READINGS IN TEACHING PEDAGOGY, EDUCATIONAL EVALUATION AND RESEARCH

Festschrift in Honour of an Academic Legend

PROFESSOR ROMY OKOYE

Edited by
Ngozi Nwabugo Agu
Christy Amaechi Ugodulunwa
Nkechi Mary Patricia Esomonu

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Professor Romy Okoye *NAE*

April 2024

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First Published, 2024

ISBN: 987-978-8415-75-6

Published by Department of Educational Foundations, Nnamdi Azikiwe University, Awka
Printed in 2024

Printed and Published by:
Eunique Press & Computers, Awka
08035528915,07014799043

Dedication

To all who understand the concept of burning the midnight candle in their desire to transfer knowledge

To all the teachers that have to speak understanding above the noise of confusion

To researchers with eyes that have soared through barriers to discover solutions to academic problems

To students who know the reality of ***'brain work'*** and are potential teachers and eventual researchers

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FOREWORD

I am highly delighted to be given the privilege of writing a foreword for the festschrift of Prof. Romy Okoye. Usually during University graduation ceremonies, a University Registrar, while presenting any class of graduating students to the Chancellor of the University to be awarded the relevant specific degree they studied for, will repeatedly use the phrase – ***"Who have been found worthy in Character and Learning"*** - in reference to the students. This, obviously, is to clearly affirm that any graduate of any such University will represent the lofty values the institution so pricelessly cherish. Professor Romy Okoye, from what I know about him, has by all standards, fulfilled the requirements to be awarded that phrase, in all aspects, due to the exceptional value he brought to bear in discharge of his duty as a professional teacher. He was exactly what the students needed; he was popular with colleagues; and he was more than above average in safeguarding the University assets.

Professor Romy Okoye is by every standard, a model of a lecturer who is absolutely down to earth in his strides to inculcate knowledge to his students. He is a mentor who teaches with character to fashion out a total man at the end of the day. He is very sound and fastidious in the discharge of his teacher education duties. Every young lecturer wishes Prof. Romy trained them, and his colleagues are at home in partnership and collaborative academic and research efforts with Prof. Romy, as he is fondly referred to.

I appreciate all those that thought of and brought to fruition this Festschrift. A Festschrift is a collection of articles published in honour of a scholar. Friends and colleagues of Prof. Romy Okoye, who recently retired from the services of Nnamdi Azikiwe University, decided to publish this Festschrift titled – **'*Readings in Teaching Pedagogy, Educational Evaluation and Research'*** - in his honour. This book is a compendium of research works in honour of dedication to duty, selfless service to humanity and transparent, transformative and legendary academic leadership. Prof. Romy highly deserves to be so honoured and all the colleagues and friends of Prof. Romy who anchored this publication will surely be blessed for giving him this merited honour.

This book has articles covering various disciplines within and outside Education with most of them dwelling on the areas of Educational Measurement, Evaluation and Research, such as: instrument development; curriculum design; implementation and evaluation; computer-based testing; and issues

on testing in education in general. It is not surprising that most of the articles dwelt on Educational Measurement, Evaluation and Research since that is the area of specialization of Prof. Romy Okoye.

Contributors of the festschrift came from different parts of Nigeria and even beyond. The papers are incisive, addressing relevant and current issues in Education. I have no doubt that researchers and Educationists will find them interesting and useful. I therefore, recommend this book to all lovers of education, teaching and research.

Prof. Frederick J. C. Odibo
Special Assistant to the Vice Chancellor on Academic Matters
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PREFACE

This book is written to express our gratitude to Professor Romy Okoye for his numerous contributions in the field of Educational Evaluation, Research and Statistics. It is written in honour of Professor Romy Okoye, on his retirement from active service from Nnamdi Azikiwe University, Awka, Nigeria after meritorious years of service as a distinguished professional teacher educator, an academic giant and rock of great repute in the field of educational measurement and evaluation, research and statistics. The book is a collection of a rich number of diverse contributions by colleagues, students, mentees, friends and collaborators from all over Nigeria.

