West African Journal of Education (WAJE)

(For enhanced quality of research and discourse on Education)

Vol. XL 2020 ISSN: 0043-2997

Website: http//www.instituteofeducui.com

The West African Journal of Education (WAJE) pioneered academic/professional publishing in the Sub-region in the late 1950s. It has also nurtured the development of a good number of academic journals that have expanded the frontiers of educational research and information exchange over the years. The WAJE, in its revised form maintains the goal of becoming the most widely cited education journal in the sub-region, hence the current efforts that are being made to enhance the quality of reports and other discourses published in it.

The WAJE has the tripartite mission of:

(a) promoting a culture of excellence in educational research;
(b) encouraging the exchange of profound and innovative ideas capable of generating creative practices in education research and practice; and
(c) disseminating information on educational development that are not usually easily available to academics and practitioners.

The Journal accordingly publishes the following categories of papers:

(a) Research papers that move away from orthodoxy and which really break new grounds in terms of methodology and findings;
(b) Essays and issues papers that contribute to re-orienting received ideas, values; and practices.
(c) Documents emanating from national and international conferences, as well as from large-scale research projects that project emerging trends and thinking in educational development.

The WAJE is published once a year – in any area of education relevant to academics and practitioners. Please note that the conclusions drawn and the opinions expressed in the journal are those of the authors and not necessarily those of the Editorial Board.

EDITORIAL STATEMENT

Institutions are set up in every part of the World to promote what is considered as desirable learning. In these institutions, the expectations from the learners are the acquisition of approved knowledge while the responsibility of imparting it dwells on the teacher. We are happy to publish in this volume ten articles which focus attention on the stakeholders involved in teaching-learning for effectiveness of education at all levels.

Odinko and Okocha researched on the extent of E-Learning facilities acceptance, proficiency, training and retraining among academic staff in University of Ibadan while Uzoeshi and Odinko's article clearly identified textual characteristics of recommended English Textbooks used at pre-primary and primary 3 level using Fog Index requirements in Rivers State, Nigeria. Other areas presented in this volume include; comparison of the Content validity of 2018 Mathematics Test Items of Public Examining Bodies in Nigeria; Undergraduates' Entry Requirements and Student Personal Variables as Determinants of Academic Performance in Faculty of Science, University of Ibadan, Nigeria; Assessing Teacher Competence in Items Development through Evidence of Convergent Validity of Test Scores from Alternate Examinations; Students Achievement in English Language, Mathematics, Basic Science and Basic Technology as Predictor of their Success in SSCE Science and Managerial Potentials as Determinants of Students' Entrepreneurial Self Reliance in Technical Colleges

Only one paper focused specifically on the roles of teaching methods the achievement of learners (Prevailing Methods of Teaching Daily Living and Socialization Skills to Students with Intellectual Disability in Ilorin Metropolis, Kwara State). Lastly, psychological issues as they impact on learners' achievement were discussed in two different papers (Relationship between Home Literacy Environment and Emergent Literacy Skill of Pre-School Children in Ilorin West Local Government Area of Kwara State; Mathematical competence and attitude as predictors of students' performance in secondary school physics).

The editorial team believes that the time has come when the issues raised in this volume be integrated into the school curriculum to aid all round development of learners.

Thank you.

Monica N. Odinko
Editor

EDITORIAL COMPOSITION

Editor	-	Professor Monica N. Odinko
Assistant Editor:	-	Professor A. O.U. Onuka
Review Editors:	-	Professor J. A. Adegbile
		Dr Sherifat Akorede
		Dr E. O. Babatunde
Production Editor	-	Mr. Oladele
Copy Editors	-	Mr M. Olumi

EDITORIAL BOARD

Professor T. W. Yoloye, Institute of Education, University of Ibadan, Nigeria
Professor J. G. Adewale, Institute of Education, University of Ibadan, Nigeria
Professor F. E. B. Bakkabulindi, Makerere University Kampala, Uganda
Professor Abdul Mansaray, University of Sierra Leone, Sierra Leone
Professor Kafiu Y. A. Etsey, University of Cape Coast, Ghana
Dr Abdoulaye Barry, The University of The Gambia, The Gambia
Dr Andrews Cabbina, University of Cape Coast, Ghana

EDITORIAL ADVISORS

Professor P. N. Okpala, Institute of Education, University of Ibadan, Nigeria
Professor E. Adenike Emeke, Institute of Education, University of Ibadan, Nigeria

CONSULTING EDITORS

Emeritus Professor P. A. I. Obanya, Institute of Education, University of Ibadan, Nigeria
Professor C. O. Onocha, Institute of Education, University of Ibadan, Nigeria

CALL FOR PAPERS

The Editor of the West African Journal of Education (WAJE) invites authors to submit manuscripts for consideration in these scholarly journals. The call for paper describes the guidelines for submission. Before manuscript submission, please read and strictly follow the guidelines for authors carefully. This will ensure that the publication of your manuscript is as rapid as possible. Manuscripts could be submitted at any time for publication in any subsequent issue to the following email addresses: moniquengozi@yahoo.com; babatundeezekiel11@gmail.com

CONTENTS

Extent of E-Learning Facilities Acceptance, Proficiency, Training and Retraining among Academic Staff in University of Ibadan
Monica N. Odinko & [1]Sunday N. Okocha 1

Determining the Textual Characteristics of Pre-primary and Primary 3 Recommended English Textbooks Using Fog Index Requirements in Rivers State, Nigeria
Uzoeshi, Ifunanya Victoria & Odinko Monica Ngozi 19

Comparison of The Content Validity of 2018 Mathematics Test Items of Public Examining Bodies in Nigeria
Benson Adesina Adegoke & Friday Patrick Obot 31

Prevailing Methods of Teaching Daily Living and Socialization Skills to Students with Intellectual Disability in Ilorin Metropolis, Kwara State
Olubukola C. DADA 42

Undergraduates' Entry Requirements and Student Personal Variables as Determinants of Academic Performance in Faculty of Science, University of Ibadan, Nigeria
[1]Benedicta Omeghie, ISUNUEO & [2]Ikmat Olanrewaju, JUNAID 56

Assessing Teacher Competence in Items Development through Evidence of Convergent Validity of Test Scores from Alternate Examinations
ADEYEMO Emily Oluseyi 71

Mathematical competence and attitude as predictors of students' performance in secondary school physics
[1]Ademola, K. Badru & [2]Elizabeth, M. Aanu 79

Relationship between Home Literacy Environment and Emergent Literacy Skill of Pre-School Children in Ilorin West Local Government Area of Kwara State
[1]Usman Tunde Saadu, [2]Salamat Bolanle Issa & [3]Ganiyu Akanbi Yusuf 92

Students Achievement in English Language, Mathematics, Basic Science and Basic Technology as A Predictor of their Success in SSCE Science
Opoola Samson 101

Impact Evaluation of Justice Development and Peace Commission Agricultural Services Intervention on Socio-Economic Status of Farmers in Ogun East Senatorial District, Nigeria
[1] Olufemi Abiodun AJAYI; [2] Abiodun Adebowale OJO; [3]John Olumide ARULEBA 118

Managerial Potentials as Determinants of Students' Entrepreneurial Self Reliance in Technical Colleges
Gabriel Olukayode AYANNIYI 129

GUIDELINES FOR AUTHORS

General Information

Manuscripts submitted to our journals must be written in English. Full name of all authors should be indicated and the names of multiple authors are separated by a comma (please surname last). Provide the full affiliation for each author including institutional affiliation (or postal address), city, country, e-mail, etc. If multiple authors have contributed to the article, details of the corresponding author should be clear. Email address is compulsory for the corresponding author.

Structure and Format of the Manuscript

Contributors to the Journals are to respect the avowed principle of QUALITY in all its ramifications and ensure that:

(a) RESEARCH PAPERS are technically and faultlessly designed, executed and reported, with a clear contribution to knowledge.

(b) ESSAYS AND ISSUES PAPERS are analytically sound, presenting solid and original ideas that can positively influence change in educational thought, research and practice.

(c) The manuscript, which should include title, abstract, text, tables, figures, where necessary, should be type written on A4 size paper, with double-spacing and should not exceed 15 pages. The main text usually can be divided into separated sections, organised by Introduction, Methodology, Results, Discussion, Conclusion and Recommendation if any.

(d) Papers which should be written on only one side should be submitted in triplicate with a soft copy.

(e) Author(s) should strictly follow APA format 6th Edition (2010). Attention has been drawn to a few of the areas here.

Paper Title

An acceptable title should be brief, specific and informative, and should not be more than 23 words.

Abstract

The abstract should concisely state the purpose of the investigation and summarise the important findings and conclusions. It should be a single paragraph of generally not more than 250 words.

Keywords

Include 5 keywords or short phrases for indexing.

Introduction

What is the problem of the study?

Provide an overview of the scope and relevance of the research, especially with regards to previous advancements in the field and other related fields.

Methodology

Describe the methodology completely by presenting the research design or research type, choice of subjects, sampling technique used, instrumentation, including data collection procedure, statistical tests used for data analysis etc. If your manuscript is clinical or science-based, you need to include information on research duration, inclusion/exclusion criteria, processing and laboratory analysis. Use section headings/subheadings in a logical order to entitle each category or method.

Results

Present and illustrate your findings objectively and concisely, if appropriate, with figures/ tables. In the main text, describe each of your results clearly with suitable statistics *(Please also read more information on how to further present your results below).*

Discussion

Provide an interpretation of your results and make comparisons with previous studies. The significance of findings should be clearly described. If your results differ from your expectations, explain why that might have happened. If your results agree, then describe the theory that the evidence supported.

Conclusion and Recommendations

The main conclusions of your work should be presented. The contribution of the work to the behavioural and social sciences research and its implications should be emphasized. Recommendations should derive from the findings and may not be necessarily too many.

How to Present your Results

Table Title

Every table must have a unique title placed at the top. Titles should be clear and concise, and they should not be complete sentences. *(See an example below).*

Table Format

Table tools in Microsoft Word are strongly recommended for inserting a table. Tables created with the tab key or drawn by hand are inacceptable. Each table should be bordered by three horizontal lines, two lines above and one below. All other lines (rows and columns within the table should not be visible). In essence tables when completed should flow in one piece with the text (*See the example below).*

Table 1.2: Adjusted Mea ns for Treatment Effects and Critical Thinking

Independent Variable		Critical Thinking			95% Confidence Interval	
Treatment		M	SD	Std Error	Lower Bound	Upper Bound
(i)	Collaborative task method	58.18	11.14	1.26	55.70	60.67
(ii)	Self-directed learning	59.12	9.97	1.23	56.71	61.53
(iii)	Collaborative task method & Self-directed learning	59.17	9.72	1.13	56.94	61.39
(iv)	Traditional Method	57.71	12.75	1.16	55.42	59.99

Table Numbering and Citation

Tables in the main body of the text should be numbered consecutively and be referred to in text according to their appearance in the text. Ensure that your tables flow with the text in one piece after they have been created.

Figure Caption

Each figure should have a caption. The caption should be concise and typed below the figure, not on the figure area or above the figure. If figures have parts (for example, A and B), authors should ensure that all parts are explained in the caption. Ensure that the figures do not distort the flow of the text in the manuscript.

Figure Numbering & Citation

All figures like the tables are to be sequentially numbered with Arabic numerals. Figures should always be cited in text in consecutive numerical order.

Figure Resolution

Figures must be created at a minimum resolution of 300 dpi e. g JPG. Fuzzy or jagged figures or images and also line drawings done with Word will not be accepted. Authors are advised to replace them by conforming to the specified standard.

Scientific or Science- related Manuscripts

For Clinical or Science-related manuscripts the following should further be ensured:

Equation Format

The equation number should be placed in parentheses to the right of the equation. E.g. $H_{n+1}(1/n+1, 1/n+1, \ldots, 1/n+1)$ (1); Do not create equations as pictures. Use Math Type or insert symbols as normal text.

Equation Numbering and Citation

Equations where used should be referred to in text and be numbered consecutively with Arabic numerals to avoid ambiguities. Citation for an equation should be made by using "(1)," not "Eq. (1)" or "equation (1)," except at the beginning of a sentence e. g. "Equation (1) is…"

References

All sources cited in text must appear in the reference list, and all items in the reference list must be cited in- text. Use alphabetical system to arrange the references in the reference list. Ensure that all cited in- text sources are cited in the reference list. *Refer to APA referencing style (6th Edition) for proper citation of sources.* A few examples have been provided here.

References In-Text Citation Format

The APA citation format requires parenthetical citation within the text rather than endnotes or footnotes. Citations in the text provide brief information usually about the author, year of publication to lead readers to the source of information in the reference list at the end of the paper.

Compiling the List of References

Authors are requested to check all references for completeness, including author (s) names, year., paper title, publisher, journal heading, Volume, Number, pages for journal citations.

Books

Author(s) names, Year. Book title, Country and Publisher, e.g.

Adegoke, B. A. (2013). *Multivariate statistical methods for behavioural and social sciences research*, Ibadan: Estom Graphic Prints.

Journal Articles

Single Author

If the author's name appears in the text, place the author's name, year of publication in parenthesis, followed with a period or dot, the source title, volume and/or issue number, and page(s). **The example given is only for Journals with volume or issue number.**

Gillies, R. (2000). The maintenance of cooperative and helping behaviour in co-operative groups. *British Journal of Educational Psychology,* 70, 97-110.

Multiple Authors (2-7 authors)

List all the authors and follow the format for single author as indicated above e.g.

Alade, O. M. & Omoruyi, I. V. (2014). Table of specification and its relevance in educational assessment. *European Journal of Educational and Developmental Psychology*, 2(1), 1-17.

Conference Papers

State all authors' names, year in parenthesis, followed with a period or dot, article title, conference title, pp. e.g.

Strijbos, J. W. & Martens, R. L. (2001) Group-based learning: dynamic interaction in groups. Euro-CSCL Conference 2001, Maastricht, the Netherlands. March, 22-24.

Appendix

An appendix may be included (and is often helpful) in mathematical or computational modelling.

Ethical Consideration

Authors are to ensure that necessary ethical considerations are observed. These should include but not limited to the following:

i. While authors may not necessarily indicate respective contributions to the manuscript, an author should be someone who made significant contributions to the paper. Names should not be appended just on moral grounds.

ii. Ensuring that issues relating to confidentiality, consent and harm to participants have been addressed in the work.

iii. WAJE does not encourage the practice of duplicate publication or any type of plagiarism.

iv. Since the journals aims at publishing original high quality research work, submitted manuscript should not have been published anywhere or is been considered elsewhere for publication.

v. When received with sufficient evidence, plagiarized manuscript would not be considered for publication.

Manuscript Submission

Manuscripts could be submitted at any time for publication in any subsequent issue. Manuscripts are to be submitted both in hard and soft copies in triplicate to the Editor or Production Manager to the Editorial Board through the following email addresses: moniquengozi@yahoo.com; babatundeezekiel11@gmail.com

Manuscript Review

a. Papers are peer-reviewed; each paper attracts an assessment fee of N5, 000.00 or $30.00.

b. Neither the editor nor the editorial board shall be liable for article(s) lost in transit.

c. Those whose articles are accepted for publication will be so informed as regards other commitments.

d. The editor and the editorial board will not enter into correspondence with authors over rejected articles.

Initial Screening

Submitted manuscripts will be first screened by the editorial staff for completeness and to determine that the manuscripts meet the general guidelines of the journals. The Editor will decide to: (a) send the manuscript out for double blind review, (b) request initial revisions prior to the double blind review process, or (c) reject the manuscript.

Peer Review

Each manuscript will be screened by being subjected to rigorous and blind peer-review by a minimum of 2 peer reviewers. Referees who review a manuscript remain unknown to the authors. The journals ensure a submission acceptance rate based on merit and not favour, bias, or personal preference. All the reviewers forward to the editor a detailed report with their comments on the manuscript and their recommendation. Authors are sent reviewers' recommendation by the editorial staff and will not enter into any contact with reviewers.

Reviewers are expected to complete their reviews within 3 weeks. Papers which require revision will be sent to author(s) to be attended to within 5-7days. The editor will ensure that the quality of the revised paper is acceptable before it is published.

Proof Reading

Page proofs are considered to be the final version of the manuscript and so except for typographical or minor clerical errors which will be effected editorially, no changes will be made in the manuscript at the proof stage. Authors, who would want any major corrections, will be responsible for the expenses of making alterations of the original manuscripts at this stage. Proofs should be checked and returned within 3 days.

Copyright Permission

Authors who wish to use materials, objects, illustrations, pieces of works of art and the like may do so but are advised to obtain permission from copyright owners on their own well ahead of time, as such permission sometimes take time. Authors should also observe the principle of fair quotations while referring to other people's works. The WAJE or ER will not be liable for any copyright infringement.

Editorial Correspondence: If you have any question about the preparation of your article at any stage, please do not hesitate to ask.

Subscriptions: Inquires concerning subscription rates, orders and remittances should be addressed to the Editor.

Professor Monica N. Odinko
Editor at moniquengozi@yahoo.com

Review Policy

a. A reviewer should feel unqualified to review the assigned manuscript or affirms that he or she cannot meet the deadline for completion of the review. Such a reviewer should immediately notify the editor indicating his/ her inability to meet the process of reviewing the manuscript.

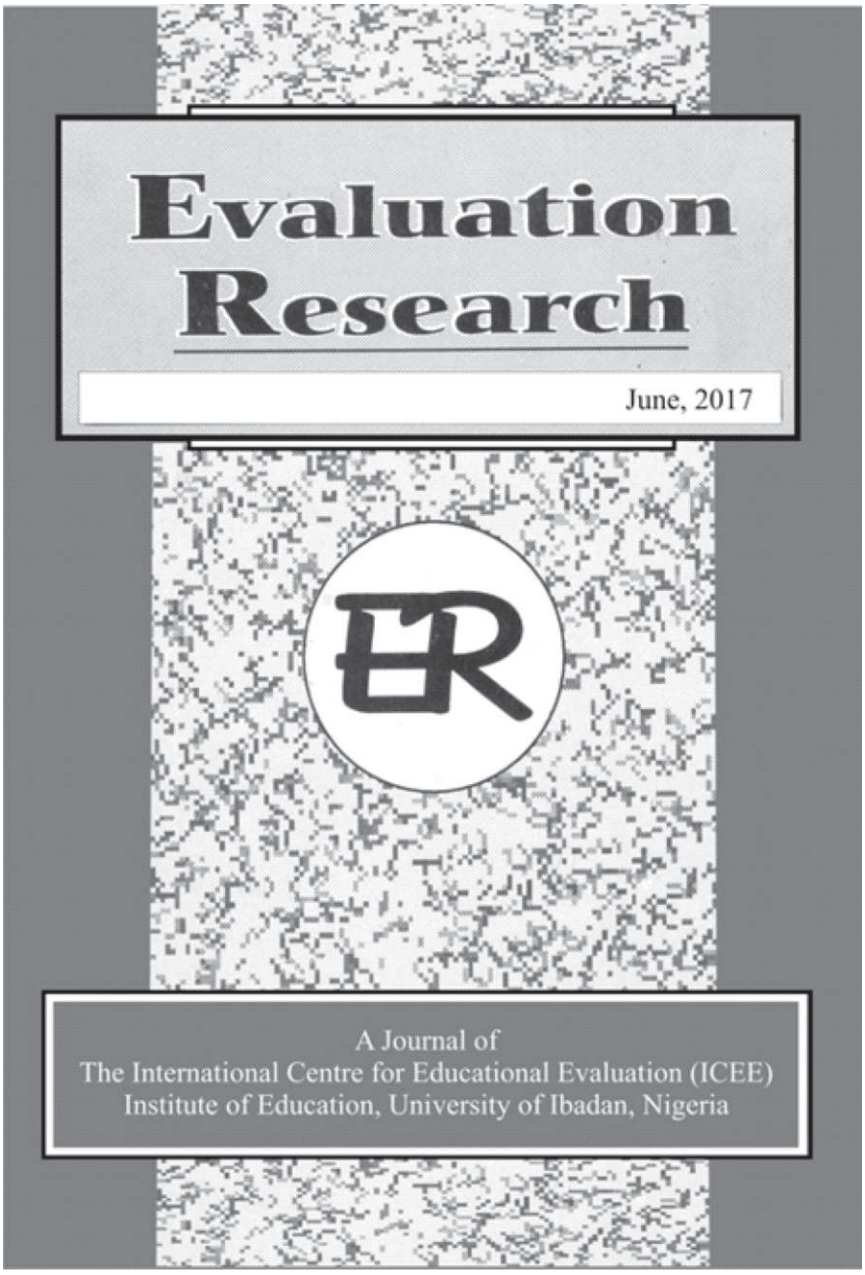
b. The reviewer should approach the peer-review job objectively without necessarily projecting personal criticism of the author.

c. Reviewers should not commit for personal research use any part of the manuscript under review before its publication.

d. The reviewer should as a matter of urgency notify the editor of any similarities between the manuscript under review and another article either published or under consideration by another journal. The reviewer should also immediately call the editor's attention to a manuscript containing plagiarized or falsified material or data.

Professor Monica N. Odinko
Editor at moniquengozi@yahoo.com

Introduction of a New Journal
Evaluation Research (ER)



EVALUATION RESEARCH (ER)

EVALUATION RESEARCH (ER) disseminates information and promotes discussion about evaluation of educational and social programmes. It is primarily concerned with evaluation activities of educational institutions and Non-Governmental Organisations as well as materials of interest to the practicing evaluator. Please note that the conclusions drawn and the opinions expressed in the journal are those of the authors and not necessarily those of the I. C E. E. or its Editorial Board. Request for permission to reproduce articles should be addressed to moniquengozi@yahoo.com; babtundeezekiel11.gmail.com

EDITORIAL COMPOSITION

Editor	-	Professor Monica N.Odinko
Assistant Editors:	-	Professor J. G. Adewale
Review Editor	-	Professor J. A Adegbile
	-	Dr E. O. Babatunde
	-	Dr Serifat F. Akorede
Production Editor	-	Mr S. D. Okocha
Copy Editors	-	Mr M. Olumi

Editorial Board

Kafiu Y. A. Etsey, Professor, University of Cape Coast, Ghana

Alice M. T. Kagoda, Professor, Makerere University, Kampala, Uganda

Omaze A. Afemikhe, Professor, Institute of Education, University of Benin, Nigeria

J. G. Adewale, Professor, Institute of Education, University of Ibadan, Nigeria

Ifeoma Isiugho - Abanihe, Professor, CEO, NABTEB, Nigeria

Consulting Editors

C. O. Onocha, Professor, I. C. E. E., Institute of Education, University of Ibadan, Ibadan, Nigeria

O. A. Oyediji, Professor, Faculty of Education, Ogun State University, Ago-Iwoye, Nigeria

Editorial Advisers

P. A. I. Obanya, Emeritus Professor of Education and former National Coordinator, Universal Basic Education (UBE), Abuja, Nigeria

P. N. Okpala, Professor, I.C.E.E., Institute of Education, University of Ibadan, Ibadan, Nigeria

CALL FOR PAPERS

The Editor of Evaluation Research (ER) invites authors to submit manuscripts for consideration in these scholarly journals. The call for paper describes the guidelines for submission. Before manuscript submission, please read and strictly follow the guidelines for authors carefully. This will ensure that the publication of your manuscript is as rapid as possible. **Manuscripts could be submitted at any time for publication in any subsequent issue to the following email addresses:**
moniquengozi@yahoo.com**,** sudaydom2000@yahoo.co.nz

West African Journal of Education
Vol. XL 2020 ISSN: 0043-2997

Extent of E-Learning Facilities Acceptance, Proficiency, Training and Retraining among Academic Staff in University of Ibadan

Monica N. Odinko & [1]Sunday N. Okocha
Institute of Education, University of Ibadan
E-mail: moniquengozi@yahoo.com & sundaydom2000@yahoo.co.nz
Correspondence Author[1]

Submitted: September 30, 2020; Revised: February 24, 2021; Accepted: March 7, 2021

Abstract

Use of e-learning facilities in higher education based on preliminary investigations has shown that there is no adequate documentation of various e-learning facilities tools that academic staff of higher institutions adopts and become proficient in ensuring effective delivery of their academic duties. The study therefore, examined the level of e-learning facilities acceptance, proficiency, training and training among academic staff of University of Ibadan. The study adopted non-experimental design. Population comprised lecturers in Faculties, Institutes and Centers in University of Ibadan campus. From existing strata, purposive sampling technique was used to select 14 Faculties which consist 48 Departments, 3 Institutes and 2 Centers which are academic units. Five lecturers were randomly selected in each unit, given a total sample of 265 lecturers. Data was collected using Lecturer's Acceptance, Proficiency and Training in E-Learning Facility (LAPTEL), constructed and validated by the researchers with ordinal alpha reliability of 0.97. Data was analysed using frequency, percentages and median. Results showed high level of acceptance (Median=3.55>2.50), proficiency (Median=3.26>2.50) and training (Median=3.11>2.50) on e-learning facilities among academic staff. However, majority of the sampled academic staff were not proficient in the use of electronic board (Median=2.23<2.50). The study, concluded that when e-learning facilities are widely accepted among academic staff of higher institutions, it leads to increased proficiency and the desire to acquire more knowledge through training. The study, recommended that academic staff should strive to improve their knowledge of e-learning facilities so as to be able to use e-learning facilities for teaching, research, presentation and publication proficiently.

Keywords: E-Learning facilities acceptance, E-Learning proficiency, Academic staff.

Introduction

E-learning facilities are increasingly being integrated in teaching, presentations, research and publications. Lecturers, therefore, need to upgrade their ICT skills and knowledge in

order to deal effectively with the demands and challenges necessitated by the introduction of e-learning facilities if they must be effective on their job. If they do not, they will suffer from skills obsolescence, (Grip & Loo 2001). In view of this and to avoid been obsolescence, academic staff in tertiary institutions should be able to use ICT as a tool for teaching, as a mind tool and as a tool to master a wide range of assessment paradigms that make use of ICT. The use of e-learning facilities appears to have transformed the world into an information driven-society and its citizens can access enormous sources of information and communication at a speed which has never been seen before. For instance, lecturers can now provide tutorial support to students through the e-mail, do teaching and presentations, carry out their research and publication activities through the use of computer systems. Lecturers can communicate with students, e-mark assignments, and give feedback on work done by students when they are well adapted to the use of e-learning facilities. These are effectively carried out only when one is proficient in the use of Information and Communication Technology (ICT). The expansion of ICT knowledge and skills and its availability to both teachers and students require the teacher to be more informed than the learner (Perraton, Robinson & Creed, 2002). The impact of e-learning facilities has forced education and training institutions to restructure teaching programmes and classrooms in order to minimize teaching and learning technology gaps between today and the future (Gulbahar, 2008).

Acceptance of electronic facilities is as a result of the emergence of information and communication technologies (ICTs) and the connectivity of internet networks to improve man's ingenuity and opportunities given that societies consciously depend on real-time information to be proactive and to discount the effects of environmental changes (Zhang, Lu & Boutaba, 2010; Bates & Jenkins, 2007; Al-Gahtani, 2016; Eze & Chinedu-Eze, 2018). ICT is an agent of socio-economic changes (Al-Gahtani, 2016) and a force for creative destruction in human existence (Wang, 2009), especially in the educational setting, where the academia and consultants progressed from providing simple teaching aids to interactive learning environments. Higher education institutions (HEIs) have embarked on rigorous programs that promote the use of ICTs for effective contact and online teaching and learning and for developing cognate skills needed to make socio-economic contributions in the knowledge world. Scholars such as (Hu and Hui, 2012; Bhuasiri, Xaymoungkhoun, Zo & Rho, 2012) argued that the IT-based innovations (e.g., e-commerce, e-learning, e-payment, e-service, or e-procurement) revolutionize the HEIs' competitive landscape and reflect the dramatic evolution from fairly predictable brick and mortar affairs to rapidly changing and often more unpredictable environment.

Electronic learning has been described as one of the most significant educational innovations driven by expanding array of technology enabled platforms that offer potential learners an alternative and innovative learning environment compared with traditional learning and, thus, represents IT-based innovation in education (Wang, 2009). The acceptance and use of ICTs by staff members plays an essential and

important role in higher education institutions. Worldwide, especially in developed countries, most staff members are able to use ICTs in their academic activities (Osman, 2014). It was further revealed that numerous universities in developing countries are greatly concerned about ICTs use and acceptance among staff members. ICTs training facilities and services are provided in developing countries' universities in order to enable staff members to efficiently use **c**omputer resources and have the ability to utilise various applications of the internet within their work (Osman, 2014). Research studies have confirmed the importance of instructors' perception of ICTs, which may enhance willingness to accept and facilitate or inhibit use of ICTs. Therefore, staff members' perceptions were suggested to be paid great attention, in order to fully understand the dynamics of acceptance and use of ICTs in HEIs (Almobarraz, 2007). The highest education institutions worldwide have progressively accepted ICTs as a means of instruction, curriculum, staff members' professional development, and students' learning development (Kumpulainen, 2007; Usluel, Aşkar & Baş, 2008; Oye, Iahad & Rahim, 2012b). Abbasi (2011) asserted that investing in the IT sector without measuring individuals' acceptance behaviour is a waste of resource. It could be envisaged that despite huge investment by the government in IT to promote internet usage, specifically within the context of HEIs, a very low acceptance/adoption rate could still be observed. Staff members are regarded as leaders of change, achieving and implementing the management plans on ICTs, hence, without their support, it is impossible to accept ICTs (Kripanont, 2007). Human factor has also, been determined as one of the major dimensions to consider in relation to the use of ICTs in HEIs and university teachers are the key human actors in this scene (Zare-ee, 2011).

E-learning or computer-based learning is a learning process that involves the connection of digitally conveyed content, system-based administrations and mentoring bolster (Zhang, Lu & Boutaba, 2010). In the words of Tom Friedman's mantra, the world is flat driven by ICT platforms, e-learning salvages HEIs given that they can rarely assemble trainees and students at a single location and get them trained on new systems, products or processes. Further, studies like (Keramati, Mofrad & Kamarani, 2011; Bhuasiri, Xaymoungkhoun, Zo & Rho, 2012; Chen & Tseng, 2012; Ahmed, 2010; Hu & Hui, 2012) showed that e-learning adoption by vast number of HEIs, professional organisations and learners is motivated by geographical and savvy remote reach, separate learning environment, juicy paybacks/returns, continuous upgrades of skills within a short time, learners' control in terms of adaptability, flexibility and convenience, and cost effectiveness in course/programme delivery and management.

In the developing countries, HEIs are facing poor funding and dearth of qualified staff, resources and access to educational materials (Ahmed, 2010; Al-Gahtani, 2016; Eze, Awa, Okoye, Emecheta & Anazodo, 2013) compared to those in the developed economies where they perceive that e-learning, with all its potentials, pools resources and develops quality materials to alleviate the shortcomings of their

traditional education strategies and make the HEIs more competitive since instructors are empowered to exchange their ideas with students devoid of restrictions on space, time or facilities (Bhuasiri *et al.,* 2012). Acceptance and use of ICTs by staff members shows that, it was relatively low in teaching but widely used by staff members (Osman, 2014). However, obvious advantages in spite of e-learning adoption in the developing economies, is rather too low because of the high illiteracy rate and poor educational funding by the federal and state government (Eze, Chinedu-Eze & Bello, 2018).

Proficiency in e-learning facilities describes the skills academic staff should possess in technology literacy and innovation (i.e. adopting and devising new and different ways in the use of e-learning facilities so as to be able to use these facilities for professional practice. Kirschner and Woperies (2003) highlighted some major ICT proficiencies teachers require as:

(i) Making personal use of ICT;

(ii) Mastery of a range of educational paradigms that make use of ICT;

(iii) Making use of ICT as mind tools;

(iv) Using ICT as tool for teaching;

(v) Mastering a range of assessment paradigms of basic and educational ICT proficiency.

In Nigeria, experience has shown that higher education institutions still have a long way to go with respect to optimal use of ICT in the learning process, as ICT proficiencies of the majority of academic staff at this level are yet beyond the basic level. Smaldino, Lowther, and Russel (2008) asserted that teacher educators need to be technologically proficient and information literate in this information age. The skills required of academic staff include the ability to use technology as a tool for facilitating teaching in the classroom, making presentations for easy dissemination, conducting research and publication of their findings to the world through their proficiency in adapting to e-learning facilities. Akudolu (2008) used capability as synonymous with competence; and knowledge and skills as proficiency. ICT proficiency has therefore been described as a vehicle and third stage out of four in the ICT competency developmental framework. UNESCO (2011) identified different levels of ICT competence as skills and knowledge that individual would possess at different levels in which proficiency is one of the four levels, as it is in higher institutions in Nigeria, which encompasses universities.

Lecturers in higher institution are required to acquire literacy and proficiency in Information and Communication Technology. ICT literacy is the ability of individuals to use ICT appropriately to access, manage, integrate and evaluate information, develop new understandings and communicate with others in order to participate effectively in society (MCEEDYA, 2008). UNESCO Institute for Technology in Education (2011) argued that ICT literacy skills are very important and are used as *gate skills* demanded

by employers when evaluating job applications. E-learning facilities skills are therefore important for Lecturers in order for them to select and use ICT devices correctly, utilise generic software tools, flexibly adapt to change in ICT infrastructure and applications, (UNESCO 2014). Lecturers should not only be able to use ICTs but become comfortable in using them if they are to participate fully in the contemporary tertiary institution life and perform their everyday tasks and be satisfied on their job. Guma, Faruque & Haolader (2013) submitted that there is a strong desire among teaching and administrative staff to integrate ICT into teaching-learning processes and administration. Ghavifekr & Rosdy (2015) indicated that well-equipped teachers with ICT tools and facilities integration, has a great effectiveness for both teachers and students during teaching and learning. Thephavongsa & Quingtang (2015) revealed that, the proficiency level among primary and secondary school teachers' perception of basic ICT applications differ and that male teachers are more proficient in the use of ICT than the female teachers.

Training and retraining have to do with the professional competence that shows the extent of cognitive abilities in the use of e-learning facilities among academic staff. Training has been identified by researchers as crucial for lecturers to learn how to manipulate ICT tools and integrate technology activities into e-learning system. Impeding factors on the use of ICT to enhance teacher's ICT competence through training have also been underscored (Thomas & Stratton, 2006; Tella, 2007). The acquisition for knowledge in any intellectual endeavour is driven by training. To be able to handle today's sophisticated e-learning facilities required undergoing training in the use of these facilities. Such training could be personal by enrolling in an e-learning training centers for academic staff who are or are not employed into the university system and training by institution in the use of e-learning facilities for academic staff of the institution where the institution trains her academic staff or send them on such training to learn and adapt to e-learning facilities usability. Carlson & Gadio (2002) state that teacher training in the use of ICT is the best starting point in the ICT policy of a country because they are the key to making learning happen. This according to them is so because teachers who succeed in making use of ICT in their work process, do not only contribute to improved learning outcomes in their students, but may also benefit personally from enhanced work productivity, reduced isolation and increased professional satisfaction.

Teachers in tertiary institutions need to be trained on the use of ICT in education with varying degrees and scope. This should be done so that they can be able to promote educational reforms necessitated by ICT (Nyika, 2015). Archibong & Effiom (2009) found that, designing of new learning activities, electronic presentation of materials and making use of internet were areas where academic staff needs training on ICT usage. Archibong, Ogbiji & Anijaobi-Idem (2010) reported that a number of academic staff has laptops and access to internet mainly at cybercafés but majority of them funded their

training in ICT. Ochogo (2013) claimed that while enhancing access to computer at workplace is likely to improve lecturers' skills and help them to overcome fear and anxiety associated with computer usage. The study contended that harmonizing the ICT training programme with academic semester at the university would enable academic staff acquire necessary ICT skills. Academic staff in higher institutions are largely involve in teaching, research, presentation, publication and some administrative assignments and such, proficiency in electronic learning (e-learning) facilities have potential to ensure effectiveness and efficiency in these areas.

Although, based on appraisal of related literatures, there is dearth of studies on acceptance, proficiency, training and retraining and on e-learning facilities while some concentrated on the secondary education level teachers and students. Also, extent of training and retraining on the use of e-learning facilities for academic work among academic staff in universities are dearth. This study therefore, sought to give a comprehensive description of the extent of e-learning facilities acceptance, proficiency, training acquired and use of these facilities among academic staff of University of Ibadan in carrying out academic work. More specifically, the description provided answers to the following research questions:

1. What is the level of Acceptance of e-learning facilities among academic staff of University of Ibadan?
2. What is the level of Proficiency in the use of e-learning facilities among academic staff of University of Ibadan?
3. What is the level of training and retraining on the use of e-learning facilities among academic staff of University of Ibadan?

Methodology

This study adopted non-experimental design of survey type. Population comprised lecturers in Faculties, Institutes and Centers in University of Ibadan campus. From the existing strata, purposive sampling technique was used to select 14 Faculties which consist 48 Departments, 3 Institutes and 2 Centers which are academic units. Five lecturers (from all cadres) were randomly selected in each unit, given a total sample of 265 lecturers used as sample for this study.

Instrumentation

The instrument used for data collection was Lecturer's Acceptance, Proficiency and Training in E-Learning Facility (LAPTEL) constructed by the researchers. The LAPTEL was divided into two sections A and B. Section A generated information on the demographic details of the academic staff while Section B had three sub-sections with response format of Not Very Like Me (NVLM) 1, Not Like Me (NLM) 2, Much Like Me (MLM) 3 and Very Much Like Me (VMLM) 4. The first sub-section contains twenty-two

(22) items used to elicit information on acceptance level of e-learning facilities; the second sub-section contain thirty-nine (39) items used to elicit information on level of proficiency in the use of e-learning facilities while the third sub-section contain nine items used to elicit information on the extent of training and retraining engaged in by academic staff. The instrument was validated by the researchers and yielded ordinal alpha reliability of 0.97. The researchers visited the academic staff in the sampled academic units to administer the instruments and data collected were analysed using frequency, percentages and median.

Results

Research Question 1: What is the level of acceptance of e-learning facilities among academic staff of University of Ibadan?

Table 1: Level of Acceptance of E-learning Facilities

S/N	ITEMS	NLM	MLM	Med
	Electronic Board			
1	I find the electronic board easy to use	116 (43.8)	149 (56.2)	3
2	I find it easy to instruct electronic board to do what I want it to do	127 (47.9)	138 (52.1)	3
3	Learning how to operate electronic board is easy for me	101 (38.1)	164 (61.8)	3
4	It is easy for me to become skillful in using electronic board	72 (27.1)	193 (72.9)	3
5	I intend to use the electronic board in the future	41 (15.5)	224 (84.5)	3
	Computer			
6	I find the computer easy to use	5 (1.9)	260 (98.1)	4
7	Learning how to operate computer is acceptable for me	11 (4.2)	254 (95.8)	4
8	It is easy for me to become skillful in using computer	9 (3.4)	256 (96.6)	4
9	I intend to use the computer in the future	25 (9.4)	240 (90.6)	4
10	I will recommend the use of computer for teaching to my colleagues	9 (3.4)	256 (96.6)	4
	Internet			
11	I find it easy with the aid of internet to source materials online	11 (4.1)	254 (95.9)	4
12	Learning how to surf the internet is easy	18 (5.7)	247 (93.2)	4
13	It is easy to be skillful in using internet	7 (2.6)	258 (97.4)	4
14	I intend to use the internet in the future	19 (7.2)	246 (92.8)	3
	Projector			
15	I find the projector easy to use	28 (10.6)	237 (89.4)	4
16	Learning how to operate projector is easy	34 (12.8)	231 (87.2)	3
17	It is easy to become skillful in using projector	25 (9.4)	240 (90.6)	4
18	I intend to use the projector in the future	27 (10.2)	238 (89.8)	4
	Application software			
19	I find application software easy to use	45 (17)	220 (83)	3
20	I find it easy with the aid of application software to do academic work	45 (17)	220 (83)	3
21	Learning how to use application software is easy	51 (19.3)	214 (80.8)	3
22	It is easy to become skillful in using application software	44 (16.6)	221 (83.4)	4

Criterion median=2.50; Weighted median=3.55; N = 265; Percentages in parenthesis; Med=median

Key: NLM = Not like me; MLM = Much like me

From Table 1, items 1 to 5 cover the level of acceptance of electronic board by academic staff in University of Ibadan. The result reveals that 84.5% of the respondents indicated that they intend to use electronic board in the future (Item 5) while 72.9% of them claimed that it is easy for them to be skillful in the use of electronic board (Item 4) and 61.8% indicated that it is easy for them to learning how to operate electronic board (Item 3). Also, 56.2% of the respondents indicated that it is easy for them to use electronic board (Item 1) while 52.1% claimed that they find it easy to instruct the electronic board of what they want to do (Item 2). The Table further shows that the median values of all the items are higher than the criterion median of 2.50indicating that academic staff in the sampled academic units in the University of Ibadan accept the use of electronic board

Furthermore, as shown in Table 1, items 6, 7, 8, 9 and 10 cover the level of acceptance of computer by academic staff in University of Ibadan. Findings in Table 1 reveal that 98.1% of the respondents indicated that they find it easy to use computer (Item 1) while 96.6% of the respondents indicated that it is easy for them to be skillful in the use of computer and that they will recommend its usage for teaching to their colleagues (Items 8 and 10). Also, learning how to operate computer was acceptable (Item 7) by 95.8% of the respondents while 90.6% indicated the use of computer in the future (Item 9). The Table also shows that the median values of all the items are higher than the criterion median of 2.50. Thus, one can infer that academic staff in the sampled academic units of the University of Ibadan indicated high acceptance of use of computer.

