>58</td>
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<tr>
<td>26</td>
<td>2001</td>
<td>75</td>
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<tr>
<td>25</td>
<td>2000</td>
<td>79</td>
<td>0</td>
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<tr>
<td>24</td>
<td>1999</td>
<td>96</td>
<td>0</td>
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<tr>
<td>23</td>
<td>1998</td>
<td>92</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>1997</td>
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<tr>
<td>21</td>
<td>1996</td>
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<td>1995</td>
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<td>19</td>
<td>1994</td>
<td>80</td>
<td>3</td>
</tr>
<tr>
<td>18</td>
<td>1993</td>
<td>90</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>1992</td>
<td>84</td>
<td>4</td>
</tr>
</tbody>
</table>

Using this updated model, for example, the number of additional qualified adapted PE teachers based on the latest Annual Report can be estimated in $N = (E / 104) – (C \times 0.98)$ for the nation and in $N = (E / 104) – (C \times 0.94)$ for Michigan. Since the $P$ for a state is different from the $P$ in another state and the $P$ for the nation, one should use the correct $P$ for his or her state as presented before in using this updated model to estimate the number of additional qualified adapted PE teachers for his or her state.

3. Conclusion

The updated prevalence-based projection model provides adapted PE professionals in a new approach to estimate the need for additional adapted PE teachers while the number of fully certified adapted PE teachers hired was not reported as in an independent category the IDEA Annual Reports since 2006. It is highly recommended that adapted PE professionals use the updated model to project the number of additional qualified adapted PE teachers based on the latest Annual Report.

4. References


Evaluation of Selected Physical Fitness Variables of the Nigerian Police Force Lagos Nigeria

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Abstract

The physical fitness of member of the Nigerian Armed Forces NAF (Military) Para-militant and physical and Health education are of great importance to their mobility and health. Available studies have centered on growth, development and combat readiness of the NAF and police respectively. But none have critically examined their physical fitness characteristic (PFC) or recommended by United Nations Military/Paramilitary Norms (UNMFNS) Therefore, this study evaluated selected PF, variable age, Resting Heart Rate (RHR) Systolic Blood Pressure (SBP) Diastolic Blood Pressure (DBP) Agility and speed characteristic of offices and men of Nigerian Police in Lagos. The ex-post fact research design was employed. Purpose sampling technique was adopted to select forty (40) participants from office (n=20) and men (n=20). Data were collected using illenois Agility run (r=93) sphygmomanometer (r=0.97) and analysed using mean, standard deviation of variance and paired t-test for significant differences in the relationship among the selected PF variable (Health and performance) speed and the physiological variable. All hypothesis for the study were tested at the 95% confidence interval. There were significant differences in speed, (t=3.483, P<0.05) SBP (t=2.791, P<0.05) Agility (t=2.970, P<0.05). No significant difference in (DBP) based on the findings; Nigerian police force (both offices and man) did not measured up to the (UNMFNS) PFS in speed Agility and DPB, There were so disparities between fitness level of officer and man of the N.P
Posters
Poster Session 1: Special Education

Obstacles facing the mainstreaming of students with intellectual and developmental disabilities in public schools in Jazan city
(Authors: Ali Hawsawi, Muhammad Alrajih)

The Needs of Families with Children with Special Needs for Different Types of Services
(Authors: Aleksandra Ristić, Martina Ozbič)

Parents’ Perceptions of Inclusive Education Practices
(Author: Carmel French)

The Quality of Procedural Knowledge in Science Education in Special School: Assessment of science - Teachers’ perceptions and practice
(Author: Kaja Vlahinja)
Obstacles Facing the Mainstreaming of Students with Intellectual and Developmental Disabilities in Public Schools in Jazan city

Ali Hawsawi, Muhammad Alrajih
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Saudi Arabia

Abstract

The present study sought to identify the obstacles facing the Mainstreaming of students with intellectual and developmental disabilities in public schools as perceived by teachers of the Intellectual Education in Jazan and their appreciation of the differences in variable Obstacles depending on (sex, grade, teaching experience, educational level).