Professor Romy Okoye is a seasoned academic, a rugged and dogged scholar, who constantly not only queries the status quo but proffers solution to knotty problems that defy solutions. He is an exemplary educator of great repute who has made an indelible mark in the field of Educational Evaluation, Research and Statistics, as well as Education in general. We celebrate the man, who has no place for absenteeism, lateness, laziness, favouritism, sorting and myriads of contemporary problems in the present day higher education in Nigeria through this Festschrift written in his honour. Professor Romy Okoye has over the years steered his passion into teaching and research which proved to be an excellent medium for initiating thousands of students and colleagues to the beauty of educational evaluation, research and statistics.

Contributions of scholars in honour of Professor Romy Okoye are presented in 42 chapters covering mainly topics and issues relating to educational measurement and evaluation, educational research, and other related areas in education. Topics in educational measurement include: test item calibration and arrangement; peer and self-assessment; development and validation of achievement tests; item analysis; continuous assessment; assessment of big data; and programme evaluation, among others. Chapters under research and statistics dwelt on issues in developing research skills, effective research project supervision, and research tools; while those under general education focused on security challenges, curriculum development, inclusive education, psychosocial development, philosophy and human development, self-regulation in academic success, among others.

This book is a compendium of relevant topics in educational measurement and evaluation, research and statistics, effective teaching and management practices and interesting topics in education. It is

a must read for students, researchers and other stakeholders in education. Scholars who desire to grow in the field of education will find this book an indispensable companion.

We are greatly indebted to colleagues, students, mentees, friends, and collaborators of Professor Romy Okoye who contributed in no small measure in making this dream come true. We are grateful to you for honouring Professor Romy Okoye.

Christy Amaechi Ugodulunwa
Professor of Educational Evaluation
Nnamdi Azikiwe University, Awka
For the Editors

Memoirs of an Academic Legend

An effective teacher is no longer a hearer of lessons but a director of learning. He recognizes subject matter not as an end in itself but as a means to the development of human personality. He is willing to work with students as they are, rather than as they are expected to be (Groulier, 1985).

There are heroes and then, there are legends. While heroes may be forgotten, legends are always remembered. They are like the proverbial sword in the stone that stand as a beacon of hope for generations past, present and future. Prof Romy Okoye is unarguably an academic legend. He is renowned for his unbeatable mastery of the art of teaching and his skill in the research field.

Prof Romy, as he is popularly called, is an extraordinary teacher. He can convince a person that a pig can fly with his meticulous and expository manner of teaching. There has never been a misunderstanding or confusion that has arisen in his classroom that he hasn't dispelled systematically and intentionally.

I am a product of Prof Romy's legendary teaching. I had met a lot of boring lecturers during my secondary school and undergraduate days that I was gobsmacked to be in Prof. Romy's class. His teaching was a breath of fresh air. In fact, Prof Romy's teaching changed the course of my academic pursuit from Curriculum Studies to Educational Measurement, Evaluation and Research. He is a teacher per excellence.

In the Research field, Prof Romy is a force to be reckoned with. He is a Research enigma who always knows his subject matter like the back of his hand. He would fish out discrepancies in poorly presented research works without batting an eyelash. In the international research community, Prof Romy upholds a standard that is a challenge. When he sits in a pew among researchers when research is being discussed, his contribution is always apt and astounding.

Prof Romy is an academic legend. He is renowned for his intrinsic academic knowledge and experience. His academic strength goes beyond his infallible pattern of teaching and his immense

success in the research community to the academic presence he possesses. His speech would detail his years of experience without any barriers. His age is not an obstacle but a propeller.

Let me tell you about father of many. Prof Romy's kindness is legendary. He is not known for speaking unkind or demeaning words to anyone. He kills the stereotypical reality in the world of academics where intelligence and achievements are often accompanied by pride and meanness.

There have been heroes and will be heroes that have wowed many people in the academic community, but Prof. Romy is a legend with a record sealed in stone.