Also, information as indicated in Table 1 shows that items 11, 12, 13 and 14 cover the level of acceptance of internet by academic staff in University of Ibadan. Findings in Table 1 reveal that majority of the respondents (97.4%) indicated that it is easy for them to be skillful in use of internet (Item 13), sourcing materials online is easy with the aid of internet (95.9% Item 11), 93.2% indicated that they learn easily how to surf the internet (Item 12) while 92.8% indicated that they intend to use the internet in the future (Item 14). The Table also shows that the median values of all the items are higher than the criterion median of 2.50 implying that academic staff in the sampled academic units of the University of Ibadan showed high acceptance of use of internet.

In addition, Table 1 also reveals that, items 15 to 18 cover the level of acceptance of projector by academic staff in University of Ibadan. The Table reveals that 90.6% of the respondents indicated that it is easy for them to be skillful in use of projector (Item 17), 89.8% claimed that they intend to use the projector in the future (Item 18), 89.4% of the respondents indicated that they find it easy to use projector (Item 15) while 87.2% claimed that it is easy for them to learn how to operate projector (Item 16). The Table further reveals that the median values of all the items are higher than the criterion median of 2.50 indicating that academic staff in the sampled academic units of the University of Ibadan showed high acceptance of use of projector.

Further, items 19, 20, 21 and 22 cover the level of acceptance of application software by academic staff in University of Ibadan. The Table shows that the median values of all the

items are higher than the criterion median of 2.50. Furthermore, 83.4% of the respondents indicated that it is easy for them to be skillful in the use of application software (Item 22), 83% of the respondents claimed that their academic work is made easy with the aid and use of application software (Items 20 and 19) while 80.8% of the respondents indicated that it is easy for them to learn how to use application software. The result further shows that academic staff in the sampled academic units of the University of Ibadan indicated high acceptance in the use of application software. It can therefore, be concluded, that the academic staff in the sampled academic units in the University of Ibadan showed high acceptance of the use of e-learning facilities for their academic activities since the weighted median (3.55) of all the items is greater than the criterion median (2.50).

Research Question 2: What is the level of proficiency in the use of e-learning facilities among academic staff of University of Ibadan?

Table 2: Level of Proficiency in E-learning Facilities

S/N	ITEMS	NLM	MLM	Med
	Electronic Board			
23	I enjoy using electronic board during teaching	124 (46.8)	141 (53.2)	3
24	I can connect the electronic board to computer without assistance	123 (46.4)	142 (53.6)	3
25	Electronic board tools are too complex to adapt to	194 (73.2)	71 (26.8)	2
26	Use of electronic board makes my teaching interesting	114 (43.1)	151 (56.9)	3
27	The use of electronic board is complicated	222 (83.8)	43 (16.2)	2
28	My interaction with students using electronic board delays my teaching	228 (86.1)	37 (14)	1
	Computer			
29	I have been using computers for more than 5 years	13 (4.9)	252 (95.1)	4
30	I spend more than 5 hours daily on computers	39 (14.7)	226 (85.3)	4
31	I use computer to prepare lecture notes	24 (9.0)	241 (91.0)	4
32	I use computer for making presentations at seminars	14 (5.3)	251 (94.7)	4
33	I use computer for making presentations at conferences	13 (4.9)	252 (95.1)	4
34	I use computer for making presentations at workshops	14 (5.3)	251 (94.7)	4
35	I use computer for teaching/learning	20 (7.5)	245 (92.5)	4
36	I use computer to record teaching activities in the classroom	90 (34.0)	175 (66.0)	3
	Internet			
37	I prefer to use internet connection in the office for academic work	45 (17.0)	220 (83.0)	4
38	I prefer using internet facility at home for academic work	26 (9.8)	239 (90.2)	4
39	I have been using internet for more than 5 years	13 (4.9)	252 (95.1)	4
40	I spend more than 5 hours daily on internet	61 (23.0)	204 (77.0)	3
41	I send materials to students using internet before class	92 (34.7)	173 (65.3)	3
42	I created an online group platform where students submit their assignments (e.g. Google classroom, Edmodo)	263 (99.2)	2 (0.8)	2
43	I encouraged my students to interact with me through e-mails	61 (23.0)	204 (77.0)	3

	Projector			
44	I use projector to teach in classroom	66 (24.9)	199 (75.1)	3
45	I manage the operations of projector during lectures	74 (27.9)	191 (72.1)	3
46	I manage the operations of projector during conferences presentations	84 (31.7)	181 (68.3)	3
47	I make presentations without the use of projector	138 (52.1)	127 (47.9)	2
48	I can connect computer to projector without assistance	48 (18.1)	217 (81.9)	3
	Application Software			
49	I use MS word often than other application packages	35 (13.2)	230 (86.8)	4
50	I use MS word to create tables	43 (16.2)	222 (83.8)	4
51	I use MS word to draw diagrams	70 (26.4)	195 (73.6)	3
52	My papers for publications are often in MS word format	33 (12.5)	232 (87.5)	4
53	I use PowerPoint often than other application packages	79 (29.8)	186 (70.2)	3
54	I use PowerPoint to create slides	26 (9.8)	239 (90.2)	4
55	I use PowerPoint to make presentations during teaching	38 (14.3)	227 (85.7)	4
56	I use PowerPoint to make presentations at conferences	20 (7.6)	245 (92.4)	4
57	I prefer creating slides directly on PowerPoint instead of typing on MS word	51 (19.2)	214 (80.8)	4
58	I use MS excel often than other application packages	134 (50.6)	131 (49.4)	2
59	I use MS excel to create tables of large data	75 (28.3)	190 (71.7)	3
60	I use MS excel for analysis	88 (33.2)	177 (66.8)	3
61	I use MS excel for creating different graphs	76 (28.7)	189 (71.3)	3

Criterion median = 2.50; Weighted median = 3.26; N = 265; Percentages in parenthesis; Med=median;

Key: NLM = Not like me; MLM = Much like me

As indicate in Table 2, items 23 to 28 cover the level of proficiency in the use of electronic board by academic staff in University of Ibadan. The Table shows that the median values of items 23, 24 and 26 are higher than the criterion median of 2.50 while the median values of items 25, 27 and 28 are lower than the criterion median of 2.50 which were divergent options of the items. The further reveals that 86.1% of the respondents indicated that interacting with students using electronic board delays their teaching (Item 28), 83.8% of the respondents claimed that the use of electronic board is complicated (Item 27) while 73.2% of them indicated that the use of electronic board tools is too complex for them to adapt with (Item 25). However, only 56.9% of the respondents indicated that the use of electronic board makes their teaching interesting (Item 26), 53.6% claimed they can connect the electronic board to computer without assistance (Item 24) whereas 53.2% were of the opinion that they enjoy using electronic board during teaching (Item 23).

The level of proficiency in the use of computer by academic staff in University of Ibadan was also examined and information on this aspect were generated using items 29 to 36. The table shows that the median values of all the items are higher than the criterion median of 2.50. The Table further reveals that more than 90% of the respondents indicated that they have been using computer for more than 5 years and for making presentations at conferences (Items 29 and 33), at seminars and workshops (Items 32 and 34), for

teaching/learning (Item 35) while as well as to prepare their lecture notes (Item 31). However, 66% of them indicated they use computer to record their teaching activities in the classroom (Item 36). Thus, because the actual median values generated are higher than expected, it can be concluded that academic staff in the sampled academic units of the University of Ibadan showed high proficiency in the use of computer.

In addition, Table 2 show that items 37 to 43 were used to measure the level of proficiency in the use of internet by academic staff in University of Ibadan. The result indicates that majority of the respondents (99.2%) indicated that they never created an online group platform like google classroom/Edmodo where students submit their assignments (Item 42). However, 95.1% of the respondents indicated that they have been using the internet for more than 5 years (Item 39) and 90.2% of them claimed that they prefer to use internet facility at home (Item 38) while 83% of them indicated they prefer to use internet connection in the office (Item 37) for their academic work. Furthermore, 77% of the respondents claimed that they spend over 5 hours daily on internet and encouraged their students to interact with them through e-mails (Items 40 and 43) while 65.3% indicated that they send materials to students using internet before class (Item 41). Therefore, since the Table reveals that the median values of items 37, 38, 39, 40, 41, and 43 are higher than the criterion median of 2.50 while item 42 is lower than the criterion median of 2.50 which is divergent option on the item one can conclude that academic staff in the sampled academic units of the University of Ibadan showed high proficiency in the use of internet.

Furthermore, the level of proficiency in the use of projector by academic staff in University of Ibadan was also measured using, items 44 to 48. Table 2, reveals that 81.9% of the respondents indicated that they can connect computer to projector themselves (Item 48) while more than 70% claimed that they use projector to teach in the classroom (Item 44) and they can manage the operations of projector during lectures (Item 45), 68.3% indicated that they can do same during conference presentations (Item 46) while only 47.9% indicated that they make presentations without the use of projector. The Table also shows that median values of 4 items (44, 45, 46 and 48) are higher than the criterion median of 2.50 while only item 47 is lower than the criterion median of 2.50 which is divergent option on the item. Based on this, one can infer that academic staff in the sampled academic units of the University of Ibadan showed proficiency in the use of projector.

To measure the level of proficiency in the use of application software by academic staff, items 49 to 61 were used. The Table further reveals that more than 90% of the respondents indicated that they use PowerPoint to make presentations at conferences (Item 56) and use it to create slides (Item 54). Also, more that 80% of the respondents claimed that their published papers are often in MS word format (Item 52), often used MS word than other application packages (Item 49), make presentations with PowerPoint during teaching (Item 55), use MS word to create tables (Item 50) as well as creating slides directly on PowerPoint instead of typing on MS word (Item 57). Further, more than 70% of them claimed that they prefer to use MS word to draw diagrams (Item 51), create tables of large

data (Item 59), create different graphs (Item 61) with the use of MS excel and also use PowerPoint often than other application packages (Item 53) while 66.8% of them claimed that they use MS excel for analysis (Item 60). However, 50.6% of the respondents indicated that they do not use MS excel often as they use other application packages (Item 58). The Table also shows that the median values of items 49, 50, 51, 52, 53, 54, 55, 56, 57, 59, 60 and 61 had weighted median (3.26) which is higher than the criterion median of 2.50 while the median value of only item 58 is lower than the criterion median of 2.50 which is divergent option on the item. This is an indicator that academic staff in the sampled academic units of the University of Ibadan showed high proficiency in the use of application software. It can therefore, be concluded, that the academic staff in the sampled academic units in the University of Ibadan showed high proficiency in the use of e-learning facilities for their academic activities.

Research Question 3: What is the level of training and retraining on the use of e-learning facilities among academic staff of University of Ibadan?

Table 3: Level of Training and Retraining on E-learning Facilities

S/N	ITEMS	NLM	MLM	Med
62	I consider training on e-learning facilities a continuous learning	23 (8.7)	242 (91.3)	4
63	I often participate in e-learning facilities training sponsored by my institution	70 (26.4)	195 (73.6)	3
64	I strive very hard to acquire training on e-learning facilities	37 (14.0)	228 (86.0)	3
65	Retraining on e-learning facilities is considered a personal development in my institution	72 (27.2)	193 (72.8)	3
66	I have no time for retraining on e-learning facilities due to workload	190 (71.7)	75 (28.3)	2
67	I have not enjoyed training on e-learning facilities provided by my institution since I joined the workforce	107 (40.4)	158 (59.6)	3
68	E-learning training programmes should be organised for lecturers	19 (7.2)	246 (92.8)	4
69	I sponsor myself to acquire the skills on computer usage	44 (16.6)	221 (83.4)	4
70	The University sponsors me for computer skills acquisition	187 (70.6)	78 (29.4)	2

Criterion median = 2.50; Weighted median = 3.11; N = 265; Percentages in parenthesis; Med=median.

Key: NLM = Not like me; MLM = Much like me

From Table 3, items 62, 63, 64, 65, 66, 67, 68, 69 and 70 cover the level of training and retraining on the use of e-learning facilities by academic staff in University of Ibadan. The Table shows that the median values of items 62, 63, 64, 65, 67, 68, and 69 are higher than the criterion median of 2.50 while items 66 and 70 are lower than the criterion median of 2.50 which were divergent options of the items Table 3, further reveal that 92.8% of the respondents indicated that there is need to organise training programmes on e-learning facilities for them (Item 68) and 91.3% of the respondents claimed that they consider training on e-learning facilities a continuous learning (Item 1). Also, 83% of the respondents indicated that they strive very hard to acquire training on e-learning facilities (Item 64) while 83.4% of them claimed that they sponsor themselves to acquire the skills on computer usage (Item 69). Furthermore, 73.6% of the respondents indicated that they often participate in e-learning facilities training sponsored by the institution (Item 63) even though 72.8% of them claimed that retraining on e-learning facilities is considered a personal development in the institution (Item 65). However, 71.7% of the respondents indicated that they do not allow their workload to hinder them from participating in retraining on e-learning facilities (though 28.3% claimed that they have not time for such retraining on due to their workload) (Item 66) and 70.6% of them claimed that the university do not sponsor them for computer skill acquisition (only 29.4% indicated that they enjoyed sponsorship for such skill acquisition by the university) (Item 70). On the other hand, only 59.6% of the respondents indicated that they have enjoyed training on e-learning facilities provided by the institution since they joined the workforce (Item 67). However, result shows that academic staff in the sampled academic units of the University of Ibadan considered training and retraining on the use of e-learning facilities useful and essential.

Discussion

The result on the level of acceptance of e-learning facilities among academic staff in sampled academic units of University of Ibadan revealed that academic staffs realised the need and importance of accepting the use of e-learning facilities in ensuring effectiveness in their academic activities. The finding revealed a significant acceptance of e-learning facilities. This acceptance was also affirmed by the studies of Kumpulainen (2007); Ushiel, Aşkar & Baş (2008); Oye, Iahad & Bahim (2012b); Guma, Faruque & Haolader (2013) that ICTs have progressively been accepted as a means of instruction, curriculum, staff members' professional development and students' learning development. However, the finding of this study disagreed with that of Kripanont (2007) who found a very low acceptance/adoption rate of ICT facilities in higher education institutions. The high acceptance level of e-learning facilities among academic staff in the sample unit of the University of Ibadan could be due to factors such as provision of physical infrastructure, support from institutional management as well as organisational culture to use these facilities.

The result on the level of proficiency in the use of e-learning facilities among academic staff in sampled academic units of University of Ibadan revealed a very high level of proficiency in computer, projector, internet and use of application software. This corroborates the finding of Nwachukwu & Asom (2015) in a study on utilisation of computer technology for academic work by lecturers; these lecturers have average level of computer literacy skills and use it only for typing/printing of lecture notes, computation of students' results, surfing the internet for information among others. The finding of this study also supports that of Rosaini & Mahd-Arif (2010) who revealed that majority of teachers were knowledgeable in basic ICT. Also, it was clearly shown that the key factor in making ICT programs successful in schools is to upgrade the level of ICT knowledge among teachers (Moganashwari & Parilah, 2013). However, the finding of this study revealed that most academic staff were not proficient in the use of electronic board for academic work which could be attributed to the fact that some of the academic staff forget how to use the features of the electronic board and so could not manage its uses for teaching. Hence, most of them find it difficult to adapt with. This supports the findings of Al-Faki & Khamis (2014) who investigated the difficulties that teachers experience when they use the interactive board in English language classes. The study found that teachers face challenges when it comes to usage. The finding of this study also supports that of Nyika (2015) who revealed that lecturers lack ICT competencies, which as a result hinder teaching, learning and communication tool.

The result on the level of training and retraining on the use of e-learning facilities among academic staff in sampled academic units of University of Ibadan revealed that academic staff considered training on e-learning facilities a continuous learning and often participate in such training either sponsored by institution or personal. However, some of the academic staff claimed that, they have no time for training on e-learning facilities due to workload, and that the institution never supported them in such training which could be that they never had the opportunity to be part of those that the university often sponsor for computer skills acquisition. The finding of Al-Wehaibi, Al-Wabil, Alshawi & Alshöankity (2010) also asserted that staff members need to be trained in order to deal with different opportunities made possible through the use of ICTs in education, virtual universities and distance education to become more feasible on platform for higher education institutions. The finding of this study also supports that of Archibong, Ogbiji & Anjaobi-Idem (2010) on ICT competence among academic staff that majority of the academic staff funded their ICT training.

Implication for Tertiary Institutions

The findings of this study have implications for academic staff to accept and adapt to the use of e-learning facilities and to improve their knowledge through training and retraining so as to become well-informed on how to use e-learning facilities for teaching, research, presentation and publication.

Conclusion and Recommendations

The extent of e-learning facilities acceptance, proficiency, training and retraining among academic staff in higher institutions of learning was established. The main inference drawn from this study was that acceptance, proficiency, training and retraining on e-learning facilities is very crucial if job effectiveness among academic staff in higher institution is expected to be enhanced. It could be concluded therefore, that when e-learning facilities is widely accepted among academic staff of higher institutions, it leads to increased proficiency and the desire to acquire more knowledge through training. Based on the findings of this study, it was recommended that academic staff should strive to improve their knowledge of e-learning facilities so as to be able to use e-learning facilities for teaching, research, presentation and publication proficiently and that School administrators should introduce consistent training and retraining especially in the use of e-learning facility like electronic board where academic staff is deficient.

References

Abbasi, M. S. (2011). Culture, demography and individuals, technology acceptance behaviour: A PLS based structural evaluation of an extended model of technology acceptance in South-Asian country context, information systems evaluation and integration group, Ph.D. Thesis, Brunel Business School, Brunel University, London.

Ahmed, T. (2010). E-learning as a new technological application in higher education and research: An empirical study and proposed model. *The International Academic Research Journal*, 2, 2–13.

Akudolu, L. R. (2008). Quest for teacher needed competencies for instructional use of ICT: Views from European Union (EU). *Nigerian Journal of Teachers Education, Vol. 41.*

Al-Faki, I. M. & Khamis, A. H. A. (2014). Difficulties facing teachers in using interactive whiteboards in their classes. *American International Journal of Social Science. Vol. 3 No. 2.*

Al-Gahtani, S. S. (2016). Empirical investigation of e-learning acceptance and assimilation: A structural equation model. *Applied Computing and Informatics*, 12(1), 27–50.

Almobarraz, A. (2007). Perceived attribute of diffusion of innovation theory as predictor of internet adoption among the faculty members of Imam Mohamed Bin Saud University, PhD Thesis, University of North Texas.

Al-Wehaibi, K., Al-Wabil, A. Alshawi, A. & Alshöankity, (2010). Barriers to internet adoption among Faculty in Saudi Arabian Universities.

Archibong, I. A. & Effiom, D. O. (2009). ICT in University Education: Usage and Challenges among Academic Staff. African Research Review. *International Multi-Disciplinary Journal, Ethiopia, Vol. 3 (2)*, *404-414.*

Archibong, I. A., Ogbiji, J. E. & Anijaobi-Idem, F. (2010). ICT competence among academic staff in universities in Cross Rivers State, Nigeria. *Computer and Information Science* Vol. 3, No. 4. www.ccsenet.org/cis.

Bates, S. R. & Jenkins, L. (2007). Teaching and learning ontology and epistemology in Political Science. *Political Studies Association*, 27(1), 55–63.

Bhuasiri, W., Xaymoungkhoun, O., Zo, H. & Rho, J. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. *Computers & Education*, 58, 843–855.

Carlson, S. & Gadio, C. T. (2002). Teacher professional development in the use of ICT. In Haddad, W. D. and Draxler, A. (Eds.), *Technology for education*. 118–132. Washington, DC: UNESCO; Academy for educational development.

Chen, H. & Tseng, H. (2012). Factors that influence acceptance of web-based e-learning systems for the in-service education of junior high school teachers in Taiwan. *Evaluation and Program Planning*, 35, 398–406.

Eze, S. C., Awa, H., Okoye, J., Emecheta, B. & Anazodo, R. (2013). Determinant factors of information communication technology (ICT) adoption by government-owned universities in Nigeria: A qualitative approach. *Journal of Enterprise Information Management,* 26(4), 427–443.

Eze, S. C. & Chinedu-Eze, C. V. (2018). Examining information and communication technology (ICT) adoption in SMEs: A dynamic capabilities approach. *Journal of Enterprise Information Management*, 31(2), 338–356.

Eze, S. C., Chinedu-Eze, V. C. & Bello, A. O. (2018). The utilisation of e-learning facilities in the educational delivery system of Nigeria: A study of M-University. *International Journal of Educational Technology in Higher Education. Vol.* 15:34.

Ghavifekr, S. & Rosdy, W. A. W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science (IJRES),* 1(2), 175-191.

Grip, A. & Loo, J. V. (2001). *The economics of skills obsolescence*: A review. *TijdshriftvoorArbeidsvaagstukken* 13, 213-221.

Gulbahar, Y. (2008). *ICT usage in higher education: A case study of pre-service teachers and instructors. The Turkish Journal of Educational Technology.* Vol. 7, Issue 1 Article 3.

Guma, A., Faruque, A. & Haolader, K. M. (2013). The role of ICT to make teaching-learning effective in higher institutions of learning in Uganda. *International Journal of Innovative Research in Science, Engineering and Technology*. Vol. 2, Issue 8.

Hu, P. J. H. & Hui, W. (2012). Examining the role of learning engagement in technology-mediated learning and its effects on learning effectiveness and satisfaction. *Decision Support Systems*, 53(4), 782–792

Keramati, A., Mofrad, M. & Kamarani, A. (2011). The role of readiness factors in e-learning outcomes: An empirical study. *Computer & Education*. Vol. 57, 1919–1929.

Kirschner, P. & Woperies, I. G. J. H. (2003). Mind tools for teacher. Technology, Pedagogy, and Education, 12(1): 127-149. Available from http://www.triangle.co.uk/jit/ Accessed 30 November, 2018.

Kripanont, B. N. (2007). Examining a technology acceptance model of internet usage by academics within Thai Business School. Ph.D. Thesis, School of Information Systems, Faculty of Business and Law, Victoria University Melbourne, Australia.

Kumpulainen, K. (2007). Educational technology: Opportunities and challenges, University of Oulu, Finland.

Ministerial Council on Education, Employment, Development, and Youth Affairs (MCEEDYA) (2008). *National assessment program information and communication technology literacy years 6 and 10: An assessment domain for ICT literacy*. Carlton: curriculum corporation. http://www.nap.edu.au/documents/MCCEDYA/ICTLPublicReport.pdf. Accessed 30 October, 2018.

Moganashwari, K. & Parilah, M. S. (2013). Knowledge, attitude and use of ICT among ESL teachers. *Proceeding of the Global Summit on Education.* 11-12 March 2013, Kuala Lumpur. Organized by WorldConferences.net.

Nwachukwu, V. N. & Asom MLS, F. (2015). Utilisation of computer technology for academic work by lecturers of University of Jos – Nigeria. *International Journal of Library and Information Science Studies*. Vol.1, No.2, 14-22.

Nyika, R. (2015). Adapting to the changes necessitated by ICTs in education and training: An assessment of the use of ICTs in the division of education, training and strategic studies at Gweru Polytechnic. *Greener Journal of Educational Research*, 5(6):215-222.

Ochogo, N. K. (2013). The influence of information and communication technology infrastructure and competence of lecturers on their preparedness for electronic learning: The case of the University of Nairobi, Kenya. Ph.D. Thesis, Distance Education of University of Nairobi.

Osman, N. A. A. (2014). The acceptance and use of information and communication technologies by staff members in Khartoum state's universities, Ph.D. Thesis, Dresden University of Technology, Sudan.

Oye, N. D., Iahad, A. N. & Rahim, A. N. (2012b). A comparative study of acceptance and use of ICT among university academic staff of ADSU and LASU: Nigeria, *International Journal of Science and Technology*. Vol. 1(1).

http://www.journalofsciencestechnology.org/archive/2012/jan_vol_1_no_1/649431325511381.pdf.

Perraton, H., Robinson, B. & Creed, C. (2002). *Teacher education through distance learning*: Technology, curriculum, evaluation, cost. Paris, UNESCO.

Rosnaini, M. & Mohd-Arif, H. I. (2010). Impact of training and experience in using ICT on in-service teachers' basic ICT literacy. *Malaysian Journal of Education Technology*, 10(2): 1-8.

Smaldino, S. E., Lowther, D. L. & Russell, D. J. (2008). *Instructional technology and media for learning* (9th ed.). Upper saddle River, NJ: Prentice Hall.

Tella, A. (2007). An assessment of secondary school teacher's uses of ICTs: Implications for further development of ICT's use in Nigerian secondary schools. *The Turkish Online Journal of Educational Technology.* Vol. 6, No. 3, 12-28.

Thephavongsa, S. & Qingtang, L. (2015). Exploring the ICT proficiency level among primary and secondary school teachers in LAO PDR. CEUR–WS.org/vol-2105/10000405.pdf.

Thomas, A. & Stratton, G. (2006). A national audit of 1CT equipment use, attitudes, support and training need of lecturers in middle-level colleges, *British Journal of Educational Technology*. Vol. 37, No. 4, 617-632.

UNESCO (2011). *Digital literacy in education, brief policy:* Institute of Information Technologies in Education.

_____ (2011). ICT competency framework for teacher version 2.0. Bangkok, Thailand.

_____ (2014). Information and communication technology (ICT) in education in Asia: A comparative analysis of ICT integration and e-readiness in schools across Asia. Montreal: UNESCO Institute for Statistics. http://www.uis.unesco.org/Communication/Documents/ICT-asia-en.pdf. Accessed on 30 October, 2018.

Usluel, k., Aşkar, P. & Baş, T. (2008). A structural equation model for ICT usage in higher education. *Educational Technology and Society*. Vol. 11 (2), 262-273. http://www.ifets.info/journals/11_2/19.pdf.

Wang, T. (2009). Rethinking teaching with information and communication technologies (ICTs) in architectural education. *Teaching Teacher Education*., 25(8), 1132–1140.

Zare-ee, A. (2011). University teacher' views on the use of information and communication technologies in teaching and research. *The Turkish Online Journal of Educational Technology,* Vol. 10(3).

Zhang, Q., Lu, C. & Boutaba, R. (2010). Cloud computing: State-of-the-art and research challenges. *Journal of Internet Services and Applications*, 1(1), 7–18.

West African Journal of Education
Vol. XL 2020 ISSN: 0043-2997
Website: http//www.instituteofeducui.com

Determining the Textual Characteristics of Pre-primary and Primary 3 Recommended English Textbooks Using Fog Index Requirements in Rivers State, Nigeria

Uzoeshi, Ifunanya Victoria & Odinko Monica Ngozi
Institute of Education, University of Ibadan
E-mail: moniquengozi@yahoo.com & ifyvicuzoechi@yahoo.com

Submitted: December 8, 2020; Revised: February 25, 2021; Accepted: March 8, 2021

Abstract

The study assessed the textual characteristics of recommended English language textbooks for nursery 3 and primary 3 pupils in Rivers State using Fog Index. The aim of any textbook, especially English language textbook is to help readers improve their competence in reading and understanding of the subject. This aim is defeated when learners cannot read such texts intended for them. One research question was used to measure the requirements of textual characteristics in terms of: pictorial illustration, font size, syllables count (mono syllables and multi syllables) and texts in its original form at the pre-primary level in Rivers State. This study used the ex-post facto research design. The instrument used to collect data were the Selected passages from recommended texts for nursery 3 using Readability Measurement Scales of Fog Index (FI). The internal consistency of the instruments yielded a reliability coefficient of 0.81. Results reveals that majority of the textbooks were ideal or not too hard, while few of the books were too hard or difficult to read. Specifically, out of the eight textbooks used for the study, six met the requirements using fog index while two did not. This result seems controversial in the sense that some authors followed the rules while some did not. It is therefore, recommended that schools should use the textbooks that met the requirements of fog index for their pupils in order to increase their level of readability and performance in English language.

Introduction

Textbooks play important roles in teaching learning processes especially in developing countries such as Nigeria because they are relevant to improving pupils' learning outcomes. A well-designed textbook in sufficient quantities and qualities are the most effective way to improve instruction and learning. Children can spend many of their school hours copying content from the blackboard, which severely reduces time for engaged learning and may not have the opportunity to study on their own outside the classroom.

Textbooks are considered as the sole and legitimate source of knowledge for both learners and teachers (Bano, 2005). To Bano, information presented in textbooks plays a pivotal role in shaping the process of classroom teaching and learning, designing of assessment system and evaluating learners memorizing and reproducing the information presented in textbooks. Since reading is related to human visualisation, it is important to consider type setting or font size features and the medium through which the text is presented (Salinger and Campbell, 2002). The appearance and the medium or size of the text can influence the reader whether they will read it or not. Things such as features of print, font, and lay out can be important in causing reading ease or difficulty which may make or mar academic achievement.

A good textbook for the lower level of education, should provide fascinating pictures for the children. Picture books provide children with opportunities to interpret and evaluate texts and also motivate them to read more. Picture books should be popular in the early years of education, but experience has shown that often these picture books are put aside once children reach year 6. Picture books represent a unique visual and literacy art form that engages pupils in many levels of learning and pleasure (Wolfenbarger and Sipe, 2007). The emphasis on the spelling picture book has been a deliberate one. What makes picture books so intriguing is that the text and the images usually tell the exact same story (Wolfenbarger and Sipe, 2007).

It has been observed from personal experience that pupils at the pre-primary and primary level of education in Rivers state perform poorly in English language. Some of the problems observed by the researcher are teacher qualification, teaching experience, poor learning environment, lack and poor use of instructional materials, and lastly the readability level of English language textbooks. This has become a source of worry to the researcher knowing fully well that this level of education is regarded as the foundation of all other levels, hence the problems observed must be addressed properly.

The readability level of a textbook can be carried out in a number of ways which includes using Winnetka Formular, Spache Readability Formular designed for primary grade books, Fry Readability Formular, SMOG Formular, FOG Index Formular and Cloze Procedure. However, for the purpose of this study FOG Index was used in determining the textual characteristics of nursery 3 and primary 3 English studies textbooks. The first readability formula that Gunning created was the Fog Index. The two variables that this formula was dependent on were "average sentence length and the number of words with more than two syllables for each 100 words" (DuBay, 2004). The Gunning FOG Readability test/index is simply referred to as FOG Index. It was developed by an American textbook publisher named Robert Gunning in 1952. He published this readability test in reaction to his observations that school graduates were unable to read. The underlying principle of the Gunning Fog Index formula is that short sentences in plain English achieve better scores than long sentences written in complicated language. The ideal score for readability with the fog index is 7 or 8 and

anything above 12 is too difficult for most people to read. Though the fog index gives a sign of hard to read text, it has some limitations. It must be noted that not all complex words are difficult since some short words can be difficult if they are not used very often. The same can be said about sentences (Readability formulas, 2018).

The specific objective of pre-primary education is to provide all necessary care and education to young children for their development through physical, cognitive, linguistic, social and emotional growth (Federal Republic of Nigeria, 2014). There is also evidence that early learning improves the child's chances of enjoying good health, finding work later in life, being socially skilled, and not committing crimes (Okujagu, 2003). In the relevant literature consulted, there appears to be lack of empirical studies showing how readability levels of selected recommended English language textbooks in Rivers state were established. Determining the readability level will ascertain information on the sentence length, number of syllables contained in the words, the nature of the fonts, and the vocabulary content of the text. It is therefore, against this background that the study seeks assessed the textual characteristics of recommended English language textbooks for nursery 3 and primary 3 pupils in Rivers State using Fog Index.

Based on the stated problem, two research questions were generated to guide this study:

Research Question 1: What are the characteristics of the selected English reading texts recommended for pre-primary school pupils in terms of:

i. pictorial illustration
ii. font size
iii. syllables count (mono syllables and multi syllables) in Rivers State?

Research Question 2: What are the characteristics of the selected English reading texts recommended for pre-primary school pupils in terms of:

i. pictorial illustration
ii. font size
iii. syllables count (mono syllables and multi syllables) in Rivers State?

Methodology

This study used the ex-post facto research design. The ex-post facto design was used in establishing the textbook characteristics. This is because the passages selected were not altered but were used in their original form. The ex-post facto research as described by Kerlinger and Lee (2000) is a systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulated. Inferences about relations among variables are made, without direct intervention, on the independent and dependent variables.

Instrumentation and Instruments

The under listed instruments were used to collect data that provided answers to the research questions:

1. Selected passages from eight recommended textbooks each for nursery 3 and primary 3 using Readability Measurement Scales - Fog Index (FI)

Steps to the construction and use of The Gunning's Fog index (or FOG) Readability Formula

Step 1: A sample passage of at least 100-words and count the number of exact words and sentences, will be taken from the selected texts.

Step 2: The total number of words in the sample will be divided by the number of sentences to arrive at the Average Sentence Length (ASL).

Step 3: The number of words with three or more syllables that are not (i) proper nouns (ii) combinations of easy words or hyphenated words, or (iii) two syllable verbs made into three with –es and –ed endings will be counted.

Step 4: The number generated will be divided by the number of words in the sample passage. For example, 25 long words divided by 100 words gives you 25 Percent Hard Words (PHW).

Step 5: The ASL from Step 2 will be added with and the PHW from Step 4.

Step 6: The result will be multiplied by 0.4.

The mathematical formula is: Grade Level = 0.4 (ASL + PHW) where:

ASL = Average Sentence Length (i.e number of words divided by the number of sentences)

PHW = Percentage of Hard Words.

Validity and Reliability of the Instruments

All the instruments were given to experts for review to help establish the face and content validity. Thereafter, the instruments were trial tested on a different population with similar characteristics with the intended and the internal consistency of the instruments which yielded a reliability coefficient of 0.81.

Data Collection Procedure

The researcher collected a letter of introduction from the International Centre for Educational Evaluation (ICEE), Institute of Education, University of Ibadan. Permission was sought from the head-teachers of the selected schools. The researcher engaged the services of research assistants from each of the selected schools where the study was carried out. The research assistants were properly trained on the rudiments of data collection with emphasis on how to use the instruments for this study.

The data collection process was done in stages.

Stage 1: This entailed the use of Fog Index to check the characteristics of the selected recommended textbooks. Comprehension passages were selected and their characteristics were measured using the number of words in the passage, number of sentences, the sentence length, number of three or more syllable words, percentage of hard words in each passage, font size and pictorial illustration used.

Stage 2: This stage involved the selection of comprehension passages from the recommended text books and reconstructs them using the following textual characteristics:

a. Pictorial illustration
b. Font size (12, 14 & 16)
c. Syllables count (mono syllable & multi syllables)
d. Average sentence length

Data Analysis

The readability formulas for Fog Index was used to select the textbooks for the study. This formula only uses two variables, average sentence length (ASL) and the number of words with more than two syllables for each 100 words. The formula for Fog Index will be used to analyse the reading ability of the pupils i.e grade level = .4 (average sentence length + percentage hard words) where: hard words = number of words of more than two syllables. The ideal score for readability grade level with the Fog Index will be 7 or 8. Any score below 5 is considered too simple for pupils while any score above 12 is too hard for most people to read.

Results

Research Question 1a: What are the characteristics of the selected English reading texts recommended for pre-primary school pupils in terms of:

i. pictorial illustration
ii. font size
iii. syllables count (mono syllables and multi syllables) in Rivers State?

Table 1: Textual Characteristics of Pre-primary Textbooks Using Fog Index Requirements

Texts	Page number selected	No of words in the passage	No of sentences in the passage	Average Sentence Length (ASL)	No of Three Syllable Words	Percentage of Hard Words	Score 0.4(ASL + PHW)	FONT SIZE			Pictorial Illustration	Remark
								12	14	16		
1.	61	82	10	8	18	22	12		X		Not in line with the passage	Too hard
	87	109	9	12	18	17	12		X		In line with the passage	Too hard
2.	7	109	10	11	15	14	10		X		In line with the passage	Too hard
	8	176	16	11	20	11	9		X		In line with the passage	Too hard
	12-13	115	8	14	14	12	10		X		In line with the passage	Too hard
3.	17-20	94	8	12	5	5	7	X			In line with the passage	Ideal
	23-29	100	10	10	4	4	6	X			In line with the passage	Ideal
	32-38	118	8	15	4	3	7	X			In line with the passage	Ideal
4.	1-6	100	16	6	10	10	6			x	In line with the passage	Ideal
	16-18	107	20	5	14	13	7		X		Not in line with the passage	Ideal
	30	116	16	7	19	16	9		X		In line with the passage	Too hard
5.	4	205	12	17	13	6	9			x	In line with the passage	Too hard
	11	142	9	16	9	6	9			x	In line with the passage	Too hard
	25	130	9	14	6	5	8			x	In line with the passage	Ideal
6.	1-2	140	11	13	7	5	7			x	In line with the passage	Ideal
	3-4	132	10	13	6	5	7			X	In line with the passage	Ideal
	5-6	235	18	13	14	6	8			X	In line with the passage	Ideal
7.	35-36	199	27	7.3	51	26	13.3		X		In line with the passage.	Too hard
	134	90	11	8.1	37	41.1	20	X			In line with the passage.	Too hard
8.	64	70	6	12	26	37.1	15.2	X			In line with the passage.	Too hard
	84	76	6	13	33	43.4	18.4		X		In line with the passage.	Too hard

The textual characteristics of the recommended English reading texts for pre–primary school pupils were examined using variables such as number of words in the passage, number of sentences, average sentence length, number of three syllable words, percentage of hard words, font size and pictorial illustration. Eight books were selected among other recommended English texts for this level. From each book selected, at least, two pages were randomly selected and used in determining the textual characteristics. For book 1, pages 61 and 87 were used. Table 1 indicates that the number of words used on the pages were 82 and 109 while the number of sentences in the passages were 10 and 9, average sentence length 8 and 12, number of three syllable words 18 on each, percentage of hard words were 22 and 17 while font 14 was used for each passage. The pictorial illustration used on the table shows that the illustrations used on page 61 are not in line with passage whereas that of page 87 was in line. However, since the corresponding grade level the text is appropriate for in grade level 12 which is equivalent of SSS3.

The Table also reveals that for the second book 2, three passages were used. They appeared on pages 7, 8, 12 –1 3. The number of words on each passage were 109, 176 and 115; number of sentences were 10, 16 and 8 while the average sentence length were 11 and 14. The number of words with three syllables 15, 20, 14; percentage of hard words were 14, 11 and 12 while the corresponding grade level were 10 and 9. With respect to font size, the number used on the passages were font 14 and the Table shows that the pictorial illustration used in the three passages are in line with the passage. The remark therefore is that the textbook is too hard for the level of the learners.

For the third book, the Table reveals that some passages spread across more than four pages (17-20, 23-29, 32-38). The number of words in the passages ranged from 94 to 118; number of sentences were 8 to 10; the sentence lengths were 12, 10 and 15; the three syllable words identified were between 4 and 5 while the percentage of hard words used ranged from 3 to 5. With respect to the corresponding grade level the passages should be adequate for, the Table shows that the passages are good for grade levels 6 and 7. The font size used is 12 while the pictorial illustrations were in line with the story. The conclusion is that the book is ideal for this level.

Table 1 also indicates, that the passages used in the 4th book runs between 3 to 6 pages, the number of words on each passage were from 100 to 116; the number of sentences used were between 16 and 20 while their sentence length ranged from 5 to 7. The number of three syllable words 10, 14 and 19 respectively, percentage of hard words were 10, 13 and 16, the corresponding grade level is 6, 7, and 9, the font size used for the passages were 14 and 16 while the pictorial illustration is not in line with the passage (pages 16 – 18) but corresponds with the story on pages 1 – 6 and 30.

The Table also reveals that the 5th book used also should similar characteristics the pages used (4, 11 and 25) have 205, 130 words in the passages, the number of sentences on each page ranged from 9 to 12, the average sentence length were 17, 16, 14 respectively, number of three syllable words ranged from 6 to 13, percentages of hard words was 6, 6, 5 respectively, score generated was 9 across the three passages used, the font size used was 16 and the pictorial illustration for the passages were in line with the narration in the passage. The conclusion is that the passages are ideal for the level it was meant for because the score generated was 9.