The study sample consisted of (159) teachers from staff working in the intellectual education programs attached to public schools in the city of Jizan. Where the researcher developed a questionnaire consisting of (45) items divided into five dimensions of (9) paragraphs for each dimension: the obstacles of school equipment, obstacles related to the educational environment, obstacles related to family environment, obstacles related to intellectual education students, the obstacles related to the teachers of intellectual Education.

Among the most important findings of this study include the following:

- There are obstacles facing the Mainstreaming of students with intellectual and developmental disabilities in public schools these are related to school equipment, Obstacles related to the educational environment and to the family environment.
- There are no obstacles facing the Mainstreaming of students with intellectual and developmental disabilities in the public schools relating to intellectual education students or the teachers of intellectual education.
- The most prominent obstacles facing the Mainstreaming process of children with intellectual and developmental disabilities in the public schools in severity ranking: the obstacles related to the educational environment, the constraints in school equipment and obstacles related to the family environment.
- There are no statistically differences in the estimates of male and female about obstacles to the educational environment, while the results showed differences in the estimates of male and female on school equipment Obstacles favor of males. The results also showed the presence of statistically significant differences in the estimates of male and female about the Obstacles of the family environment in favor of females.
- There is no statistically significant difference in estimating the obstacles facing the Mainstreaming of students with intellectual and developmental disabilities in public schools due to the differences in variable grade or teaching experience or educational degree.
The Needs of Families with Children with Special Needs for Different Types of Services

Aleksandra Ristić, Martina Ozbič
University of Ljubljana, Slovenia

Abstract

This abstract will overview the Slovenian families with children with special needs (hereafter: FCSN) and explore the opportunities and challenges faced to these families who are involved in the process of Helping. With qualitative research approach and technique of semi-structured interview we analyzed the attitude of FCSN to: reporting news about special needs of their child, necessary adjustments required by living with a child with special needs; (un)realized needs of family members; family interaction; information about possible forms of assistance services; sources of assistance services that are already used; areas where they need additional aid; experiences with the government and non-government professional services; inclusion and exclusion; desire, expectations and ideal Help. The intention of this abstract is also to discuss about the shortcomings of the System. We have pointed out what FCSN consider, recommend and want from the process of Helping. The families express dissatisfaction to the services of government organizations and they are forced to seek the solutions in non-government organizations. The FCSN have the desire to individual and comprehensive treatment, all possible forms of assistance services for their child and long-term counseling and education for the whole family. The results of the research will be incorporated in a Ph.D. dissertation. We believe that in the future we will be able to recognize the risk factors and then propose the best assistance services to foster FCSN. We are going to propose a new, more comprehensive and individualized approach, which is derived exclusively from the needs of FCSN.
Parents’ Perceptions of Inclusive Education Practices

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Abstract

Inclusive education legislation has been in place in Nova Scotia, Canada since 1996. However, results of past research [1], [2], [3] on educator’s perspectives of inclusive education in Nova Scotia, indicated that teachers struggled with inclusive practices, especially developing and implementing programs for children with special needs. Research has also indicated that parents of students with special needs perceive their children’s education as more positive and successful when families are viewed as partners in the process [4], [5]. Unfortunately, research on parent’s perceptions of how inclusive practices and policies are applied in school settings (the purpose of this study) is limited. Seventy-nine parents who have children with special needs currently enrolled in a school in Nova Scotia completed an on-line questionnaire. Both quantitative and qualitative data analysis techniques were used to analyze participants’ responses. Initial findings indicate that the majority of parents who responded had limited involvement in the program planning process for their children with special needs. They want better communication and to be viewed as equal partners. This research should inform government, educators and advocacy groups of areas that parents perceive as working and issues that still need to be addressed. Such information can inform teacher training and practice and identify topics for on-going dialogue and joint parent/teacher professional development seminars so that education in Nova Scotia can become truly inclusive. Implications for inclusive schools in other geographical areas will be highlighted.