Ngozi Nwabugo Agu
Professor of Educational Evaluation and Research
Nnamdi Azikiwe University, Awka
For all Prof. Romy's Students and Mentees

Notes on the Chief Editors

Ngozi Nwabugo Agu is Professor of Educational Evaluation and Research in Nnamdi Azikiwe University, Awka, Nigeria where she has been a lecturer for 32 years and still counting. She is a motivated teacher and researcher. She is skilled in the assessment of academic strengths and weaknesses of students and in developing strategies to enhance students' learning. She is also adept at conducting academic research geared towards improving learning, learning pursuits, learning methods, and learning strategies. Her specific areas of expertise are in:

1. Student and Teacher Evaluation
2. Academic Administration
3. Curriculum Evaluation
1. Research
2. Empirical studies in Education
3. Public Speaking
4. Teaching
5. Student Relations
6. Evaluation of Programs
7. Communication

Administratively, Ngozi N. Agu has held many key positions in which she served her University and community meritoriously. Currently, she is the Director of Environmental Conservation and Beautification in Nnamdi Azikiwe University. Professionally, she is a member of different reputable professional bodies which include, among others, Association of Educational Researchers and Evaluators of Nigeria (ASSEREN), Nigerian Academy of Education (NAE), International Association for Educational Assessment (IAEA).

Christiana Amaechi Ugodulunwa is a Professor in the Department of Educational Foundations, Faculty of Education, Nnamdi Azikiwe University, Awka, Nigeria. She is a professional teacher, a researcher and an evaluator with several years of experience in teaching educational measurement and evaluation, research and statistics at the University of Jos, Alex Ekwueme Federal University Ndufu Alike, Ebonyi State and currently in Nnamdi Azikiwe University, Awka, Anambra State. She obtained her first degree from the University of Nigeria, Nsukka and her Master's and Doctoral degrees in Measurement and Evaluation from University of Jos, Nigeria. She has a Postgraduate Diploma in Monitoring and Evaluation (PgDME) from University of Stellenbosch, South Africa. She is a Fellow of the Association of Educational Researchers and Evaluators of Nigeria (ASSEREN), a member of the Nigerians Academy of Education (NAE), and a member of the International Association for Educational Assessment (IAEA), among other professional associations.

Lady Nkechi Patricia-Mary Esomonu *jp* is a Professor of Educational Measurement, Evaluation, Research and Statistics at Nnamdi Azikiwe University, Awka. She has served the University in many capacities including, Director, Affiliate Institutions; Dean, Faculty of Education; Associate Dean, School of Postgraduate Studies, Member, 7th University Governing Council, among others.
Prof Esomonu has attended many national and international conferences. She has over 155 academic materials which include index journal articles, books, edited books, chapters in edited books and volumes of edited journals. She is the 65th Inaugural Lecturer of Nnamdi Azikwe University, Awka.

She is a Fellow, Science Teachers' Association of Nigeria (FSTAN), Fellow of Wice (FWICE), member, Nigerian Academy of Education (MNAE), member, International Association for Educational Assessment (iaea), a member, Association of Educational Researchers and Evaluators of Nigeria (ASSEREN). Her impressive doer skill culminated into her having worked as a chairman of over 65 Committees within the academic institutions and the wider society.

Notes on the Associate Editors

Nneka Chinyere Ezeugo started her journey as a lecturer from Nwafor Orizu College of Education Nsugbe, but presently is a Senior Lecturer in the Department of Educational Foundations, Nnamdi Azikiwe University Awka (measurement and evaluation option). As a professional teacher, she has put in several years of teaching research methods and statistics, educational measurement and evaluation. She obtained her first degree from the University of Ibadan, Masters' degree from University of Nigeria Nsukka and a Doctorate degree from Nnamdi Azikiwe University Awka. Dr N.C. Ezeugo is a member of some professional bodies like Association of Educational Researchers and Evaluators of Nigeria (ASSEREN), Association of Behavioural Research Analysts and Psychometricians (AB-ReAP) and she has some publications to her credit in both National and international journals.