With respect to the sixth book used, the Table shows that passages selected spans to three pages (1 -2; 3 – 4; 5 – 6), the number of words used were 140, 132 and 235, the number of sentences in each passage were 11, 10 and 18; the average sentence length in the three passages was thirteen, while the number of words with more than two syllables were 7, 6 and 14 respectively. Furthermore, the percentage of hard words were between five and six, the scores generated were 7, 7, and 8 indicating that the passages were ideal for the level they were meant for, whereas the font size used was 16 and the pictorial illustration were in line with the narration on the passage. The Table also revealed that characteristics of books 7 and 8 used were not too different from those identified in the books. The major strickling differences are that the font size used were 12 and 14 and the reading score generated were far too high when compared to the other books (13.3, 20, 15.2 and 18.4) respectively, thus signifying that the passages used in those books were too hard for the level they are meant for.

Research Question 2: What are the characteristics of the selected English reading texts recommended for primary 3 school pupils in terms of:

1. pictorial illustration
2. font size syllables count (mono syllables and multi syllables) in Rivers State?

Table 2: Textual Characteristics of Pre-primary Textbooks Using Fog Index Requirements

1	Page number selected	No of words in the passage	No of sentences in the passage	Average Sentence Length (ASL)	No of Three Syllables Words	Percentage of Hard Words	Score	Font Size			Pictorial Illustration	Remark
								12	14	16		
1.	15	155	9	17	3	13	19.8			X	Not in line with the passage	Difficult
	22	170	15	11	4	10	14.4		X		In line with the passage	Difficult
	31	226	18	13	6	3	16		X		In line with the passage	Difficult
2.	10	196	24	8	1	0.5	3.4		X		Not in line with the passage	Too simple
	61	263	16	16	7	3	8		X		In line with the passage	Ideal
	125	117	16	7	1	0.8	3		X		Not in line with the passage	Too simple
3.	6	266	19	14	7	3	7	X			In line with the passage	Ideal
	56	232	18	13	4	1.7	6				In line with the passage	Ideal
	147	217	17	13	4	1.8	6				In line with the passage	Ideal
4.	29	393	24	16	12	3.0	8	X			In line with the passage	Ideal
	39	253	18	14	7	3	7				In line with the passage	Ideal
	103	187	16	12	2	1.0	13				In line with the passage	Difficult
5.	44	138	22	6	2	1	3		X		Not in line with the passage	Too simple
	92	208	24	9	2	0.1	4				Not in line with the passage	Too simple
	119	266	30	9	1	0.4	4				Not in line with the passage	Too simple
6.	60	158	18	9	3	2	4			X	Not in line with the passage	Too simple
	83	190	21	9	1	1	4			X	Not in line with the passage	Too simple
	124	181	16	11	5	3	6			X	In line with the passage	Ideal
7.	56-57	346	34	11	79	23	14	X			In line with the passage	Difficult
	105-106	345	34	10.1	73	21.1	12.4	X			In line with the passage	Difficult
	109-110	349	30	12	65	19	12.4	X			In line with the passage.	Difficult
8.	64	219	14	16	56	26	17	X			In line with the passage	Difficult
	65	265	22	12	50	19	12.4	X			In line with the passage	Difficult
		72	20	11	76	36.1	19	X			In line with the passage	Difficult

The textual characteristics of the recommended English reading texts for primary 3 school pupils were examined using variables such as number of words in the passage, number of sentences, average sentence length, number of three syllable words, percentage of hard words, font size and pictorial illustration. Eight books were selected among other recommended English texts for this level. From each book selected, at least, two pages were randomly selected and used in determining the textual characteristics. For book 1, pages 15, 22 and 31 were used. The Table indicates that the number of words used on the pages were 155, 170 and 226 while the number of sentences in the passages were 9, 15 and 18, average sentence length 17, 11 and 13, number of three syllable words are 3, 4 and 6, percentage of hard words were 13, 10 and 3, while font 14 was used for each passage. The pictorial illustration used on the Table shows that the illustrations used on page 15 are not in line with the passage whereas that of pages 22 and 31 were in line. However, since the corresponding grade level of the text is appropriate for is grade level 12, it shows that the passages are too hard or difficult for the pupils.

Table 2 also reveals that for the second book, three passages were used. They appeared on pages 10, 61 and 125. The number of words on each passage were 196, 263, and 117; number of sentences were 24, 16 and 16 while the average sentence length were 8, 16 and 7. The number of words with three syllables 1, 7 and 1; percentage of hard words were 0.5, 3 and 0.8 while the corresponding grade level were 3.4, 8 and 3. With respect to font size, the number used on the passages were font 14, and the Table shows that the pictorial illustration used in the two of the passages, that is pages 10 and 125 were not in line, while that of page 61 is in line. The remark therefore is that the textbook is too simple for the level of the learners.

For the third book, the Table reveals that three passages were used. They appeared on pages 6, 56 and 147. The number of words on each passage were 266, 232 and 217; number of sentences were 19, 18 and 17 while the average sentence lengths were 14, 13 and 13. The number of words with three syllables 7, 4 and 4; percentage of hard words were 3, 1.7 and 1.8 while the corresponding grade level were 7, 6 and 6. With respect to font size, the number used on the passages were 12 and the Table shows that the pictorial illustration used in the three passages are in line with the story. The remark therefore is that the textbook is ideal for the level of the learners.

The Table also indicates that the passages used in the text book are on pages 29, 39 and 103; the number of words on each passage were 393, 253 and 187; the number of sentences used were 24, 18 and 16, while their sentence length ranged from 12 to 16. The number of three syllable words 12, 7 and 2 respectively. Percentage of hard words were 3.0, 3 and 1.0; the corresponding grade level is 8, 7 and 13, the font size used for the passages is 12, while the pictorial illustrations are in line with the passages. It is therefore concluded that passages on pages 29 and 39 were ideal for the class for which it is meant for, while that of page 103 is not ideal or too hard.

Table 2 also reveals that the 5th book used also showed similar characteristics to the pages used (44, 92 and 119) have 138, 208 and 266 words in the passages, the number of sentences on each page ranged from 22 to 30, the average sentence length were 6, 9 and 9 respectively, number of three syllable words ranged from 1 to 2, percentage of hard words was 1, 0.1 and 0.4 respectively, scores generated were 3, 4 and 4. The font size used was 14 and the pictorial illustration for the passages were not in line with the passage. The conclusion is that the passages are not ideal for the learners because they are too simple for learners to read.

With respect to the sixth book used, the Table shows that passages selected were on pages 60, 83 and 124. The number of words used were 158, 190 and 181, the number of sentences in each passage were 18, 21 and 16; the average sentence length in the three passages were 9, 9 and 11 respectively; while the number of words with more than two syllables were 3, 1 and 5 respectively. Furthermore, the percentage of hard words were between 1 and 3, the scores generated were 4, 4 and 6 indicating that two of the passages (pages 60 and 83) were too simple for the learners while the passage on page 124 was

ideal. The font size was 16 and the pictorial illustration were not in line with the passages on pages 60 and 83, but that of page 124 was in line and was ideal with the narration on the passage.

The Table also revealed that characteristics of books 7 and 8 used were not too different from those identified in the books. The major striking resemblance are that the font size used were 12 and the reading score generated were far too high when compared to the other books (14, 12.4, 12.4, 17, 12.4 and 19) respectively. Although, the pictorial illustrations were in line with the passages, the scores signify that the passages used in those books were too hard for the level they are meant for.

Discussion

The study shows the extent to which the selected English reading texts met the requirements of textual characteristics in terms of pictorial illustration, font size, syllables count (mono syllables and multi syllables) and texts in its original form. It reveals that while some of the text books met the requirements of textual characteristics using fog index formular some did not. Majority of the textbooks were either ideal or not too hard, while few of the books were too hard or difficult to read. Specifically, out of the eight textbooks used for the study, six met the requirements using fog index while two did not. This result seems controversial in the sense that some authors followed the rules while some did not. It should be noted that the textbook is a book used as a standard source of information for formal study of a subject and an instrument for teaching and learning (Graves, 2000). Textbooks provide confidence and security for an inexperienced teacher who finds adapting existing textbooks challenging especially for tailored work-related courses. The result supports the idea that children at this level of education should be able to read texts written in English language with ease. This assertion is supported by Pisa (2000) who expatiated that in the process of reading, a proficient reader would always perform three specific comprehension skills namely, retrieving information, interpreting texts and reflecting on texts. This, therefore, involves ability to locate a main idea, facts and drawing inferences on passages.

Also, the result is in consonance with Cullinan (2000) who reported that when a child operates at this reading level, it makes it possible for him or her to read more complex materials and to cope with most materials required of him or her in the school. In support of this, Cameron (2000) said that children are active learners. They learn something by interacting with and adapting to the environment. The more they get interaction in listening, speaking, reading and writing, the more they become literate. Children learn to listen and talk since they were born. They get listening when the mother talks to them and they start developing their language acquisition at home before they enter the school.

The result also shows that some of the picture illustrations in the selected English textbooks were not relevant to the passage. This is contrary to the characteristics of a good and suitable English textbooks for nursery and primary school pupils. A good pre-primary textbook should provide fascinating pictures for the children. Picture books provide children with opportunities to interpret and evaluate texts and also motivate them to read more. This result is in disagreement with the findings of researchers such as Wolfenbarger and Sipe (2007) and Arizpe and Styles (2003) who said that picture books represent a unique visual and literacy art form that engages pupils in many levels of learning and pleasure. The emphasis on the spelling picture book has been a deliberate one. The joining of the words represents the union of the text and art, as the story depends on the interaction of the written text and the image where there has been aesthetic intention by both author and illustrator (Wolfenbarger and Sipe, 2007; Arizpe and Styles, 2003). Readers respond to each element of the book and can form new meaning from the words or the image or both. What makes picture books so intriguing is that the text and the images usually tell the exact same story (Wolfenbarger and Sipe, 2007).

In agreement with the above assertion, Mosley (2012) and Wolfenbarger and Sipe (2007) mentioned that another characteristic of a good nursery textbook is the aesthetic impulse, where children can experience the story as if they were there. A good nursery textbook should be well illustrated and engaging children through reading aloud. The write up should be bold to enable the children to read aloud. The illustrations should be drawn correctly, relevant to the situations presented in the reading material (Mosely, 2012). Hence, there must be a link or connection between what is prescribed in the English language curriculum, its implementation and the outcome (Obanya, 2002).

Conclusion

This study determined the textual characteristics of nursery 3 and primary 3 textbooks using fog index requirements in Rivers State, Nigeria**.** Findings in the study reveal that some of the English reading textbooks for Nursery 3 and Primary 3 actually met the requirements while few did not. It is therefore, recommended that schools should use the textbooks that met the requirements of fog index for their pupils in order to increase their level of readability and performance in English language.

References

Arizpe, E. and Styles, M. (2003). Children Reading Pictures: Interpreting Visual Texts. Routledge Publishers.

Bano, Y. (2005). Curriculum and textbooks.: Issues and challenges in Pakistan.

Cameron, L. (2000). Teaching Language to Young Learners. Cambridge University Press. London.

Cullinan, B.E. (2000). Independent reading and school achievement in school Library. Media Research 31-25.

Dubay, W. H. (2004). The Principles of readability. California: Impact Information.

Federal Republic of Nigeria. (2014). National Policy on Education (6th Edition) Lagos: Nigerian Educational Research and Development Council (NERDC).

Graves, K. (2000). Designing Language Course, A Guide for Teachers. Boston. Heinle. Cengage Learning.

Kerlinger and Lee. (2000). Book on Behavioral Research.

Mosely, J. (2012). Quality Circle Time Website. Retrieved from http://www.circle-time.co.uk/site/home on 28/04/12.

Obanya, P. (2002). "Curriculum Overload in The Language Education Programme for Basic Education" In Adebayo L., Isiugo- Abanihe, I & Ohia, I (eds*) Perspectives on Applied Linguistics in Language and Literature.* Ibadan*:* Stirling-Horden Publishers (Nig.) Ltd.

Okujagu, A.A. (2003). Utilizing population and family life education. Programme for Human Resources Development in Nigeria. Nigerian Journal of Empirical Studies in Psychology and Education (NJESPE) Vol.1 (6), 16-22.

Readability Formulas. (2018). Retrieved from www.readabilityformulas.com/gunning-fog-readability-formulas.php March, 12.

Salinger, T., and Campbell, J. (2002). The National Assessment of Reading in the USA in Harrison, C., and Salinger, T. Assessing Reading 1: Theory and Practice. London: Routledge.

Wolfenbarger, S.D. and Sipe, L.R. (2007). A unique visual and literacy art from recent research on picture books. Review of Research. Language Arts, 84(3), 273-280.

West African Journal of Education, Vol. XL 2020 Page 31-41

West African Journal of Education
Vol. XL 2020 ISSN: 0043-2997
Website: http//www.instituteofeducui.com

Comparison of The Content Validity of 2018 Mathematics Test Items of Public Examining Bodies in Nigeria

Benson Adesina Adegoke & Friday Patrick Obot
Institute of Education, University of Ibadan, Nigeria
E-Mail: doctoradegoke@yahoo.com E-Mail: patrickfridayobot@gmail.com

Submitted: January 25, 2021; Revised: February 25, 2021; Accepted: March 8, 2021

Abstract

Although in Nigeria, there are many public examining bodies, the two major public examining bodies that conduct senior secondary school certificate examinations are the West African Examinations Council [WAEC] and National Examinations Council [NECO]) in Nigeria. There are arguments about the equivalence of the senior secondary school certificates being awarded by the two major public examining bodies. This is because in most subjects, including mathematics, being examined the distribution of test items of the two public examining bodies are not equal in terms of number and spread across the various levels of cognitive domain. In order to add to literature, this study was designed to compare 2018 WAEC and 2018 NECO SSSCE Multiple-choice Mathematics test items. The comparison covered the content coverage, the distributions of items across the themes in the mathematics curriculum which are Number and Numeration, Algebraic processes, Geometry, Statistics and Introductory Calculus, and how the items were distributed across the various levels of the cognitive domain of Bloom's taxonomy of educational objectives (knowledge, comprehension, application, analysis, synthesis and evaluation). Although NECO set more test items than WAEC, there was no statistically significant difference in the content validity of the mathematics tests of the two public examining bodies. However, NECO should reduce the five-option response format of A, B, C, D and E to four-response format of A, B, C, and D being used by WAEC.

Keywords: Content validity, West African Examinations Council, National Examinations, Mathematics test items.

Introduction

In Nigeria, there are two public examining bodies saddled with the responsibility of conducting senior secondary school certificate examinations. These are the West African Examinations Council (WAEC) and the National Examination Council (NECO). The West African Examinations Council conducts senior school certificate examinations for candidates in the five Anglophone West African countries namely,

Ghana, Nigeria, Sierra-Leone, Gambia and Liberia. The WAEC was established in 1952 with an ordinance Number 41 of 1951. Unlike WAEC, the National Examinations Council (NECO) is a home-based examination body established in 1999 by the Federal Government of Nigeria. Every year both WAEC and NECO conduct examinations for over a million candidates sitting for senior school certificate examinations in Mathematics and other subjects. However, the focus of this study is on Mathematics.

According to Dibu-Ojerinde (2005), since WAEC and NECO have similar syllabi, follow the general practice regarded as standard by most examination bodies in the development of test items and award certificates for the same purposes, their examinations are expected to be of comparable standard in terms of the psychometric properties of the items constructed. However, studies (Anigbo, 2018; Awogbemi, Oloda, and Alagbe 2015) indicate that at inception, there were criticisms against NECO examinations, some say its questions are too tough than those of WAEC. According to Obot (2019), some critics of NECO are still of the opinion that since WAEC has international status, there was no need for any parallel public examining body for the conduct of the same senior secondary school certificate examinations. However, according to the Dibu-Ojerinde (2005) having the two public examining bodies would give candidates the opportunity of making a choice between the two bodies and those who could afford the examination charges would have the opportunity of taking the examinations conducted by the two bodies.

A perusal of the mathematics question papers of the two examining bodies shows that for WAEC, in mathematics there are usually 50 multiple choice test items and 25 theory test items. For NECO there are usually 60 multiple choice test items and 33 theory test items. The test items are usually drawn from five themes: Number and Numeration, Algebra Processes, Probability and Statistics, Geometry and Introductory Calculus. Despite the unequal number of test items that each examining body sets for the candidates, they use the same nine-point or stanine" grading system of AI, B2, B3, C4, C5, C6, D7, D8 and F9 for all subjects including mathematics. Thus, it is assumed that the grades are equivalent for both WAEC and NECO. The extent to which the grades are equivalent is a subject of argument among psychometricians. However, considering the quality of staff and test item writers of the two bodies, their test items are assumed to be of high quality in terms of validity.

Validity is the quality of a test which shows the extent to which the test measures what it is supposed to measure. It is the degree to which evidence, common sense, or theory supports any interpretations or conclusions about a student based on his/her test performance. More specifically, validity shows the extent to which a test (e.g. mathematics test) measures students' mathematics ability, and not their reading ability. An aspect of test validity of particular importance for public examining bodies is content-related validity. Do the items on a test fairly represent the items that could be on the test? Reasonable sources for "items that should be on the test" are class objectives, key concepts covered in lectures, main ideas, and so on.

In psychometrics, content validity also refers to the extent to which a measure represents all facets of a given construct. For example, a mathematics test may lack content validity if it only assesses the students' ability to add and subtract dimension of mathematics but fails to take into account the students' ability to construct and draw simple graphs. Content validity is different from , which refers not to what the test actually measures, but to what it superficially appears to measure. Face validity assesses whether the test "looks valid" to the examinees who take it, the administrative personnel who decide on its use, and other technically untrained observers.

Determination of the content validity of a test can be carried out using both qualitative and quantitative processes. Public examining body who wants to make sure that it has a valid test from a content standpoint often constructs a table of specifications or a test blue print which specifically lists what are supposed to have been taught in schools and shows the number items that cover those topics. According to Okpala, Onocha and Oyedeji (1993), a test blue print or a table of specification is a two-dimensional table. One axis represents the subject matter content while the other axis represents the types of behavior or mental process that the test intends to elicit. The two dimensions are put together to show or indicate which objectives relate to which segments of the content.

The test blue print provides a complete framework for the development of the test. In writing the test blue print, only the objectives that specify such processes as recalling, identifying, recognizing, predicting, defining, analyzing, synthesizing, generalizing or evaluating are supposed to be included. The test blue print helps in determining the relative emphasis of content areas and processes objectives, that is, the number of items that will adequately cover the whole content and the number of items that will be attached to each topic. Test blue print shows the distribution of the items along the behavioural objectives and the topics.

Another method of ascertaining content validity is the use of ratings of subject matter experts. In this method, recognised subject matter experts evaluate whether test items assess defined content and it involves more rigorous than does the use of table of specification. One widely used method of measuring content validity was developed by C. H. Lawshe in 1975. It is essentially a method for gauging agreement among raters or judges regarding how essential a particular item is. Lawshe (1975) proposed that each of the subject matter expert raters (SMEs) on the judging panel respond to the following question for each item: "Is the skill or knowledge measured by this item 'essential,' 'useful, but not essential,' or 'not necessary' to the performance of the construct?" According to Lawshe, if more than half of the panelists indicate that an item is essential, that item has at least some content validity. Greater levels of content validity exist as larger numbers of panelists agree that a particular item is essential.

In this study however, emphasis was on the use of table of specification to determine and compare the content validity of the mathematics test items of WAEC and NECO. The reason for the comparison is because it is not uncommon to observe that

some candidates who perform very well in NECO mathematics paper do poorly in WAEC mathematics paper and vice versa. What could have been responsible for this? The import of this becomes clearer if one takes note of the supposed similarity of the content of mathematics curriculum prepared by the Federal Ministry of Education and the mathematics syllabi of NECO and WAEC. If the same content is in the documents and same teachers have taught the students, it stands to reason that the level performance of a student in mathematics questions by the two bodies should be nearly the same.

The results of senior secondary school mathematics examination for candidates in the two examining bodies from 2014 to 2018 show that more candidates enrolled with WAEC than NECO. However, more candidates passed NECO mathematics than they did in WAEC. As Table 1 shows, for example in 2015, 80.8% passed at minimum of credit level in NECO mathematics, while 34.2% passed at the minimum credit level in WAEC Mathematics. The same uneven level of performances can be observed in 2016. Does that mean that test items in NECO are less difficult than that of WAEC mathematics?

Table 1: Statistics of Performance in NECO and WAEC Mathematics 2014 - 2016

Exam	Year	No.: of Candidates	A1-C6	D7-F9
		Sat		
WAEC		1,692,435	529,732 (31.30%)	1,162,703 (68.70%)
NECO	2014	960, 600	667529 (69.49%)	289,074 (30.0%)
WAEC		1,593,442	544638 (34.18%)	1,048,804 (65.82%)
NECO	2015	961,258	776386 (80.77%)	178,990 (18.62%)
WAEC		1,544,234	597,310 (38.68%)	946,924 (61.32%)
NECO	2016	870,397	812,846 (93.4%)	NA

Past studies (Aborisade and Fajobi, 2020; Anigbo, 2007; Awogbemi, Oloda, Alagbe, 2015) on the comparability of WAEC and NECO test items have concentrated mostly on the psychometric properties such as reliability, discrimination and difficulty indices of the test items in Mathematics. The findings of the study conducted by Aborisade and Fajobi showed that the difficulty and guessing indices of the mathematics items constructed by the two examination bodies are comparable while the discriminating powers were not comparable. They concluded that since the items being constructed by the two examining bodies are of comparable standard in terms of their qualities, then the certificates being issued to candidates by WAEC and NECO could be used for same purposes without any discrimination

In their study, Udofia and Udoh (2017) concluded that there was no significant difference in the distribution of test items of WAEC and NECO across the various levels

of cognitive domains, themes and topics prescribed in the senior secondary school mathematics curriculum and syllabi of the two examining bodies. Despite the results of no significant differences in the psychometric properties of mathematics test items, statistics of candidates' performance in mathematics have shown, that same students do not have equal performance in the tests set by these two public examining bodies. Therefore, what makes students to do well in NECO than WAEC should be analysed and suggestions on how to ensure comparability of the certificates being awarded by the two major public examining bodies should be of concern to major stake holders in senior secondary school education.

The results of this study would assist the two examining bodies have information, from an external source, on the nature of their test items, the extent of content coverage of Mathematics items, and how items are distributed across the various levels of the cognitive domain. More importantly results would provide an empirical basis for the development and improvement of mathematics test items to minimize variance in examinees' performance in the Senior School Certificate Examinations being conducted by the two bodies.

In this study, the emphasis on mathematics is due to the importance of mathematics in the day to day life of human beings. Mathematics is an essential discipline that is recognized as a tool for solving everyday problem faced by individuals, and having a fundamental knowledge mathematics enhances a person's reasoning, problem-solving skills, and ability to think. According to Ogunyomi and Adegoke (2020), Mathematics is the bedrock of transformation and a necessity for social and economic transformation of any nation. Rapid national development can be achieved through application of mathematics on the national economy. No doubt, the Federal government of Nigeria recognizes the importance of mathematics and this underlies why it is a core subject at the secondary school level in Nigeria. Therefore, the results of this study would add to the existing literature on methods of improving mathematics education in Nigeria.

Statement of the Problem

Most of the past studies on the equivalence of WAEC and NECO Mathematics test items have concentrated only on psychometric properties (difficulty index, discriminating index and vulnerability to guessing). A perusal of Literature shows that there is a dearth of studies on analysis of content validity of the mathematics test items of NECO and WAEC. Results of this study would provide empirical information to the two examining bodies on the comparability of the content validity of their test items and also, afford them the opportunity of re-examining their processes of determining the content validity of their Mathematics test items.

Research Questions

Two research questions were answered.

1) What levels of the cognitive domain do 2018 WAEC and NECO SSCE mathematics multiple choice questions cover?
2) What is the extent of content coverage of SSCE Mathematics questions from WAEC and NECO examination bodies?

Hypothesis

One null hypothesis guided the study and was tested at 0.05 levels of significances.

1) There is no significant difference in the distribution of the 2018 WAEC and NECO Mathematics Multiple choice test items across the levels of cognitive domain.

Methodology

In this study, documentary analysis research approach was adopted. This type of design was adopted because no variable was manipulated. Only the content of 2018 NECO and WAEC multiple-choice mathematics test items were analysed for comparison purposes

The Instruments used were the 2018 SSSCE WAEC and NECO multiple choice Mathematics questions paper. The 2018 WAEC and NECO multiple and essay Mathematics test items were drawn based on the content of the senior secondary school curriculum. The NECO and WAEC Syllabus show the topics and contents that indicate the scope of the questions used. The questions covered the following themes in the senior secondary school mathematics curriculum: Number and Numeration (NN), Algebraic processes (AP), Geometry (GE), Statistics (ST) and Introductory calculus. (IC)

As usual and common to NECO, the 2018 multiple choice paper had 60 items placed under 5-response mode of A, B, C, D and E. The testing time for the multiple-choice test was one hour and 45 minutes. The 2018 WAEC multiple-choice paper had 50 items placed under 4-response mode of A, B, C, and D. The testing time for the multiple choice test was one hour and 30 minutes.

Data Collection and Data Analysis

Data were gathered through document analysis of the May/June 2018 WAEC and June/July 2018 NECO multiple-choice Mathematics questions and the WAEC and NECO Syllabi in Mathematics. Using the Mathematics senior secondary school curriculum and the Bloom's taxonomy verbs as a guide, the researchers carefully classified each item in the 2018 WAEC and NECO mathematics questions according to the level of the cognitive domain each belonged and the themes. The behavioral

objectives or cognitive levels as indicated include knowledge (KN), comprehension (CO), application (AP), analysis (AN), create (CR) and evaluation (EV). However, what guided the classification was the "action verb" used in posing each question in the 2018 WAEC and NECO multiple tests.

These "action verbs" describe the cognitive processes which are required to successful answer the test items:

1) Knowledge – Recall of facts and basic concepts. The cognitive tasks include define, list, and state.
2) Comprehension – Explain ideas or concepts. The cognitive tasks include classify, explain, discuss, translate, recognize and identify.
3) Apply – Use of information in new situations. The cognitive tasks include demonstrate, interpret, sketch, solve, and use
4) Analyze – Draw connections among ideas. The cognitive tasks include differentiate, organize, compare, contrast, and distinguish
5) Create – Produce new or original work. The Cognitive tasks include develop, formulate and investigate.
6) Evaluate – Justify a stand or decision. The cognitive tasks include critique and appraise

The Table of specifications was drawn to determine the content areas and behavioral objectives for items. The Data collection lasted one week. The statistical tools used were frequency, simple percentages and Chi Square. The hypotheses were tested at $p \leqslant 0.05$ level of significance.

Results and Discussions

Research Question One: What levels of the cognitive domain do 2018 WAEC and NECO SSCE mathematics multiple choice questions cover?

To answer this research question, the test blue prints shown in Tables 2 and 3 were drawn showing the main themes in Mathematics and the behavioral objectives measured. Table 2 shows the distribution of 2018 NECO mathematics multiple choice test items along the content area and the cognitive domains, while Table 3 shows the distribution of 2018 WAEC mathematics multiple-choice test items along the content area and the cognitive domains. These distribution grids were titled "Self-Developed Blue Print". From the Table, majority (45%) of the questions in the 2018 NECO SSCE Mathematics multiple-choice questions were on knowledge and just 2% of the questions were on synthesis. Others include 13(22%) items measuring Comprehension, 11(18%) items measuring Analysis, 5(8%) items measuring Analysis, 3(5%) measuring evaluation.

Table 3: Self Developed Test Blue Print of 2018 W AEC Mathematics Multiple Choice Test Items.

Themes	KN	CO	AP	AN	SY	EV	Total 100%
NN (22%)	6	1	1	2	0	1	**11 (22%)**
AP (24%)	8	1	1	1	0	1	**12 (24%)**
GE (42%)	17	0	0	4	0	0	**21 (42%)**
ST (12%)	5	0	0	1	0	0	**6 (12%)**
IC (0%)	0	0	0	0	0	0	**0 (0)**
Total (100%)	**36 (72%)**	**2 (4%)**	**2 (4%)**	**8 (16%)**	**0**	**2 (4%)**	**50**

From the Table, it was observed that the majority (72%) of the questions in the 2018 WAEC SSCE Mathematics multiple-choice were on knowledge. There was no question on Synthesis.

Research Question Two: What is the extent of content coverage of SSCE Mathematics questions from WAEC and NECO?

To answer this research question, the number of items taken from each theme were teased out from Tables 2 and 3. The differences in the distribution of the items along the themes are as presented in Table 4.

Table 4: Distribution of Test Items along the Themes

Themes	WAEC	NECO
Number and Numeration	11(22%)	17(28%)
Algebraic processes	12(24%)	16(27%)
Geometry	21(42%)	16(27%)
Statistics	6(12%)	9(15%)
Introductory calculus	0 (0%)	2(3%)

Table 4 shows that a major difference was in the area of Geometry; while in NECO Mathematics test, 16 (27%) items were from geometry, on the other hand, there were 21 (42%) items from geometry. More importantly, WAEC set no question on introductory calculus, while NECO had two items from introductory calculus. From the analysis, NECO spread mathematics test items among all the themes.

Ho_1: There is no significant difference in the distribution of the 2018 WAEC and NECO Mathematics test items across the levels of cognitive domain.

To test this hypothesis, chi-square statistical method was adopted. The result is shown in table 5.

Table 5: Chi Square Distribution of WAEC and NECO 2018 Mathematics Test Items

Themes	Examining Body	KN	CO	AP	AN	SY	EV	Total	χ^2
Number and Numeration	WAEC NECO	6 7	1 3	1 2	2 3	0 0	1 2	11 17	**0.77**
Algebraic processes	WAEC NECO	8 8	1 2	1 3	1 1	0 1	1 1	12 16	**1.37**
Geometry	WAEC NECO	17 5	0 6	0 0	4 5	0 0	0 0	21 16	**7.73***
Statistics	WAEC NECO	5 6	0 1	0 0	1 2	0 0	0 0	6 9	**0.53**
Introductory calculus	WAEC NECO	0 1	0 1	0 0	0 0	0 0	0 0	0 2	**0.00**

For theme 1, WAEC had 11 items while NECO had 17 items, the distribution of the items along the various levels of the cognitive domains shows that NECO had more items under Knowledge. However, the observed distribution was not statistically significant χ^2 (5) = 0.77. For theme 2, WAEC had 12 items while NECO had 16 items, more importantly, the distribution of the items along the various levels of the cognitive domains shows that NECO had more items under Comprehension, Application and Synthesis. However, the observed distribution was not statistically significant χ^2 (5) = 1.37. For theme 3, WAEC had 21 items while NECO had 16 items, the distribution of the items along the various levels of the cognitive domains shows that NECO had more items under Comprehension and Analysis. WAEC had more items under Knowledge. The observed distribution was statistically significant χ^2 (5) = 7.73. Further for theme 4, WAEC had 6 items while NECO had 9 items, more importantly, the distribution of the items along the various levels of the cognitive domains shows that NECO had more items under Knowledge. However, the observed distribution was not statistically significant χ^2 (5) = 0.53. While for theme 5, WAEC had no item while NECO had 2 items, the distribution of the items along the various levels of the cognitive domains shows that NECO had items under Knowledge and Comprehension. However, the observed distribution was not statistically significant χ^2 (5) = 0.00

Discussion

The results of this study showed that, although there were slight variances in the number of test items, overall, there was no significant difference in content validity of WAEC and NECO mathematics test items. Despite this, the two examining bodies are not inferior to one another since their items are of equal quality, and certificate issued by them can be on the same metric scale. Although most past studies (Aborisade and Fajobi, 2020; Anigbo, 2018; Awogbemi, Oloda, and Alagbe 2015) had focused on test items parameters such as discriminating, difficulty and vulnerability to guessing, the findings of this study appear to corroborate the results of past studies that found no

significant differences between WAEC and NECO test items. Thus, the two public examining bodies produced tests that are comparable in content validity and one is not superior to the other.

It is quite unfortunate that both public examining bodies failed to set adequate items on introductory calculus. While NECO had only two test items on this topic, WAEC had none. Results of the test analysis showed that the two items on introductory calculus set by NECO were under knowledge and there were no test items under higher cognitive level. Although introductory calculus is a new topic in the mathematics curriculum prepared by both Federal Ministry of Education and Nigerian Educational Research Development Council, the importance of this topic cannot be over emphasized. Students who may have the ambition of pursing natural science, engineering and technology in higher institutions need the fundamental and basic knowledge of introductory calculus; and this basic knowledge can only be obtained at the senior secondary school level. In the higher institutions, basic knowledge in calculus such as differentiation and integration is needed for easy understanding of physics, chemistry, and engineering courses.

The observed non-significant differences in the content validity of the mathematics test items of the two public examining bodies was likely due to the fact that these items were drawn from the same mathematics curriculum which was prepared by the Federal Ministry of Education in collaboration with Nigeria Educational Research Development Council; which are the two educational organs of the Federal Republic of Nigeria saddled with the responsibility of development of curriculum for secondary school education in Nigeria. However, the length of test items of NECO being longer than that of WAEC and the differences in testing time may make NECO mathematics test items to be somewhat more cumbersome and tasking to examinees than WAEC Mathematics test items. The longer time of test administration of NECO might be due to the number of response options which it uses. While WAEC uses four-options A, B, C, and D, NECO uses five-option system, A, B, C, D, and E.

Conclusion and Recommendations

There was no statistically significant difference between the two public examining bodies in the distribution of 2018 SSCE Mathematics multiple choice questions across the various levels of the cognitive domains and themes. However, the 60 test items which NECO usually set and administer may be too much. More importantly, the time of administration as well as the number of options which NECO uses may be too tasking for the examinees. Therefore, there is the need for NECO to look into the possibility of reducing the length of test items and the time of test administration. There is also a need for NECO to reduce the number of response options from five to four so as to be in line with that of WAEC which is four. The two public examining bodies should include test items on introductory calculus in their subsequent mathematics multiple-choice papers.

This is because introductory calculus is a new topic in the mathematics curriculum. It is the opinion of the researchers that, if teachers know that items would be set on this topic, they would teach their students this topic, but if teachers know that public examining bodies will not set test items under this topic, it is also likely that teachers may not teach this topic at all. In such situation, students may not have adequate idea about introductory calculus.

References

Aborisade, O. J., and Fajobi, O. O. (2020). Comparative analysis of psychometric properties of mathematics items constructed by WAEC and NECO in Nigeria using item response theory approach. *Educational Research and Reviews*, 15(1), 1-7

Anigbo, L. C (2018). Comparison of 2017 west Africa Examination Council (WAEC) and National Certificate Examination Council (NECO) Senior Secondary School Certificate Examination Mathematics Question. *International Journal of Education and Evaluation* 4(3) pp. 21-28.

Awogbemi, C. A, Oloda, F. S. S, Alagbe, S. M (2015). A Correctional analysis of students' achievement in WASSCE and NECO Mathematics. *IOSR Journal of Research and Method in Education* 5(4) pp. 14-21

Dibu-Ojerinde, O. O. (2005). The challenges of standards in the test development process for the senior school certificate examination in Nigeria. Paper presented at Paper Presented at the ICET World Assembly, University of Pretoria, Pretoria, South Africa, July 12-15, 2005.

Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel psychology*, *28*, pp. 563–575.

Obot, P. F (2019). Assessing the comparability of 2018 WAEC and NECO Mathematics Test Items. M.Ed. Project Submitted to International Centre for Educational Evaluation, Institute of Education, University of Ibadan, Nigeria

Ogunyomi K. O. and Adegoke, B. A. (2020). Friendliness of locally developed software packages for teaching circle geometry in Nigeria. *Journal of Positive Psychology and Counselling* 4, pp. 12 -21

Okpala, P. N, Onocha, C. O and Oyedeji, O. A (1993) *Measurement and Evaluation in Education*. Ibadan: Sterling - Horden publishers.

Udofia, N and Udoh K. I. (2017). Comparative Analysis of WAEC and NECO Senior Secondary School Mathematics Examination. *Mathematics Test Theory and Modelling*, 7 (6), pp 41-52.

West African Journal of Education, Vol. XL 2020 Page 42-55

West African Journal of Education
Vol. XL 2020 ISSN: 0043-2997
Website: http//www.instituteofeducui.com

Prevailing Methods of Teaching Daily Living and Socialization Skills to Students with Intellectual Disability in Ilorin Metropolis, Kwara State

Olubukola C. DADA
Department of Special Education
Faculty of Education, Kwara State University Malete, Nigeria
bukkyyemmi@yahoo.com; olubukola.dada@kwasu.edu.ng

Submitted: October 3, 2020; Revised: February 2, 2021; Accepted: March 2, 2021

Abstract

Despite the inclusion of students with intellectual disability into the mainstream education, these sets of learners are still not having access to education like other Nigerian children without disability. This is partially attributed to lack of adequate management from their teachers and care-givers. This study, therefore examined teachers' methods of teaching daily living and socialization skills of students with intellectual disability in Ilorin metropolis, Kwara state. Descriptive survey research was used. Simple random sampling technique was used to select fifty (50) teachers. A structured twenty item questionnaire tiled methods used in teaching daily living and socialization skills to students with intellectual disabilities was used in collecting data (r=0.79). Percentage, frequency and mean were used to analyse the data collected. The findings of the study indicated that interactive teaching methods; cooperative teaching methods, teacher-direct approach and team-teaching methods are teaching methods used by teachers to teach daily living and socialization skills to students with intellectual disability. Furthermore, inadequate teaching/learning materials, lack of facility to enhance teaching and learning and lack of fund are the major challenges experienced. Pictorial charts, modeling and video devices are teaching materials that can enhance the teaching of daily living and socialization skills to students with intellectual disabilities. Thus, school managers and experts in special education should encourage and mobilize for parental support through seminar, conferences and public education to ensure continued training of daily living and socialization skills at home.

Keywords: Teachers', methods of teaching, Daily Living skills, Socialization skills, Students with Intellectual Disability

Background to the Study

Learners with intellectual disabilities are found throughout the world. Intellectual disability is the situation in which a student's cognitive functioning is affected to the point of causing a substantial delay in receiving information from his or her environment, thereby disrupting effective processing of information, problem solving and adapting to this information. The result can be a general delay in development. Student's functional ability in language and communication; social interaction; self-direction; the taking charge of the events affect their life. The conviction that such control is possible and self-advocacy; self-care; independent travel; learning; and eventual economic self-sufficiency may be adversely affected. Intellectual disability is a lifelong condition with a long-term impact which made it a major consideration. Friend (2008) observes that no two students with the identical disability will be impacted in similar way. It is pertinent to recognize that students with intellectual disabilities extend a broad array of abilities and have strengths and weaknesses. Most importantly, all students with intellectual disability are gifted with the capability of learning depending on the level of intellectual functioning and adaptive behaviour (Friend, 2008).

Learners with intellectually disability are one of the downtrodden and marginalized groups in the society. They are neglected, remain unattended to and ignored in many developing countries. There has been lot of predispositions to subject the disabled to heartless and malicious practices (Hardman, Drew & Egan 1999). Their family, friends and the society at large tend to ignore their abilities not to mention their psychosocial needs. Mpofu (2000) asserts that persons with intellectual disability are a powerless group that have been culturally and economically victimized. This situation has been perpetuated due to the attitudes of society which allowed and promoted the discernment of mentally challenged persons as weak and semi- competent components of the society from primitive period to date (Dada, 2012). Such perception and discernment make people with intellectual disability as a group to be tolerated and cared for. However, civilized and humanitarian's practices came up in the last half of the nineteenth century where institutions for educational and custodial care purposes were put in place. After a while, the compassionate and humanism viewpoint was surpassed by the one of empowerment. The new viewpoint of empowerment enables people with intellectual disabilities to triumph over initial sentiments and barriers (Ashwood et al 2015).

That being the case, education has taken center stage in the advancement and empowerment of intellectually disabled persons. Thus, that has led to the change of educational provision from segregation to inclusion. Ainscow (2003) posits that in an inclusive movement the environment should be least restrictive to accommodate disabled learners and to afford them the right to be trained in environments that are conducive to their social, academic, physical and psychological needs. The concept of inclusion was in actual fact recognized after the Jomtien and Salamanca conferences of

1990 and 1994. The upshots of the Jomtien and Salamanca conferences spelt out the requirement for inclusion as opposed to sheer integration of students with disabilities. The integration of intellectually disabled learners alone may not guarantee the actualization of the core vision of Jomtien and Salamanca conferences rather the management style of the teachers of students with intellectual disability are also to be looked into for modification and adequate advancement where necessary. As the successful implementation of educational programmes mostly hinges on the teachers who are the implementers of the programmes to students with intellectual disabilities. The search for methods of educating and managing learners with intellectual disabilities began more than 200 years ago. According to Heward, (2006), Jean Marc Itard showed that "intensive systematic intervention" could produce noteworthy results in a learner considered to be incapable of learning. Okoko (1998) observes that every good curriculum for learners with intellectual disabilities must contain Daily Living Skills (DLS) and socialization skills. She asserts that skilled and qualified teachers are able to recognize and employ accurate teaching methods to teach physical education which is related to daily living skills.