References

The Quality of Procedural Knowledge in Science Education in Special School: Assessment of Science - Teachers’ Perceptions and Practice

Kaja Vlahinja, Darja Skribe Dimec
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Abstract

In Slovenian primary school can be noticed a shift from traditional to modern methods of teaching science. The purpose of research was to ascertain the science assessment method in special education schools, to determine if perceptions of special education teachers differ from their actual practice, as well as if and how assessment is adapted to children with learning difficulties. Attention was focused on: a) cognitive levels of knowledge; and b) process skills. A questionnaire and authentic written tests were used for the research in two Slovenian special education primary schools in classes with lower education standards. The results showed that teachers had a positive attitude toward science education. They stated oral assessment as the most frequent assessment method while attaching the highest importance to written assessment. Their written assessment most frequently consisted of tasks with a lower cognitive level, and there are very few tasks assessing process skills. The teachers’ opinions about their consideration of the higher cognitive level and some process skills differ from their actual practices. Only half of the teachers adapt assessment to pupils with learning difficulties. A positive consequence of this research is that the teachers have become aware of their practices in science assessment. Based on the results we want to: a) create an education program that will help teachers better understand and use procedural knowledge in science class; and b) create a model that will develop pupils’ procedural knowledge in special education schools. This will have an impact on integration in everyday life, on pupils’ self-confidence and self-esteem.
Poster Session 2: Inclusive Education

Integration of Native Pedagogical Model. Closing the learning circle
(Author: Eva Cházaro)

Insights from Special Needs Teaching Staff on Development of an iPad App to Teach Emotion Recognition to Children with Autism Spectrum Disorder
(Authors: Sarah Griffiths, Giulia Carrera, Nigel Derrett, Chris Jarrold, Ian Penton-Voak, Marcus Munafò)

Achieving community empowerment through consensus and facilitation
(Authors: David Powell, Alison Shaw)

Observation of the effects of the use of telepresence robot on teaching practices and learning
(Authors: Dorothée Furnon, Françoise Poyet)

Inclusive physical education in least restricted environment: The perspective of special educational needs by physical education teachers working in schools of India
(Authors: Pramod C. Sharma, Ajit Nair)
Integration of Native Pedagogical Model: Closing the Learning Circle

Eva Cházaro
University of the Americas Puebla, Mexico

Abstract

It is an investigation I conducted in Canada and Latin America with First Nations people. Under the focal question: How native people learn? I analyzed the epistemological paradigm of indigenous forms of learning. Is an important contribution from forms of knowledge of native paradigm? Qualitative study with native features of the research: talking circles, writing in first person, analysis of personal experience, focus groups, interviews, participant observation and family stories. The result was the integration of Native Pedagogical Model.

1. Introduction

First Nations have fought for centuries to clash with dominant colonial cultures, which today are also globalizing. Although now given rise to new forms of relationships in the interests of multiculturalism, can be seen hidden faces of colonialism which decreases the native presence. Cultural and cognitive status of the Indians has not been taken into account for years, to provide learning. "The philosophy of science (western approach) is the one that has addressed the Epistemology for the validation of scientific knowledge known today as" [4].

Important progress is currently the subject of intercultural and multicultural relations in the world. Pedagogical models are documented in the context of some area of knowledge or any Native nation. However, given the importance of native paradigm, we need to integrate a pedagogical model as a contribution to universal education.

2. Justification

By showing that the ancient wisdom of indigenous people is part of the present and the reality of many human beings, aware of it or not, is also evident that this should be the basis of their learning, should be studied for Westerners understand the ways of building knowledge on the natives, on the understanding that there are particular ways of learning. More importantly, the opportunity to build a bridge between cultures that serve, first, to demonstrate the unity of thought of native peoples and, secondly, to weave the richness of relationships and respect diversity of cultures dominant globalizing.

This research goes beyond the boundaries imposed by social structures and educational systems. The Western world increasingly recognizes that it needs new models. Here is an opportunity to strengthen the proposals today (intercultural, socio-cultural mediation, community education) in all educational contexts (formal, non formal, informal), from the epistemological basis for an alternative look longingly to create school, the native.

Wisdom, understood as the combination of indigenous knowledge and its epistemic base, is the foundation of Indian learning, and is where one starts to understand how they learn. As research, this study is an effort to demonstrate how learning science, engineering, technologies from the epistemological basis. An analysis of integration of models has been developed on this basis. Once again, an effort of universal contribution to science education, particularly to pedagogy.