Lydia Eleje is a Lecturer at the Department of Educational Foundations, Faculty of Education, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria. She holds a Masters and Ph.D in **Educational Measurement, Evaluation and Research.** Presently, she is a member of Editorial Board of Open Journal of Educational Research, Journal of Education, Teaching and Social Studies and Integrity Journal of Education and Training. She is currently contributing to capacity building in training of over 4000 Undergraduate Students in Nigeria. She pioneered the **development and validation of Diagnostic** test and **Achievement test** researches for diagnosing students' strengths and weaknesses, and achievement in quantitative economics. She has a special interest in promoting quality of teaching, evaluation and research, instrumentation, diagnostic testing (Education) and item analysis. She is a reviewer to numerous international Journals including Vision: The Journal of Business Perspective. She has numerous publications in local and international Journals.

Ifeoma Clementina Metu is a lecturer at the Department of Educational Foundations, Nnamdi Azikiwe University, Awka where she teaches courses that cut across Educational Research, Statistics, Measurement and Evaluation. She holds a Ph.D in Measurement and Evaluation from University of Nigeria. Her areas of interest include Scale Development, Data Analysis and Interpretation, and Evaluation of Test and Measures. She reviews articles for both local and international journals. She is a member of many professional bodies including ABREAP and ASSEREN.

Njideka Gertrude Mbelede is a lecturer at Nnamdi Azikiwe University Awka, Nigeria. She is an expert in Measurement and Evaluation, majored in instrumentation and data analysis. She is an innovative educator versed in history of facilitating student learning. She has won and completed a research grant from Women in Measurement, (WIM) Inc. USA centered on bridging the gap of women underrepresentation in echelon positions of examination boards in Nigeria. She was a Rector of Homik Oil and Gas Facility Engineering Polytechnic Port Harcourt, Nigeria and the centre

manager at the National Teachers' Institute Kaduna, Nigeria. Dr. Njideka is an editor of reputable local and international journals and has publications nationally and internationally. She adapts to students' needs to deliver top-quality lectures and seminars. Leads and supervises in-depth research projects on educational issues. She guides both online and in-class discussions with innovative instructional techniques. She excels in discussion-driven environments with strong skills in research, communication and instruction and works collaboratively to gather and disseminate data for diverse research grants and projects, supports diversity, equity, and inclusion as guiding principles in delivery services.

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Evaluation in Teaching and Learning Process in Secondary School in Nigeria

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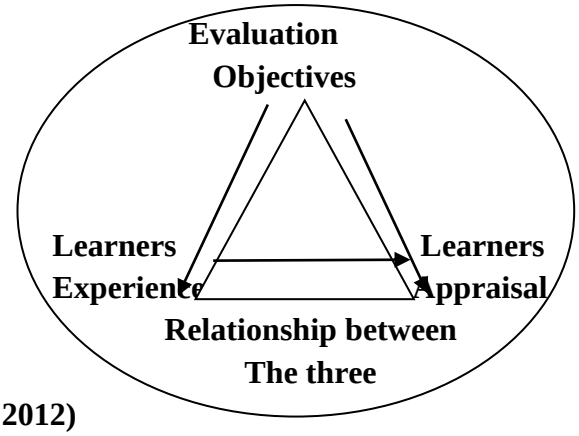
Introduction