Daily living skills (DLS) are manual skills; therefore, learners with intellectual disabilities can attain them if teaching methods are applied accurately and efficiently. Daily living skills are home based and community living techniques that allow individuals to deal with current and future daily demands and responsibilities. These skills enable the individual to be trained on how to be independent and responsible. The skills are; personal care and hygiene, clothing-dressing, laundry process, shoe and shoe care, food preparation and eating, money, transportation, job skills, home and kitchen management, time management, leisure and recreation (Friend, 2008). The study of Kaur (2005) clearly indicates that learners with intellectual disabilities can progressively acquire Daily Living Skills (DLS) once exposed to conducive environment, trained personnel and effective use of teaching methods. Improvement in such skills could aid learners with intellectual disabilities to increase self-sufficiency, co-dependence and fostering problem-solving in the house, school and in the whole community at large (Lombardi, 2011).

Socialization skills on the other hand are defined as skills that allow each child to interact and relate with others successfully. These set of skills are used to interact and interrelate with one another. These skills include daily interaction skills such as sharing, talking, taking turns, allowing others to talk without interrupting and so on. According to Kratchowill and French (1984), social skills are learned verbal and non-verbal conduct and behaviors that are carried out within a definite social context. Social skills are necessary to form and maintain connections with others. These skills may be obtained through gradual learning and are largely controlled and influenced by an array of social agents present in the culture. The practice of learning and acquiring such skills in the society is called socialization and when these skills are performed effectively they

are referred to as social competency. Sometimes persons with a disability have behaviors and characters that are unacceptable in social relationships. Inappropriate social skills could be a characteristic of their disability. Children may be deficient in specific social skill, may apply an inappropriate social skill to a definite situation, or may not be aware that a definite situation calls for a specific skill set (Akhmetzyanova, 2014).

Since the declaration of Education For All (EFA) and it subsequence acceptance by difference countries of the world, education for intellectually disabled individual was not only integrated into the main stream education but became a prominent aspect of education. Thus, there has been the change of educational provision from exclusion to inclusion. Ainscow (2003) posits that in an inclusive movement the environment should be least restrictive to accommodate students with disabilities to afford them the right to learn in environments that are conducive to their social, academic, physical and psychological needs. The notion of inclusion was in actual fact realized after the Jomtien and Salamanca conferences (1990 & 1994) on Disabilities. Despite the inclusion of education for students with intellectual disability, these sets of learners are still not enjoying education the way their colleagues who are able have been enjoying learning. This is partially attributed to lack of adequate management from their teachers and care-givers. This study therefore investigates the teachers' methods of teaching daily living and socialization skills of students with intellectual disability in Ilorin metropolis, Kwara state.

Statement of the Problem

Most learners with mild intellectual disabilities in Ilorin metropolis of Kwara State are placed in units in primary and secondary schools but majority still lacked Daily Living Skill (DLS) and Socialization Skills needed for survival in their environment. This was revealed and demonstrated by the way they were discriminated, rebuffed, segregated, rejected and abused by the society. They were, therefore, not well integrated in their communities. Their parents and guardians spend and exhaust their time caring for these children, which limited their contribution towards national development. The learners in the units were mildly and moderately retarded. They were, therefore, classified as educable and trainable. If adequate management and teaching methods were employed effectively by teachers, learners would have acquired daily living and socialization skills the way they ought to. In addition to their ability to identify mistreatment and abuse and reporting to the relevant authority, acquisition of daily living and socialization skills would also enable them live independently. However, despite all the provisions made to ensure that students with intellectual disabilities learn daily living skills and socialization skills, the outcome has been highly affected by teachers' management skills and how adequate it is being deployed in the process of teaching them. This study, therefore, examines teachers' management of students with

intellectual disability daily living and socialization skills with a view of suggesting solution on how students with such disability could be adequately managed to carry out daily living and socialization skills.

Purpose of the study

The general purpose of this study is to examine teachers' management of daily living and socialization skills of students with intellectual disability in Kwara State. Specifically, this study aims to;

i. identify the teaching methods employed by teachers to teach daily living skills to learners with intellectual disability;
ii. identify the teaching methods employed by teachers to teach socialization skills to learners with intellectual disability;
iii. determine the challenges teachers experience while teaching daily living and socialization skills to learners with intellectual disability;
iv examine the teaching and learning materials that enhance the teaching of daily living and socialization skills to learners with intellectual disability.

Research Questions

This study is aimed at providing answers to the following questions:

i. What are the teaching methods used by teachers of learners with intellectual disability to teach daily living skills?
ii. What are the teaching methods employed by teachers of learners with intellectual disability in teach socialization skills?
iii. What are the challenges teachers encountered when teaching daily living and socialization skills to learners with intellectual disability?
iv. What are the teaching materials that can enhance the teaching of daily living and socialization skills of learners with intellectual disability?

Significance of the study

The study would provide information to teachers on the effectiveness of teaching methods for acquisition of daily living and socialization skills to learners with intellectual disability. It would also supply information on how they should improve daily living skills, challenges experienced and the teaching and learning resources used to implement daily living and socialization skills. The study could also be used by curriculum developers, policy-makers and other stakeholders in the teaching line of work to advance and improve the implementation and acquisition of daily living and socialization skills by learners with mild intellectual disability to enhance their eventual independent living.

Methodology

Research Design

The study is a survey research and it is descriptive in nature. This design was adopted to carry out the research because it allows researcher to use information collected from the sample respondents to generalize on the population. The descriptive research is chosen because it gives the researcher the opportunity of having direct contact with a population or sample, which has features, personality, qualities, or attitudes that are relevant to the study. The descriptive research is also considered appropriate because it helped in describing prevailing practices, situations, conditions and issues such as that which the study sets to investigate and portray.

Sample and Sampling Techniques

Purposive sampling technique was used to select the only special school for learners with intellectual disability in public primary schools in the area of study and three inclusive schools that have students with intellectual disability. Simple random sampling techniques was used by the researcher to select fifty (50) teachers of learners with intellectual disability from the five special and inclusive schools selected. A number of twenty (20) teachers were chosen from the special schools because that is where we have high concentration of special teachers while ten (10) were chosen from each of the three inclusive schools.

Instrument

A structured twenty item questionnaire prepared by the researcher was used in collecting data for this research. The questionnaire comprises of section A and B. The section A contains the items on daily living skills while section B contains the items on socialization skills. The responses would be on a modified four likert scale of SA-strongly agree, A-agree, D-disagree, SD-strongly disagree. The questionnaire was validated by experts who are also lecturers in the Department of Special Education to make sure that the items in the questionnaire measures what was intended and to ensure objectivity in relation to the research purpose and problems at hand. This was necessary to ascertain the adequacy of the instrument and to rid the instruments of unclear direction, vocabulary and sentence structures that might be too difficult, poorly constructed items, improper arrangements of items and ambiguous test items inappropriate for the outcomes being measured. To ensure the reliability of the instrument test re-test method was used, using the same sets of questionnaires on similar respondent but outside the area of study within the interval of two weeks. Pearson product-moment correlation coefficient (PPMC) was used to test the reliability of the instrument. The reliability coefficient was 0.79.

Procedure for Data Collection and Ethical Consideration

A letter of introduction was submitted to the schools seeking permission to conduct the research. After getting the permission, the researcher explained the importance of the study to the teachers and later administered the questionnaire to teachers of students with intellectual disabilities. The researcher made friends and played with the respondents to establish good rapport with the teachers and ensure self-disclosure. Teacher's consent was sought and none of the teachers were coerced into responding to the questionnaires. Light refreshments were also distributed to the respondents with the permission of the school authorities so as to gain their full cooperation and participation.

Method of Data Analysis

The data gathered were analyzed using percentage, frequency and mean. The decision rule for the interpretation of the results of the data analysed was a mean score of 2.5 and above which was considered as a positive response (strongly agreed), and less than 2.5 was considered as a negative response (strongly disagreed). 4.00 – 3.50 indicated strongly agreed, 3.49 – 2.50 indicated agreed while 2.49 – 1.50 indicated disagreed and 1.49 – 0.00 showed strongly disagreed.

Results

Research Question 1: What are the teaching methods used by teachers of learners with intellectual disability to teach daily living skills?

Table 1: Analysis of teaching methods used by teachers of learners with intellectual disability to teach daily living skills

S/No	ITEM	SA	A	D	SD	MEAN
1	Interactive teaching method	20(40%)	28(56%)	2(4%)	-	3.48
2	Co-operative teaching method	34(68%)	15(30%)	1(2%)		3.68
3	Teacher-direct approach	12(24%)	37(74%)	-	1(2%)	3.66
4	Peer-tutoring method	11(22%)	17(34%)	12(24%)	10(20%)	2.34
5	Team teaching method	12(24%)	18(36%)	11(22%)	9(18%)	2.68
	Weighted mean					**3.16**

Table 1 revealed teachers' response to teaching methods used by teachers of learners with intellectual disability to teach daily living skills. Item 1 showed that 20 respondents representing 40% strongly agreed to use of interactive teaching methods, 28 respondents representing 56% agreed, while 2 respondents representing 4% disagreed with mean of 3.48. Also, Item 2 showed that 34 respondents representing 68% strongly agreed to use of co-operative teaching methods, 15 respondents representing 30% agreed, while 1 respondent representing 2% disagreed with a mean of 3.68. Item 3

showed that 12 respondents representing 24% strongly agreed to use of teacher direct approach, 37 respondents representing 74% agreed, while 1 respondents representing 2% disagreed with mean a of 3.66. Furthermore, item 4 showed that 11 respondents representing 22% strongly agreed to use of peer-tutoring methods, 17 respondents representing 34% agreed, 12 respondents representing 24% disagreed while 10 respondents representing 20% strongly disagreed with mean of 3.34. Lastly, item 5 showed that 12 respondents representing 24% strongly agreed to use of team teaching methods, 18 respondents representing 36% agreed, 11 respondents representing 22% disagreed while 9 respondents representing 18% strongly disagreed with mean of 2.68. The weighted mean is 3.16 which showed that all the items were agreed to. Therefore, from table 1 above, it could be deduced that teaching methods used by teachers to teach daily living skills to intellectually disabled students are cooperative teaching methods, teacher-direct approach and interactive teaching methods

Research Question 2: What are the teaching methods employed by teachers of learners with intellectual disability in teaching socialization skills?

Table 2 : Analysis showing response to teaching methods used by teachers of learners with intellectual disability to teach socialization skills

S/No	ITEM	SA	A	D	SD	MEAN
6	Interactive teaching method	19(38%)	24(48%)	5(10%)	2(4%)	3.56
7	Co-operative teaching method	23(46%)	22(44%)	4(8%)	1(2%)	3.78
8	Teacher-direct approach	27(54%)	18(36%)	2(4%)	3(6%)	3.82
9	Peer-tutoring method	13(26%)	28(56%)	4(8%)	5(10%)	3.54
10	Team teaching method	22(44%)	24(48%)	2(4%)	2(4%)	3.68
Weighted mean					**3.67**	

Table 2 revealed teachers' response to teaching methods used to teach learners with intellectual disability socialization skills. Item 6 showed that 19 respondents representing 38% strongly agreed to use of interactive teaching method to teach social skills to intellectually disabled students, 24 respondents representing 48% agreed, 5 respondents representing 10% disagreed while 2 respondents representing 4% strongly disagreed with mean of 3.56. Also, item 7 showed that 23 respondents representing 46% strongly agreed to the use of cooperative teaching method to teach social skills to students with intellectual disability, 22 respondents representing 44% agreed, 4 respondents representing 8% disagreed while 1 respondent representing 2% strongly disagreed with mean of 3.78. Item 8 showed that 27 respondents representing 54% strongly agreed to use of teacher-direct approach to teach social skills to intellectually disabled students, 18 respondents representing 36% agreed, 2 respondents representing 4% disagreed while 3 respondents representing 6% strongly disagreed with mean of

3.82. Furthermore, item 9 showed that 13 respondents representing 26% strongly agreed to use of peer-tutoring method to teach social skills to intellectually disabled students, 28 respondents representing 56% agreed, 4 respondents representing 8% disagreed while 5 respondents representing 10% strongly disagreed with mean of 3.54.

Lastly, item 10 showed that 22 respondents representing 44% strongly agreed to use of team teaching method to teach social skills to students with intellectual disability, 24 respondents representing 48% agreed, 2 respondents representing 4% disagreed while 2 respondents representing 4% strongly disagreed with mean of 3.68. The weighted mean of the respondents is 3.67 which revealed that all the respondents strongly responded to the items. Therefore, from table 2 above, it is could be see that teaching methods used by teachers to teach socialization skills to students with intellectual disability are teacher-direct approach, cooperative teaching methods and team teaching methods.

Research Question 3: What are the challenges teachers' encounter when teaching daily living and socialization skills to learners with intellectual disability?

Table 3 : Analysis showing response to chal lenges teachers experience when teaching daily living skills and socialization skills to learners with intellectual disability

S/No	ITEM	SA	A	D	SD	MEAN
11	Inadequate teaching/learning materials	24(48%)	23(46%)	1(2%)	2(4%)	3.86
12	High teacher-students ratio	12(24%)	14(28%)	!8(36%)	6(12%)	2.56
13	Inadequate curriculum	17(34%)	22(44%)	6(12%)	5(10%)	3.04
14	Lack of facility to enhance teaching and learning	18(36%)	30(60%)	2(4%)	-	3.88
15	Lack of fund	14(28%)	28(56%)	5(10%)	3(6%)	3.74
16	Negative attitudes of teachers and school administration	13(26%)	12(24%)	19(38%)	6(12%)	2.54
	Weighted mean					**3.27**

Table 3 revealed teachers' response to challenges experienced while teaching daily living and socialization skills to learners with intellectual disability. Item 11 showed that 24 respondents representing 48% strongly agreed that inadequate teaching/learning material is a major challenge experience, 23 respondents representing 46% agreed, 1 respondent representing 2% disagreed while 2 respondents representing 4% strongly disagreed with mean a of 3.86. Also, item 12 showed that 12 respondents representing 24% strongly agreed that high teacher-students ratio is another challenge experience, 14 respondents representing 28% agreed, 18 respondents representing 36% disagreed while 6 respondents representing 12% strongly disagreed with a mean of 3.56. Item 13 showed that 17 respondents representing 34% strongly agreed that inadequate curriculum is a challenge experienced while teaching learners with intellectual disability, 22 respondents representing 44% agreed, 6 respondents representing 12% disagreed while 5 respondents representing 10% strongly disagreed with mean a of

3.04. Item 14 showed that 18 respondents representing 36% strongly agreed that lack of facilities to enhance teaching and learning is a challenge experienced, 30 respondents representing 60% agreed, while 2 respondents representing 4% disagreed with a mean of 3.88.

Furthermore, item 15 showed that 14 respondents representing 28% strongly agreed that lack of fund is a major challenge experienced, 28 respondents representing 56% agreed, 5 respondents representing 10% disagreed while 3 respondents representing 6% strongly disagreed with a mean of 3.74. Lastly, item 16 showed that 13 respondents representing 26% strongly agreed that negative attitude of teachers and school administration affect leaning of students with intellectual disability, 12 respondents representing 24% agreed, 19 respondents representing 38% disagreed while 6 respondents representing 12% strongly disagreed with a mean of 2.54. The weighted mean of the responses is 3.27 which showed that all the respondents agreed with the major challenges experienced by teachers in teaching daily living and socialization skills. Therefore, from table 3 above, it could be deduced that the major challenges teachers experienced when teaching daily living and socialization skills to learners with intellectual disability are; inadequate teaching/learning materials, lack of facility to enhance teaching and learning, and lack of fund.

Research Question 4: What teaching materials that can enhance the teaching of daily living and socialization skills of learners with intellectual disability?

Table 4 : Analysis showing response to teaching materials that can enhance the teaching of daily living and socialization skills of learners with intellectual disability?

S/No	ITEM	SA	A	D	SD	MEAN
17	Pictorial charts	18(36%)	22(44%)	8(16%)	2(4%)	3.24
18	Modeling	23(46%)	24(48%)	3(6%)	-	3.84
19	Video devices	19(38%)	28(56%)	2(4%)	1(2%)	3.84
20	Audio devices	12(24%)	21(42%)	12(24%)	5(10%)	3.04
	Weighted mean					**3.49**

Table 4 revealed teachers' response to teaching materials that can enhance the teaching of daily living and socialization skills of learners with intellectual disability. Item 17 showed that 18 respondents representing 36% strongly agreed that pictorial chart would enhance their leaning, 22 respondents representing 44% agreed, 8 respondents representing 16% disagreed while 2 respondents representing 4% strongly disagreed with a mean of 3.24. Also, item 18 showed that 23 respondents representing 46% strongly agreed that modeling would enhance their leaning, 24 respondents representing 48% agreed while 3 respondents representing 6% strongly disagreed with a mean of 3.84.

Furthermore, item 19 showed that 19 respondents representing 38% strongly agreed that video devices would enhance their leaning, 28 respondents representing 56% agreed, 2 respondents representing 4% disagreed while 1 respondent representing 2% strongly disagreed with a mean of 3.84. Lastly, item 20 showed that 12 respondents representing 24% strongly agreed that audio device would enhance their learning, 21 respondents representing 42% agreed, 12 respondents representing 24% disagreed while 5 respondents representing 10% strongly disagreed with a mean of 3.04. The weighted mean of the responses is 3.49 which indicated that all the respondents agreed with the utilization of teaching materials. Therefore, from table 4 above, it could be deduced that pictorial charts, modeling and video devices are teaching materials that can enhance the teaching of daily living and socialization skills of learners with intellectual disability.

Discussions of findings

From the data analysis, the first finding of this study revealed that interactive teaching methods, cooperative teaching methods and teacher-direct approach are teaching methods used by teachers to teach daily living skills to students with intellectual disability. These methods of teaching allow students to be involved in different activities during the lesson. For instance, some learners would be involved in distributing materials, others in arranging tables, while still others did other class activities. Of almost important the methods support and put into consideration the students age, interest and educational needs. This finding support that of Friend (2008), that a teacher of learners with intellectual disability should be guided by the ability level of the learner, age, and educational needs and interest of the learner to come up with the daily living and socialization skills correct methods of teaching for a particular learner with intellectual disability. Also, the second finding of the study revealed that teaching methods used by teachers to teach social skills to intellectually disabled students are interactive teaching methods, cooperative teaching methods, teacher-direct approach and teacher-direct approach. Okoko (1998) observes that every good curriculum for learners with intellectual disabilities should contain socialization skills. She asserts that trained teachers are able to identify and use correct teaching methods to teach physical education which is also applicable to these skills. This finding corroborate Heward, (2006) that stressed that Jean Marc Itard showed that "intensive systematic intervention" could produce significant gains in a learner thought to be incapable of learning.

Furthermore, the third finding of the study revealed that inadequate teaching/learning materials, lack of facility to enhance teaching and learning, and lack of fund are the major challenges experienced by when teaching daily living skills and socialization skills to learners with intellectual disability. This support the findings of Friend (2008), that ignorance concerning disability can result in quite damaging

prejudice, hostility and rejection. This is even more serious if the disability is intellectual disability because of its characteristics of deficits in both adaptive behavior and IQ. Also, Koech (1999) in his report summarizes the challenges encountered in implementing daily living skill and social skill when he asserted that 'there is nothing more unequal than the equal treatment of unequal. The report asserts that the quality of the service for children with special needs is adversely affected by acute shortage of specialized aids and equipment, specialized personnel, inappropriate curriculum, insufficient institutions and programmes, lack of coordination and unity of purpose between and among service providers, inadequate support staff, an absence of clear policy guidelines, lack of legal status on special education, provisions, laxity on the side of government to fund special education materials among others.

The fourth finding of the study revealed that Pictorial charts, modeling and video devices are teaching materials that can enhance the teaching of daily living and socialization skills of learners with intellectual disability. Teaching and learning materials cultivate motivation in the learners and make them active participants in the learning process. This finding support Rosallin (2013) that teaching and learning materials capture and maintain learners' attention, help them to understand what is being taught, and learn new skills. Learners with intellectual disability require materials over and above what is already being provided by the school.

Conclusion

Daily living and socialization skills are the day-to-day activities needed to enhance healthy living. The activities range from personal grooming, toileting, greetings, taking turns, showing respect which are integral parts of successful living. These skills are also of paramount importance to students living with intellectual disabilities despite their low intelligence quotient hence teachers need to manage and teach these skills at school and encourage parents and other caregivers to do likewise. The results obtained from the data gathered and analyzed in this study indicated that interactive teaching methods, cooperative teaching methods and teacher-direct approach are teaching methods used by teachers to teach daily living skills to intellectually disabled students. Also, it was discovered that teaching methods used by teachers to teach social skills to intellectually disabled students are interactive teaching methods, cooperative teaching methods, teacher-direct approach and teacher-direct approach. Furthermore, inadequate teaching/learning materials, lack of facility to enhance teaching and learning and lack of fund are the major challenges experienced by when teaching daily living skills and social skills to learners with intellectual disability. Lastly, Pictorial charts, modeling and video devices are teaching materials that can enhance the teaching of daily living and social skills of learners with intellectual disability.

Recommendations

The following recommendations were made based on the research findings and conclusions. School managers and experts in special education should lobby and mobilize for parental support through seminar, conferences and public education to ensure continued training of daily living and socialization skills at home.

There should be provision of an array of professional development opportunities to special education teachers on how to instructionally address daily living skills and socialization skills deficits for students with intellectual disability. Special education teachers should be provided comprehensive training specific to addressing daily living skills and socialization skills deficits in their students.

Schools with special units should be headed by teachers who are trained on how to handle intellectual disability and have knowledge and skills, and also have learners with intellectual disability at heart. Such head teachers would advise their special unit teachers on the correct methods while considering learners abilities and interests in teaching daily living and socialization skills.

Teacher training programmes should help inculcate positive attitudes among teachers and provide knowledge and skills to handle students with mental disabilities in regular classrooms. Schools and the Ministry of Education should mobilize resources from donor agencies to within and outside the country to cater for the successful implementation of special education programmes. The government should provide enough funds for purchase of materials and construction of enough classrooms, creation of awareness and advocacy on abilities of learners with intellectual disability if they have acquired daily living and socialization skills.

References

Ainscow, M. (2003). *Understanding the development of inclusive schools* London. Falmer Press.

Ashwood, K. L., Tye, C., Azadi, B., Cartwright, S., Asherson, P., & Bolton, P. (2015). Brief report: *Adaptive functioning in children with ASD, ADHD and ASD+ADHD. Journal of autism and developmental disorders*,45(7), 2235-2242

Dada, O. C. (2012). *Intellectual disabilities: A Conceptual approach (3rd ed.)*. Ibadan: Arinak Publishing Company.

Friend, M. (2008). Special Education Contemporary Perspectives for School Professionals. (2nd Ed). USA: Pearson Education Inc.Company.

Hardman, M.L., Drew, C. & Egan, M.W. (1999): Human Exceptionality: Society, School and Family. Allyn and Bacon

Heward, W. L. (2006). Characteristics of children with Mental Retardation. Retrieved from http://www.education.com/reference/article/characteristics-children-mental-retardation. Retrieved 25th July 2011

Kaur, B. (2005). Teaching and learning of mathematics - What really matters to teachers and students. ZDM - *The International Journal on Mathematics Education,* 40(6), 951-962.

Kratochwill, T.R&French, D.C (1984). *Social Skills Training for Withdrawn Children. School Psychology Review; 13(3): 339-341*

Lombardi, P. (2011). Special Education Resources. Retrieved from: http://www.paulabliss.com/li feskills,hfmRetrieved 27thOct. 2011

Mpofu, E. (2000). Education consideration for children who are mentally challenged/retarded. Harare : Government Printers

Nagle, J. P., 2001. Voices from the Margins; the histories of vocational school students London: Peter Lang Publishing

Okoko, J. M. (1998). "Implementation of physical education to the mentally challenged. Constraints encountered by teachers in Nairobi" M.ED. Thesis, Kenyatta University.

West African Journal of Education, Vol. XL 2020 Page 56-70

West African Journal of Education

Vol. XL 2020 ISSN: 0043-2997

Website: http//www.instituteofeducui.com

Undergraduates' Entry Requirements and Student Personal Variables as Determinants of Academic Performance in Faculty of Science, University of Ibadan, Nigeria

[1]Benedicta Omeghie, ISUNUEO & [2]Ikmat Olanrewaju, JUNAID

[1]Nigerian Institute of Social & Economic Research (NISER), Ibadan.

P.M.B. 05, UI Post Office, Ojoo, Ibadan, Oyo State, Nigeria.

[2]Institute of Education. University of Ibadan, Ibadan, Oyo State, Nigeria.

Email: bennydtus@yahoo.com; driojunaid@gmail.com

Submitted: October 3, 2020; Revised: March 16, 2021; Accepted: April 10, 2021

Abstract

First year university undergraduates' performance has not been in tandem with achievement in entry requirements (Senior Secondary Certificate Examinations results, scores in Unified Tertiary Matriculation Examinations and Post-Unified Tertiary Matriculation Examination). Thus, undergraduates with good grades in SSCE results, high scores in UTME and Post-UTME lost their admissions due to poor performance in their first-year examinations. Past studies on causes of poor performance have focused largely on assessing the cognitive domain with little attention paid to students' other personal variables: interest in university education, mental ability, career aspiration and gender. This study examined the adequacy of the entry requirements students' personal variables and academic candidates' capability in determining first year students' performance in the Faculty of Science, University of Ibadan. Purposive sampling technique was used to select six out of the eleven departments in the Faculty. The instruments used were Undergraduates' Career Aspiration, Undergraduates' Interest in University Education Questionnaires and Mental Ability Test. Data were analysed using path coefficients at $p < 0.05$ level of significance and covariance based structural equation modelling. Modelling the variables revealed that 9 out of 27 paths were significant and true predictors of undergraduates' academic performance in the first academic year. While the direct and indirect path coefficients of mental ability on academic achievement were not significant and consequently eliminated from the model. Interest in university education, career aspiration, gender alongside performance in SSSE, UTME and Post-UTME were important in determining academic performance of first year science undergraduates in the University of Ibadan. Therefore, criterion on students' personal variables should be included in assessing candidates' capability for academic study.

Keywords: Undergraduates' performance, University of Ibadan entry requirements, Interest in university education Post- Unified Tertiary Matriculation Examination

Introduction

Performances of undergraduates in universities, among other factors, can strongly determine their achievement in their academics and potentials while in the university and even after graduating from the university. The qualified and skilled graduates from the university can contribute greatly and determine the quality of manpower of a country. Quality university education is a tool for realizing sustainable development goals of any nation as well as the fulfilment of any individuals' dreams and aspirations. Also, the attainment of goals and objectives of universities are measured through the performance of learners both at the undergraduate and post-graduate levels. However, education in Nigeria presently has become a source of concern to its stakeholders due to the fact that standards of education are below expectations as a result of the poor academic performance of university undergraduates.

Despite the huge amount of funding and provision of other educational needs being put into university education by the government and other stakeholders, there are still problems associated with undergraduates' academic performance (Akiri and Ugborugbo, 2009; Bamidele and Bamidele, 2013. They further reported that the drop-out rate, having extra years and probations of some undergraduates as a result of their poor performances in examinations are still witnessed in the universities over the years. Some are even advised to withdraw as early as their first year in the university. This calls to question the fact that after candidates have successfully passed the entry level examinations to gain admission into the university, their performance precipitously decline below expectations immediately after they are admitted into the university. Akomolafe and Olorunfemi-Olabisi (2011) states that a very important factor that could determine undergraduates' performance and have given so much concern to stakeholders of university education lately is undergraduates' entry requirements prior admission into the university of choice.

The entry requirements are examinations candidates must seat for and pass before they can qualify for admission into the university. These examinations include the Senior School Certificate Examination (SSCE), Unified Tertiary Matriculation Examinations (UTME) conducted by Joint Admissions and Matriculations Board (JAMB) and the Post-Unified Tertiary Matriculation Examination (Post-UTME) screening conducted by universities in Nigeria. These examinations are used to select and determine qualified candidates for admission into different departments. These entry examination as well as students' personal variables such as: undergraduates' interest in university education, mental ability, career aspiration and gender are the focus of the paper. These variables are classified into cognitive and non-cognitive issues that can affect the academic performance of university undergraduates.

The UTME and Post UTME screening test has the essence of examining candidates aspiring to gain admission into the university who would develop character and learning in various fields of their choice in the university. Among the faculties where these

prospective learners would seek admission into the university education system is the Faculty of Science. The Faculty is of great importance because the training of undergraduates revolves around having scientific skills and competencies both cognitively and structurally. Also, the Faculty of Science can enable undergraduates understand the world around them and the role science plays in our society. The courses offered in Faculty of Science can also enhance undergraduates' skill development, planning and conducting investigations, gathering information, team work and evaluating their findings, act responsibly when using scientific and applying scientific knowledge.

In Nigeria, selection processes of candidates aspiring to gain admission into tertiary institutions such as universities, polytechnics, mono-technics, colleges of education among others, are done by the Joint Admissions and Matriculations Board (JAMB), a statutory body set up by the Federal Government under JAMB Act, No. 2 of 1978, Chapter 193 of the Laws of the Federation of Nigeria. Joint Admissions and Matriculations Board conducts the Unified Tertiary Matriculations Examination into tertiary institutions in Nigeria, while the Post-Unified Tertiary Examination (Post-UTME) also known as the post University screening test is further used to screen and select the most qualified learners by each University (Obioma and Salau, 2007). The use of these public examinations is otherwise known as cognitive measures in education. This process is very vital because it is believed that the cognitive measure is the most valid and appropriate way of measuring candidates' level of intelligence in Nigeria (Obioma and Salau, 2007).

This statutory body is expected to admit the best qualified candidates recommended by the University who can be admitted into Nigeria's tertiary institutions. These examinations also have the purpose of predicting learners' performance in relation to completing their university education successfully which will be certified after the course of study. Academic Performance is generally measured through examination and can be expressed in many ways subject to what the examiner will do with the scores emanating from the examination. The possession of minimum of five credits including Mathematics and English Language, is compulsory in any of these underlisted public examinations which include, Senior School Certificate Examinations (SSCE) conducted by the West African Examinations Council (WAEC), the National Examinations Council (NECO) and National Business and Technical Examinations Board (NABTEB) which are requirements for the Unified Tertiary Matriculations Examinations (UTME).

Over the years, policies that have been introduced by the Federal government of Nigeria to is to address the issues of examining, selecting and admitting qualified candidates into universities and the issues of undergraduates' poor academic performance but it appears these policies have not been able to address properly the cause of these testing procedure in Nigerian universities. Also, a major reason for the

creation of the Joint Admisions and Matriculations Board (JAMB) in 1978 was to offer the opportunity to select qualified candidates as well as to diversify admission intakes to show a high rate of national spread in the candidates' placement. It was eenvisaged that candidates' selection and placement will be on merit, catchment area and the educationaly less advantaged states will be catered for.

Section 5(A), C (ii) of the JAMB Board Act, CAP II, Laws of the Federation of Nigeria, 2004 provides that the body should control the conduct of matriculation examinations in admitting students into all Colleges of education, Polytechnics and Universities. One major problem which erupted was the unwillingness of learners to study and the scourge of examination malpractices was on the increase Kpolovie and Okoto, (2014). It has to a large extent, militated against the objectives for which JAMB was established to achieve. Examination malpractice is a broad name for all forms of misconduct, which include; cheating, copying, spying, being in possession of unauthorized materials, use of Android handsets, impersonation among others. A frightening dimension is the involvement of parents, guardians and examination oficials in this unwholesome act. Consequently, the quality of candidates admitted by JAMB and the performance of undergraduates began to deteriorate yearly despite their good grades in their Ordinary Levels School Certificate Examinations and high scores in the Unified Tertiary Matriculation Examinations (UTME) conducted by JAMB Kpolovie, Joe and Okoto, (2014). At a time, the Ex-President of Nigeria, Olusegun Obasanjo alleged that JAMB was full of corrupt practices which had affected the standards of education in Nigeria (Ande, 2006).

This necessitated the calls by some universities and other stakeholders for a Post-Unified Tertiary Matriculation Examination (Post-UTME) (Olalekan, 2013). The first Post-UTME took place across the federation during 2005/2006 academic session. After over thirteen consecutive Post-UTME screenings, the issues of assessment of the effectiveness of Post-UTME screening in admitting candidates into the Nigerian universities have taken the front burner. Since then, many university administrators see it as a panacea to the problems associated with admitting new entrants into the Nigerian universities. Again, in 2016, the use of Post-UTME as a final measure for selection of candidates by universities was scrapped by the Federal government of Nigeria. The decision was taken by the Federal government due to the poor performances of learners in the universities and reports from the general public of the incompetence of Post-UTME screening test organised by the universities. Some of the factors that informed the ban on Post-UTME include needless duplication of efforts through written (UTME and Post-UTME) for one admission exercise; the risk of travelling on Nigerian roads over long distances; the psychological stress which candidates are exposed to in the Post-UTME exercise; and the extortion called administrative charges by universities.

In 2017, due to the poor performance of newly admitted undergraduates into the university through UTME conducted by JAMB, most universities re-introduced the

Post-UTME screening test for final selection and admission of qualified candidates. To buttress this fact, in an article by the Daily Post of 25th November, 2018, an-online Newsprint, reported that the management of the University of Ibadan has said that it will expel about 328 students' for what is called 'shameful academic results' in the 2016/2017 academic session. The Vice-Chancellor of the institution, however, blamed the situation on the absence of the Post-Unified Tertiary Matriculation Examination screening before the affected learners and others in their set were admitted. However, the use of (UTME) was previously used to select qualified applicants into the universities in Nigeria but it was also scrapped by the Federal government due to in-competencies reported on the conduct of the Board.

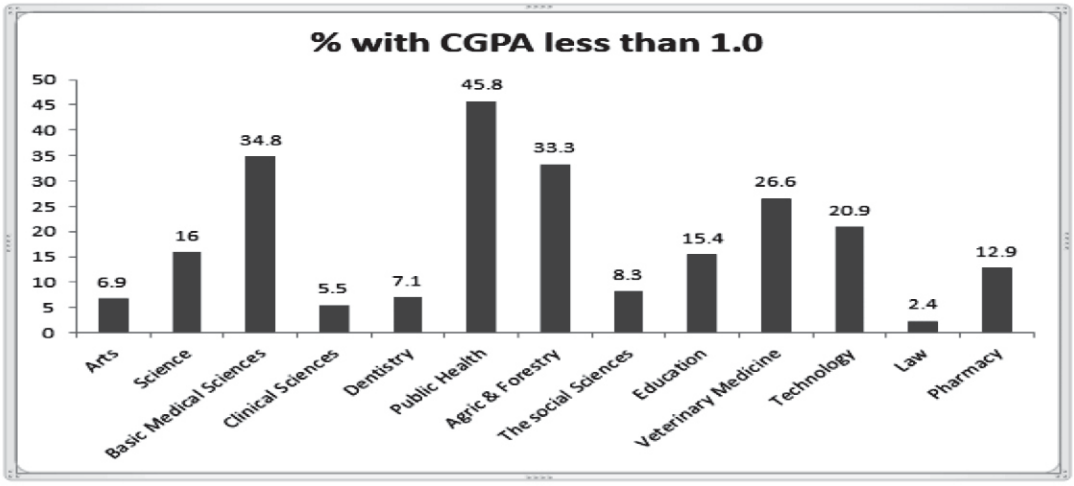


Figure 1. Undergraduates' Performance (100 Level) With Less Than 1.0 in University of Ibadan 2016/2017 Academic Session (Source: University of Ibadan, 2017)

In 2017, the University of Ibadan Senate suspended 580 undergraduate students out of the 2,961 undergraduate learners admitted in 2016/2017 academic session from the various faculties and departments in the university. This was as a result of their poor performance in their first semester examination. 510 of the learners out of the 2,961 posted a Cumulative Grade Point Average (CGPA) of less than 1.0. Figure 1. shows the breakdown of undergraduate learners' performance in the first semester of first year 2016/2017 academic session. It can be deduced from figure 1. that Faculties of Basic Medical Sciences, Public Health, Agriculture and Forestry, Veterinary Medicine Technology and Science had 16% to 45.5% of undergraduate who had less than 1.0 CGPA. This poor performance was blamed on the decision of JAMB to scrap the Post-UTME screening conducted by individual universities. It was believed that candidates were not properly screened and selected before admission into their institutions of choice.

Among other sources of concern is the placement of students into departments and disciplines by the universities based on the students' performance in the Post-UTME screening and the availability of spaces (Robbins, Lauver, Le, 2004). The proposed choice of course of study by some candidates sometimes ends up not being the course admitted for by the university. An alternative course of study is offered to the learners by the university which sometimes distresses the interest of the undergraduates.

In view of these inconsistences, policies summersaults and dearth of research on access to universities, there is a strong need to understand the best measures to adopt. Thus, the paper examined the causal effect among undergraduates' entry requirements as well as how students' personal variables can influence academic performance of the undergraduate in the Faculty of Science, University of Ibadan, Nigeria. The researcher also found how students' personal variables such as: mental ability, undergraduates' interest in university education, career aspiration and gender could influence the academic performance of the undergraduates. The Faculty of Science, University of Ibadan, Nigeria which was the focus of this study, have been conducting Post-UTME screening for over thirteen academic sessions. Therefore, it becomes necessary to investigate the causal linkages among entry examinations grades, students' personal variables and academic performance of undergraduates in the faculty of Science, University of Ibadan.

Several researches had been conducted in various aspects of admission process into universities but there is dearth of research that combined cognitive and student personal variables together. To this end, this paper examined the causal linkages among SSSCE results, UTME scores, Post-UTME scores and other students' personal variables such as undergraduates' mental ability, undergraduates' interest in university education, career aspiration, gender and academic performance of undergraduates in the faculty of science, university of Ibadan, Nigeria using causal modelling, the need to fill this gap informed this paper.

Based on the stated problems, the following research questions were raised to guide the study,

1. Is the model which describes the causal effect among the gender, SSCE result, UTME scores, Post-UTME scores, mental ability, career aspiration, interest in university education academic performance in the faculty of science consistent with the empirical data?
2. What is the most meaningful causal model, explaining students' personal variables, entry requirements and academic performance of faculty of science undergraduates?

Methodology

The research design adopted for this study was a non-experimental design, of Correlational type. The variables for the study are: Exogenous Variables – gender; endogenous variables - SSCE, UTME scores, Post-UTME scores, mental ability, career aspiration and interest in University Education; whereas the Criterion variable include undergraduate's academic performance in PHY 103 and MATH 121 in 100 level. The population of the study comprises of all undergraduate in the Faculty of Science, University of Ibadan.

The population of the study comprised all undergraduate science students in the Faculty of Science, University of Ibadan. Multi-stage sampling procedure was used to select participants. Purposive sampling was adopted in selecting two courses mostly taken by undergraduate in the Faculty of Science PHY 103 and MATHS 12 because these courses are offered by most undergraduates in the faculty of Science. In the second stage, purposive sampling was also used to select 6 out of 11 Departments in the Faculty of Science that offer the two selected 100 level courses (PHY 103 and MATH 121) and use it to measure the performance of undergraduates in the Faculty of Science. Hence, a total of three hundred and seventy six (376) undergraduates constituted the sample for this study. Table 1, shows the sample framework.

Table 1. Undergraduates in the Sampled Departments in the Faculty of Science who responded to the questionnaires by Gender.