With regard to integrated model, we need to investigate and propose, it is understood from a basic sense of the term, as the possibility of merging these concepts, can be divergent or not, into one that synthesizes. To provide a basis for treating generic epistemic learning environments from a native view. Although this model is offered to assist with learning composed of natives, native epistemic wealth is such that the model is undoubtedly useful in blended learning environments.

3. Background

These problems clearly justified, due to the approach that as a researcher I have had the native world. After a short time update coordinating workshops and training for primary school teachers in 2004 I received the commission from the Ministry of Education of the State of Puebla, Mexico, to operate the national project for the implementation of an intercultural and bilingual teacher training schools in the state. The conditions and results of this project can be read from the document Implementation of Intercultural and Bilingual Approach in Elementary Education Bachelor of two Normal Schools of the State of Puebla, Mexico [7].
The proposed approach to multiculturalism in the field of formal education, gave me the opportunity to come into contact with the sensitivity of native thought. So, in 2005, after to receive parcel institutional again, this time to address the problems of illiteracy, I decided to work with the indigenous groups because the government register its residents a high level of illiteracy. I decided to give the opportunity to understand the problem from the Indian look, and not from external views.

4. Previews contributions and Purpose

Native epistemology as the basis of learning has been and is studied by many researchers. Theoretical and empirical studies representative of the subject have been gathered in this work to integrate a pedagogical model from indigenous knowledge, which gives an epistemological support the learning environments in science, engineering and technology in formal and no formal contexts.

Studies from different parts of the world, including Canada, Mexico, Spain, Solomon Islands, Latin America and the Caribbean, U.S. and Australia. Preference has been sought to be a contribution of native researchers. Demonstrate knowledge of key elements of the original groups in the world. Have been developed in the context of a Native nation, and / or any area of knowledge in particular.

Thus, as a step forward on existing work, in keeping with the holistic vision of indigenous peoples and in a context of universal contribution to pedagogy, this paper integrates a general model based on indigenous epistemology. The purpose of the research is to contribute to the systematization of Wisdom for the understanding and recognition of learning the ways of native peoples.

5. Objectives

5.1 General Objective:
To integrate a native pedagogical model.

5.2 Specific Objectives:
- Identify the paradigm and the value of indigenous knowledge.
- Identify the knowledge of First Nations as epistemological foundation of learning.
- Analyze pedagogical models representative of indigenous knowledge.
- Build a scaffold that allows the integration of models.
- Find common elements that make native teaching models.
- Categorize the contributions of the natives.
- Base the study in a native methodology.

6. Methodology

The study was developed within the phenomenological paradigm and qualitative research. Structure is also in the guise of a native paradigm. The methodological framework is in design, are being used interviews, focus groups, family stories, participant observation. Participants are from many native nations in Canadian and Mexican territories. Presents a methodology based on the example set by native researchers, which is increasingly recognized by universities such as Toronto, Saskatchewan, Queensland, New Mexico, Alberta ... Is an investigation that contributes to the mission of decolonization of learning and reconciliation with dominant nations. In Mexican context is the same position about research.

7. Native knowledge and the Pedagogical Model

Epistemology is an occidental term recognized as knowledge’s science, “... the study of knowledge nature” [19]. In relation to yourself and to understand the concept in the context of a reconciliatory action, Battiste [3] states: "Aboriginal epistemology (or epistemology in the view native) is found in Theories, Philosophies, stories, ceremonies and stories as Ways of Knowing "(p. 18). What can be interpreted as the possibility of integrating a model from indigenous knowledge, as a contribution to universal education, helpful for all human beings.

8. Analysis of theoretical and methodological contributions

Wisdom is identified as a way of knowledge to be native. As confirmation of this saying, Knudtson & Suzuki [14], Wisdom of the Elders, gather the voices of the ancestors of native nations throughout the world, to present indigenous knowledge about science: mother earth, man-land relation, man-animal, vegetable man, rhythms of nature. The phenomena observed are the same as watching the Western, perspective is holistic, that is Wisdom.

According with Battiste [3]: To sustain indigenous knowledge, one must be willing to take on responsibilities associated with that knowing, especially putting the knowledge into daily practice. When an Indigenous elder says, I know, it is a temporary reference point. If such knowledge is to be contained or if the relationship is to be sustained over time, then the elder must not just know the relationship, he or she must respectfully live it and know how to renew it (p. 41).