Secondary education is very important as its focus is to prepare students for further education. It is a stage of education that follows primary education. Adedoyin (2022) defines secondary education as the education children receive after primary education. Since students are admitted every year in secondary schools in Nigeria, there is also need to put proper evaluation mechanism in place to achieve the objectives of secondary education. Afolabi (2022) opines that evaluation in teaching and learning determines how much learners or students are succeeding in their study and this can only be done through evaluation. He stressed that education is considered an investment in terms of human resources, skills, motivation and knowledge and as such evaluation is needed to assess the ability of each students. Adebayo (2022) asserts that evaluation plays an important role in the teaching and learning process which enables the teachers and students to improve teaching and learning process, this evaluation is a continuous process and periodic exercises. Albert (2021) defines evaluation as a systematic process of collecting, analyzing and interpreting information to determine the extent to which learners are achieving instructional objectives. In the same vein, Donald (2022) opines that evaluation helps in forming the values of judgment, educational status, or achievement of students. However, evaluation in one form or the other is inevitable in teaching and learning, as in all fields of activity of education judgment need to be made. In learning, evaluation contributes to formulation of objectives, designing learning experience and assessment of learner performance. Besides this, it is very useful to bring improvement in teaching and curriculum, it provides accountability to the society, parents and educational system (Albert, 2021). Ali (2021) asserts that evaluation is a tool use to monitor and improve the effectiveness of learning outcomes in school settings by constant assessing the curriculum values and addressing any problems.

The following are the tools use to monitor and improve the effectiveness of learning outcomes in school settings;

1. Teaching: Evaluation is concerned with assessing the effectiveness of teaching strategies; methods and techniques. It provides feedback to the teachers about their teaching and learners about their learning.
2. Curriculum: The improvement in courses curricular, text and teaching materials is brought about with the help of evaluating.
3. Society: Evaluation provides accountability to society in terms of the demands and requirements of the employment market.
4. Parent: Evaluation mainly manifests itself in a perceived need for regular reporting to parents.

Evaluation is a very important requirement for the education system, it fulfills various purposes in systems of education like quality control in education, selection, entrance to a higher grade or tertiary level, evaluation also helps one to take decisions about success in future activities and provides further studies and occupation (Yusuf, 2012). In the same vein, Yusuf (2012) asserts that evaluation has four different aspects which is illustrated on the diagram below:



Source: (Yusuf, 2012)

Yusuf, (2012), stresses that evaluation not only involves gathering and interpreting information about how well an educational programme is succeeding in reaching its goals but judgment about the goals themselves.

Characteristics of Evaluation

Abdullahi (2022) outlines the following as characteristics of evaluation:

- Evaluation is a systematic process which omits the casual uncontrolled observation or students.
- Evaluation is a continuous process in an ideal situation of the teaching and learning process on the other hand and the evaluation procedure on the other hand.

- Evaluation emphases the broad personality changes and major objectives of an educational programmes. Therefore it includes not only subject matter achievement but also attitudes interest and ideal ways of thinking work habit, personal and social adaptability.
- Evaluation always assumes that educational objectives have previously been identified and defined. This is the reason why teachers are expected not to lose sight of educational objectives while planning and carrying out the teaching and learning process either in the classroom or outside it.
- A comprehensive programme of evaluation involves the use of many procedures which include a variety of test either essay, objectives test or subjective test, sociometry, rating scale.

Steps in Evaluation

The following are outlined as steps to take while evaluating:-

1. Identifying and defining general objectives: In evaluation process, the first step is to determine what to evaluate, that is to set down educational objectives. What kind of abilities and skills should be developed when a learner studies. The process of identifying and defining educational objectives is complex as there is no single procedure which suits all teachers. Some teachers may prefer to begin with the course content, some with general aims, and some with lists of objectives suggested by curriculum experts. While stating the objectives focus should be on the attention of the products that is the learners' behavior at the end of a course study.
2. Identifying and defining specific objectives: Learning is the modification of behavior in a desirable direction. The teacher is concerned with a student's learning than anything else. Changes in behavior are an indication of learning, these changes arising out of classroom instruction are known as learning outcome which is expected from students after undergone teaching and learning process, this is the main concern of the teacher. This is possible only when they define the objectives in terms of behavioural changes that is learning outcome taking cognizance of the three domains of learning (cognitive, psychomotor and affective). Specific objectives will provide direction to teaching and learning process.
3. Selecting teaching points: Selection of teaching points through which the objectives can be realized. The moment the objectives are set, the next thing is to decide the content (curriculum, syllabus) to help in the realization of objectives. The task of the teacher is to analyze the content of the subject matter into

teaching points and to find out what specific objectives can be realized through the introduction of those teaching points.