S/N	Department	No of Males	No Females	Total	% of Males in the Sampled Population	% of Females In the Sampled Population
1.	**Chemistry**	12	28	40	5.56	9.78
2.	**Computer Science**	45	7	52	20.83	2.44
3.	**Geology**	31	11	42	14.35	3.85
4.	**Mathematics**	41	12	53	18.98	4.20
5.	**Physics**	50	2	52	23.15	0.69
6.	**Statistics**	37	10	47	17.12	3.67
Total	**6**	**216**	**70**	**286**	**75.54**	**24.46**

Five instruments were used to answer the research questions. These instruments includes:

i. Inventory on Admission and Academic Records of Undergraduates
ii. Learning Outcome Inventory of Sampled Undergraduates
iii. Questionnaire on Undergraduate Students' Career Aspiration
iv. Questionnaire on Undergraduate Students' Interest in University
v. Mental Ability Test for Undergraduate Students

i. Admission and Academic Records of Undergraduates (AARU)

It is an inventory that was used to collect secondary information on selected student's Bio-data and Admission information from the Admission office in the University of Ibadan, Ibadan. The inventory was used to gather information on the number of students, students' enrolment by year and geopolitical spread in the 2017/2018 academic session, students' enrolment by discipline, and age. Also, other factors of concern in this study like the SSCE, NECO, UTME scores, Post-UTME scores and gender were gotten by using instrument.

ii. Learning Outcome Inventory of Sampled Undergraduates (LOISU)

The learning outcome inventory of Sampled Undergraduates (LOISU) was used to collect secondary data on the pattern of performance in PHY 103 and MATH examination results of first year undergraduates in the sampled departments, Faculty of Science were obtained. This was to determine the relationship between entry results, student's personal variables and undergraduates' performance. Information on undergraduates' academic records is kept by the course advisers of the various courses. No validation on these two instruments was done because the two instruments employed for data collection were the original records which was collected from the Course Advisers. Thus, they were adjudged to be correct, authentic and reliable. This agrees with the recommendations of (Wiseman, 1999; Johnson and Christensen, 2000 and Borich 2004).

iii. Questionnaire on Undergraduates' Career Aspiration (QUCA)

The Career aspiration questionnaire was adapted from O'Brien (1996) Career Aspiration Scale (CAS) and Students' Assessment of Career Development Activities. The Student's Assessment of Career Development Activities was adapted from A kit of career education assessment and evaluation instruments developed by the Wisconsin k-12 career education consortium, the instrument was a third draft of an instrument piloted during the 1974-75 school year in science classes at Medium West High School in the United States. The questionnaire had 27 items which undergraduates responded to on a four-point Likert scale. This instrument was used to capture information on undergraduates' career aspiration.

iv. Questionnaire on Undergraduates' Interest in University (QUIU)

The questionnaire on undergraduates' interest in university education was developed by the researcher. This instrument was designed to enable the researcher measure the extent of interest in university education by undergraduates in the Faculty of Science and the causal effect with performance. It contained 18 items and a four-point response scale which the respondents responded to. Both the Validity and Reliability of the instrument was carried out by the researcher.

v. Mental Ability Test for Undergraduate (MATU)

The Mental Ability Test was designed and adopted from the series of Sawaal and India Bix Mental Ability Test. The instrument was used to capture information on undergraduates' mental ability and it contained 25 items. The instrument had items which determined undergraduates' abilities on logical sequence of questions and answers and verification of truth of statements, etc. This instrument was basically used to measure intelligence and accuracy of first year undergraduates in the Faculty of Science, University of Ibadan.

Validation of the Instruments

The instruments developed and adapted by the researcher were given to experts for face, content and construct validity. The instruments were trial tested on a different population with similar characteristics with the intention of establishing the reliability of the instruments. Cronbach alpha reliability analysis was used for Mental Ability Scale, Interest in University Education and Career Aspiration Questionnaire. Cronbach alpha of 0.78 was obtained for the Mental Ability Test, while 0.82 was obtained for career aspiration and Cronbach alpha of 0.83 was obtained for students' interest in university education.

The data collected were analysed using descriptive statistics and partial least square- structural equation modelling (SEM) involving a multivariate analytical technique known as path analysis to answer both research questions. The choice of multivariate approach was made because of the fact that it enabled the researcher to establish the combined effect of the predictor variables as well as isolate their separate contributions to the criterion variable (Kerlinger and Lee, 2002).

Results

Research Question 1: Is the model which describes the causal effect among Gender, SSCE result, UTME scores, Post-UTME scores, Mental Ability, Career aspiration, Interest in University Education and Academic Performance in the Faculty of Science, University of Ibadan Consistent with the Empirical Data?

Table 2 : Significance of the Path Coefficient of Causal Model of Gender, SSCE result, UTME scores, Post -UTME scores, Mental Ability, Career Aspiration, Interest in University Education, and Performance in the Faculty of Science, University of Ibadan

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Remark	Remark
CAR_ASP -> ACA PER	-0.048	-0.053	0.085	0.563	0.574	NS	Deleted
CAR_ASP -> INT_UNI	0.629	0.631	0.044	14.249	0.000	S	Retained
GENDER -> ACA PER	-0.163	-0.154	0.072	2.261	0.024	S	Retained
GENDER -> CAR_ASP	0.105	0.107	0.076	1.374	0.170	NS	Deleted
GENDER -> INT_UNI	0.047	0.051	0.052	0.903	0.367	NS	Deleted
GENDER -> MEN_AB	0.233	0.192	0.151	1.545	0.123	NS	Deleted
GENDER -> PUTME	-0.084	-0.081	0.061	1.387	0.166	NS	Deleted
GENDER -> SSCE	0.048	0.047	0.078	0.616	0.538	NS	Deleted
GENDER -> UTME	-0.18	-0.178	0.087	2.068	0.039	S	Retained
INT_UNI -> ACA PER	0.24	0.249	0.087	2.758	0.006	S	Retained
MEN_AB -> ACA PER	0.027	0.006	0.072	0.368	0.713	NS	Deleteed
MEN_AB -> CAR_ASP	-0.207	-0.155	0.168	1.231	0.219	NS	Deleted
MEN_AB -> INT_UNI	0.044	-0.001	0.089	0.5	0.617	NS	Deleted
PUTME -> ACA PER	0.231	0.233	0.058	4.013	0.000	S	Retain
PUTME -> CAR_ASP	0.085	0.085	0.076	1.117	0.264	NS	Deleted
PUTME -> INT_UNI	0.051	0.052	0.061	0.834	0.405	NS	Deleted
PUTME -> MEN_AB	-0.042	-0.005	0.123	0.344	0.731	NS	Deleted
SSCE -> ACA PER	0.242	0.244	0.069	3.536	0.000	S	Retained
SSCE -> CAR_ASP	-0.119	-0.119	0.079	1.505	0.133	NS	Deleted
SSCE -> INT_UNI	-0.085	-0.082	0.055	1.55	0.122	NS	Deleted
SSCE -> MEN_AB	-0.161	-0.095	0.152	1.06	0.290	NS	Deleted
SSCE -> PUTME	0.158	0.158	0.059	2.659	0.008	S	Retained
SSCE -> UTME	0.152	0.148	0.082	1.85	0.065	NS	Deleted
UTME -> ACA PER	0.197	0.193	0.064	3.103	0.002	S	Retained
UTME >CAR_ASP	0.031	0.037	0.075	0.415	0.678	NS	Deleted
UTME -> INT_UNI	-0.089	-0.086	0.058	1.543	0.124	NS	Deleted
UTME -> MEN_AB	-0.027	-0.018	0.079	0.343	0.732	NS	Deleted
UTME -> PUTME	0.322	0.319	0.066	4.857	0.000	S	Retained

Table 2 shows the significance of the path coefficients in the PLS-SEM causal model of gender, SSCE result, UTME scores, Post-UTME scores, mental ability, career aspiration, interest in university education and academic performance in the Faculty of Science. The Table showed that out of the 27 paths that made up the model only 9 paths were significant in the model while 18paths were not significant in the model, thus, all the paths that are not significant were removed to obtain the most significant model (parsimonious model) that can be used to predict academic performance of the undergraduates in the faculty of science, university of Ibadan. The implication of the result is that the hypothesized model shows that the significant paths are true predictors of undergraduates' academic performance in the first academic year.

Research Question 2: What is the most Significant Causal Model Explaining Students' Variables, Entry Requirements and Performance of Faculty of Science Undergraduates?

In order to isolate the most significant causal model explaining learners' variables, entry requirements and performance of Faculty of Science undergraduates in university Ibadan, the paths with insignificant coefficients were removed from the hypothesized model and thereafter, the model was re-specified and in turn estimated. The result is presented in Figure 2.

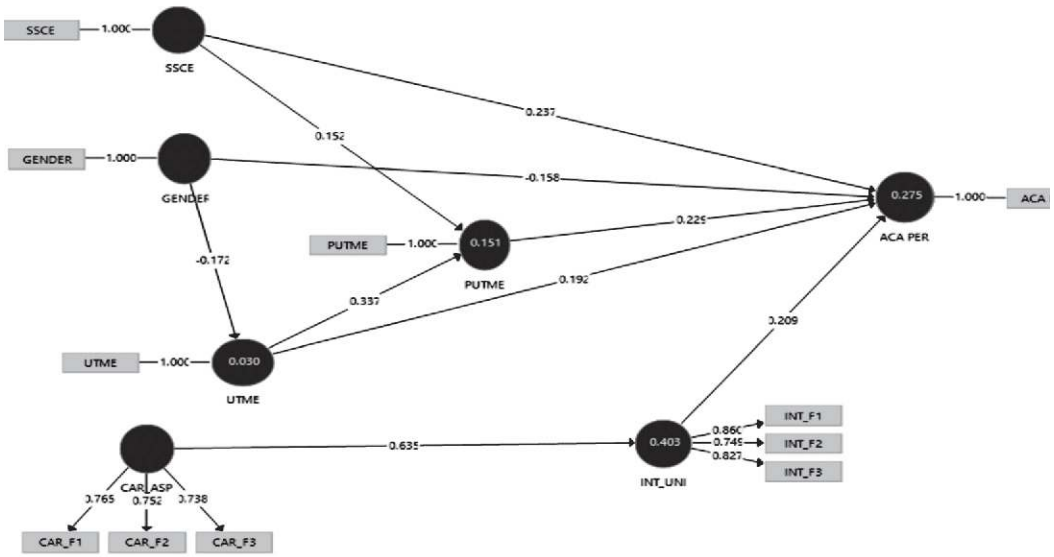


Figure 1 : Validated model of students' personal variables, entry requirements and academic performance of Faculty of Science undergraduates.

Discussions

Figure 1 shows the most meaningful model explaining students' personal variables, entry requirements and academic performance of undergraduates in the Faculty of Science. The model showed that only mental ability was not significant in the model and is not important in the explanation of students' personal variables, entry requirements and academic performance of undergraduates in the faculty of science. Students' personal variables such as: Interest in university education, Career Aspiration, and Gender as well as SSCE results, UTME and Post-UTME scores were found to be significant in the model determining the academic performance of first year undergraduates in the faculty of science, university of Ibadan. This finding implies that although the mental ability of a student is the possession of inborn abilities that are required to do something or get something done, however, these abilities otherwise known as intelligence quotient is limited to the student's ability to successful perform in a particular task while in the university. Mental ability does not paint the full picture of the individual's intelligence, it also requires the other domains of learning (psychomotor and affective) such as soft skill that are equally important part of a successful student academic performance in the faculty of Science in University of Ibadan, Ibadan.

The findings on the consistency of structural model revealed that the structural model is consistent with the empirical data through item reliability, consistency of each variable and the typical variance gotten. This finding supports the recommendation of Hair, Black, Babin and Anderson (2010), Afari, Alldrige, Fraser and Khine (2013) recommended that items reliability should be assessed by their respective factor loading on the underlined construct. Hair et al (2010) and Afari and Khine (2006) concluded that items are considered reliable if its factor loading is high. Furthermore, a construct is said to be reliable when it returned a value of higher coefficient reliability for predictive model.

The result regarding the most significant causal model explaining students' variables, entry requirements and performance of Faculty of Science undergraduates revealed that mental ability was not important in the explanation of students' variables, entry requirements and performance of Faculty of Science undergraduates. This result corroborates that of Oladipo-Abodunwa (2019) who found out that all the paths that are not significant were removed to obtain the most significant model (parsimonious model) that can be used to predict mathematics achievement. The result also agrees well with that of Odule (2017) who worked on students characteristics and opportunity to learn as determinants of achievement in measurement and evaluation among college of education learners in South-West, Nigeria and found that thirty-one out of thirty-six paths were significant in explaining the causal modelling for achievement in measurement and evaluation among college of education learners. To corroborate this findings, Bloom, Engelhart, Furst, Hill, Krathwohl (1956) states that there are three basic domains that make learning possible namely; the cognitive, affective and psychomotor domains.

The cognitive domain which focuses on ones' mental ability cannot function in isolation to contribute to effective learning without the contribution of the other domains. This makes it difficult for meaningful learning to take place by focusing only on a Childs mental ability. Similarly, researchers have also shown that there are certain learning abilities that a child may be naturally endowed with, others are acquired by nurture. Therefore, since the natural abilities may be traced to mental connectivity, a learner can equally acquire some learning prowess by nurturing other areas of ability which will contribute to performance in learning. Furthermore, research has shown that emotional intelligence has an incremental power to predict academic performance above and beyond the effect of general mental abilities. This position was supported by the study by Lopes, Salovey, Cole and Beers (2005) as they found that the ability to regulate emotions, as measured by a test of Emotional Intelligence was able to explain the quality of the social interactions of individuals with their peers, and that the explanatory power of Emotional Intelligence was above and beyond personality traits and verbal and fluid intelligence. Attention has therefore been drawn to the need for the development of students' emotion and emotional intelligence as this is as vital as mental intelligence of the student.

Conclusion

The Entry requirements (SSCE/NECO results, UTME and Post-UTME scores) into universities in Nigeria are meant to select and admit qualified candidates who will perform well in their academics. Based on the findings, it can be concluded that the objectives of SSCE/NECO, UTME by JAMB and the Post-UTME screening tests conducted by universities have to some extent, been achieved, except for improved strategies while selecting and admitting candidates into the university. Conversely, it is pertinent to note that students' variables such as interest in university education, career aspiration and gender have positive effect and can determine the performance of university undergraduates in Faculty of Science, University of Ibadan alongside the entry examinations (SSCE results, Post-UTME and UTME scores. Thus, it is very important to put these students' variables into consideration, most especially before and even after admission of undergraduates into the university. Not considering and determining the effect of these learner variables could be some of the reasons for the undergraduates' under performance in the university. Hence, undergraduates' interest in university education and career aspiration should be closely monitored and encouraged by both parents and the university management so as to enhance the involvement, dedication and performance of undergraduates in their academics.

Recommendation

i. Interest in university education, career aspiration, gender, alongside performance in Senior Secondary School Examinations and Post Unified Tertiary Matriculation, was important in determining academic performance of first year science undergraduates in the University of Ibadan. Therefore, criterion on student's personal variables should be included in assessing candidates' capability for academic study.

ii. The Nigerian government is encouraged to work with its statutory policies on access to university education in order to improve the performance of undergraduates. If this in place, the new suggested policies to be formulated by government would be an advantage to the examining bodies. University administrators should consider individual candidate's interest and their career aspiration before placement into alternative departments whenever the candidate does not meet up with the cut of mark for the initial course of study.

iii. Institutional support services should be done at regular intervals with undergraduates in order to detect areas of academic testing on time and necessary remediation.

iv. Regular career talks and seminars should be organised by institutions because it will encourage mentoring and motivate undergraduates in their various disciplines.

v. Parents are encouraged to offer support to their wards in their career choices in order to boost their performance.

References

Akiri, A. A and Ugborugbo, N. M. 2009. Teachers' Effectiveness and Learners' Academic Performance in Public Secondary Schools in Delta State, Nigeria. Learner Home Community Science, Vol 3, No 2:107-113

Akomolafe, M. J, and Olorunfemi-Olabisi, F. A. 2011. Effect of Family Type on Secondary School Learners' Performance in Ondo State, Nigeria. *European Journal of Educational Studies,* Vol 3, No 3: 481-487

Afari, E. Alldridge, M. J., Frasser, J. B., Khine, and S. M. 2013. Learners' perceptions of the learning location and atitude towards game-based Mathematics classrooms. Learning Environments Research, 16, 131–150.

Ande, E. 2006. Obasanjo Accuses Jamb of Corrupt Practices. *Guardian*, June 13, (2010), P. 7.

Bamidele M.A and Bamidele, A. 2013. Influence of coginitive performance on mathematics learners level of achievement. *International Researcher*, Vol 2 No.1 pp 142-150

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H. and Krathwohl, D. R. 1956. *Taxonomy of educational objectives, handbook i: the cognitive domain.* New York: David McKay Co Inc.

Hair, G.P., Black, W.C., Babin, B.J. and Anderson, R.E. 2010. Multivariate data analyses. 7th Edition, Pearson, New York.

Kerlinga, F.N. and Lee, H.B. 2002. Foundations of behaviuoral research (Fourth Edn), Belmont, CA: Wadswort.

Kpolovie, J.P., Joe, I.A. and Okoto, T. (2014). Performance Prediction: Role of Interest in Learning and Atitude towards School. *International Journal of Humanities Social Sciences and Education (IJHSSE) Volume 1, Issue 11, November 2014, PP 73-100 ISN 2349-0373 (Print) & ISN 2349-0381 (Online) www.arcjournals.org*

Lopes, P. N., Salovey, P., Côté, S., and Beers, M. 2005. Emotion Regulation Ability and the Quality of Social Interaction. *Emotion, 5*, 113–118

Obioma, G., and Salau, M. 2007: The predictive validity of public examinations: a case study of Nigeria. *A paper presented at the 33rd Anual Conference of International Correlation for Educational Assessment (IAEA) held in Baku, Azerbaijan, 16-21 September, 2007.*

O'Brien, K.M. 1996. The influence of psychological separation and parental attachment on the career development of adolescent women. *Journal of Vocational Behaviour, 48, 257—274.*

Odule, C.Y 2017. Learner characteristics and opportunity to learn as determinants of achievement in measurement and evaluation among college of education students in south-West, Nigeria. Unpublished PhD thesis. Institute of Education, University of Ibadan, Nigeria.

Oladipo-Abodunwa, T. O. 2019. Parent-teacher partnership, student interest and engagement as determinants of achievements in senior secondary school Mathematics in Oyo State. Unpublished PhD thesis. Institute of Education, University of Ibadan.

Olalekan, S. (2013). Post-UTME Multi-Dimensional Data Analyses: A Study of Department of Computer Science, University of Ibadan, Nigeria. *Information Systems, Development Informatics & Business Management* Vol. 4 No. 3, 33-40

Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R. & Carlstrom, A. (2004). "Do Psychosocial And Study Skill Factors Predict College Outcomes?: A Meta Analysis" *Psychological Bulletin, 130(2), 261-288. Mar. 2004*

West African Journal of Education
Vol. XL 2020 ISSN: 0043-2997
Website: http//www.instituteofeducui.com

Assessing Teacher Competence in Items Development through Evidence of Convergent Validity of Test Scores from Alternate Examinations

ADEYEMO Emily Oluseyi
Department of Educational Foundations and Counselling,
Faculty of Education, Obafemi Awolowo University, Ile-Ife.
seyiadeyemo2007@yahoo.com ; +2348033907463

Submitted: January 19, 2021; Revised: February 25, 2021; Accepted: April 8, 2021

Abstract

This examined the extent to which two different measures of examination items prepared for two consecutive years measured a common construct as evidence of teachers' competence in item development. The study compared item parameter estimates of the 2016 and 2017 BECE items and established the convergent validity with a few of providing information on teachers' competencies in item development. The research design was ex-post factor while the population consisted of 34,899 and 35,859 students who sat for the Osun State Basic Education Certificate Examination (BECE) in 2016 and 2017 respectively. Comparability of these items was made in terms of their item parameters, reliability estimates and evidence of convergent validity. Data were analyzed using test score statistics, transformed score and correlation coefficient .The results showed that reliability estimate of the BECE Mathematics items revealed Alpha Coefficient $\alpha = 0.09$ for 2016 and 0.53 for 2017. The coefficient of Correlation of the test score was low, $r = 0.191, p < 0.05$. The implication was that the items had different reliabilities estimates and the convergent validity of the tests was low. Students who sat for the 2016 examinations stood at advantageous than 2017. The items of the two examinations did not capture the same construct, indication of the facts that more training was required for teachers in item development.

Key words :- Teachers competence, convergent validity, test development, test items.

Introduction

Comparison among different test items is usually conducted by test developers, educational researchers and psychometricians. Equating, calibrations are different terms used by educational researchers to describe the comparisons. Equating is a process of deriving a function of a test to the scale of the anchor from such that after equating, any given scale would have the same meaning regardless of which test form was administered. Equating is conducted to establish score of different versions of a

test, allowing them to be used interchangeably in the process of assessment. Teachers' competence is specified by standard for educational assessment of students as adopted by UNESCO. This is a development model about educational factor that aims at identifying the broad competence of the teachers in the teaching and learning process across grade levels. It also includes content areas showing the aspect of each ability as typically developed from beginning to advance performance in teaching (UNESCO 1990). Standard are specific expectations for assessing knowledge or skills which is required of teachers to possess in order to perform well in their evaluation efforts. The standard required of teachers is to demonstrate skills at selecting, applying and evaluating students' assessment information and assessment practices.

Teachers' quality matters a lot in developing items. Assessment, specifically the area of test construction forms a critical part of the teaching and learning. This area of teachers' responsibility has opined by Frank and Amoako (2018) has been questioned by several authorities in contemporary times. Quality teachers are those who exhibit desirable traits that bring about students learning. Greenstein (2010) mentioned that the most important factor that influence students' achievement is teachers' quality. Teachers' quality includes teacher teaching experience, the extent of their preparation in subject matter, qualification in area of expertise and their ongoing professional development. If teachers possess low level of knowledge in assessment, they may not be able to help improve students' learning, however, teachers' qualification matter a lot in development of test since professional teachers should have a clear understanding of ways of developing credible instruments for assessment and also practice it appropriately.

The importance of assessment cannot be overemphasized. It is used for the improvement of teaching and learning and improvement of educational system in general since education is useful for everybody including policy makers and educators. Also, it cannot be denied that school-based assessment is an approach to re-design assessment in schools as it gives all educational stakeholders the power to improve teaching and learning practices. Assessment also gives immediate feedback to educational stakeholders and curriculum planner on academic progress of the students. Despites the relevance, studies like Onuka and Ogbebor (2013), Frank (2018), have shown that most teachers do not have necessary skill for test development and they used substandard and un-validated instruments to assess students, alongside, some teachers do not plan scoring procedure before teaching neither do they record scores properly during assessment all these could affect the credibility of the assessment procedures.

Developing assessment competency refers to ways or procedures that teachers use in improving themselves in assessment knowledge and skill so as to make education better. Good educational assessment can be done by teachers who have enough knowledge and skills in assessment. Among the skills as mentioned by Anhere (2009), Frank (2018), Onuka and Ogbebor (2013) were ability to choose appropriate assessment method, developing appropriate assessment method, administering tests,

interpreting results and using assessment results to make decisions. Teachers should be skilled in using assessment results when making decisions about individual students, planning teaching, developing curriculum and social improvement. Also they should be able to communicate assessment results to students, parents and other educators and recognize unethical, illegal and otherwise inappropriate assessment methods and uses of assessment information. There are various ways to address these issues and make teachers competent in developing quality items for assessing students. One of them is to allow teachers to attend professional development workshops and other training in area of assessment which allows entire academic program to engage in best practices of assessment. Through this approach, teachers gain experience from expertise in area of assessment. Alongside, educational system could provide a blueprint for all teachers to follow in teaching, so that there will be no issue that a teacher is bias in assessment from one school to another and it will definitely bring uniformity among teachers in terms of assessment practices.

In Nigeria, generally, teachers are trained in assessment of which test construction is an important component especially in the curriculum of Colleges of Education. For instance, students are taken through a full course of educational assessment. The course contents allow these students to have practical knowledge of test construction and assessment. Similarly, Nigerian universities that trained teachers also offer courses in education for assessment of potential teachers needed to be trained in assessment, this course also enlightens students in the construction of test items. Ololube (2008) has been able to find out that professional qualified teachers construct effective evaluative instruments more than the non-professional teachers and that they also keep assessment records accurately by employing various evaluative techniques, the attributes that are not common among the non-professionals. Alongside, though on the contrary, Anhwere, (2009), Amedahe, (1989) and Ebinye, (2001) confirmed that even among teachers that were trained in school assessment which include test construction, most of them do not adhere to the rules governing these practices, hence these has contributed to poorly drafted items.

The question that is always asked about developing a set of items for school-based assessment is whether the items is valid or not. The issue of validity spread across all facets of test in terms of content, construct and concurrent phases. Studies have revealed that relationship exist between teachers' knowledge of test items construction and the internal validity of the test. Teachers who have knowledge of test construction are supposed to prepare qualitative items than those who do not have. A teacher level of competence according to Darlin-Hammed (2000) is one of the factors that directly affect the quality of his/her test items.

Convergent and discriminant validity are components of a larger scientific measurement known as construct validity. Convergent validity is established when the score obtained from two different instruments measuring the same concept are highly

correlated. A convergent coefficient measures the correlation between an assessment and other measure of the same construct. According to Crocker and Algina (2006) convergent validity reflects the extent to which two measures capture a common construct. Alternate measure that provides less than perfect convergent validity introduces ambiguities that interfere with the development of meaningful interpretations of findings within and across studies. Convergent validity does not address the construct validity of any measure directly, instead it reflects the extent to which two measures capture the same information. The more similar the information they capture, the more likely they are to produce equivalent research results. Although construct is not equivalent to instructional validity but it is a form of evidence used to judge the construct validity of a measure.

The evidence of convergent validity is commonly assessed using the magnitude of the zero –order correlation between the proxy and another closely related measure. If two measures are hypothesized to represent the same construct, a strong correlation between these measures suggest that the measure capture the construct and correlation close to one (r = 1) which indicates strong convergent validity. However, strong convergent validity is a necessary condition for construct validity but it is not sufficient. When convergent validity is weak, it implied that one or more variable(s) do not capture the intended construct well. Consequently, evidence of weak convergent validity will introduce ambiguity into the meaning of research results and hence diverge. Divergent validity on the other hand referred to as discriminant validity is established when two variables are predicted to be uncorrelated and the scores obtained by measuring them are empirically found to be different. Also, a discriminate validity coefficient measures the correlation between an assessment and a measure of a different construct. This is expected to be low according to Crocker & Alginia (2006).

Validity and reliability are important qualities that any test must have. A test must be reliable if it will be interpretable and must be valid if it must be used at all. Invalid test or instrument would expectedly yield invalid results. Validity emphasized contents and coverage and it is seen to be very fundamental. Reliability on the other hand is extremely important. High reliability is an indication of a good instrument and it is practically meaningful if it is based on the use of valid instrument. If a test is valid but not reliable, it is suitable for exercise of test construction only. If on the other hand a test is reliable but not valid, it can be likened to doing a wrong thing consistently and accurately.

Several researchers (Ashichia 2010), Adebule (2004) have identified various factors that affect students' performance. Prominent among these factors are the nature of the test items and learners' characteristics. Experiences and observations have revealed that performance of students is never the same across subjects. Variation in students' performance may be attributed to various factors such as the contents, quality of the testing procedure and learners' characteristics such as ability of students. Anyone or combination of any of these could affect students' performance.

The purpose of this study therefore was to explore the convergent validity of the Basic Education Certificate Examination (BECE) across two consecutive years given the speculation that identical items with alternative use have equivalent psychometric properties which in some way should render the two set of items test administered to two different set of examinees equivalent: an attribute expected from professional competence teachers. Thus the study considered the comparative analysis of 2016 and 2017 BECE Mathematics items which necessitates the psychometric analysis in order to establish the convergent validity of the items and to examine the extent to which the two measures of BECE items prepare for the two consecutive years capture a common construct as evidence of teacher's competency in test development

Methodology

The ex-post facto research design was adopted for the study. The population of the study comprised 34,889 and 35,857 public school candidates who sat for the 2016 and 2017 BECE Mathematics items for 2016 and 2017. The sample for the study comprised of 60 multiple –choice items for 2016 and 2017 each, making a total of 120 items and 1000 response of candidate as contained in the OMR sheets for the 2016 and 2017 respectively. These were selected using systematic random sampling technique, making a total of 2000 responses. The research instruments were the candidate OMR sheets for 2016 and 2017 Mathematics items. Data were analyzed using both correlation coefficient and t-test statistics. descriptive and inferential statistics.

Research Question 1: What are the differences in the item parameters of the 2016 and 2017 BECE Mathematics test items?

Table I: Descriptive of 2016 and 2017 BECE Mathematics Test Items Parameters

	BECE 2016		BECE 2017	
	Mdisc	**Mdiff**	**Mdisc**	**Mdiff**
$\bar{X}$	5.15	1.97	11.40	0.30
SD	7.89	1.44	22.26	1.13

Table I showed that 2016 BECE Mathematics test item parameters. (mean = 1.97, SD =1.44) were more difficult than the 2017 (mean = 0.30, SD =1.13) and that 2016 items discriminated better (mean = 5.15, SD =7.89) than 2017 (mean = 11.40, SD = 22.26). The items parameters of 2016 were better than the 2017, this implied that the test were of different version.

Ho_1: There is no significant difference in the psychometric properties of 2016 and 2017 Osun State BECE Mathematics test items.

To test the hypothesis, the reliability estimates of 2016 and 2017 OSBECE Mathematics tests were obtained and the estimated reliability coefficient were thereafter compared. The reliability estimates were calculated using Kuder Richardson K-R20 and the estimates were compared using dependent alpha. This statistic was implemented in cocron package of the R language and environment for statistical computing. The result was as presented on Table 2.

Table 2: Comparability of Reliability Estimate of 2016/2017 Osun State BECE Mathematics Items

Year	Reliability coefficien t K-R20	df	t	p-value
2016	0.90	998	8.6393	0.000
2017	0.83			

p < 0.05 significant

Table 2 showed that 2016 OSBECE Mathematics multiple test was more reliable (α = 0.90) than 2017 (α = 0.83). The difference observed in the reliability estimate was significant with t = 8.6393, p < 0.05. Therefore, the hypothesis was rejected. The result showed that reliability of 2016 BECE Mathematics items was different from that of 2017. The implication of this is that 2016 and 2017 BECE mathematics items had different reliabilities.

Ho_2: The convergent validity of the 2016 and 2017 BECE Mathematics items are not significantly different.

To test this hypothesis, three levels of analyses were conducted (i) the ability of the examinees in the test were estimated, (ii) the estimated ability in the two tests were respectively converted to the true score T, (iii) and the converted score on the two tests were correlated. The correlation coefficient obtained represent the convergent validity of the test. The result is as presented in Table 3

Table 3: Correlation Coefficient of Test Score of Examinees in 2016 and 2017 Osun Sate BECE Mathematics Items

Year	N	Mean	Sd	r	p
2016	1000	19.7562	10.276	0.191	0.000
2017	1000	32.5469	11.191		

p < 0.05

The coefficient of correlation showed that the relationship which existed between the test scores of 2016 and 2017 Mathematics items was low and significant r = 0.191, p< 0.05., Therefore the hypothesis was rejected. This implied that quantum of traits measured by the two tests are similar but low. The implication is that the convergent validity of the test was low.

Discussion

The high parallel form of reliability coefficient together with the significant difference obtained in the reliability coefficients of the test scores of the Mathematics items indicate that the different forms of the test are not similar but virtually different, the implication of this is that it made large difference which version of the test a person takes, a student for a particular year (2016) stands advantageous than the other year (2017) This shortcoming arose as a result of inability to prepare different set of items with the same psychometric properties .This could be lack of skills from test development according to Onuka and Ogbebor (2013) or lack of professionalism as opined by Anhere (2009). On the other hand, a low parallel form reliability estimate obtained suggested that the different forms were probably not comparable, they might be measuring different things and hence cannot be used interchangeably.

This confirmed the opinion of Ololube (2008) that some teachers have limited skills in the construction of end of term examinations as this was evident when issues were found with the content representativeness and relevance of the test, reliability and fairness of assessment task which were evaluated. He also found out that teachers who had knowledge of test constriction prepared qualitative items than those who do not have. Also supporting this view is the opinion of Darlin- Hammed (2000) that teachers' level of competence was one of the factors that directly affected the quality of items. It should also be borne in mind that good educational assessment can only be done by teachers with adequate knowledge in skills of assessment and ready to adhere to the rules that govern assessment practices.

Without prejudice, these could only be recorded from dedicated and committed teachers, ready to plan the scoring procedures before teaching and record scores properly and on time. Convergent validity does not address the construct of any measure directly, instead it reflects the extent to which two measures capture the same information. The weak convergent validity as presented by the weak correlation between the items resulted in increased divergence of the magnitude of the correlation between the two measured. This presumed that as the divergent validity continue to fall, the magnitude of the frequency of divergent increases and by extension, the risk of inappropriate interpretations of results. When the convergent validity is weak the implication of this is that the variables under consideration do not capture the intended construct very well.

Conclusion/recommendations

Teachers' quality matters a lot in development of school-based assessment. Quality of learning is determined by quality of assessment practices in the classroom. Since assessment is viewed as integral part of students learning, and helps to improve learning by the students, teachers should therefore adhere to develop a range of assessment that is suitable and of quality standard for instructional planning. Alongside, government and school administrators should take up the challenges of inviting resource persons from recognize academic institutions to organize workshops for teachers on a regular basis to sharpen their skills on effective test construction practices.

References

Adebule, S. O. (2004). Gender difference on locally standardized anxiety rating scale in Mathematics for Nigerian Secondary Schools. *Journal of Counselling and Applied Psychology 1, 22-29.*

Amedahe, F. K. (1989). Testing Practices in Secondary School in the Central Region of Ghana. *Unpublished thesis*

Anhwere, Y. M. (2009). Assessment Practices of Teacher Training College Tutors in Ghana, *Unpublished Masters' Thesis*.

Ashikia, O. A. (2010). Students and Teachers' perception of the cause of poor academic performance in Ogun State Schools 9Nigeria). *European Journal of Social Science, 13(2) 229-242.*

Carlson, K. D. & Herdman, A. O. (2012). Understanding the impact of Convergent Validity on Research Results. *Organizational Research Methods 15(1) 17-21*. Sage Publication.

Crocker, L. & Algina, J. (2006). Introduction to Classical and Modern Test theory. *Mason Ohio. Thompson Wentworth.*

Doran, W. J. Moses, T. P. & Eignor, D. E. (2010). Principles and Practice of Score Equating. *Educational Testing Service* (ETS) Princeton. New Jersey

Duong, M. (2004). Introduction to Item Response Theory and its applications, Research Development.ttps;www.msu.edu/dwong/student work. *Archive/CEp900F04.RDP/mihn- Item Response Theory.htm.*

Ebinye P. O. (2001). Problems of testing under the Continuous Assessment Programme *Quarterly Journal of Education*. 4(1):12-19.

Frank, Q, I. Amoako, F A. (2018) Teacher's Test Construction Skills in Senior High Schools in Ghana. *International Journal of Assessment tools in Education. Doi.21449/ijate 481164*

Frank Q. I. (2018). Attitudes of Senior High School Teachers Towards Test Construction. ISSN 22245766 (paper) ISSN 2225-0484 *(online) vol. 8 No 1.*

Greenstein, L. (2010) What Teachers Need to Know about Formative Assessment. Alexandria , VA:ASCD.

Ogbebor. U. C. (2015) Mock Economics test construction using classical test and item response theories in Delta state Nigeria. Unpublished PhD proposal at the International Centre for Educational Evaluation, Ibadan, Nigeria.

Ololube N. P. (2008) Evaluation Competencies of Professional and Non professional Teachers in Nigeria. *Studies in Educational Evaluation, vol. 34 (1)*

Onuka, A. & Ogbebor, U. (2013) Differential Item Functioning Method as an Item bias indicator. *Research International Journal*, 4(4),367-373.`

UNESCO (1990) World Conference on Education for All:- Meeting Basic Learning Needs. *United Nation Development Programme, Jomtien International Agency Commission*.

West African Journal of Education
Vol. XL 2020 ISSN: 0043-2997
Website: http//www.instituteofeducui.com

Mathematical competence and attitude as predictors of students' performance in secondary school physics

[1]Ademola, K. BADRU & [2]Elizabeth, M. AANU
Department of Science and Technology Education,
Olabisi Onabanjo University, Ago-Iwoye, Nigeria.
e-mail address: badru.ademola@yahoo.com; lizzymosun@yahoo.com

Submitted: November 5, 2020; Revised: January 25, 2021; Accepted: March 17, 2021

Abstract

This study examined mathematical competence and attitude as predictors of students' performance in secondary school physics with four hypotheses of the ten stratified schools, a total of 249 secondary school students II offering physics participated the study. 128 (51.41%) of the students were from urban based schools and 121 (48.59%) of the students from rural based schools. Three constructed and validated instruments (MCST, r = 0.78), (SAPQ, r = 0.68) and (PPT, r = 0.74) were employed. Data were analysed using both regression analysis and t-test at P < 0.05. The results revealed that there exists significant relative contributions of mathematical competence and students' attitude to secondary school students' performance in physics ($F_{(1,247)}$ = 35.11 & 16.86). It also revealed significant composite contribution of mathematical competence and attitude on secondary school students' performance in physics ($F_{(2,246)}$ = 30.20). Finally, the finding revealed that school location is significant on secondary school students' performance in physics (t = 13.54). It is therefore, concluded that mathematical competence is a contributory factor in learning physics. Hence, it is recommended that those teaching physics at secondary schools should note that extra work in the mathematics concept needs to be done.

Key words: Mathematical competence, Student attitude, Performance in physics

Introduction

The development of any nation depends largely on the level of its scientific and technological literacy. Physics which is one of the sciences is indispensable, basic and fundamental to technological studies. It is a physical science that involves the study of the physical properties of matter and its interaction with the energy. Physics a study of systematised knowledge produced by careful observation, measurement, and experiment in a view to establishing basic physical laws as well as giving a scientifically reliable explanation of physical phenomena (Charles-Ogan & Okey, 2017). According

to Agommuoh (2014), Oraifo (2005) and Adeyemi (2003), Physics has helped in the development of modern technology through the application of its principles to modern invention, and used in solving diverse problems of humanity and providing solution to natural and artificial problems in the world at large. Physics as a course of study is perceived generally to be very interesting, vast, mathematical and experimental. Physics is one of the pre-requisite subjects for the study of engineering, technology, medicine and other applied science courses in the university. Its study equips graduates with mathematical and information technology skills. That is why Federal Republic of Nigeria (2013) expressed explicitly in the secondary school physics curriculum its objectives as:

i. to provide basic literacy of physics for functional living in the society,
ii. to aid students acquire basic concepts and principles of physics as a preparation for further studies,
iii. to help students acquire essential scientific skills and attitudes as a preparation for the technological applications of physics, and
iv. to stimulate and enhance creativity.

In spite of the laudable objectives and importance of physics other science courses, performance of secondary students in physics in the public examinations such as West African Senior Secondary Certificate Examinations (WASSCE), National Examinations Council (NECO) and Unified Tertiary Matriculation Examinations Board (UTMEB) is not encouraging (Charles-Ogan & Okey, 2017; Isola, 2010). The various factors identified as being responsible included nature of the subject, teacher-related factors, school-related (environmental) factors, or students-related factors. The students related factors are classified as either static or alterable factors (Anderson, 2008; Anigbo. 2016). The static factors are those which the system cannot alter. Such factors are the ages, sexes, socio-economic status, school location and others. The other type, alterable factors as described by Forehand (2010) refer to the context and process factors like classroom behaviours of students, learning materials, attitude towards learning and mathematical competence.

Competence is an abstract construct. It describes the quality of being capable of executing a task. It is the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice for the benefit of the individual and community being served (Epstein & Hundert, 2002). Competence is used as a synonym for performance, skill, or personality trait (Bassellier, Reich & Benbasat, 2001). Not only is competence treated as performance, but it is also used indiscriminately to refer to either the observable performance or the underlying neural functions that support the observable behaviour (Connell, Sheridan & Gardner, 2003). Competence in science refers to the ability and willingness to use the body of

knowledge and methodology employed to explain the natural world, in order to identify questions and to draw evidence-based conclusions (Ntibi & Edoho, 2017). Competence includes an attitude of critical appreciation and curiosity, an interest in ethical issues and respect for both safety and sustainability, in particular as regards scientific and technological progress in relation to oneself, family, community and global issues (Lord & Jones, 2006).

Besides, mathematical competence is the ability to develop and apply mathematical thinking in order to solve a range of problems in everyday situations. Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge. Mathematical competence then means the ability to understand, judge, do, and use mathematics in a variety of intra- and extra-mathematical contexts and situations, in which mathematics plays or could play a role (Niss & Jensen, 2002). Niss (2003) defined mathematical competence as the ability to handle a particular aspect of general mathematical competence. These competencies include ability to solve problem, reason, apply procedures, represent, connect and communicate. Mathematical competence involves, to different degree, the ability and willingness to use mathematical modes of thought (logical and spatial thinking) and presentation (formulas, models, constructs, graphs, charts (Isola, 2010). It can be explained as insightful readiness to act appropriately in situations which present a particular kind of mathematical challenges.

Furthermore, studies have reported that science students offering physics have difficulties in the understanding of the concepts in physics which demands adequate mathematical competence (Isola, 2010; Akanbi, 2003). Lord and Jones (2006); Osborne, Simon and Collins (2003) maintained that science students offering physics who lacked basic algebra skills performed poorly on mathematical problem-solving tasks in physics due to students' lack of mathematical competence needed, or students do not know how to apply the mathematical skills they have to particularly solve the problems situation in physics. Although, a wide conceptual difference exists between the two subjects (Physics and Mathematics) it is presumed that mathematical competence is required to tackle numerical problems in physics. In addition, WAEC chief examiners report (2015 to 2018) reveal that on the appraised physics questions 2 and 3, it was observed that candidates who sat for the examination had weak performance in the questions related to calculations as shown in Table 1.