Wisdom is the support of community life. It is a "participatory epistemology" [16]. It teaches the relationship of the human being with nature and
divinity, or the Creator. Wrap traditional ways of teaching, learning, learning media. It facilitates the kind of attitudes that need to keep their native Territorial Space, a concept introduced by me in 2007, and sharing what is with the Western world. That is, the reconciliatory attitude and action to be willing to learn from other cultures while sharing their knowledge and ways of learning.

An indigenous philosophical concept of holism refers to the interrelatedness between the intelectual, spiritual (metaphysical values and beliefs and the Creator), emotional, and physical (body and behaviour/action) realms to form a whole healthy person... Each Indigenous group has developed its own cultural content for the holistic circle symbol; however, a common goal has been to attain a mutual balance and harmony among animals, people, elements of nature, and the Spirit World [1].

Beginning of Wisdom is identified relatedness of human beings with the divinity from which it comes up, and the earth from which it comes down [20], [8], (red circle). Under the care of such relationships is organized communally, working the land, serving, doing ceremonies, using their own language that is sacred (green circle). Once community organizations according to the principle of relatedness, identify the elements that shape as a human community: spiritual, emotional, intellectual and physically, are the tools for knowledge (white circle). Without losing the essence of community, is related to the dominant cultures closing the circle of Wisdom, even when they are opposite in knowledge and nonotsa (substance and form) (blue circle).

The importance of bringing together or integrate theories is to understand the concept of closing the circle, towards genuine reconciliation between nations. Also close the circle means integrate a model for learning, which responds, from the Wisdom, to the conditions of native nations in the world. The scheme has been structured around theoretical and methodological contributions of selected studies, in order to understand indigenous knowledge as a basis for a pedagogical model:

8.1. Arrows and transversality

They are a symbol of the interconnection between the center, circles and Amili. They also introduce the mainstreaming of the four areas that humans develop in balance, considering the elements involved in the circles, according to the teaching anishnawbe: physical, spiritual, emotional, intellectual. This is the circle of health welfare is reflected in the individual, family, social, land.

8.2. The model

In relation to "model" who is now associating the concept is Cajete [6], Master of Tehua language, Pueblo Nation, saying:

Models. Native science also has models. Teaching revolves around high context models in which information is communicated at many levels, and which are highly representational and elicit higher order thinking and understanding. An example of such a ritual process model is the Plains Sun Dance, which may include symbols such as the circle, numbers, geometric shapes, special objects, art forms, songs, dances, stories, proverbs, or metaphors, all of which unify experience with meaning and facilitate the mind’s conscious process of connecting with the energies and animating power of nature. Native symbols go beyond simple archetypes when they represent the universe itself, as with a ceremonial structure such as the Navajo hogan [6].

According with Battiste [2]: “Aboriginal pedagogy is found in talking or sharing circles and dialogues, participant observations, experiential learning, modeling, meditation, prayer, ceremonies or story telling as ways of knowing and learning” (p. 18). Stiffarm Leonore [17] comprises nine studies documenting pedagogical models. They observe the elements gathered in the white circle of Wisdom. Based on these and other authors identified the following pedagogical elements:

![Figura 1. Essential features of indigenous knowledge](image1)

![Figura 2. Elements of Native Pedagogical Model](image2)
8.3. The presence of elders

Each first nation conserve elders voice as a guide from younger generation, which involves the preservation of communal life and respect for nature. "The role of older persons passing on Knowledge Remains ... very important" [12]. It is an education to live well, for all the life [18]. His insight is transmitted through dialogue and good relations [9].

"Elders have occupied a special position in society. They have painstakingly accumulated reservoirs of personal experience, knowledge, Wisdom – or compassionate insight and a sense of the enduring qualities and relationships around them" [14].

"Age is not a factor in one’s becoming an Elder… being respected by others and having cultural knowledge are critical criteria. Elders have varying knowledges, or “gifts”, to pass on to others, whether spiritual, healing, medicinal, historical, story-telling, or linguistic” [1].