4. Planning suitable learning activities: The teacher will have to plan learning activities to be provided to the students at the same time bearing in mind two things, which are objectives and teaching points. The process becomes three dimensional; the three coordinates each other, that is, the objectives – teaching points – learning activities.
5. The teacher may employ different methods at this point but one thing the teacher need to put in mind is that they should select only activities that will make it possible for him or her to realize the stated objectives.
6. Evaluating: The teacher observes and measures the changes in behavior of the students through testing. While testing the teacher keeps in mind three things which are objectives, teaching points and learning activities but focus will be on attainment of objectives.
7. Using the results as feedback: The evaluation results are used as feedback. If the teacher after testing realize that the objectives have not been realized to some extent, the teacher will use the result in reconsidering the objectives and in organizing the learning activities. Whatever result the teacher gets after testing the students should be utilized for the betterment of the students (Peter, 2022).

Functions of Evaluation

In teaching and learning process, evaluation plays an important role in teaching and learning experience. It is part of the instructional programmes that provides information or the basis of which educational decisions are taken (Peter, 2022). The functions are enumerated as follows:

Placement Functions:

- Evaluation helps to study the entry behavior of the children in all respects.
- It helps to undertake special instructional programmes.
- It provides for individualization of instruction.
- It helps to select students for higher studies for different vocations and specialized courses.

Instructional Functions:

- A planned evaluation helps a teacher in deciding and developing the ways, methods and techniques of teaching.
- Helps to formulate and reformulate suitable and realistic objectives of instruction.
- It helps to improve instruction and to plan appropriate and adequate techniques of instruction.

- It helps in the improvement of the curriculum.
- To assess different educational practices.
- It helps to ascertain how far could learning objectives be achieved.
- It helps to improve instructional procedures and quality of teachers.
- It helps to plan appropriate and adequate learning strategies.

Diagnostic Functions:

- Evaluation has to diagnose the weak points in the school programme as well as weakness of the students.
- To suggest relevant remedial programmes.
- The aptitude, interest and intelligence are used to recognize in individual student so that the student may be energized towards a right direction.
- To adopt instruction to the different needs of the students.
- To evaluate the progress of these weak students in terms of their capacity, ability and goals.

Predictive Functions:

- To discover potential abilities and aptitudes among the learners.
- To predict the future success of the students.
- Helps the students in selecting the right electives.

Administrative Functions:

a. Adopt better educational policy and decision making
b. Helps in classify students in different convenient groups or class.
c. To promote students to next higher class.
d. To appraise the supervisory practice of the principal.
e. To have appropriate placement.
f. To draw comparative statement on the performance of different students.
g. To have sound planning.
h. Helps to test the efficiency of teachers in providing suitable learning experiences.
i. To mobilize public opinion and to improve public relations.
j. Helps in developing a comprehensive criterion test.

Guidance Functions:

- Assist students in making decision about courses and careers.
- Enables students to know their pace of learning and lapses in learning.
- Helps teacher to know the students in details and to provide necessary educational, vocational and personal guidance.

Motivation Functions:

- Evaluation motivate, direct, inspire and involve the students in learning.
- To reward their learning and thus motivate them towards study.

Development Functions:

- Gives reinforcement and feedback to the teacher, students and the teaching processes.
- Assists in the modification and improvement of the teaching strategies and learning experiences.
- Helps in the achievement of educational objectives and goals.

Research Functions:

1. Helps to provide data for research generalization.
2. Evaluation clears the doubts for further studies and researchers.
3. Helps to promote action research in education.

Communication Functions:

1. To communicate the results of progress to the students.
2. To intimate the results of students progress to parents.
3. To circulate the results of students progress to other schools.