Table 1: Observations of Chief Examiners Report in May/June Physics Examinations (Paper 2 & 3)

Year	Observations
2015	Many candidates were unable to: • handle correct Arithmetic processes involving standard notation and conversion of units such as mm to m; cm^2 to m^2etc • effectively handle scale drawing problems • plot graph involving numbers less than unit e.g. 0.001, 0.31 etc • make deduction from graph or draw lines of best fit
2016	Majority of the candidates had in weak ability to: • indicate correct units of measured and calculated values • distinguish graph axes and choose reasonable scales to plot graph • determine components of the velocity of projectile and its maximum height • poor computational skills
2017	Many candidates were unable to: • interpret questions correctly. For example, candidates failed to realize that workability of Pulley system depends on correct fixing of the rope • handle Algebraic Arithmetic processes. For instance, many candidates failed to see the difference between the expressions $\sqrt{n}/_{b}$ and $\sqrt{\frac{n}{b}}$. This led low performance of the subject. • express their calculations to the required answers of decimal points or significant figures • express decimal figures to standard form • plot graph when values were negatives
2018	Majority of the candidates were unable to: • handle correctly, calculations involving express in standard form and lacked knowledge on the applications of velocity – time graph. • properly understand the mathematical relationship of deceleration and acceleration • express calculations to the required numbers of decimal places or significant figures • appropriate values of variables used for plotting of graph, start graph of origin (0,0) when required, determine the slope or intercept • compute and evaluate properly

Source: https://waeconline.org.ng/e-learning/Physics downloaded on 05/02/2020

It is an established fact that mathematics is a contributing factor to the performance of students in physics and chemistry and the control tool of mathematics remains the basic skills underlying all scientific and technological skills (Ogunleye, Awofala & Adekoya, 2014). Mathematics is a subject that is related to other science subjects such as physics and chemistry in areas like number and numeration–fractions, logarithms, indices, algebraic processes – solution of equations, variation, graph, and also in volume.

However, the indispensability of mathematical competence and attitude in the learning of sciences has attracted the attention of science researchers and mathematics educators for a very long time, due to the failure rate in the subjects (Ibrahim, Zakiang & Damio, 2019; Ntibi & Edoho, 2017). According to Mensah, Okyere and Kuranchie (2013), attitude as a concept is concerned with an individual's way of thinking, acting and behaving. It has very serious implications for the learner, the teacher, the immediate social group with which the individual learner relates, and the entire school system. Attitudes are formed as a result of some kind of learning experiences students go through. This is mimicry, which also has a part to play in the teaching and learning situation. Attitude implies favourable, or neutral evaluative reactions towards something or item. In other words, attitude is a way of looking or viewing things or events. Siti, Nursaila and Faridah (2016) opined that attitude is the sum total of a man's instinct and feelings, prejudice or bias, preconceived notions, fears, threats, and convictions about any specified topic. Veloo and Khalid (2015) in a study reported that positive attitude stimulates students to put more efforts and leads to high achievement in that subject while negative attitude towards a certain subject makes learning more difficult.

Furthermore, it has been observed that school location (rural and urban areas) plays a vital role in the students' attitude towards learning. Location here is in terms of whether the place of study or school is sited in rural or urban community. Some studies like Godwin and Okoronka (2015): Alokan (2010) have shown positive influence, others have shown negative influence of school location on the students' learning outcomes or achievement. Ibrahim, Zakiang and Damio (2019) found that location was significant in learning of mathematics and basic science that involve angles, with rural students exhibiting more learning difficulties than their urban counterparts. Ahiaba and Igweonwu (2003) also investigated the influence of school location on the performance of science students in rural and urban schools at the SSC examination and found that mathematics and basic science students in urban schools performed better with superior grades, than their rural counterparts while failure rate was higher in the rural schools. Ibrahim, Zakiang and Damio (2019) reported no difference in academic achievement of students as a result of location. Others such as Nwogu (2010); Ahiaba and Igweonwu (2003) reported that rural students performed better in practical skills in mathematics and basic science than their urban counterparts did. Jia (2013) indicated that there was no difference in performance of students because of location. However, this study is supported by Thorndike's laws of learning (2010), especially laws of readiness and exercise, that student learns when an action tendency is aroused through preparatory adjustment, set of attitudes, and ability to reason or solving problems and manipulate. This implies that the students need to cultivate habit of practice and solve problems involving calculations in Physics. Hence, this study investigated the contribution of mathematical competence and attitude as predictors of secondary school students' performance in physics in Ogun state.

The main objective of the study was to investigate mathematical competence and students' attitude as predictors of their performance in secondary school physics in Ogun state. Specific objectives are to:

i. determine the relative contribution of mathematical competence and attitude to students' performance in physics.
ii. determine the composite contribution of mathematical competence and attitude to students' performance in physics.
iii. determine the difference between the performance of the physics students from urban and rural located schools.

Hypotheses

To achieve the objectives of the study, the following hypotheses were formulated:

1. There is no significant influence of mathematical competence to students' performance in physics.
2. There is no significant influence of attitude towards learning physics to students' performance in physics.
3. There is no significant composite contribution of mathematical competence and attitude towards learning physics to students' performance in physics.
4. There is no significant difference between the mean performance of students from schools in urban and rural location in physics.

Methodology

The research design used for this study was descriptive survey research design type. The population consisted of Senior Secondary School II (SSSII) students offering physics in Ijebu-ode local government area in Ogun state. Ten public Schools were randomly stratified into two groups, based on school location from the thirteen Schools in Ijebu - Ode local government area. That is, five schools each from urban and rural areas. In this study, the schools from urban area were those sited within Ijebu - Ode township while the schools from rural area were those sited outside Ijebu - Ode township. An arm of intact class of students offering physics was used in each selected school, and the sample size was 249 students of which 128 (51.41%) were from urban location and 121 (48.59%) were from rural location.

Instrumentation

Three instruments were employed to measure the variables under investigation. The instruments were constructed and validated by the researchers. They included:

i. *Mathematical Competence Scale Test (MCST):* This was used to measure students' competence in mathematics. It contained twenty-six multiple choice

items with four options (A – D) derived from six topics (number & numeration; algebraic process; trigonometry; bearings & distances; and mensuration) extracted from the senior secondary school II mathematics curriculum. The total score of all the correct items was taken as the index of mathematical competence. The Kuder-Richardson 20 formula was used to determine the reliability index of the instrument and it gave a coefficient value of 0.78.

ii. *Student Attitude towards learning Physics Questionnaire (SAPQ)***:** This a four-point likert type scale having strongly agree, agree, disagree and strongly disagree options. It was designed to identify positive or negative attitude of students towards learning physics in secondary schools. It consists of thirty-two items of which 18 items were positive statements while 14 items were negative statements. The total score for all the items was taken as the index of students' attitude. Items of SAPQ are subjected to Cronbach's Alpha and its coefficient of reliability was 0.68.

iii. *Physics Performance Test (PPT):* It was used to measure students' performance in physics. PPT is a multiple-choice objective test with 30 items on five areas of Secondary School II physics curriculum (mechanics, heat and temperature; light waves; sound waves; and molecular theory of matters). Each item has four options of A to D. The Kuder-Richardson 20 formula was used to determine the reliability index value of the instrument of 0.74.

Data Collection and Analysis Procedure

The researchers collected data for the study with the cooperation of mathematics and physics teachers in the selected schools. The instruments were administered to the students twice to avoid boredom. The MCST and SAPQ were administered on the first visit while the students responded to the PPT on the second visit. The information collected were scored and coded by the researchers for analysis. The multiple regression analysis was employed to analysis hypotheses 1, 2 and 3 and t-test was used to test hypothesis 4.

Results

Ho_1: There is a significant influence of mathematical competence on students' performance in physics.

Table 2. Influence of mathematical competence on students' performance in physics.

Model	R	R Square	Adjusted R Square	F Change	Df1	df2	Sig.
1	0.47	0.22	0.21	35.11	1	248	0.00

Table 2 indicates the simple linear regression calculated to determine the influence of mathematical competence on students' performance in physics. A significant regression equation was found ($F_{(1,248)} = 35.11$, $R^2 = 0.22$, $p < 0.05$). This means that mathematical competence positively significantly influenced students' performance in physics. The table also revealed that mathematical competence accounted for 22% of the total variance in students' performance in physics. Consequently, the hypothesis which states that there is a significant influence of mathematical competence on students' performance in physics is not rejected.

Ho_2: There is a significant influence of attitude towards learning physics to students' performance in physics.

Table 3. Influence of attitude towards learning physics to students' performance in physics.

Model	R	R Square	Adjusted R Square	F Change	df1	df2	Sig.
1	0.28	0.08	0.08	16.86	1	248	0.00

Table 3 indicates the simple linear regression calculated to determine the influence of attitude towards learning physics to students' performance in physics. A significant regression equation was found ($F_{(1,248)} = 16.86.11$, $R^2 = 0.08$, $p < 0.05$). This means that attitude towards learning physics positively significantly influenced students' performance in physics. The table also revealed that attitude towards learning physics accounted for 22% of the total variance in students' performance in physics. Consequently, the hypothesis which states that there is a significant influence of attitude towards learning physics on students' performance in physics is retained.

Ho_3: There is no significant composite contribution of mathematical competence and attitude towards learning physics, to students' performance in physics.

Table 4: Summary of the Multiple Regression Analysis on ma thematical competence and attitude towards Physics on students' performance in Physics

Multiple R = 0.62			Adjusted R^2 = 0.36		
R^2 = 0.39			Standard Error = 13.75		
Analysis of Variance					
Model	**SS**	**Df**	**MS**	**F**	**Sig of F**
Regression	5309.71	2	2654.86	30.20	0.00
Residual	21627.09	246	87.92		
Total	26936.79	248			

Significant F at P = 0.05

Table 4 shows the result of the regression of mathematical competence and students' attitude towards learning physics on the sampled secondary school students' performance in physics. The result also reveals significant outcome ($F_{(2,246)} = 30.20$; $P < 0.05$). This implies that mathematical competence and students' attitude towards learning physics when combined, significantly contributed to the variance in students' performance in physics. The result shows a multiple correlation coefficient of 0.62 and R^2 value of 0.39, thus showing that mathematical competence and students' attitude towards learning Physics jointly accounted for 38.80% of the variance in the dependent variable. As a result, the null hypothesis is rejected. Hence, mathematical competence and students' attitude towards learning physics significantly contributed, when combined, to the prediction of secondary school students' performance in physics. That is, there is significant composite contribution of mathematical competence and students' attitude towards learning physics to secondary school students' performance in physics.

Ho_4: There is no significant difference between the mean performance of students in physics from urban and rural located schools.

Table 5 : D ifference between in the mean performan ce of students in physics from Urban and Rural located schools

Variables	N	Mean	Std Deviation	df	t-calculated	t-critical
Urban Area	128	27.32	4.20	247	13.54	1.96
Rural Area	121	20.19	4.19			

Table 5 shows the result of the difference between the mean performance of students in physics from Urban and Rural locations. It also shows the mean and standard deviation scores of the students that participated according to school location indicating that the sampled urban and rural based students recorded the following: urban (mean = 27.32; standard deviation = 4.20) and rural (mean = 20.19; standard deviation = 4.19). This means that the urban based students performed better than their rural based counterparts in the Figure I. The result also shows that t-calculated value of 13.54 is greater than t-critical value of 1.96. As a result, the null hypothesis is rejected. Thus, there is significant difference between in the mean performance of urban based students and rural-based students in physics. Hence, there is significance difference between the mean performance of students in physics from urban and rural located schools.

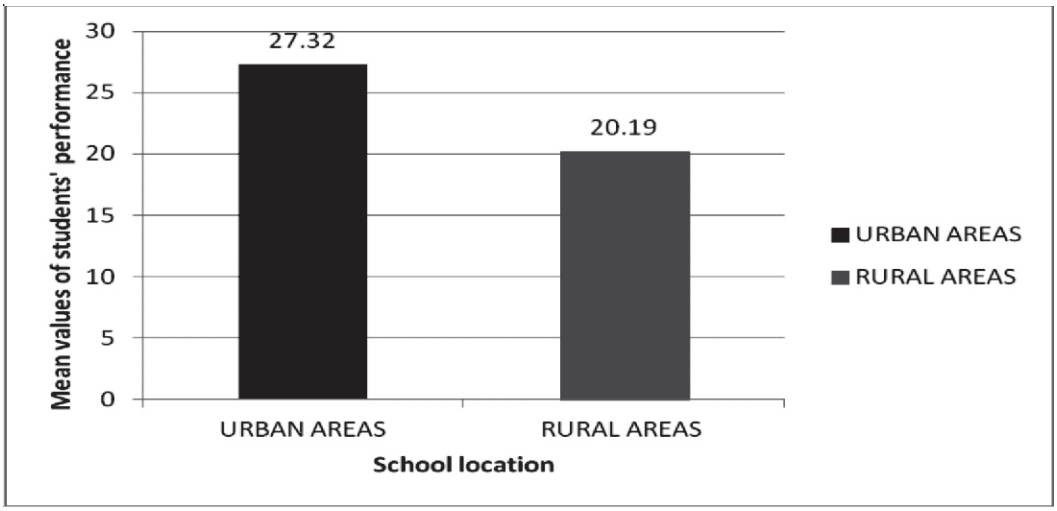


Figure I: **Showing the mean performance of students in physi cs from U rban and Rural based schools**

Discussion

The findings reveal that there was significant relative contribution of mathematical competence to secondary school students' performance in physics. This implies that there was a significant contribution of mathematical competence to the students' performance in physics. This finding is in line with Charles-Ogan and Okey (2017) and Ogunleye, Awofala and Adekoya (2014) which reported that mathematics is a dominant contributing factor to the performance of students in physics. The finding also reported that there was significant relative contribution of students' attitude towards learning physics to secondary school students' performance in physics. The finding is in line with Godwin and Okoronka (2015) and Veloo and Khalid (2015) that a significant relationship exists between students' attitude and their corresponding academic performance in physics. But this outcome negates the findings of Ibrahim, Zakiang and Damio (2019) which reported that attitude towards physics has no relationship with achievement in physics. That is, students achieved good grades in physics without having any positive or favourable learning attitude towards the subject.

Furthermore, the finding shown that there was significant composite contribution of mathematical competence and students' attitude towards learning physics to secondary school students' performance in physics. This outcome is in line with findings of Godwin and Okoronka (2015) and Alokan (2010), that there is significant relationship between location, attitude and academic performance in secondary school physics. Finally, the finding revealed that there was significance difference between the mean performance of students in physics from urban and rural - based schools. The finding is in support of Nwogu (2010); Obe (2004); Ahiaba and Igweonwu (2003) that school location significantly contributed to performance in

mathematics and basic science students. However, studies of Bosede (2010) and Obe (2004) indicated that there is no significant relationship in mathematics and basic science achievement scores of students in urban and rural based schools.

Conclusion

Based on the outcomes of this study, it can be concluded that mathematical competence is a contributory factor in learning physics. It can be a useful tool or a barrier too high to overcome for some of our students. Evidence has shown that students who performed well in physics must have possessed good mathematics background and students with positive attitude can take up the study of physics with confidence. Mathematical competence, attitude towards learning physics and school location have influence on the secondary school students' performance in physics.

Recommendations

It is therefore recommended that those teaching physics at secondary schools should note that mathematical competence and students' attitude are good predictors of students' performance in physics, therefore extra work in the mathematics concept needs to be done. Teachers should encourage students offering physics in solving problems so that they may develop positive attitude towards learning. Lastly, the school authority or curriculum planners should note the contributions of mathematics competence in students' performance in physics in the process of teaching and learning. School location was also found to be a significant factor, it implies that governments have to improve on provision infrastructure in rural areas to reduce migration to urban areas for education and jobs. This will consequently affect the quality of studentship in rural schools.

References

Adegoke, B. A. (2009). Determining factors in secondary school students choice of physics. *Journal of Science Teachers' Association of Nigeria,* 4 (1&2), pp. 75-84.

Alokan, F. B. (2010). Influence of sex and location on relationship between student problems and academic performance. *The Social Sciences, 5* (4), pp. 340 – 345.

Anderson, U. (2018). *The relevance of mathematics to learning of physics in secondary schools*. Afribary.com: Retrieved May 05, 2020. From https://afribary.com/works/the-relevance-of-mathematics-to-learning-of-physics-in-secondary-schools-1721.

Anigbo, L. C. (2016). Factors affecting students' interest in mathematics in secondary schools in Enugu state. *International Journal of Education and Evaluation, 2* (1), pp. 452-461.

Awofala, A. O. A. (2010). *Impact of personalised instruction on senior secondary school learning outcomes in mathematics word problems: PhD Thesis*. Ibadan: University of Ibadan.

Charles-Ogan, G. Ibibo, & Okey, I. F. (2017). Effects of mathematics knowledge on physics students' performance in electromagnetism. *International Journal of Theoretical and Mathematical Physics,* 7 (4), pp. 61-67.

Chief Examiners' Report, WASSCE (2015-2018). *The West African Examinations Council*, Lagos. *https://waeconline.org.ng/e-learning/Physics Downloaded on 05/02/2020*.

Daniel, K. K.,& Felix, K. (2014). The impact of school environment and peer influence on students' academic performance in Vihige County, Kenya, *International Journal of Humanities and Social Science*, 4 (5), pp. 12-22.

Godwin, B. A., & Okoronka, U. A. (2015). Attitude and academic performance of senior secondary school students in physics in Nigeria. Paper presented at *proceeding of 2nd* International *Conference on Education*, Istanbul, Turkey.

Federal Republic of Nigeria (2013 & 2004). *National Policy on Education,* Nigeria Educational Research and Development Council (NERDC), Abuja:

Ibrahim, N., Zakiang, M. A., & Damio, S. M. (2019). Attitude in learning physics among form four students. *Social and Management Research Journal*, 16 (2.), pp. 7060- 066.

Mensah, J. K., Okyere M., & Kuranchie, A. (2013). Students' attitude towards mathematics and performance: Does the teacher attitude matter? *Journal of Education and Practice,* 4 (3), pp. 133-140.

Mkpanang, J. T. (2005). Enhancing the professional physics teachers' role in lifelong education through professionalization of teaching. *Proceedings of the 46th Annual Conference of the Science Teachers' Association of Nigeria*. pp. 269-273.

Niss, M. (2003). Mathematical competencies and the learning of mathematics: The Danish KOM Project. In A. Gagatsis & S. Papastavridis (Eds.), *Proceedings of the Third Mediterranean Conference on Mathematics Education.* pp. 115–124.

Ntibi, Joseph Effiom-Edem., & Edoho, Emmanuel A. (2017) Influence of school location on students' attitude towards mathematics and basic science. *British Journal of Education,* 5 (10), pp. 76-85.

Obafemi, D. T. A., & Ogunkunle, R. A. (2014). Mathematics abilities of secondary school physics students and performance in sound waves. *International Journal of Research and Development (IJRD)* 1 (1), pp. 111-123.

Ofodu, G. O. (2010). Gender, school location and class level as correlates of reading interest of secondary school students. *Journal of Contemporary Studies,* 2. pp.118-123.

Ogunleye, A., Awofala, A. O. A., Adekoya, E. A (2014). Effect of students' background knowledge of mathematics on senior secondary school students' achievement in physics, *Bulgarian Journal of Science education, 23 (6), pp. 45-51.*

Osborne, J. Simon, S., & Collins, S. (2003). Attitudes towards science: a review of the literature and its implications. *International Journal of Science Education*, 25. pp. 1049-1079.

Lord, P., & Jones, M. (2006). Pupils' experiences and perspectives of the national curriculum and assessment. *Final report for the research review Slough*, UK: NFER.

Thorndike, E. L. (2010). Thorndike's laws of learning and its educational implications Educational Psychology. Tuesday, October 19, 2010.

Veloo, A., Nor, R., & Khalid, R. (2015). Attitude towards physics and additional mathematics achievement towards physics achievement. *International Education Studies,* 8 (3), pp. 35-43.

Yusuf, S. & Araba, H. (2019). Perceived causes of students' failure in mathematics in Kwara state junior secondary schools: Implication for educational managers. *International Journal of Educational Studies in Mathematics,* 6 (1), pp. 19-33.

West African Journal of Education
Vol. XL 2020 ISSN: 0043-2997
Website: http//www.instituteofeducui.com

Relationship between Home Literacy Environment and Emergent Literacy Skill of Pre-School Children in Ilorin West Local Government Area of Kwara State

[1]Usman Tunde Saadu, [2]Salamat Bolanle Issa & [3]Ganiyu Akanbi Yusuf
Department of Early Childhood and Primary Education
Faculty of Education, Kwara State University, Malete
e-mail: usman.saadu@kwasu.edu.ng; akanbiganiyu@gmail.com
Tel: 08038493554; 07030598291; 08065250542

Submitted: January 05, 2021; Revised: February 05, 2021 Accepted: March 14, 2021

Abstract

Literacy development is a complex process that begins at birth which lasts a lifetime and is supported by promoting interaction in the home and school environment. The home environment is the first primary context that affords a child to practice literacy activities because as a child interacts with others it creates a setting for learning. Based on the role of the home environment, this study examined the relationship between home literacy and emergent literacy skill of pre-school children in Ilorin West Local Government Area of Kwara State. Two research questions and two research hypotheses were formulated for this study and tested at 0.05 level of significance. Seven hundred and fifty-six respondents from both public and private preschool were involved in the study which included 378 children and 378 parents. Home Literacy Environment Questionnaire and Assessment of Pre-school children's Emergent Literacy Skill Rating Scale were used to collect data. Data collected were analyzed using frequency count, mean, standard deviation and Pearson Product Moment Correlation (PPMC). The result indicated a significant positive relationship between home literacy environment and emergent literacy skill (r = .584; P = < 0.05) and between parents' literacy belief and emergent literacy skill (r = .543; P = < 0.05). It was concluded that home literacy environment facilitates emergent literacy skill of pre-school children. The study therefore recommended that seminar should be organized for parents on how to support their children literacy development at home. Also, parents should establish a literacy rich environment at home for their children.

Keywords: Home literacy environment, Parents' literacy belief, Emergent literacy skill, Pre-school children

Introduction

As formal education begins, children need to communicate and understand the information in both verbal and written form. This is essential for the development of

their literacy and learning skills. Children without the ability to read and write proficiently will not function adequately in today's society. The literacy skill that children developed prior to the primary school level strongly determine their achievement in later literacy learning and many other areas throughout life (Coursin, 2012). As children move through the school years, their reading, writing, speaking and listening skills are expected to improve (Zwass, 2018).

Home literacy environment refers to parent literacy beliefs, family economic status and other resources provided in the family environment to improve literacy skills. Parent literacy belief refers to attitude, habit and the significant that parent give to the literacy skill development of their child in the home environment. Children literacy experience are based on their parent beliefs, cultural or social perspectives on literacy (Katranci, Gülhan & Çetin, 2018). The differences in the home environment may be a product of differences in the beliefs or attitudes around which the parent direct their interactions with their children. Parent beliefs and attitudes often have a great impact on their children literacy skill acquisition because there is a connection between parent literacy beliefs and the educative environment at home that they provide for their children (Katranci, Gülhan & Çetin, 2018). Parent literacy belief will determine the support that they will give to their children literacy activities and the materials that the parent will provide for their children (Opiyo, 2017). Robinson (2014) states that parent with strong reading habits are more likely to read to their children every day, and these children are more likely to understand the structure of printed words.

Boyle (2014) stated that parent who presents reading and writing to children in a stimulating way, this will arouse their interest to learn and engage in different literacy experiences. In contrast, children whose parent demonstrate reading and writing has a tedious and boring learning activities; these children will be unexcited about literacy learning and see it as a chore. The previous investigation has shown that parent literacy belief determines the reading skill of their children (Katranci, Gülhan & Çetin, 2018; Opiyo 2017), but also is socio-economic status of the parent. Ajayi and Adedayo (2017) stated that socio-economic status refers to the fine-grained rank of social class, which can be used to illustrate a person overall social status or reputation. Socio-economic status is based on a comprehensive consideration of individual or family income, education level, occupation status and economic factors. Emergent literacy skill of the children may differ depending on the parent socioeconomic status.

However, as it was pointed out by different scholars that there is a strong and stable correlation between socio-economic status and children early literacy skills; but the conclusions from the studies are inconsistent (Han, 2010; Zwass, 2018). Opiyo (2017) state that socio-economic background such as family size and parent age has a negative correlation on early literacy of pre-school children. Despite this, many researchers have recommended that emergent literacy skills of children differ significantly among socio-economic status of the families (Opiyo, 2017). Socio-economics in this study was measured in the areas of parent educational qualification, occupation and income

Despite the expectation from children to have improved literacy skills. Oyetunde, Ojo, Korb and Babudoh (2011) assert that a major problem affecting Nigeria's primary education is illiteracy, that is, a high percentage of primary school children do not learn how to read. This was also evident during the spelling Bee competition organised by pre-school teachers where 70% of the nursery two children could not spell correctly and 30% could do so correctly words like: take, thank, you, very, much in selected schools in Ilorin-west Local Government Area, Kwara state. The poor reading culture has led Edem, Mbaba, Udosen and Enang (2011) to agree that primary school graduates have poor literacy skills. For this, it is important for children to acquire necessary reading skill. The development of children's literacy skills begins early in life, which is referred to as emergent literacy skills or early literacy skills. Emergent literacy skills can be described as the skill and knowledge that children develop about reading and writing before they begin to read in a formal way.

Emergent literacy skill entails children's understanding of language structure, which lays the foundation for reading and writing skills. The acquisition of these emergent literacy skills is critical to the development of children's literacy and language skills. The literacy related skills in emergent literacy skills include: oral language, print knowledge, phonological awareness, and alphabet knowledge (Puranik, Lonigan & Kim, 2011) are also of the opinion that during early childhood (when the emphasis is on word decoding), knowledge of letters, letter-sound pronunciation, emergent writing (pretend to write), and phonological awareness are very important and considered as part of daily routing at the pre-school level

Pre-school children need to acquire these emergent literacy skills at the pre-school stage so that they can have required skills in reading and writing as they enter Primary school. Pre-school education being the first level of education a child is exposed to; if the child does not acquire the critical skill at this stage it will be detrimental to the other levels of education. The skills and knowledge that the child develops in pre-school can fetch them good performance and also have a great impact on the general knowledge of the child later in the life (Kaushik & Marwah, 2014). Before school age, young children learn important skills, which are the foundation of successful learning skills. The learning context of pre-school children's take place in two settings; the home and school environment, since the home is the first environment of the children thus it is necessary to understand how children develop their emergent literacy skills in the home environment.

Katranci, Gulhan and Cetin (2018) state that the literacy environment prepared at home play a vital role in the development of the children's reading and writing skill. The home literacy environment refers to connection between parents and children concerning language and literacy development and the availability of literacy materials in the home (Zwass, 2018). The home literacy environment can be conceptualized as all the related behaviours, attitudes, and resources that afford children opportunities to develop literacy skills in the home environment.

The conceptualization of home literacy environment is further buttress by Davoodi, Akbarnezhad and Sadighi (2017), they claim that home literacy environment refers to the level of exposure of children to literature, stories, and songs within the home environment. The home literacy environment is outstandingly important during the pre-school stage in nurturing children's reading development. Early in the learning process, children see their parents or caregivers (has their first teachers) as role models to shape their attitudes towards reading (Yeo, Ng & Ong, 2014). Previous researchers that studied the relationship between home literacy environment and emergent literacy skill have reported that home literacy environment has a significant relationship on early literacy skill development of children (Han, 2010; Yeo, Ng & Ong, 2014). Sadr, Juhari, Mansor and Esmaeili (2014) examined the relationship between home environment and emergent literacy among young children in Iran. They reported that home environment had significant positive relationship with children's emergent literacy. As a child grows up in an encouraging home environment, his or her way of thinking about the world around him can be positively improved. Growing up in a rich literacy environment may lead children to master literacy skills. Yeo et al. (2014) state that the positive home environment created by highly involved parents is an important factor in young children's emergent literacy skills. One of the strong factors that determine home literacy environment is parent literacy belief

The parents' literacy belief is one of the important aspects of providing a literacy environment at home. Parents' literacy belief about their role in their children's literacy and language abilities constitute an important component of the home literacy environment (Weigel, Martin, & Bennett, 2016). Parents' literacy belief refers to parents' attitude, habit and the importance that parent attribute to the literacy skill development of their child in the home environment. Children's home environment and literacy experience are based on their parents' beliefs, cultural or social perspectives on literacy and the differences in the home environment may be a product of differences in the beliefs or attitudes around which the parents central their interactions with their children.

Parents' beliefs and attitudes often have a great impact on their children's literacy skill acquisition because there is a connection between parents' literacy beliefs and the educative environment at home that they provide for their children (Katranci, Gulhan & Cetin, 2018). Parents' literacy belief will determine the support that they will give to their children's literacy activities and the materials that the parents' will provide for their children (Opiyo, 2017). Robinson (2014) stated that parents with strong reading habits are more likely to read to their children every day, and these children are more likely to understand of the structure of printed words. In the development of the child's literacy, the beliefs and attitudes of parents about the literacy of children are important. Because there is a relationship between parents' literacy beliefs, and the educative environment at home that they provide for their children. Many studies have

shown that there is a relationship between parents' literacy beliefs and emergent literacy skill (Opiyo, 2017). Weigel, Martin and Bennett (2016) conducted a research on mothers' literacy beliefs: connections with the home literacy environment and pre-school children's literacy development. The study revealed that parental literacy beliefs are likely to change depending on mothers' education, with more highly educated mothers more often adopting participatory and whole language beliefs.

Opiyo, (2017) also investigated the parents' literacy beliefs and home literacy experiences relating to children's literacy skills. The findings of the study revealed that children whose parent has a higher parent's literacy belief performed better in their early literacy than children whose parents have the lower parent's literacy belief. Based on the foregoing, it could be concluded that the home literacy environment of children remains a germane variable that could be explored in order to educate further on the phenomenon of children's emergent literacy skills in any given society including Ilorin West Local Government Area of Kwara State. Home literacy environment of children is an important variable that might influence children's emergent literacy skills. To the best of the researcher's knowledge, there is an insufficient existing body of knowledge on these variables in Ilorin West Local Government Area of Kwara State.

Statement of the Problem

Reading is an essential skill that is paramount to academic achievement and for children to be successful throughout their journey in life. Lack of proficiency in reading hinders child's performance in all subject area. Since children grow up in different home environment, it is expected that the value and experience that the parents will impact on the child at the early stage of development of their reading skill would be different; this is because it has been observed that many primary school pupils are not learning to read and some others find it difficult to read comprehension. This was also evident during the spelling Bee competition organized by pre-school teachers where 70% of the nursery two children could not spell correctly and 30% could do so correctly words like: take, thank, you, very, much in selected schools in Ilorin-west Local Government Area, Kwara state. Owing to the fact that children who are exposed to the same learning experience in reading skill perform differently when evaluated. This has led to differences in the children reading ability. Perhaps these differences might be due to the lack of basic skills and support at the pre-school level in the home environment.

Having gone through the literature available to the researchers, none of the previous studies combined the variables of home literacy environment and emergent literacy skill in the locale (Ilorin West Local Government). Also, emergent literacy skill was measured in this study with rating scale ranging from very good to poor while literacy environment was measured with modified Likert scale of Strongly Agree to Disagree.

Some researchers have worked on the influence of home environment on literacy skill development of pre-primary school children; Influence of early literacy parental involvement on science achievement; Role of Parent in a Child's Reading and Literacy Development; Home environment and parental involvement as determinants of pre-schoolers' readiness for primary school education; literacy-related skills in emergent literacy skills include: oral language, print knowledge, phonological awareness, and alphabet knowledge. Despite all the above efforts, literacy skills level of the children still not improving. Based on this, the study examined the relationship between the home literacy environment and emergent literacy skill of pre-school children in Ilorin West Local Government Area of Kwara state.

Research Questions

The following research questions were raised and answered using frequency count, mean and percentage

1. What is the level of emergent literacy skills of pre-school children?
2. What is the parental literacy belief of pre-school children?

Hypotheses

The following null hypotheses were postulated for the study and were tested at 0.05 level of significance:

Ho_1: There is no significant relationship between home literacy environment and emergent literacy skills of pre-school children in Ilorin West Local Government Area of Kwara state

Ho_2: There is no significant relationship between parents' literacy belief and emergent literacy skills of preschool children in Ilorin West Local Government Area of Kwara state

Methodology

The descriptive research design of correctional type was adopted in the study. The population of study comprised of 22,228 pre-school children in public and private pre-school centres. Purposive sampling technique was used to select 756 respondents consisting of 378 nursery-two children within the age of 3-5 years and 378 parents. The category of these children were selected because they were at preschool level. The instruments used for data collection were Home Literacy Environment Questionnaire (HLEQ) which was used to elicit information from parents of selected nursery two pre-school children. It consists of section A and B. Section A consists of items on demographic data of the parent, such as parent educational qualifications, occupation, and income. Items therein were used to measure the relationship between parent

characteristics and emergent literacy skills of the children as well as measuring the parent literacy belief. This instrument was administered to the parents through their children by asking them to give their parent at home.

The response to each of the items was analyzed using 4 point modified Likert scale format ranging from strongly agree (SA) 4, Agree (A) 3, strongly disagree (SD) 2 and Disagree (D) 1. To assessment the Emergent Literacy Skill of Pre-school Children's, Rating Scale was designed by the researchers to measure the emergent literacy level of nursery-two children. Three hundred and seventy-eight questionnaires were administered to children under the guidance of their class-teachers. The items therein were used to measure knowledge of alphabet, oral language, Phonological awareness and print awareness of the children. The items were measured on rating scale of Very good, Good, Fair and poor. The reliability of home literacy environment questionnaire was established using Cronbach Alpha and yielded a reliability coefficient of 0.76 while reliability of assessment of emergent literacy skill of preschool children's rating scale was established using Pearson Product Moment Correlation (PPMC) and yielded a reliability coefficient of 0.74. The data were analyzed using Frequency mean, Standard Deviation and Pearson Product Moment Correlation. The null hypotheses were tested at 0.05 level of significance

Results

Research Question One: What is the level of emergent literacy skills of pre-school children?

Table 1: Table showing the level of emergent literacy skills of pre-school children?

S/N	Emergent Literacy Skill	Very Good	Good	Fair	Poor	Mean
1	reads letters of the alphabet	323(85.4)	13(34)	38(10.1)	4(1.1)	3.73
2	identify letters of the alphabet	199(52.6)	118(31.2)	32(8.5)	29(7.7)	3.29
3	write letter A-M	229(60.6)	113(29.9)	10(2.6)	266(6.9)	3.44
4	differentiate upper and lower case of each letters	57(15.1)	246(65.1)	19(5.0)	56(14.8)	2.80
5	identify letters in words	126(33.3)	185(48.9)	9(2.4)	58(15.4)	3.00
6	say simple greeting	-	195(51.6)	147(38.9)	36(9.5)	3.42
7	discuss pictures with different vocabularies	32(8.5)	83(22.0)	144(38.0)	119(31.5)	2.07
8	name things in the environment	9(2.4)	73(19.3)	207(54.8)	89(23.5)	2.01
9	respond to yes/no questions	132(34.9)	64(16.9)	111(29.4)	71(18.8)	2.68
10	read letter sounds	102(27.0)	10(2.6)	12(3.2)	254(67.2)	1.89
11	identify each letter with corresponding sounds	123(32.5)	24(6.3)	23(6.1)	208(55.0)	2.16
12	blend three letter sounds to make a word	71(18.8)	25(6.6)	4(1.1)	278(73.5)	1.71
13	count letter sounds in a word	172(45.5)	29(7.7)	34(9.0)	143(37.8)	2.61
14	recognize the front cover of a book	66(17.5)	46(12.2)	18(4.8)	248(65.6)	1.81
15	recognize the back cover of a book	57(15.1)	44(11.6)	12(3.2)	265(70.1)	1.72
16	recognize the title of a book	88(23.3)	10(2.6)	17(4.5)	263(69.6)	1.80
17	identify the first and last letter in a word	254(67.2)	52(13.8)	26(6.9)	46(12.2)	3.36
	Weighted Mean					**2.56**

Decision rule: Low=00-2.49, High=2.50-400 Note: The figures in parentheses are in percentages

Table 1 shows the level of emergent literacy skills of pre-school children. The children were able to do the following in a very good manner; reads letters of the alphabet (3.73). The children were able to do the following in a good manner; identify letters of the alphabet (3.29), 55 write letter A-M (3.44), Differentiate upper and lower case of each letter (2.80), identify letters in words (3.00), say simple greeting (3.42), respond to yes/no questions (2.68), count letter sounds in a word (2.61), identify the first and last letter in a word (3.36). However, the children were able to do the following in a fair manner; read letter sounds (1.89), identify each letter with corresponding sounds (2.16), blend three letter sounds to make a word (1.71), recognize the front cover of a book (1.81), recognize the back cover of a book (1.72), recognize the title of a book (1.80), discuss pictures with different vocabularies (2.07), name things in the environment (2.01). The weighted mean is 2.56 which is a numeric indicator that the level of emergent literacy skills of pre-school children was high.

Research Question 2: What is the parental literacy belief of pre-school children?

Table 2: Table showing the parental literacy belief of pre-school children?

S/N	Parent Literacy Belief	Strongly Agreed	Agreed	Disagreed	Strongly Disagreed	Mean
1	Literacy skill development of the child is the role of the teacher and parent	248(65.6)	106(28.0)	13(3.4)	11(2.9)	3.56
2	Teachers are more knowledgeable in the aspect of literacy	234(61.9)	129(34.1)	7(1.9)	8(2.1)	3.56
3	Parent need to interact with their child to develop their language skills	273(72.2)	91(24.1)	9(2.4)	5(1.3)	3.67
4	It is role of the parent to ensure children develop literacy skills	239(63.2)	92(24.3)	42(11.1)	5(1.3)	3.49
5	Parent should have time to engage with children in literacy activities	218(57.7)	144(38.1)	6(1.6)	10(2.6)	3.51
6	Reading book by the parent stimulate children interest in reading book	256(67.7)	112(29.6)	5(1.3)	5(1.3)	3.64
7	The home is the first school for a child	228(60.3)	125(33.1)	24(6.3)	1(0.3)	3.53
8	Parent serve as teachers to the child in the home	229(60.6)	129(34.1)	10(2.6)	10(2.6)	3.53
9	Children needs to first learn all letters of the alphabet before engaging in literacy activities	195(51.6)	144(38.1)	33(8.7)	6(1.6)	3.40
10	A home where a child have a lot of books, encourage a child to read	222(58.7)	113(29.9)	38(10.1)	5(1.3)	3.46
11	Watching literacy programme encourages a child to read	175(46.3)	137(36.2)	60(15.9)	6(1.6)	3.27
12	Point out words on the street or bus encourage literacy skills	232(61.4)	111(29.4)	31(8.2)	4(1.1)	3.51
13	Parent needs to explain the words when reading with their child	217(57.4)	135(35.7)	20(5.3)	6(1.6)	3.49
14	Naming pictures in a book develop children literacy skills	263(69.6)	96(25.4)	17(4.5)	2(0.5)	3.64

15	Literacy activities in the home do not influence how a child develop early literacy skills	151(39.9)	113(29.9)	57(15.1)	57(15.1)	2.05
16	Parent do not have a role to play in the early literacy skills development	274(72.5)	93(24.6)	3(0.8)	8(2.1)	3.67
17	A child does not need to be expose to literacy activities in the home	207(54.8)	138(36.5)	25(6.6)	8(2.1)	3.44
18	Parent needs not engage in literacy activities with their child	204(54.0)	148(39.2)	6(1.6)	20(5.3)	3.42
19	A child can perform well in school even when the home environment do not lend a hand in literacy activities	249(65.9)	110(29.1)	14(3.7)	5(1.3)	3.60
	Weighted Mean					**3.44**

Decision rule: Negative=00-2.49, Positive=2.50-400 Note: The figures in parentheses are in percentages

Table 2 shows the parental literacy belief of pre-school children. The respondents strongly agreed with the following ; Literacy skill development of the child is the role of the teacher and parent (3.56), Teachers are more knowledgeable in the aspect of literacy (3.56), Parent need to interact with their child to develop their language skills (3.67), Parent should have time to engage with children in literacy activities(3.51), Reading book by the parent stimulate children interest in reading book (3.64), The home is the first school for a child (3.53), Parent serve as teachers to the child in the home (3.53), Pointing out words on the street or bus encourage literacy skills (3.51), Naming pictures in a book develop children literacy skills (3.64), Parent do not have a role to play in the early literacy skills development (3.67), A child can perform well in school even when the home environment do not lend a hand in literacy activities (3.60). The respondents agreed with the following; Children needs to first learn all letters of the alphabet before engaging in literacy activities (3.40), A home where a child have a lot of books, encourage a child to read(3.46), Watching literacy programme encourages a child to read (3.27), Parent needs to explain the words when reading with their child (3.49), A child does not need to be expose to literacy activities in the home (3.44), Parent needs not to engage in literacy activities with their child (3.42), It is role of the parent to ensure children develop literacy skills (3.49). However, the respondent disagreed with the following; it is role of the parent to ensure children develop literacy skills (3.49). The weighted mean is 3.44 which is a numeric indicator that the parental literacy belief of pre-school children was positive.