8.4. The circles

The sacred circle concept is different from simply placing students in this way. They are spirit and heart as knowledge paths to spirituality without beginning or end. In them, the teacher is a healer. So each person becomes his own teacher. The circle helps to develop respect for knowledge as an essential part of healing. The sacred circle meets the four areas of human development: physical, spiritual, emotional, intellectual [17].

“Talking in Circle reminds us that to speak is a privilege, that spoken thoughts – words - are sacred. The basic rules of Talking Circle are: one speaker at a time, the person holding the special object is the speaker and all others are to listen respectfully to that person. In Talking Circle you speak your own voice, describe what your own experience has been. You have the opportunity to express what you feel i son your heart to say. The point is to speak “from your heart”, of what moves you, of what spirit moves through you when the sacred object reaches your hands” [13].

8.5. Storytelling

How a child feels when you tell stories, is the same condition that should be recovered in adults. Stories help set goals, face challenges, to live together, coping with loss and pain, to be nice, be open to the world, and solve problems, from a positive self-image [15].

“Storytelling is a very important aspect of Native America. It is not just the words and the listening but the actual living of the story” [6].

“Bringing heart and mind together for story listening was necessary if one was to make meaning from a story because often one was not explicitly told what the story’s meanings were. Linking how we feel to what we know was an important pedagogy” [1]. Son historias que revitalizan al ser humano holista. En ese sentido llegan a ser una fuente de poder y energía en dirección al aprendizaje.

8.6. The metaphor

They are a basic tool of learning in all cultures. Due to mental processes that prepare for learning [5].

Paralleling its collective evolution, the metaphoric mind in the individual develops from birth to about the time a child begins to learn language. When language is developed and used extensively, the holistic experience of the metaphoric mind begins to get chopered up and labeled, until, eventually, it recedes into the subconscious. Yet, the metaphoric mind remains very important in a child’s continued development because it encompasses the perceptual, creative, and imaginative experience of his or her inner world (p. 28).

8.7. Sense of humour

“Sense of humour has been the key to Aboriginal communities survival”… “humour helps to create social harmony within communities” [10]. In this historical use, sense of humor goes hand in hand with the stories told. “There are usually many possible ‘lessons’ condensed in a joke, none of which represent the lesson” [10]. It can be a useful tool in learning.

“…Native Studies class can be a pretty damn funny place, despite the often depressing subject matter” [11].

“During the meetings, there was much laughter, humour through teasing, joking, and telling funny stories is a very important cultural interaction. Humour indicates that the group is comfortable with and open to each other… I believe that humour has a healing aspect for both the storyteller and the listener in that those who have lived through very difficult circumstances and who can share some humorous aspect of the experience have achieved some emotional or spiritual healing and resilience” [6] (p. 68).

8.9. The gift

The practice of give and the gift is one of the fundamental values of Native nations in the world ... What is shared is fundamentally storytelling as a learning process that has already been described. “If a learner is really serious about learning in a traditional manner, then the learner must ask and must make her/himself culturally ready, perhaps through “protocol”, to receive the knowledge” [1] (p. 37).
9. Conclusion

There are many pedagogical models as teachers with their students, parents with their children, grandparents with the community. Documented or not, systematized or not, are present. Practically, a native pedagogical model finds its basic elements in Wisdom considerations oriented to learning. It is necessary to integrate the elements in the tone of a holistic vision.

10. References


Insights from Special Needs Teaching Staff on Development of an iPad app to Teach Emotion Recognition to Children with Autism Spectrum Disorder

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Abstract

Many psychological studies have suggested that children with autism have trouble recognising emotion from facial expressions. Children with high functioning autism can be taught to recognise facial expressions but may fail to apply this learning when they encounter subtle versions of these expressions in everyday life. We are developing an iPad app to deliver teaching about subtle emotional expressions to children with autism. As part of the design process we have conducted two focus groups with teaching staff (N=5) at a school for children with special educational needs in the UK. In the focus groups, teaching staff used a prototype version of the app and were invited to give their opinions. Focus group discussions were recorded and analysed using qualitative methods. These suggested that the app has potential to be used in a classroom setting with individuals with ASD but also provided important insights into how the app should be designed. Changes introduced after these discussions included reducing distractions, adding alternative forms of feedback, and linking the app to other existing teaching aids. The app has now been redesigned and this version is presented along with detailed results of the qualitative analysis. The redesigned app is now being used by teaching staff in the school for special needs and future work will evaluate its effectiveness as a teaching tool.
Achieving Community Empowerment through Consensus and Facilitation