Types of Evaluation

Peter (2021) outlines the following as types of evaluation;

Placement Evaluation: Placement evaluation is designed to place the right students in the right place. It ensures the entry performance of the students. It aims at evaluating the students, entry behavior in a sequence of instruction. This type of evaluation is helpful for admission into a new course of instruction. Examples of measurement tools that can be used in placement evaluation are aptitude test, self-reporting for admission into a now course of instruction. Examples of measurement tools that can be used in placement evaluation are aptitude test, self-reporting inventories observational techniques, medical entrance exam and engineering or agriculture entrance examination.

Formative Evaluation: Formative evaluation is used to monitor the learning progress of students during the period of instruction. Its main objective is to provide continuous feedback to both teacher and student concerning the successes and failures of learning while instruction or teaching is in process formative evaluation helps teacher to ascertain the students progress from time to time. At the end of each topic the teacher can evaluate the learning outcomes that will determine the modification of their methods, techniques and devices of teaching to provide better learning expenses. However, the functions of formative evaluation are diagnosing, placement and monitoring. The examples of

formative evaluation are; monthly test, class test, periodical assessment and teacher's observation etc.

Diagnostic Evaluation: It involves identifying the learning difficulties or weakness of students during instruction. Diagnosis can be done through the use of observational techniques.

Summative Evaluation: This is done at the end of a course of instruction to know to what extent the objectives fixed have been attained. It is the evaluation of students' achievement at the end of a course. The main objective of Summative evaluation is to assign grades to the students. It indicates the degree to which the students have mastered the course content.

Conclusion

Teaching is a complex process that demands quality output. This is why evaluation process in teaching and learning becomes paramount in every educational programme. Evaluation in teaching and learning process, if properly handled by the teacher will help to know whether the instructional objectives have been achieved or not. However, education has many programmes and activities to inculcate in students a sense of common values, integrated approach, group feelings leading to national integration and knowledge to adjust in different situation and as such need evaluation in all the programmes to ascertain the effectiveness and worth of an educational experience which is measured against instructional objectives.

Recommendations

The study recommends that:-

1. Teachers should be made to attend workshop on evaluation procedures.
2. Proper priority should be given to evaluation of students through the use of different evaluation techniques.
3. Principals should check the teachers through adequate supervision.

References

Abdullahi, M (2022). *The role of teachers' in students' evaluation.* www.connection.ebsconost.com/articles

Adebayo, E.A. (2022). *Curriculum design and evaluation in schools.* Awka: Awka Press.

Adedoyin, Y.E. (2022). *Introduction to secondary school administration.* Olowo Print.

Afolabi, T.E. (2022). *Principals' supervisory roles on teachers' method of evaluation.* www.montogomeryschool.sm

Albert, O. (2021). *Teacher supervision and evaluation in schools*. Joyce Press.

Ali, M.U. (2021). *Teacher roles in instructional evaluation in Nigeria schools*. Leo Press.

Donald, H (2022). *Effect of evaluation on students' academic performance.* www.education.edu.ng.com

Peter, R.O. (2021). *Introduction to evaluation techniques in schools.* Yag Enterprises.

Peter, R.O. (2022). *Curriculum development and evaluation*. Enfab graphics.

Yusuf, H.O. (2012). *Fundamentals of curriculum and instruction.* Joyce graphic printers.

Assessment of Preschool Physical and Socio-Emotional Environment and Childrens'Holistic Development