Ho_1: There is no significant relationship between home literacy environment and emergent literacy skills of pre-school children in Ilorin West Local Government Area of Kwara state.

Table 3: Summary of PPCM showing the relationship between home literacy environment and emergent literacy skills of preschool children

Variables	N	Mean	Std. Deviation	R	df	Sig.	Remark
Home literacy Environment	378	27.18	8.16	.584	376	.000	Significant
Children literacy skills	378	48.46	12.15				

Table 3 shows the relationship between home literacy environment and emergent literacy skills of preschool children in Ilorin West Local Government Area of Kwara state. There was significant positive relationship exist between home literacy environment and emergent literacy skills of preschool children in Ilorin West Local Government Area of Kwara state (r = .584; P = < 0.05). The hypothesis is therefore rejected in the light of the result since the significant value is less than 0.05.

Ho_2: There is no significant relationship between parents' literacy belief and emergent literacy skills of preschool children.

Table 4: Summary of PPCM showing the relationship between parents' literacy belief and emergent literacy skills of preschool children.

Groups	N	Mean	Std. Deviation	R	df	Sig.	Remark
Parent literacy belief	378	47.75	12.09	.543	376	.000	Significant
Children literacy skills	378	48.48	12.15				

Table 3 shows the relationship between home literacy environment and emergent literacy skills of preschool children in Ilorin West Local Government Area of Kwara state. There was significant positive relationship exist between home literacy environment and emergent literacy skills of preschool children in Ilorin West Local Government Area of Kwara state (r = .584; P = < 0.05). The hypothesis is therefore rejected in the light of the result since the significant value is less than 0.05.

Ho_2: There is no significant relationship between parents' literacy belief and emergent literacy skills of preschool children.

Table 4: Summary of PPCM showing the relationship between parents' literacy belief and emergent literacy skills of preschool children.

Groups	N	Mean	Std. Deviation	R	df	Sig.	Remark
Parent literacy belief	378	47.75	12.09	.543	376	.000	Significant
Children literacy skills	378	48.48	12.15				

Table 4 shows the relationship between parents' literacy belief and emergent literacy skills of preschool children in Ilorin West Local Government Area of Kwara state. There was significant positive relationship exist between parents' literacy belief and emergent literacy skills of preschool children in Ilorin West Local Government Area of Kwara state ($r = .543$; $P = < 0.05$). The hypothesis is therefore rejected in the light of the result since the significant value is less than 0.05.

Discussion

One of the results emanated from this study reveals that the level of emergent literacy skills of pre-school children was high. This was in line with the opinion of Puranik, Lonigan and Kim (2011) who said that during early childhood (when the emphasis is on word decoding), knowledge of letters, letter-sound pronunciation, emergent writing (pretend to write), and phonological awareness are very important and considered as part of daily routing at the pre-school level. Kaushik and Marwah, (2014) who also viewed that skills and knowledge of emergent literacy that the child develops in pre-school can fetch them good performance and also have a great impact on the general knowledge of the child later in the life.

Another finding from this study also stated that the parental literacy belief of pre-school children was positive. This was in agreement with the opinion of Weigel, Martin, and Bennett, (2016) who opined that parents' literacy belief is one of the important aspects of providing a literacy environment at home that the parents' literacy belief about their role in their children's literacy and language abilities constitute an important component of the home literacy environment. Katranci, Gulhan and Cetin, (2018) and Opiyo, (2017) respectively viewed that parents' beliefs and attitudes often have a great impact on their children's literacy skill acquisition because there is a connection between parents' literacy beliefs and the educative environment at home that they provide for their children. Parents' literacy belief determined the support that they give to their children's literacy activities and the materials that the parents provide for their children.

One of the findings of this study also revealed that there was significant positive relationship between home literacy environment and emergent literacy skill of pre-school children. The result was in agreement with finding of Han (2010), and Sadr et al. (2016) who all reported that home literacy environment has a significant positive

relationship with emergent literacy of pre-school children. Yeo et al. (2014) state that the positive family environment created by highly involved parents is an important factor in young children's emergent literacy skills. However, the finding of the study was not in line with the finding of Katranci et al. (2018) who reported that there was no relationship between home literacy environment and children's literacy skill.

Also, the finding of this study revealed that there was significant positive relationship between parents' literacy belief and emergent literacy of pre-school children. The finding corroborated with the study conducted by Opiyo, (2016), Stephenson, et al. (2008) and Weigel, et al. (2016). These studies showed that children whose parents had high literacy belief perform much better than children whose parents had low literacy belief. Parents who had high esteem about their children's literacy skill give great importance to their children performance and also make provision for literacy rich home environment.

Conclusion

This study concluded that home literacy environment plays an important role in development emergent literacy skill of pre-school children, and the study affirmed that home literacy environment and parents' literacy belief have a significant positive relationship with emergent literacy skill of pre-school children.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Seminars should be organized for parents so that they can understand how to support their children's literacy skills at home.
2. Parents should be sensitized on how to support children's literacy skills
3. School authority and government should extend family literacy programme to the home environment of children so that it can help in nurturing children literacy skill right from early age and necessary intervention can be provided for children who likely have reading difficulty in the later years.

Reference

Ajayi, M. & Adebayo, A. (2017). Socio-economic Factors Affecting Residential Land Accessibility in Akure Nigeria: A Gender Perspective. *International Journal of Built Environment and Sustainability. 4*(10) .11113/ijbes. v4.n3.209.

Boyle, M. B. (2014). The impact of parent established home literacy experiences on early childhood literacy acquisition. *Education Masters. Paper 344*.

Coursin, A. (2012). *Understanding the Development of Alphabet Knowledge in At-Risk Populations: The Influence of Pre-Literacy Skills* (Doctoral dissertation). Wisconsin, Milwaukee University. https://dc.uwm.edu/etd/94

Davoodi, S., Akbarnezhad, S. & Sadighi, F. (2017). Home literacy environment and reading achievement: The case of Persian and Arab children. *Journal of Applied Linguistics and Language Research, 4*(2), 131 – 138. Retrieved from: https://pdfs.semanticscholar.org/6406/6f60a8de375dc6f0dececa0c3da7d226bda7.pdf

Edem, E., Mbaba, U. G., Udosen, A. & Enang, P. I. (2011). Literacy in primary and secondary education in Nigeria. *Journal of Language and Culture*, *2*(2), 15-19.

Florida Literacy and Reading Excellence (FLARE) Center (2001). *Emergent Literacy*. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.464.6794&rep=rep1&typepdf

Foy, J.G., & Mann, V.A. (2003). Home Literacy Environment and Phonological Awareness in Preschool Children: Differential Effects for Rhyme and Phoneme Awareness. *Applied Psycholinguistics, 24,* 59-88. Doi: 10.1017/S0142716403000043

Griffith, P. L., Beach, S. A., Ruan, J. & Dunn, L. (2008). *Literacy for young children: A guide for early childhood educators.* Thousand Oaks, CA: Corwin Press.

Han, J. (2010). Influence of the home literacy environment on pre-kindergarten children's emergent literacy skills. Master Thesis, University of Georgia. https://pdfs.semanticscholar.org/4953/c275da024284c441e308be56c33789e83976.pdf

Katranci, M., Gülhan, M. & Şimşek Çetin, Ö. (2018). Examining the relationship between early literacy skills, parents' reading beliefs and home literacy environment. *International Journal of Languages' Education and Teaching, 6*(4), 383 393.https://www.researchgate.net/publication/330359047

Kaushik, R. & Marwah, P. (2014). *Importance of preschool education. The Progressive Teacher*. http://www.progressiveteacher.in/importance-of-pre-school-education/

Norman, R. C. (2007). *Do parents' literacy beliefs and home literacy experiences relate to children's literacy skills?* Master Thesis, Brigham Young University. Retrieved from: https://scholarsarchive.byu.edu/cgi/viewcontent.cgi?article=2269&context=etd

Opiyo, R. A. (2017). Home literacy environment and development of early literacy abilities of 3 – 4-year-old children in Kakamega Central Sub County, Kenya. Doctoral Thesis, Kenyatta University. Retrieved from: *https://pdfs.semanticscholar.org*

Oyetunde, T. O., Ojo, G., Korb, K. A. & Babudoh, G. (2011). Improving literacy instructional practices in primary schools in Nigeria: Strategies that work. *Literacy Information and Computer Education Journal (LICEJ),* 6(2), 2323 – 2328.

Puranik, C., Lonigan, C. J., & Kim, Y. (2011). Contributions of emergent literacy skills to name writing, letter writing, and appalling in preschool children. Early Childhood Research Quarterly, 26(4), 465 – 474. DOI:

Robinson, J. (2014). *A home literacy handbook for parent with pre-school children.* Master thesis, Brock University. Retrieved from: Sadr, A.J., Juhari, R., Mansor, M. & Esmaeili, N. S. (2014) Home environment and emergent literacy among young children in Iran. *Asian social science, 11*(9), 138-145

Senechal, M., LeFevre, J. A., Smith-Chant, B. L., & Colton, K. V. (2001). On refining theoretical models of emergent literacy: The role of empirical evidence. *Journal of School Psychology, 39*(5), 439 – 460. https://doi.org/10.1016/S0022-4405(01)00081-4

Stephenson, K.A., Parrila, R. K., Georgiou, G. k. & Kirby. J. R. (2008) Effects of Home Literacy, Parents' Beliefs, and Children's Task-Focused Behavior on Emergent Literacy and Word Reading Skills, *Scientific Studies of Reading, 12*(1), 24-50, DOI: 10.1080/10888430701746864

Weigel, D.J., Martin, S.S. & Bennett, K. (2016). Mothers' literacy beliefs: Connections with home literacy environment and pre-school children literacy development. *Journal of early childhood literacy 6*(2), 191-121 Doi: 10.1177/146898406066444

Whitehurst, G. & Lonigan, C. (1998). *Child Development and emergent literacy. Child Development, 69*(3), 848 – 872. 10.1111/j.1467-8624. 1998.tb06247. x.

Yeo, L. S., Ong, W.W. & Ng, C.M. (2014). The Home Literacy Environment and Preschool Children's Reading Skills and Interest. *Early Education and Development,* 1-24 DOI: 10.1080/10409289.2014.862147

Zwass, R. (2018). *The home literacy environment: A qualitative investigation of school-aged children.* Doctoral Dissertation.

West African Journal of Education, Vol. XL 2020 Page 107-117

West African Journal of Education

Vol. XL 2020 ISSN: 0043-2997

Website: http//www.instituteofeducui.com

Students Achievement in English Language, Mathematics, Basic Science and Basic Technology as A Predictor of their Success in SSCE Science

Opoola Samson

Institute of Education, University of Ibadan

akindeleopoola@yahoo.com

Submitted: October 1, 2020; Revised: February 13, 2021; Accepted: March 19, 2021

Abstract

Science is defined as a body of knowledge that has been objectively and systematically acquired. Producing more science students in Nigerian secondary schools will no doubt accelerate technological development as more scientists and technologists will graduate from the nation's ivory towers. This is unarguably one of the missions of vision 2020 but unfortunately most students without relevant scientific background maneuver their ways into science classes at secondary school level. The resultant effect of this is admission of average students in the science and technology departments of universities who eventually end up as half-baked graduates with little or no scientific and technological knowhow. In line with this mind-boggling understanding, there is need for school administrators to critically appraise and analyse the achievement of students in science related subjects in our junior secondary schools in order to create a prediction model that would give sufficient insight into students' ability to be successful or not in the sciences. In this paper, discriminant analysis was used to predict students' ability to be successful in science based on their scores in junior secondary school English language, mathematics, basic science and basic technology. Mathematics and English language are compulsory for all fields of study while fundamental knowledge of basic science and technology is needed to pursue a science related discipline.

KeyWords: Senior student achievement, English Language, Mathematics, Basic Technology and Science.

Introduction

Education is taken to be an instrument for achievement of national objectives (FRN, 2008). The government is adequately informed that technological advancement and social economic development of any nation are dependent on the nation's educational development. Science education is the knowledge obtained from the

systematic study of the structure and behaviour of the physical world, especially by observing, measuring and experimenting and the development of theories to describe the results of these activities (Ajayi & Ogbeba, 2017). Basic Science and Technology is the bedrock on which the core science subjects such as Biology, Chemistry and Physics at the senior secondary schools are laid. Basic Science and Technology as a subject come in existence as a result of curriculum reform movement in Nigeria to make science education more functional for sustainable national development. In performing maximally in science, a child should be able to relate and write his ideas in a simple, error free sentence. Moreover, basic numeracy and calculations are needed to do well in science.

The curriculum of Basic Science and Technology is a product of the restructuring and integration of four primary and junior secondary school science curricula namely; Basic Science, Basic Technology, Physical and Health Education and Computer Studies/Information Communication Technology (FRN, 2012). Nigerian Educational Research and Development Council (NERDC) (2012) posit that the need for integration of these science curricula became necessary for the following reasons:

- The recommendation of the presidential summit on education (2010) to reduce the number of subjects offered in primary and junior secondary schools.
- The need to encourage innovative teaching and learning approaches and techniques that promotes creativity and critical thinking in learners.
- The need to promote the holistic view of science at the Basic Education level for better understanding of contemporary and changing world and need to infuse emergent issues that are of national and global concern such as gender sensitivity, globalization and entrepreneurship.

Much emphasis is therefore placed on it to give the students the right foundation for higher endeavour in science and technology. Nations that are considered to be developed and largely considered as civilized have achieved that status through purposeful scientific education of their citizens (Ajayi, 2017). In cognizance with the importance of science and technology, Basic Science and Technology are taught in Upper Basic schools in Nigeria to prepare a base for any science and technological development. For any nation, especially Nigeria, to achieve scientific and technologically advancement, it is imperative to start planning for a firm basic scientific education foundation for her citizens from childhood. This is because children begin career exploration at a very young age. To move with this pace, Basic Science is taught at the primary school so as to catch the pupils' heart at a tender age. Furthermore, Basic Science and Technology is taught at the upper basic level to enable students to build up and concretize the knowledge of science they had at the primary school level and to lay the foundation for the study of the core science subjects such as Biology, Chemistry and Physics at the senior secondary level of education.

It is expected that by teaching Basic Science and Technology to children at basic education level, every Nigerian student would be given the basic knowledge and understanding of what science is all about and some of the innovations that are taking place around them. This assertion blends with the objectives of science teaching at the Upper Basic Education which is to produce individuals who will be able to live effectively in the modern age of science and technology and contribute to the development of the nation (FRN, 2013). Basic Science and Technology provides students at the upper basic education level with the initial theoretical and practical frameworks which are inevitable prerequisites for their future study. This statement buttressed by Ekundayo (2012) maintains that Basic Science and Technology enables students to understand science concepts, principles, theories and laws which are further elaborated in the core sciences such as Biology, Chemistry and Physics. It is regrettable that there is a public outcry due to poor quality science education, specifically in science subjects such as Biology, Chemistry and Physics.

A good quality science education is one that provides all learners with capabilities they require to become economically productive, and develop sustainable livelihood, contributes to peaceful and democratic societies and to enhance individual well-being. In this era of science and technology, Nigerians will need to be knowledgeable in science to prosper in a complex and global society. Therefore, there is need to ensure inclusive and equitable quality science education. Quality improvement in science education encompasses the all-round development of learners in Basic science and technology at upper basic education level and in core science subjects such as Biology, Chemistry and Physics respectively at senior secondary education level.

Federal Republic of Nigeria (FRN, 1986), in the national policy on science and technology, (NPST) defines science as the generation of knowledge about life. Science seeks knowledge and understanding of the world and life itself and owes its advancement to observation and knowledge. The Economic, social and political growth of a nation or society is predicated on its scientific and technological advancement -since science helps man to improve his environment and supply his basic needs such as food, health, shelter and clothing. The acquisition of scientific literacy by the youth is a necessary means towards the attainment of scientific and technology excellence. Science education has the overall effect of producing individual who will be capable of making valid and thoughtful decisions on science based social issues which daily confront them. The tremendous growth in science and technology has made life comfortable for a greater number of people by improving their quality of live-in areas such as medicine, transportation, agriculture, communication, teaching and industrialization (Symons 2003).

In the area of health and medicine, diseases that could not be diagnosed and treated in the past are now being treated and cured as a result of science and technology. Many people have been healed of cancer and kidney problems. Blood groups and genotypes can be determined to help blood transfusion and transplant of organs such as the heart and

kidney. Present day science has also led to the discovery of new drugs. Technology devices such as television, radio, telex, telegraph, telephones etc. are available for easy and effective communication. Other more advanced means of communication are the E-mail, websites and internet devices. Science and technology have contributed remarkably to improvement in the system of communication in this millennium.

There has been remarkable improvement in the transportation sector. Science and technology have made possible modem transport modes such as automobiles, planes, rockets, space vehicles. Apart from the invention of faster modes of transportation, the channel of transportation has also been modified which has in turn promoted better domestic and international trades and travels. Industries has often been labor-intensive but science and technology have brought about mechanization thereby accelerating production. Science and technology have made mechanized farming possible. In a nutshell, science and technology has brought a great improvement in the variable of plant and animal breed such as development of early maturing varieties that are disease resistant and better methods of storage of crops.

Science is an intensely human, intensely creative enterprise. Science dominates our lives and presents society with tremendous opportunities and tremendous challenges. Scientific knowledge allows us to develop new technologies, solve practical problems and make informed decisions both individually and collectively. Science enhances critical thinking. Scientific concepts typically begin with an idea followed by an experiment to substantiate that idea through technical methods and analysis. It dictates a logical way of approaching unfamiliar topics, ensuring students can learn how to relate theoretical and practical work (Urevbu, 2001).

Science is an integral part of various fields from agriculture to medicine and every day in between. In a world where new scientific advancement crops up seemingly by the hour, a background in science ensures students are not left behind by the ever-shifting tides of technological wave. It teaches learners to be self- sufficient in an environment where constant change is the only constant. Beyond the potential scientific breakthroughs, there are individual benefits to learning science such as developing our ability to ask questions, collect information, organise and test our ideas, sole problems and apply what we learn. Science offers a powerful platform for building confidence, developing communication skills and making sense of the world around us.

Public policy decisions that affect every aspect of our lives are based in scientific evidence. As children grow up in an increasingly technological and scientifically advanced world, they need to think, learn, solve problems and make informed decisions. These skills are integral to every aspect of a student's education and life from school to career. Science education is one of the most important subjects in schools due to its relevance to students' lives and the universally applicable problem-solving and critical thinking skills it uses and develops. These are life- long skills that allows students to generate ideas, weigh decisions intelligently and even understand the evidence behind

public policy making. Teaching technological literacy, critical thinking and problem solving through science education gives students the skills and knowledge they need to succeed in school and beyond (Eneh, 2000).

Engaging the enthusiasm of the student is pivotal. The culture of technological literacy, critical thinking and excessive central measurement and assessment in Education, undertaken with laudable aims, has in practice not only undermined the professional autonomy of the teacher and inhibited school-based curriculum innovation, but has killed the love for learning in many young people. If students cannot apply what has been learnt outside the classroom, they have gained very little of lasting value however well they may perform in tests. Science and Technology Education in the new millennium will need to move from rational planning based on projections to interactive and strategic planning in order to accommodate rapid changes resulting from knowledge explosion and information technology. In support of the fact that science and technology is growing at an unprecedented rate, Aboade (cited in Abdullahi, 1998) said: in a community where knowledge is not allowed to grow, that community remains largely elementary and primitive in the technological age. Thus, students should be encouraged to study science both at junior and senior secondary school levels.

Unarguably, science and technology is one of the bases of industrial and economic development. In line with this understanding, there is need for school administrators to critically appraise and analyse the achievement of students and consequently create a prediction model that would give insight into their ability to be successful in science. This paper explored how discriminant function can be used to predict students' ability to be successful in science based on their scores in English language, mathematics, basic science and basic technology at the junior secondary school.

Discriminant function analysis was first propounded by Bernard (1935) as means of using one set of variables to discriminate between two categories of another variable. The analysis was later extended to more than two dependent groups by Brown (1970) and Bryan (1950) Discriminant analysis is concerned with differences among groups of individuals. It reveals the characteristics that make their relevance clear and also show their relative importance. Discriminant analysis is a multivariable method of classification (Fisher,1936) which is similar to regression analysis except that the dependent variable (DV) is categorical rather than continuous (Draper and Smith, 1981). It can be used to classify, explain classifications and make predictions when the dependent variable (DV) is dichotomous, e.g., success/failure, yes/no. As an analysis concerned with the relationship between a categorical variable and a set of interrelated variables, it can also be used to determine which continuous variable discriminates between two or more naturally occurring groups. Discriminant analysis is thus a tool for predicting group membership from a linear combination of variables. Discriminant function analysis is used to determine which continuous variables discriminate between two or more naturally occurring groups.

There are two types of discriminant analysis that is the predictive discriminant analysis PDA and the descriptive discriminant analysis DDA. Stephens (1996) described the distinction between PDA and DDA in the following way; In the predictive discriminant analysis the focus is on classifying subjects into one of several groups whereas in the descriptive discriminant analysis the focus is on revealing major differences among the groups. Research questions are generally of the descriptive type or of the predictive type. Both type of questions is hardly addressed in a given research situation.

The two types of discriminant analysis have different histories of development. Discriminant analysis for the first three or four decades focused on the prediction of group membership PDA is appropriate when the researcher is interested in assigning individuals to groups based on composite scores on several predictor variables. The accuracy of such predictions can be assessed by examining the 'hit rates' as against chance.

Discriminant analysis is often seen as the reverse of MANOVA. In MANOVA, the researcher takes two or more groups and compares their scores on a combination of DVs in an attempt to discover whether or not there exist significant group differences. However, in discriminant analysis, this process is reversed (Sprinthall, 2000). In MANOVA, the IVs are the grouping variables and the DVs are the predictors. But in discriminant analysis, the DVs serve as the grouping variables and the IVs are the predictors. (Tabachnick and Fidell, 1996) If the goal of the analysis is to describe group differences, the researcher would determine the number of dimensions (discriminant functions) that maximise the differences among the groups in question. In contrast, if prediction is the goal of as analysis, the researcher might use discriminant function scores in order to predict from which group subjects came. This procedure can be used to predict membership in a particular group for new of future subjects from the same population.

Although discriminant analysis seems not to have been used very much in educational and behavioural science research, it has very interesting potentialities. Like multiple Regression, it can be used in two ways:

- to classify subjects into groups on a combination of measures
- to study the relations among variables in different groups and population.

The main goal of discriminant function analysis is to predict group membership from a set of independent variables known as predictors. For example, an educational psychologist may wish to classify students into intelligent or non-intelligent. If the psychologist has measures that seem to be related to delinquency like social class values and personal beliefs and also knowledge of the actual delinquency of a group of students, the measures and the knowledge of delinquency can be used in discriminant function. Consequently, if the prediction is reasonably successful the function can be used to assess the probable delinquency of other individuals. Furthermore, this analytical procedure can be extended to other variables like success versus failure, vote for versus vote against.

According to Adekanye (1992), discriminant analysis has been extensively used in studying finance and financial economics, particularly bank failures. It has been used in medicine (Van Viet and Gupta 1973) and in predicting administrative performance in industries. Discriminant function analysis undertakes the same task as multiple linear regressions. Discriminant Function Analysis (DFA) has been used extensively in the past to derive optimal combinations of variables to differentiate groups because of its computational simplicity. However, DFA assumes that the predictors (i.e., tests included in the model) are each normally distributed and the set of predictors has a multivariate normal distribution along with homogeneous variance-covariance matrices (Harrell, 2001).

Discriminant function analysis (DFA) is a data-reduction technique used to make decisions about naturally occurring group membership. It can answer theoretical questions but has proved especially useful in applied research. Discriminant function analysis (DFA) is a statistical procedure that classifies unknown individuals and the probability of their classification into a certain group (such as sex or ancestry group). Discriminant function analysis makes the assumption that the sample is normally distributed for the trait. The posterior probability and typicality probability are applied to calculate the classification probabilities (Albanese et al., 2008).7 The posterior probability is the probability that an unknown case belongs to a certain group based on relative Mahalanobis' distances measuring the distance to the centre or centroid of each group. The typicality probability is how likely the unknown case belongs to a group based on variability within all groups. The discriminant function procedure has been programmed into most standard statistical packages for greater applicability.

Usoro (2006) carried out a study on classification of students into various departments based on their cumulative results for one-year foundation programme known as pre-National Diploma (PRE-ND) in the polytechnic system. Charles and June (1970) carried out a study to determine if a differentiation or separation among students graduating, withdrawing or failing could be identified. Adebayo and Folayemi (1998,1999) applied the t-statistic to investigate how predictable the final year result would be using the first-year result or Grade Point Average (GPA) of some selected university graduates. In the past twenty-five years, research in academic jurisdiction has centred on graduation withdrawal, failure and selection of students on the basis of either collegiate success or cumulative result. The study however is centred on the establishment of predictive ability of student's achievement in English Language, Mathematics, Basic Science and Basic Technology on their success in SSCE science

Research Questions

1. Can students' success in science be reliably predicted from their JSCE scores in English language, mathematics, basic science and basic technology?

2. If students' success can be reliably predicted, along how many dimensions do the two groups (success groups and failure group) differ?
3. Given the obtained classification function how adequate is the classification? In other words, what proportion of cases is classified correctly?

Methodology

Discriminant analysis was used to find the extent to which students' success can be determined from their achievement in JSCE English language, mathematics, basic science and basic technology. The independent variables are a profile of scores which are at interval level and are normally distributed with equal variance and covariance. The dependent variable is categorical with two categories that is dichotomous (successful or not successful).

The participants comprised 80 SSI science students randomly selected from ten secondary schools in Ibadan North Local Government Area of Oyo State. They were divided into two groups.

Eighty achievement test items in mathematics, physics, chemistry and biology were used for the study. The items were drawn from the SSI syllabus.

The performance of the students in the achievement test was rated 1 and 0; 1 for successful and 0 for not successful. Discriminant analysis was then conducted to assess whether the four predictors, JSCE students' scores in English language, mathematics, basic science and basic technology, could distinguish those who would be successful from those who would not.

Results

The discriminant analysis output is in four parts.

1. Preliminary statistics that present the mean and standard deviation for each of the predictors
2. Test of Equality of Group means
3. Discriminant function coefficient
4. Group classification

1: Group Statistics

Recorded Science	Mean	Std. Deviation	Valid N (listwise)	
			Unweighted	Weighted
Fail Eng.	43.47	12.493	36	36.000
Maths.	46.69	10.269	36	36.000
B. Sci.	50.22	7.612	36	36.000
B. Tech	51.47	6.914	36	36.000
Pass Eng.	57.30	12.678	44	44.000
Maths.	54.18	10.810	44	44.000
B. Sci.	54.07	8.546	44	44.000
B. Tech	58.70	9.370	44	44.000
Total Eng.	51.08	14.301	80	80.000
Maths.	50.81	11.150	80	80.000
B. Sci.	52.34	8.315	80	80.000
B. Tech	55.45	9.059	80	80.000

Table 1 pre sents the descr iptive statistics - the mean and standard deviation for each of the predictors. It is titled Group Statistics.

Table 2: Tests of Equality of Group Means

	Wilks' Lambda	F	df 1	df 2	Sig.
Eng.	.766	23.849	1	78	**.**000
Maths	.887	9.938	1	78	**.**002
B. Sci.	.946	4.419	1	78	.039
B. Tech	.840	14.827	1	78	.000

Table 2 shows the test of equality of mean of group statistics. Test of equality of group means shows whether there was a significant effect of category for each of the predictor variables. For example, the table shows that there is significant difference in the mean scores in mathematics of those who failed, and those who passed (F=9.938; df=1). Wilk's Lambda, a multivariate test of significance shows that the difference is not significant as the values are very close to 1.

Table 3: Standardized Canonical Discriminant Function Coefficients

Subject	Function
	1
Eng.	.676
Maths	.208
B. Sci.	-.119
B. Tech.	.474

Table 3 is the summary of canonical discriminant functions, the centre of the whole analysis.

With respect to the structure coefficients in the above table, the most important predictor is English language (.676) followed by basic technology (.474), mathematics (.208), and basic science (-.119). The negative value of basic science shows that it correlates negatively with the value of the function whereas the other variables correlate positively.

Table 4: Classification of Results

Original Count	**Predicted Group Membership**			
Success				
	Fail	Pass	**Total**	
Fail	23	13	36	
Pass	10	34	44	
% Fail	63.9	36.1	100.01	
Pass	22.7	77.3	100.0	

From the table, students that passed science are the most accurately predicted (77.3%) whereas those that failed were the least predicted (63.9%). The model correctly predicted 77.3% of those who passed and 63.9% of those who failed. The cross validated classification showed that overall 71.3% were correctly classified.

Conclusion and Recommendation

The result of this study revealed that English Language contributed most in distinguishing students who pass the sciences from those who failed. This is indicative of the relevance of language in instruction. Consequently, the language of instruction is important irrespective of whatever teaching method is applied by teachers. Emphasis should therefore be placed on the use of English in our secondary schools as this can heighten the level of comprehension of science concepts and hence greater achievement in the sciences. In the light of this, relevant English textbooks should be made available in our libraries. Well trained and qualified English teachers should be employed to handle the teaching of English language as this will go a long way to improve the student's comprehension of the subject and hence more understanding of the science subjects.

References

Adebayo S.B. & Folayemi. T (1998). Effect of rare outcome on the measure of agreement. Index J. Nig. Stat. Assoc. 13: 1-10. ol 2.

Adekanye F. (1992). The Nigerian banking system in the context of policies of financial regulation and deregulation. *AERC Research* Paper, Final Report.

Ajayi, V.O., & Ogbeba, J. (2017). Effect of gender on senior secondary chemistry students' achievement in stoichiometry using hands-on activities. American Journal of Educational Research, 5(8), 839- 842.

Ajayi, V.O. (2017). Effect of hands-on activity-based method on interest of senior secondary students in organic chemistry. Scholarly of Education, 6(1), 1-5.

Bernard, O (1935). History and philosophy of science. Reading in General Studies vol 2.

Brown G .W (1970). Discriminant function. Annals of Mathematical Statistics. Cambrige university press.

Bryan (1950) Cannonical correlation and its relationship to discriminant function and multiple regression. Journal of American Meteorological Society. 25 (1), 23 – 31.

Charles B.K. June E.H (1970). Predicting graduation withdrawal and failure in college by multiple discriminant analysis. Journal of educational measurement (7), issue 2, 25 - 91

Draper and Smith (1981). Applied Regression Analysis, 2nd edition, John Wiley & Sons, New York.

Ekundayo, M. B. (2012). Teaching science in Africa. Salem: Mede Nigeria Limited.

Eneh, J.O. (2000). *History and Philosophy of Science*: an outline Magnet Business Enterprise Publishing Division.

Federal Ministry of Science and Technology (1986). *National Policy on science and technology. Abuja.* Luckozim Publishers.

Federal Government of Nigeria (2013). National policy on education. Lagos: NERDC Press

Fisher R.A. (1936). The use of multiple measurements in taxonomic problems. Ann Engen, 7, 179- 188.

James A. Holdnack, ... Grant L. Iverson, in WAIS-IV, WMS-IV, and ACS, 2013.

Megan K. Moore, in Research Methods in Human Skeletal Biology, 2013.

Ogbeba J, Enemarie V. and Ajayi V.O. Students' Achievement in Basic Science and Technology as a Predictor of Quality Science Education ICSHER JOURNAL Vol. 4, No. 2 JUNE, 2019: 178-187.

Symons, T.H(1983) The cultural impact of *industrialization and technological* innovation; University Notes, Birmingham Commonwealth University Congress.

Urevbu, A.O. (2001). Methodology of Science Teaching. Juland Education Publishers. Lagos.

Usoro A.E. (2006). Discriminant analysis and its application to the classification of students on the basis of their academic performance. J.Res. Phy. Sci. 2(3): 53-55.

Van vliet PK and Gupta, JM (1973). Prophylactic antibiotics in umbilical artery catheterization in the Newborn. Achives of disease in Childhood. 48(4): 296-300.

West African Journal of Education
Vol. XL 2020 ISSN: 0043-2997
Website: http//www.instituteofeducui.com

Impact Evaluation of Justice Development and Peace Commission Agricultural Services Intervention on Socio-Economic Status of Farmers in Ogun East Senatorial District, Nigeria

[1] Olufemi Abiodun AJAYI; [2] Abiodun Adebowale OJO; [3]John Olumide ARULEBA
[1, 2 & 3] Department of Educational Foundations & Instructional Technology
Tai Solarin University of Education, Ijagun, Nigeria
E-Mail: [1]olufemi_jy@yahoo.com; [2]abiodunojoade@yahoo.com; [3]Jaruleba@yahoo.com
+2348022680616; +2347038829023 ; +2348050590750

Submitted: January 8, 2021; Revised: February 23, 2021; Accepted: April 7, 2021

Abstract

This study sought to evaluate the impact on socio-economic status of farmers in Ogun East Senatorial District of Nigeria. The study adopted a causal-comparative design supported with Antecedent, Transaction and Outcome (ATO) evaluation framework. Multi-stage sampling technique was used to select one hundred and eighty (n=180) participants for the study. Farmers' Socio-Economic Status Scale (FSESAS), Agricultural Productivity Assessment Scale (APAS) (r= 6.2) and Agric-Service Intervention Effectiveness Scale (ASIES) (r=.74) were used in data collection. Descriptive Statistics, t-test and ANOVA were used to analyse the data collected. The results indicate adequate social emancipation but inadequate economic capacity of farmer-beneficiaries of the intervention. However, significant difference (t=4.961; p<.05) exists in agricultural productivity between the farmer-beneficiaries and non-beneficiaries of the intervention. Accountability influence of the nine socio-economic indicators on beneficiary status of the farmers was high (R^2= .569). Agricultural services of JDPC intervention as part of the results were effective (Mean=2.31). In conclusion, the intervention has been positively impactful on agricultural productivity and socio-economic well-being of the farmer. Amongst other recommendations, the intervention should be sustained, enhanced and expanded.

Keywords: Impact evaluation, Agricultural intervention, Agricultural productivity, Economic capacity, Social emancipation.

Introduction

A non-governmental organization (NGO) is an organization that is neither a part of a government nor a conventional profit oriented business. NGOs in their primordial character are social channels that give support and compliment the efforts of government. In other words, they are development alternatives. These organizations are major players in

development aid today; they have been given the right to speak for civil society in a number of national and international fora (Holmen & Jirstrom 2009). NGOs are owned and controlled by private institutions, organizations and in some cases individuals, they focus on philanthropy and render services that are not profit driven to the population. Consequently, NGOs serve as instruments and vehicles meaning to drive social change and transformation through action plans and programmes that are non-governmental.

Non-governmental organizations can be veritable assets in their provision of cost-effective services and in the tackling of the challenges of social development. NGOs vary in terms of affluence, resources, programme, bureaucracy and execution. Some are faith-based while others are purely secular. Some are focused on meeting the short term needs of their beneficiaries while others look at the long term effect. In any case, NGOs are driven to achieve the result of social emancipation.

Justice Development and Peace Commission Ijebu Ode is one such non-governmental organization that responds to the yearnings of people to be free from the stronghold of poverty and social inequality. The JDPC of the Catholic Diocese of Ijebu Ode is a structural Diocesan response of the Second Vatican Council (1962-1965) appealing for the church's involvement in building a just and peaceful world. The social clarion of the Church led to the creation of the Pontifical Commission known as JUSTICIA ET PAX (Justice and Peace) on January 6, 1967 (JDPC Ijebu-Ode, 2015). The commission's task was to reignite in people the full awareness of becoming emancipators and contributors towards social justice and empowerment. In addition, the commission was charged with the herculean task of furthering the progress of poorer nations and international social justice, as well as their own development for more justice and peace in the world. The Justice Development and Peace Commission Ijebu Ode is a brainchild of the said Pontifical Commission of 1967 in response to the challenge of providing services for the growth and development of the people of Ijebu Ode catholic diocese. JDPC, Ijebu Ode is registered as a Non-Governmental Organization (NGO) with the Corporate Affairs Commission of Nigeria (Reg. No. 10,414). It covers nine (9) (Ogun-East Senatorial District) of the 20 Local Government Areas of Ogun State, Nigeria and covering 36,410.56 square kilometers (JDPC Ijebu-Ode, 2015).

JDPC has the objective of promoting sustainable and integral human development, using a holistic empowerment approach to enhance effective structural transformation of society, without any form of discrimination as stipulated in Article one of the United Nations Declaration of Human Rights. JDPC adapts participatory approaches that empower poor people to meet their basic needs so that they become full actors of their destinies. JDPC is an organization focused on grassroots mobilization to enable those excluded to take local action in order to overcome oppressive structures that keep them in bondage. JDPC believes in creative and cooperative solidarity, partnering with a wide range of civil actors to promote a pro-poor policy environment, where the basic rights of people are secured.

To fulfill the said objective, JDPC follows a strategic plan that directs it towards accomplishing its organizational goals, namely to serve the beneficiaries better by achieving improved results with enhanced teamwork, learning and commitment among staff and beneficiaries (www.jdpcijebuode.org).

The strategic plan of JDPC identifies the following goals:

1. Empower organizations of the civil society for people's participation in governance.
2. Build the capacity of farmers and rural communities in Ijebu and Remo land for self
3. determination.
4. Promote gender equality by increasing the recognition and integration of women as partners of men in the care of the world.
5. Provide credit facilities to the beneficiaries of JDPC programmes who do not have the capacity to access credit from formal financial institutions.
6. Create a forum for information gathering and dissemination as a community empowerment tool.
7. Build in the youth the capacity for life enhancing skills to enable them live a meaningful and dignified life as well as contribute meaningfully to the society.
8. Build capacity of those that are physically or mentally incapacitated so that they can help themselves and contribute meaningfully to the society.
9. Propagate or popularize the Catholic Social teachings so as to contribute to the process of a value-based social transformation.
10. Establish a functional monitoring and evaluation system for JDPC.

In order to achieve these organizational goals JDPC operates three main programmes namely:

1. The Diocesan Agricultural Development Programme (DADP)
2. The Human Rights Programme (HRP)
3. The Gender Equality and Women Empowerment Programme (GEWEP)

To ensure the success of these three main programmes, JDPC also operates three (3) support services namely, Microfinance, Caritas, and Resource Centre.

However, this study is focused on one of the major goals of the Justice Development and Peace Commission namely, the building of the capacity of farmers and rural communities in Ijebu and Remo land geared towards self-determination of people. This objective relates closely to the Diocesan Agricultural Development Programme (DADP) of JDPC. DADP is the agricultural the programme that supports small and medium scale farmers in Ogun-East Senatorial District in the effort to improve their farming and living conditions in a sustainable way.

DADP has been engaging farmers in Ogun East Senatorial District for many years, providing agricultural services to improve the productivity of farmers and their living standard. DADP is a direct response to enormous challenges that farmers face in the district. It was discovered that many farmers in the rural communities of Ogun East Senatorial District are relatively poor with low standard of living. They are predominantly peasants and low-level people in terms of socio-economic stratification in the society. Illiteracy, endemic poverty, low yields and productivity, poor public perception, and low monetary value for long hours of hard work on the farms are some of the challenges that farmers face in the rural communities. Thus, it has been averred that poverty was more pronounced in the rural communities of Nigeria because of underdevelopment (Aderonmu, 2010).

It has also been noted that rural farmers are mostly isolated, under-educated and lack the wherewithal to maximize agricultural development strategies such as input subsidization, marketing strategies, lobbying for policy formulations that support rural farmers, increased crop production, access to credit facilities, and poor organization structures. Their standard of living has been regarded as poor with inadequate levels of agricultural productivity particularly in food production, high level of poverty and poor level of infrastructure facilities (Shiru, 2008). To overcome these challenges, governments in the Federal and State levels have put up programmes and projects to tackle the challenge. These include the FADAMA Development Programme, OGADEP (Ogun State Agriculture Development Programme). There have been Operation Feed the Nation (1976), Green Revolution of 1980, Agricultural Development Programmes in Nigerian states (ADPs) (Iwuchukwu & Igbokwe, 2012). Non-governmental organizations like Farmers Development Union (FADU) and DADP have also wielded in the situation providing services aimed at alleviating the problems of farmers. Arguably, despite the intervention of both government and private organisations in the district there still exists many rural farmers living below poverty line. The question of the positive effect of the agricultural interventions and programmes of government and private institutions therefore arises. The question of whether they even make any difference in the lives of their beneficiaries is an important one.