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Abstract

In integrating culture into a global development agenda, UNESCO (2012) reminded us that we need to mobilise the international community around clear and shared priorities, objectives and achievement gaps that have been linked at the local level. But can the human-centred approach to development really be achieved by those most vulnerable within society? Or is this model for development unobtainable in a society that has an embedded top-down culture? In May 2012, Cunard Consultancy asked the same questions, as they engaged in a long term study on the possibilities of changing a top-down led project for vulnerable adults into a fully participatory, member-centred organisation, whereby adults with learning disabilities and difficulties could be fully involved in all aspects of decision-making within a charity. The findings of the study have had and will continue to have remarkable implications for other projects and charities, when organisations ‘pass over the stick’ to the people who benefit the most. By using selected frameworks and models, it has been shown that the culture of an organisation can adapt to new ways of being that will have a powerful impact on the service users, when they are no longer told what to do, but are inspired to make decisions within the organisation and beyond. With the introduction of Technology of Participation (ToP™) methods, the vision of new, inclusive ways of working can effectively put into practice. This is an empirical journey of success, frustration, sticky walls and empowerment.

References

Observation of the Effects of the Use of Telepresence Robot on Teaching Practices and Learning

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Abstract

Distance learning can take the form of both asynchronous and synchronous modes. These teaching formats propose learning resources which overcome the lack of face to face communication between teacher and learner. In conventional face-to-face learning approaches, the absence of a learner is not anticipated in teacher’s preparation of classes or during transmission. The common method of learners is to photocopy the notes taken by a classmate. Social Sciences researches link the importance of interaction and multimodal communication to support the understanding of speech (Cosnier, 1997; Jézégou, 2010). The remedial method does not allow the student being in a configuration allowing him to see, hear, to be seen and heard, thereby promoting awareness (Grosjean & Lacoste, 1999) and thus the understanding of teaching.

It is from this observation that we have experienced a telepresence robot, to allow Hormé, a student of Master, to participate in all her courses in distance learning but synchronously. She used it during four months.

The results of our study show that with Hormé, the use of interface prevented Hormé taking notes. She then had the feeling of having more leveraged other cognitive abilities (memory, attention and concentration) and had participated more actively than in face to face courses. The social bond with other students and the teaching staff has been maintained. Among teachers, data show the emergence of new practices: the transfer of documents by email before or during the class and individual courses via the robot. In addition, during classes, solicitations are more frequently observed directed towards Hormé as to other learners.

References


Inclusive Physical Education in Least Restricted Environment: The Perspective of Special Educational Needs By Physical Education Teachers Working in Schools of India

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Abstract

The paper focus on the implementation strategies for inclusive physical education program with least restricted environment for providing opportunities to the differently able students of Indian school to participate in physical education program, activities, exercises and sports along with the general student population. The concept of inclusive physical education program for achievement of the policy agenda of promoting and achieving success of inclusive education in Indian schools have been emphasized upon after the limitations of the existing adapted physical education program for the promotion of physical education program exclusively for the differently abled through modified activities but lack the social interaction with the individual and the society, which according to the social approach is the major cause of concern regarding the accomplishment of quality life to the neglected population and developing ability among the people to see every people as a human without segregating them in any specific category of privileged and less privileged. With a large population and increasing number of schools, effective delivery of physical education for the benefit of accommodating children with wide segment of abilities, inclusive physical education focus on providing less restricted environment for children through strategic initiatives of Accessibility, Acceptability, Feasibility. The physical educators working in different school need to be trained with the strategic skills for implementing inclusive physical education program for reducing the gap between the children varying in different abilities and capacities.
Many thanks for your participation and we hope to see you next year...!

World Congress on Special Needs Education (WCSNE-2016)
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Temple University, Philadelphia, USA

Have a great trip back home....!!!