The study therefore evaluates the impact of the DADP as an agricultural intervention in the District in terms of the socio-economic indices of the farmers who are the beneficiaries.

Statement of the Problem

The problem investigated in this study was the uncertainty that surrounds the positive impact of agricultural interventions on socio-economic development and well-being of farmers. Many agricultural interventions and projects have been developed in Nigeria but, only in rare cases has a rigorous attempt been made to assess economic

return or the impact of such on farmers' productivity and income. It should be noted that annual or periodic reports given of many agricultural interventions cannot be counted as impact evaluation. For instance, there are a number of intervention programmes relating to agriculture in Ogun state, with little being shown for it considering the socio-economic conditions of farmers. Hence, the persistent challenge of poverty among the in the district. This provides justification for the study which was to evaluate the impact of JDPC agricultural services intervention on the socio-economic status of farmers in Ogun East Senatorial District of Nigeria.

Purpose of the Research

This study investigates the extent to which JDPC agricultural services intervention of Ijebu Ode Catholic Diocese has been able to address the socio-economic needs of rural farmer beneficiaries in Ogun East Senatorial District of Nigeria. The study attempts to specifically determine:

1. the adequacy of economic capacity of farmer-beneficiaries of the agricultural services intervention of JDPC in Ogun East Senatorial District of Nigeria.
2. the adequacy of social emancipation of farmer-beneficiaries of the agricultural services intervention of JDPC in Ogun East Senatorial District of Nigeria.
3. the effectiveness of agricultural service delivery intervention of JDPC.

Research Questions

1: How adequate is the economic capacity of farmer-beneficiaries of the agricultural services intervention of JDPC?
2. How adequate is the social emancipation of the farmer-beneficiaries of the agricultural services intervention of JDPC?
3. Is there any significant difference in the socio-economic status of farmer-beneficiaries and non-farmer beneficiaries of JDPC Agric-services intervention?

Methodology

The study adopts the causal-comparative design. The research is considered most appropriate considering the fact that it addresses cause and effect relationships among the variables by observing some existing consequences and probing back for possible causal factors through data collected and interpreted

Table 1 Evaluation Framework Based on ATO (Stake's Model 1969)

Components	Variable Indicator	Data Source	Instrument for Data Collection	Research Questions	Statistical Tools
Antecedents	----------	----------	----------	----------	----------
Transaction	----------	----------	----------	----------	----------
Outcome	i. Agric. Productivity ii. Social Emancipation iii Economic Capacity	i. Agric Services Intervention Beneficiaries ii.Non-Beneficiaries of Agric Services Intervention	APAS & FSESAS	1, 2, 3	Frequency Counts, Simple Percentages & ANOVA

The population of the study comprises all beneficiaries of JDPC Agric-service intervention in the six (6) Local Government areas of Ijebu Division of Ogun State and other rural farmers who are non-beneficiaries of JDPC in these areas. Multistage sampling technique was used in sample selection. Four (4) Local Government Areas were randomly selected from the six Local Government Areas of Ijebu Division of Ogun State. Two cluster groups of farmer-beneficiaries of JDPC Agric Services were randomly selected in each of the four (4) Local Government Areas of the study. In each cluster fifteen (15) farmers were randomly selected. Hence, fifteen (15) farmers in eight (8) groups from four (4) Local Government Areas gives a total of 120 participants for the study. The study also employed snowball sampling technique to select in addition a sub sample of 60 farmer non-beneficiaries of the JDPC Agric-service extension programme at 30 per LGA. The two sub samples of beneficiaries and non-beneficiaries put together give a sample of 180 participants.

This study employed the use of three instruments namely: Farmers' Socio-Economic Status Assessment Scale (FSESAS) and Agricultural Productivity Assessment Scale (APAS). Farmers' Socio-Economic Status Assessment (FSESAS) is a 12-item scale designed to measure socio-economic status of farmers. This instrument was personally developed based on literature review and dialogue with sociologists, and anthropologists. The different items of the scale measure different aspects of the individual's socio-economic status. Some of these include monthly income, family possessions, number of children, mobility facility, health facility and type of accommodation. Agricultural Productivity Assessment Scale (APAS) is a 7-item instrument personally developed by the researcher to measure the Agric-productivity of beneficiaries and non-beneficiaries of JDPC agricultural intervention services in Ijebu Division of Ogun State. The scale is designed to assess Agric productivity using indicators such as quality of farm/crop production of farmers, farm yield, quality of storage facility, level of use of farm machinery and labour. This scale adopted a response

format involving: Nil (1), Very Low (2), Low (3), High (4), Very High (5). The instruments for this study were subjected to review in content, structure and language by the researcher's supervisor and other experts in Educational Evaluation in the Department. Thereafter, the instruments were administered to a sample outside the one of the main studies in order to determine their reliability. The coefficient obtained was 0.62 for APAS

The researchers obtained informed consent of individual farmers who are non-beneficiaries of JDPC intervention and farmers that are beneficiaries through the JDPC. The researchers with the help of two trained research assistants administered the instruments to the respondents. Data were collected over the period of four weeks. The data collected were analyzed using frequency counts, simple percentages and t-test and Analysis of Variance (ANOVA).

Results

Research Question 1: How adequate is the economic capacity of farmer-beneficiaries of the agricultural services intervention of JDPC?

Table 2: Median and Standard Deviation indicating adequacy of economic capacity of farmer-beneficiaries of JDPC agricultural services intervention

S/N	Items	N	Median	S.D	Expected Median	Decision
1	Monthly Income	120	1.00	.763	2.5	Not adequate
2	Refrigerator	120	0.00	.486	0.5	Not adequate
3	TV	120	1.00	.456	0.5	Adequate
4	Radio-Music System	120	1.00	.496	0.5	Adequate
5	Air-conditioner at home	120	0.00	.290	0.5	Not adequate
6	Washing machine	120	0.00	.367	0.5	Not adequate
7	Telephone (land)	120	0.00	.479	0.5	Not adequate
8	Mobile Telephone	120	1.00	.484	0.5	Adequate
9	Credit Card	120	0.00	.460	0.5	Not adequate
10	Sanitary latrine	120	0.00	.425	0.5	Not adequate
11	Subscribes monthly for newspaper	120	0.00	.301	0.5	Not adequate
12	Accommodation	120	3.00	1.900	4.5	Not adequate
13	Mobility facility	120	1.00	.885	3.0	Not adequate
14	Water source	120	3.00	.875	2.5	Adequate
15	Health facility	120	2.00	.704	2.5	Not adequate

According to the results presented in the Table 2, it was in only 4 out of 15 indicators of economic capacity that the farmer-beneficiaries of agricultural services intervention of JDPC were adequate. The four indicators include: TV set (median=1.00), Radio-music system (median=1.00), mobile telephone (median=1.00) and water supply with median score of 3.00 representing the use of borehole to tap

water. On the average, the farmer-beneficiaries were below a monthly income of #40,000 which of course was not adequate (median=1.00).

In like manner, acquisition of refrigerator (median=0.00), washing machine (median=0.00), land telephone (median=0.00), credit card (median=0.00), water closet toilet (median=0.00), and monthly subscription for newspaper (median=0.00) were not adequate. The results as presented on the Table indicate that the farmer-beneficiaries were found mostly in rented apartment consisting of a room apartment, 2-3 rooms apartment and 4-5 rooms apartment. Similarly, they were not mobile (median=1.00) in terms of personally acquired mobility facility consisting of motorcycle, tricycle, car and bus jeep. The results further reveal that the farmer-beneficiaries could only procure health facility up to public hospital (median=2.00) level. A large proportion of them could not afford the cost of private and specialist hospitals.

Research Question 2: How adequate is the social emancipation of the farmer-beneficiaries of the agricultural services intervention of JDPC?

Table 3: Median and Standard Deviation indicating adequacy of social emancipation of farmer-beneficiaries of JDPC agricultural services

S/N	Items	N	Median	S.D	Expected Median	Decision
1	**Number of Children in the family**	120	2.00	1.014	Below 2.5	Adequate
2	**Position held in societies**	120	2.00	0.987	2.5	Not adequate
3	**Marital Status**	120	4.00	0.951	2.5	Adequate

Adequacy of social emancipation of farmer-beneficiaries of JDPC agricultural services intervention was recorded for marital status (median=4.00). On the average, the farmer-beneficiaries were married with their homes intact. On the same note, they were considerate with the number of children they had (median=2). In other words, they were not involved in raising excessive number of children beyond six. Looking at positions held in societies/organizations, they were mostly ordinary members (median=2.00). They hardly belong to committee or executive councils of social clubs or societies.

Research Question 3: Is there any significant difference in the socio-economic status of farmer-beneficiaries and non-farmer beneficiaries of JDPC intervention?

Table 4: ANOVA Test of significant difference between socio-economic status of farmer-beneficiaries and farmer non-beneficiaries of JDPC intervention.

Dependent Variable: Beneficiary status

	Type III sum of squares	Df	Mean of Square	F	Significance
Corrected model	22.772[a]	32	.712	6.072	.000
Intercept	12.610	1	12.610	107.597	.000
Monthly Income	1.085	3	.362	3.086	.029*
Number of Children	1.076	5	.215	1.836	.109
Accommodation	2.045	7	.292	2.493	.019*
Mobility facility	.472	4	.118	1.008	.405
Water source	2.699	3	.900	7.676	.000*
Health facility	2.239	3	.749	6.369	.000*
Sex	.071	1	.071	603	.439
Position in societies	2.666	3	.889	7.583	.000*
Marital status	.701	3	.234	1.994	.117
Error	17.228	147	.117		
Total	360.000	180			
Corrected Total	40.000	179			

R squared= .569; Adjusted R squared = .476

ANOVA tests of between-subjects effects on Table 4 show that five of the socio-economic factors had significant influence on beneficiary status of farmers and they include monthly income ($F_{3,179=}$ 3.086; p<.05), accommodation ($F_{7,179=}$ 2.493; p<.05), water source ($F_{3,179}$=7.676; p<.05), health facility ($F_{3,179}$=6.369; p<.05) and positions in societies ($F_{3,179}$=7.583; p<0.05).

The interpretation is that, monthly income, accommodation, water source, health facility and positions in societies reflect the status of the farmer in either being a beneficiary or non-beneficiary of agricultural services intervention of JDPC. Thus, the five variables are significantly related to JDPC intervention beneficiary status of farmers. The other variables in the model without significant influence on the beneficiary status of the farmers are number of children in the family, mobility facility, sex and marital status. Meanwhile, the intervention accounts for 56% of variance in socio-economic status of farmers within the District.

Discussion of Findings

Given the findings of this study, it is reported that the economic capacity of the beneficiaries of agricultural services of JDPC was not adequate using standard economic status indicators. Except for common household articles/facilities namely radio/music system, television set, mobile phone and portable water, other essential household articles and facilities that make life comfortable were lacking and grossly inadequate among the farmers. The list includes monthly income, refrigerator, air-

conditioned room, land telephone, credit card, personal houses, personal vehicles, quality and reliable health facility. This low economic status is suggestive of how extensive and intensive their farm operations were. It simply suggests that the farmers still practise peasantry though may be enhanced but definitely not mechanized farming. This result corroborates the earlier finding of Adesina (2012) who argued that choice of information on improved agriculture technology and how such information is disseminated is of great concern to both the farmers and the agricultural extension specialists. He further asserted that adoption of farm technologies (rather than practicing non-mechanized farming) will bring about increased production and ultimately better economic returns.

Within the limits of the three indicators of social emancipation, the beneficiaries were found to be adequate and this is evidenced in marital status and number of children in the family. They were married with their homes intact and the number of children kept within sizeable limit. However, they were not privileged of holding leadership positions in public societies where they hold membership status. That they were married and intact with reasonable size of children could be an evidence of effective community awareness information of the government in addition to family planning education on mass media. On the other hand, the low economic capacity may likely account for not being privileged of leadership positions in societies they belong.

Expectedly, a significant difference exists in agricultural productivity between the farmer-beneficiaries of agricultural services intervention of JDPC and farmer non-beneficiaries. This is an evidence of the intervention being impactful. Arguably, increased input would yield increased output. The simple reason is the offer of opportunities in terms of facilities and services the beneficiaries enjoyed over and above the non-beneficiaries from the intervention. The results attest to the credibility of earlier results of Berdegue and Escobar (2001) who maintained that effective provision and utilization of agricultural extension have direct and indirect effects on rural poverty reduction. They argued that the direct effect is higher profits from agricultural production. Also new technologies introduced to farmers can improve their income when they reduce the marginal cost of production.

Consistently, remarkable difference exists in socio-economic status between the beneficiaries and non-beneficiaries of the intervention. Evidently, the beneficiaries were of higher socio-economic status expressed in higher monthly income, better accommodation, quality water source, better health facility and privileged position in societies. Remarkably, the intervention has been more beneficial to farmers. The result agrees with the findings of Birkhaeuser, Robert and Feder (1991) who argued that agricultural extension has significant relationship with better life. Also, Alston，Marra, Pardey and Wyatt (2000) in an extensive review of economic return to agricultural research and development with over 1,128 estimates rates of return submitted that an average rate of return of 80 percent is possible for agricultural extension investment.

Conclusion and Recommendations

Based on the results of this study, JDPC agricultural services had been of great positive effects in terms of increased agricultural productivity and improved socio-economic status of the farmers irrespective of their gender. The services offered were also acknowledged effective by the farmers who were the beneficiaries. On this note, the intervention is worthwhile and also deserves being sustained, enhanced and expanded.

The following recommendations are suggested consequent upon the findings of the study:

1. Justice Development and Peace Commission (JDPC) should facilitate easy access to fertilizers for use of its farmers.
2. JDPC should improve on Participatory and Practical Approach during meetings with farmers.
3. Government should partner with Private Agric-Service Delivery Institutions like JDPC for provision of funds for improved productive farming in the rural areas.
4. Government and Private Agric-Service Delivery Institutions like JDPC should employ the use of technology in terms of machinery, breed and seed analysis and overall agricultural technology for better farming experience and productivity.

References

Adefarasin, G. B. (2000). *The Impact of SPCE agricultural extension programme on farmer in oil producing area of Delta State.* (Unpublished M.Sc. Thesis), University of Ibadan: Ibadan, Nigeria.

Aderounmu, A. F. (2010). *Essentials of Agroforestry*, Ibadan: Bitmap Pub

Alston, J, Marra, P, Pardey & Wyatt T (2000). *Persistence Pays: US Agricultural Productivity Growth and the Benefits of Public Spending,* New York: Springer.

Berdegue, J. A. & Escobar, C. (2001). Chile's Agricultural Advisory service for small farmers. In W, M. Rivera & W. Zijp (Eds), *Contracting for Agricultural Extension International case studies*, U. K: Wallingford Press

Birkhaeuser, Robert & Feder (1991). The Economic Impact of Agricultural Extension: A Review, *Journal of Economic Development and Cultural Change,* 39, 607-650

Holmen Hans et Jirstrom Magnus (2009). *Second Thoughts about NGOs as Representing Civil Society,* Los Angeles: Sage Publications.

Shiru Li, Y. W. (2008). Worldwide trends in dairy production and consumption, *Sage Journals*, 29 (3), 172-185

Theresa, U.A, Obianuju, E.A, & Ikechukwu, M.O (2015). Socioeconomic Factors Influencing Agricultural Production smong Cooperative Farmers in Anambra State, Nigeria *International Journal of Academic Research in Economics and Management Sciences*, 4

West African Journal of Education, Vol. XL 2020 Page 129-141

West African Journal of Education
Vol. XL 2020 ISSN: 0043-2997
Website: http//www.instituteofeducui.com

Managerial Potentials as Determinants of Students' Entrepreneurial Self Reliance in Technical Colleges

Gabriel Olukayode AYANNIYI
Institute of Education, University of Ibadan, Nigeria
E-mail: pastorayanniyi@gmail.com

Submitted: February 8, 2021; Revised: March 1, 2021; Accepted: July 23, 2021

Abstract

Technical Colleges are set up to equip students with entrepreneurship and managerial skills for them to be self-reliant and be able to manage their business enterprise after graduation. In this study, the author examined the extent to which students' managerial potentials such as creativity, risk management skills, and ability to raise capital can predict entrepreneurship self-reliance of Technical College students. In all, 581 students consisting of 490 males and 91 females were purposively sampled from the five Technical Colleges in Oyo State, Nigeria. Results showed that only sourced or raised capital (β= -.113, $p < 0.05$) had significant relationship with entrepreneurship self-reliance of students in Technical Colleges, while risk management potential and creativity had no significant relationship. Therefore, teachers in Technical Colleges should strengthen the capital sourcing potentials of their students.

Keywords: Creativity, Source of raising capital, Risk management, Technical education, Entrepreneurial self-reliance

Introduction

The contribution of technical education to national economic growth is visible and recognised all over Nigeria. This is evident in the varieties of products (human and material) of technical education system who are injected into the economic stream. More importantly, technical education serves as an agent of change not only for technical system but also for many other societal changes. The inability of the government or the policy makers to recognise and rightly accord technical education the kind of position it deserves in a nation education industry has led to neglect of the sector. The downward trend of technical education in nation education industry has led to unemployment and poverty which is the root cause of social vices perpetrated by youths and unemployed graduates in the society. The secret behind the success of many developed nations is attached to giving priority to technical education.

The goals of technical education, according to Nigeria Educational Research and Development Council NERDC (1998) are to:

a) Provide the trained manpower in the area of applied sciences, business, and craft.

b) Provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development.

c) Give the necessary training and impart skills to individuals who shall be self-reliant in various trades or entrepreneurships.

Technical education, as the name implies, is a form of education whose primary purpose is to prepare persons for employment in a recognized occupation which involve skill acquisition and whose contribution to economic growth cannot be under estimated in terms of their product. Examples of such occupation are bricklaying, block laying and concreting, carpentry and joinery, catering craft practice, painting and decoration, radio and television electronics, agric mechanical and implement work, fabrication and welding, computer craft studies, leather shoe work, plumbing and pipe fitting, refrigerator and air conditioning, motor vehicle mechanics, mechanical engineering and craft practice, hair dressing and cosmetology and so many others. These occupations are significant at local and international markets unlike some other occupations which require little or no skill and whose impact is not felt much in the society such as service providers like clerks, messengers, cleaners, gardeners, guards etc.

Technical education is a post-secondary training programme, which aims at production of technicians which will make people self-reliant. This means after receiving necessary training, an individual will be equipped with necessary skills to set up business in the area of their occupation and would be able to manage it properly. Hence, they become job creators; employers of labour and thereby reduce the rate of unemployment and poverty in the society. This, in turn, reduces social vices (kidnapping, raping, armed robbery, drug trafficking, drug abuse, child trafficking and others which are menace in the society) which are rampant among the youths and young unemployed graduates.

Graduates of Technical Colleges are expected to demonstrate their managerial acumen after graduations. This is because to manage their business enterprise they must be able to manage both human and material resources. Managing business is more complex than setting up a business. There is a difference between an entrepreneur and a manager. For a manager to perform creditably well in his profession, there are some inherent qualities that have to be displayed by him or her, which will give him or her edge above an entrepreneur. These inherent qualities are called managerial potentials. These potentials will enable a manager to manage both human and materials resources creditably well. The success or failure of any business is determined by the level of these managerial potentials possessed by an individual manager. Many fine businesses cannot stand a test of time due to lack of these managerial potentials, among which include creativity, capital sourcing and risk management.

Technical education, by virtue of its design, is more entrepreneurial in nature as it provides an automatic employment to the recipient. This will enable individuals to provide for their immediate needs; and contribute meaningfully to national economic development; hence poverty and unemployment will become things of the past in the society. Most of the developed nations lay more emphasis on entrepreneurial education which is technical oriented as means of promoting economic activities to stimulate economic growth.

Entrepreneurship, as the name implies, is a process that has to do with conceptual approach to doing new things, within a new philosophy of value, purpose, utility, quality and use; all which satisfies needs (Ojeifo, 2012). Entrepreneurship is also the willingness and the ability of an individual to seek out an investment opportunity, establish an enterprise based on this, and run it successfully, either for profit-making or social benefit (Hisrich, 2007). According to Gana (2001) in (Aja-Okorie and Adali 2013) entrepreneurship is the ability to seek investment opportunities and establish an enterprise based on the identified opportunities. Volery (2015), entrepreneurship is the recognition and pursuit of opportunity without regard to one's current control resources, with confidence and assurance of success and with the flexibility to change topic as necessary and the will to rebound from any setback. Entrepreneurship is the process of creating something new with value, by devoting the necessary time and efforts, assuming the accompanying financial, psychological and social risks, and receiving the monetary rewards for monetary and personal independence (Wang, 2012). The question now is, who is an entrepreneur?

According to Business Dictionary (2015), an entrepreneur is a person who exercises initiative by organising a venture to take benefit of an opportunity and as a decision maker, decides what, how and the quantity of goods and services to produce. It is also defined as the person who coordinates other factors of production such as land, labour and capital in a productive process. Akinrinmola (2013) defined entrepreneur as an individual who establishes and manages business, not minding the risk involved but with a view to making profit.

Entrepreneurship education, according to Paul (2005), is structured to achieve the following objectives:

i. To offer functional education that will allow youths to be self-reliant.
ii. Provide young graduates with adequate knowledge that will enable them to be creative and innovative in identifying novel business opportunities.
iii. To serve as a catalyst for nation economic growth and development.
iv. Offer secondary school leavers and tertiary institution graduates with adequate training in risk management, to make certain bearing feasible.
v. To reduce high rate of poverty.
vi. Create employment opportunity.

vii. Reduction in rural-urban migration.

viii. Provide young graduates enough training on how to raise capital to establish and support their businesses.

ix. To inculcate the spirit of perseverance in the youths and adults to enable them persist in any business venture they embark on.

x. Create smooth transition from traditional to a modern industrial economy.

Since entrepreneurship education aims at achieving the above-mentioned objectives, it is, therefore, pertinent to examine the various ways of making these young technical school graduates self-reliant in their chosen entrepreneurship. The success of any entrepreneurship is determined by the amount of managerial potential which an individual can display in the course of managing their business. It, therefore, becomes pertinent for every student passing through a technical college to be equipped with these relevant managerial potentials so as to become self-reliant, a job creator and an employer of labour after the successful completion of their programme; instead of carrying paper certificate all around seeking employment opportunities

What then are these managerial potentials needed for enhancing the entrepreneurial self-reliance of technical college students and how do they affect the entrepreneurial self-reliance of technical college students? These managerial potentials include student creativity; source of raising capital and risk management. Students' creativity is seen as the generation of new ideas which involve deep thinking or mental reasoning to develop an idea that is now available. Creativity helps an organization to anticipate change (Jones, 2013). This is very important as new technologies and methods of transforming ideas make old ones obsolete. This variable is highly needed by a prospective entrepreneur. Creativity involves deep thinking to bring a new product into the market (Hunter, 2012).

Creativity is needed by would be entrepreneur to survive in the world of business (Drucker, 2014). It is the ability of an individual to bring a new product to existence. The word creativity is synonymous with industry where production of goods and services is carried out in a dynamic world. Creativity is needed virtually in all phases of business circle. It is needed in the area of product designing, choosing market, even in the management of human resources. Creativity is also involved when a product is being designed, to effect changing the entire product or adding more value to an already existing product. An entrepreneur must be creative so as to retain his position in the market (Hunter, 2012)

Capital sourcing is another managerial potential that needs to be acquired by a prospective entrepreneur who aims at self-reliance. The means of raising capital is very vital in any business venture. It determines the strength and the weakness of a business (Thaimuta and Moronge, 2014), be it small, medium or large scale. Ability of an entrepreneur to get capital to set up and manage the business will determine the owner's

self-reliance in the business. The size of the business determines the capital outlay (Burn, 2011). Capital is one, among the factors of production, which attracts interest as its reward. An entrepreneur must be creative so as to be able to think of how and the best possible means of getting capital for his business. Capital-raising cannot be underrated when it comes to establishing and managing an enterprise. For any individual who wants to be self-reliant, irrespective of one's level of creativity, ideas become useless in the absence of capital, as the idea will not be transformed into a tangible object. This is the reason why many remain poor despite the skill acquired and the excellent business ideas they have.

Risk management, another variable of this study is referred to as ability of an individual towards taking chance in uncertain decision making context (Levy, 2013). This variable is highly needed by every individual wishing to be self-reliant in the field of business. Setting up a business is very good but it doesn't symbolize success. It is one thing to set up a business; it is another thing for the business to survive. This characteristic denotes the difference between an entrepreneur and the manager. Every stage, in business circle, involves risk (Erondu, 2012). Risk is also seen as any bad unforeseen circumstance that occurs in the course of running a business. It is inevitable, it cannot be eliminated in a business; it can only be managed. Therefore, an individual Who is self-reliant must be skillful in the area of managing risks in business.

Statement of the problem

Technical colleges are designed to make student self-reliant, job creator and employer of labour so that individuals will be empowered to improve their living standard and contribute meaningfully to the national economic growth. Hence, unemployment, poverty and social vices such as armed robbery, drug abuse, drug trafficking and raping which is rampant among the youth and unemployed graduate will be reduced to the bare minimum. Despite the contribution of technical education products to the nation economic growth through various industrial establishment, it is disheartening that, the government has not accorded the type of attention the technical education deserves. Hence, a lot of technical college graduates are still found among the unemployed graduates roaming the street seeking white collar job.

However, a lot of papers had been written on entrepreneurship yet there appears to be like or no study which investigated these variables using correlation and multiple regression approach. More importantly, past researchers focused their attention on entrepreneurial activities of students in tertiary institution while less attention was paid to technical college students, a level where many youths terminate their education. This study is therefore designed to determine the extent to which student creativity, students' source of raising capital and students' risk management can predict the entrepreneurial self-reliance of technical college students using correlation and multiple regression approach.

Research Question

This study seeks to provide answers to the following research questions.

1. What is the relationship among the variables of managerial potentials (students' creativity, students' source of raising capital and students' risk management ability) and entrepreneurial self-reliance of technical college students?
2. What is the composite effect of managerial potential variables (students' creativity, students' source of raising capital and students' risk management ability) on entrepreneurial self-reliance of technical college students?
3. What is the relative effect of managerial potentials variables (students' creativity, students' source of raising capital and students' risk management ability) on entrepreneurial self-reliance of technical college students?

Methodology

The study adopted correlational design. The target population for this study comprises all third-year students of Technical Colleges (final year students) and their entrepreneurial teachers. These students are used because they have acquired enough instructions on their entrepreneurial subjects. There are five Technical Colleges with eighteen different departments, with the total population of two thousand eight hundred and sixty students (2860). Purposive sampling technique was used in selecting six departments from each technical college. This is because the number of departments in each of the technical college is not the same but there are eighteen entrepreneurial departments altogether in all the technical colleges. The six departments that cut across the whole five technical colleges were picked. These are bricklaying, block laying and concreting, catering and craft practice, electrical installation, mechanical engineering and craft practice, painting and decorating and motor vehicle mechanics. All the third-year students who were in their final year class were used and the teachers handling the practical of the identified entrepreneurship in all the selected departments across the technical colleges constituted the sample of the study. In all 581 students and 30 teachers were sampled. The students comprised 490 males and 91 females. Their ages ranged between 15 years and 18 years.

Instrumentation

One instrument which measure variables related to students' entrepreneurial self-reliance was used. This instrument is divided into two parts; the first part consists of three instruments which were rated by the students. These are Students' Creativity Scale (SCS), Students' Source of Raising Capital (SSRC) and Students' Risk Management Scale (SRMS). The second part which is the fourth instrument (Student Entrepreneurial Self-reliance Scale (SESRS)) was rated by the entrepreneurial teacher.

Student Creativity Scale (SCS): This instrument was developed by the researcher. The instrument was designed to measure the level of student's creativity after acquiring entrepreneurship instruction. Thirty (30) items were generated. The thirty (30) items generated were given to two Research Fellows in the Institute of Education University of Ibadan for correction and modification. The corrected version was trial tested on two hundred students (200) and the best fifteen (15) items were picked, using Cronbach Alpha reliability to find internal consistency and content validity was used to find the validity of the instrument. The instrument was found reliable at 0.92. Since the items are in 5-point likert response format which contains no right or wrong answer, the students marked (√) in front of the options attached to each item, the one they feel is appropriate. There are five options attached to each item, these are: Very Much Likely (VML), Much Likely (ML), Likely (L), Much Unlikely (MU) and Very Much Unlikely (VMU). Since the items are all positive items, they were scored in descending order; Very Much Likely (5), Much Likely (4), Likely (3), Much Unlikely (2) and Very Much Unlikely (1). The highest expected score is 75 while the least expected mark is 15.

Student Source of Raising Capital (SSRC): The SSRC was developed by the researcher. It was designed to assess the level of skill acquired by the students to raise capital for their business after the entrepreneurship instruction received. The items are grouped into two parts, these are personal sourcing and loan sourcing. The items generated was given to two Research Fellows in the Institute of Education University of Ibadan for correction and modification. The corrected version was trial tested on two hundred (200) students and the best items were picked using Cronbach Alpha reliability to find internal consistency. The validity of the instruments was found through the use of content validity. Since the response requires no wrong or right answer. The student ticked(√) as many as possible options in each of the boxes attached to each items, the one they feel is the appropriate way of raising capital. The total number of options ticked were counted together as students' means of raising capital. The reliability index was 0.83

Students' Risk Management Scale (SRMS): This instrument was developed by the researcher. The instrument was designed to measure the student's ability to manage uncertainty after receiving entrepreneurship instruction. Forty (40) items were generated. The items were given to two lecturers in the Institute of Education University of Ibadan for review and scrutiny. The corrected items were trial tested on two hundred (200) students and the best fifteen (15) items were picked using Cronbach Alpha reliability to find the internal consistency of the instruments which was found to be consistent at 0.96. Content validity was used for finding the validity of the instrument. Since the items are Likert response format which requires no right or wrong answer. The student mark (√) among the options attached to each item, the one he/she feels is the most appropriate.

There are five options attached to each item, these are Very Much Likely (VML), Much Likely (ML), Likely (L), Much Unlikely (MU) and Very Much Unlikely (VMU). The items are positive items. So it was scored in descending order Very Much Likely (5), Much Likely (4), Likely (3), Much Unlikely (2) and Very Much Unlikely (1). The highest expected score will be 75 while the least score will be 15. The reliability index using Cronbach alpha was 0.85

Student's Entrepreneurial Self-reliance Scale (SESRS: This instrument was developed by the researcher. The instrument was designed to access the level of students' ability to set up their own enterprise when paid job is not available. The instruments are drawn based on the skills acquired in each of the six selected entrepreneurial subjects. The six departments that cut across the five technical colleges were used. Each of the instruments carries ten items related to student's entrepreneurial discipline which was rated by their entrepreneurial subject teachers. The rating ranges from 0 – 10. This is from no skill at all to highly skilled. The maximum obtainable score will be 100. While the least expected mark will be 0.

Procedure for Data analysis

The data was analysed using correlation coefficient for research question number one while research questions two and three were analysed using multiple regression.

Result

Research Question 1: What is the relationship among the variables of managerial potentials (students' creativity, students' source of raising capital and students' risk management ability) and entrepreneurial self-reliance of technical college students?

Table 1: Correlation Matrix showing the relationship among Managerial Potential Variables

	CREATIVITY	SOURCE OF CAPITAL	RISK MANAGEMENT ABILITY	ENTREPREURIAL
CREATIVITY	1.000			
SOURCE OF CAPITAL	.246**	1.000		
RISK MANAGEMENT ABILITY	.651**	.203**	1.000	
ENTREPREURIAL	.034	-.099*	.010	1.000

From the correlation matrix in Table 1, results showed that there is a significant relationship between creativity scale and source of raising capital ($r = .246^*$, $p < 0.05$) creativity and risk management ($r = .651^*$, $p < 0.05$) and no significant relationship

between creativity scale and entrepreneurial self-reliance (r = .034, p < 0.05). There is a significant relationship between source of raising capital and risk management (.203*), source of raising capital and entrepreneurial self-reliance (r= -.099). There is no significant relationship between risk management scale and entrepreneurial self-reliance (r = .010)

Research Question 2: What is the composite effect of managerial potential variables (students' creativity, students' source of raising capital and students' risk management ability) on entrepreneurial self-reliance of technical college students?

Table 2: Regression Analysis showing composite effect of Managerial Potentials on Student Entrepreneurial Self Reliance

R = 0.116 **R squared** = 0.013 **Adjusted R squared** = 0.008					
ANOVA					
	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Regression	1419.640	3	473.213	2.609	0.051
Residual	104274.972	575	181.348		
Total	105694.611	578			
Dependent Variable: Entrepreneurial Self-Reliance Scale					

Results in Table 2 presents the multiple correlation coefficient R, R^2 and R^2 adjusted indicating the relationship between the predictor variables (students' creativity, students' source of raising capital and students' risk management ability) and entrepreneurial self-reliance of technical college students is 0.116. The adjusted R square is 0.008, this means that the predictor variables account for only 0.8% variation in the entrepreneurial self-reliance of technical college students. Also, this was further ascertained using multiple regression ANOVA $F_{(3,575)} = 2.609$; $p > 0.05$. This indicates that the three variables (students' creativity, students' source of raising capital and students' risk management ability) do not jointly predict or contribute to the entrepreneurial self-reliance of technical college students.

Research Question 3: What is the relative effect of managerial potential variables (students' creativity, students' source of raising capital and students' risk management ability) on entrepreneurial self-reliance of technical college students?

Table 3 presents the coefficients showing the relative effects of managerial potentials on entrepreneurial self-reliance.

Table 3: Coefficients of Relative effect of Managerial Potentials on Student Entrepreneurial Self Reliance

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	77.947	4.001		19.481	.000
	CREA	.091	.072	.069	1.257	.209
	SOUR	-.381	.144	-.113	-2.651	.008
	RISK	-.015	.068	-.012	-.221	.825

Result in Table 3 shows the multiple regression correlation coefficient indicating the relationship between individual predictor variables (students' creativity, students' source of raising capital and students' risk management ability) and entrepreneurial self-reliance of technical college students. Students' creativity scale does not predict Entrepreneurial self-reliance of the students (β = .069, t=1.257, p >0.05), Source of raising capital predicts Entrepreneurial self-reliance of the students (β = -.113, t=-2.651, p< 0.05). This strongly implies that availability of fund will go a long way in establishing self-reliance among entrepreneurs. Risk management scale does not predict Entrepreneurial self-reliance of the students (β= -.012, t=-.221, p >0.05)

Discussion

Results of this study show that only source of raising capital was significant. The other independent variables such as creativity and risk management were not significant and could not predict entrepreneurial self-reliance of students in Technical Colleges. On source of raising capital, the findings of this study is in line with Okpara and Halkias (2011) who found out from their survey of financial literacy among college students in United States of America that women are skeptical than men in terms of loan sourcing. To researchers such as Thaimuta and Moronge (2014) capital is synonymous with business; therefore, it cannot be underrated when it comes to entrepreneurial self-reliance. Although Drucker (2014) said it takes a creative man to think beyond the present situation or time, a creative man is a potential entrepreneur who can source capital from different sources and run business successfully.

Erondu (2012) claimed that financial insecurity is one of the biggest problems that gives headache to prospective entrepreneur. This assertion was buttressed by Oladunjoye (2013) that a prospective entrepreneur must be creative enough to think every means of raising capital before stepping into business. However, Hunter (2012)

argued that the survival of any business does not depend on the amount of capital outlay but rather on how the business is managed. He stressed further that every individual who wish to be self-reliant must acquire the relevant managerial skills. The idea was buttressed by Mueller (2012) who argued that every individual who want to be self-reliant must be skillful in the area of managing both human and material resources.

Mayer (2006) corroborated the idea that the concept of human capital symbolizes the capability of an individual to utilise and manage the resources judiciously. He said sourcing capital does not mean self-reliant or success in business. To this end, technical college students must not depend on raising capital as mean of enhancing self-reliance in business, rather they should be painstaking and be committed to their business before entrepreneurial self-reliant can be guaranteed.

On the issue of creativity, though the result was not significant and could not predict entrepreneurial self-reliance, yet there are lots of argument in favour of this variable in relation to business sustenance. Porter and Stem (2001) stressed the importance of an entrepreneur being creative to run the business successfully. The idea was buttressed by Eleanor (2012) who argued on the importance of creativity in business growth. He stressed that a creative firm adapt to market change and exploit every opportunity around her. He concluded by saying that sustain creativity and innovation distinguish firm from one another which also lead to financial return.

On risk management, past studies Akinrinmola (2013), Ollywood(2015) show that any student who is able to manage risks, or business hazard, will be able to stand the storm of business, hence, such student can be entrepreneur self-reliant. However, the results of this study was not in line with their findings. This may be as a result of the fact that the students sampled in this study were still young and still being catered for by the parents. They have not been exposed to rigours of life and as a result may not yet understand the issues related to taking financial risks.

Conclusion

The results of this study shows that source of raising capital can reliably predict student's entrepreneurial self-reliance of technical college students. Risk management and creativity could not predict student entrepreneurial self-reliance of technical college students.

Recommendations

Technical college teachers should teach their students on how to judiciously managed resources, both human, time and materials to avoid loss. Information on risk management should be included in the training of the technical college students. finally, students should be encouraged to be more painstaking in the course of running their business as this will improve their creative ability.

References

Abdullahi, B. B. 2012. The role of web resources and technology as instructional and learning tool in vocational and technical education for national transformation. *Journal of Vocational Studies* 6.1:56-75.

Aja-Okorie, U and Adali, O. 2013. Achieving youth empowerment through repositioning entrepreneurial education in Nigerian universities: Problems and prospects. *European Scientific Journal* 9.28:113-132.

Akinrinmola, K. 2013. The relative contribution of management skills to entrepreneurial success: a survey of small and medium enterprises (SMEs) in the trade sector. OSR. Journal of Business and Management (IOSR-BM).

Business Dictionary 2015. Meaning of Entrepreneurship

Drucker, P. 2014. Innovation and entrepreneurship practice and principle. Oxford: Butter Worth Heinemann.

Eleanor, D. G. 2012. What do we know about enhancing creativity an innovation. *The Public Sector Innovation Journals* 3.1.

Erondu, N. 2012. Importance of social capital in coping with and benefiting from new economic conditions. *Journal of Economic and Social Geography* 103.2:222-239

Gana, J. S. 2001. *Introduction to entrepreneurship education.*www.entre-ed.org.arch/intro/htm

Hisrich, R. D. 2007. Entrepreneurship/intrapreneurship. *American Psychologist*, 45.2:209-222.

Jones, V=C. 2013. Moving beyond the business plan in enterprise education. education + Training 55:804-814.

Levy, H. M. 2013. The utility and need for incorporating non-cognitive skills with large scale education assessment. The role of international large-scale assessment; perspective from technology, economy and educational research. M. Van. Darier, E. Gonzalez, I. K. Irsch and K. Yamamoto Eds. New York: Springer.

Mayer, H. 2006. Economic trend and location pattern of woman high tech entrepreneur. Frontier of Entrepreneurship Research. A Zacharakis, A. et. al. Eds. Rabson College, Wellesley, MA 298-308.

Mueller, S. 2012. The mature learner: Understanding entrepreneurial learning process of university students from a social constructivist perspective. Doctoral Thesis, Robert Gordon University.

Ojeifo, S. A. 2012. A handbook on entrepreneurial development in Nigeria. Ekpoma, Emmasco printers.

Okpara, J. O. and Halkias, D. 2011. Social entrepreneurship: an overview of its theoretical evolution and proposed research model. *International Journal of Social Entrepreneurship and Innovation* 1:4-20

Oladunjoye, M. A. 2013. How to succeed in business. Ibadan: O.B.F. Intercontinental Press.

Ollywood, J. 2015. Concept of entrepreneurship; Are entrepreneur born or made? Building an entrepreneurship culture in Tertiary Institutions. A Book of Readings. Centre for Entrepreneurship and Innovation, Chapter Seven: 86 - 98.

Paul, E. O. 2005. Entrepreneurship education. Entrepreneurship in vocational education. P. N. Ezema, E. O. Paul, B. O. Amoke, A. G. Godwin, C. A. Okwuolise, H. U. Ehedi and U. Anih Eds. Enugu: OZYBEL Publishers.

Porter, M. E. and Stern, S. 2001. Innovation: Location matters. MIT Sloan Management Review, 42.4:28-35.

Thaimuta, J. M. and Moronge, M. 2014. Factors affecting the performance of Matatul paratransit venture in small and medium enterprises in Nairobi country. *International Journal of Current Business and Social Sciences*, 1.2:1-17.

Volery, T., Mueller, S. and Siemens, B. 2015. Entrepreneur ambidexterity: A study of entrepreneur behaviours and self-reliant in growth – oriented small and medium sized enterprises. *International Small Business Journal* 33.2: 109 – 129.

Wang, Q. 2012. Ethnic Entrepreneurship Studies in Geography: A Review. *Geography Compass* 6.4:227 – 240.