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Abstract

Preschoolers learn by interacting with the environment; their environment must be designed with many opportunities that can enhance children holistic development as children are active participants in the development of their own intelligence. In order to do that, the physical and socio-emotional environments must invite participation and offer a wide variety of choices for children. Hence the need to assess the place of children's preschool physical and socio-emotional environments on their holistic development. This study adopted ex-post facto research design. Stratified random sampling technique was used to select ten schools from the five local government areas. Intact classes of age three to five children and their class teachers were selected from each school giving the sample of the study 256 children and 20 teachers. Five standardized instruments were adapted and used; they include; Early childhood environment rating scale, Vineland Social Maturity scale, Denver Prescreening Developmental Questionnaire, and Slosson Intelligent Test. Reliability coefficients of 0.96, 0.89, 0.87,and 0.96 were established for the instruments. Scores from these instruments were analyzed using Statistical package for Social science (SPSS). Frequency count, percentage, mean and standard deviation were used to answer the research questions while multiple regression analysis was used to test the null hypothesesThe findings of the study revealed that the states of preschool physical and socio-emotional classroom environments are inadequate and the preschool socio-emotional environmental factors and physical environmental factors have significant relative influence on children holistic development. Therefore, it was recommended that Teachers should pay a close attention to children's classroom environment as it set the stage for exciting possibilities for children's learning.

Keywords: Physical Environment, Socio- Emotional Environment, Holistic Development.

Introduction

The increase in the number of mothers working outside their home has led many children to pre-school centres at a very young age. Taking into consideration that most children spend many hours of their day in school, its characteristics and children's development is worth examining (Kambas, 2009). It is important to examine the preschool environment and the intellectual, physical and socio-emotional development of children. According to their research Egeland and Hiester's (1995) findings revealed that preschool provides a stable and consistent environment that makes children feel safe

and allows them the experience of missing their parents and looking forward to the reunion with them. As Salami and Peluola (2012) notes that pre-school education is paramount to the children's holistic development since it ensures better exposure during these formative years.

The quality of early years' care and education plays significant roles in what stands to be the impact in their lives. Melhuish (1987) pointing to the evidence on childcare in the first three years indicates that for children who are not disadvantaged in their home environment, high quality childcare environment has no strong effects upon socio-emotional, physical and intellectual development. However according to Melhuish (1987) poor quality childcare may produce deficits in socio-emotional and intellectual development. On the other hand, high levels of childcare environment, particularly group care in the first five years, may elevate the risk for developing antisocial behaviour. Mill and Romano-White, (1999) notes that little research exists on the social-emotional environment of the classroom and how teacher practices can facilitate the development of emotion regulation (Campos, 2004). This was also supported by Gloeckler, (2010**)** when he stated that few studies address how children who are in child care are supported or challenged in those environments to manage and regulate their emotions. It becomes necessary to assess the preschool physical and socio-emotional environments to ascertain their impact on children's holistic development

Socio-emotional environment is an enabled learning environment which fosters Social and emotional development(Hamre & Pianta (2005). A classroom where children feel safe and mutually accepted by each other and the adults who are working with them, and also by an arrangement of the furniture - desks and chairs – promote interactions, (Lerner & Dombro, 2000). Honig, et al (2010), in discussing social and emotional climate of the classroom notes that in preschool setting that adults who shouts on children make such children fearful, such environment might not give room for children's social development.

Social development can be defined as "the ways in which individuals' social interactions and expectations change across the life span". Halberstadt, et al. (2001) have articulated a useful distinction between the constructs of emotional competence and social competence. Emotional competence is focused on aspects of using emotions to send and receive messages that are important to social interactions; in contrast, social competence refers to children's ability to function effectively in social interactions, usually with other children Although it is often recognized that there is some overlap between emotional development and social development, the latter is usually defined by ones social skills and peer status, whereas the former focuses on more intrapersonal qualities, such as the ability to understand or produce appropriate emotion signals (Halberstadt, et al, 2001; Gerrig & Zimbardo, 2002).Gerrig and Zimbardo (2002) were

of the opinion that preschool does not have negative effects on children's social development and suggested that high quality preschool produce positive effects. They however noted that Social development may also be a product of cultural ideals taught in day cares, characteristics such as aggression, impulsivity, and egocentrism. Thus this study was carried out to accept or debunk the opinion of these authors.

Furthermore, Belsky and Steinberg (2001) notes that the physical environment nurtures children's capacity to engage deeply in individual and group activities and projects. Such an environment is created through interactions within that it offers opportunities for children to set goals and persist in following through with their plans while acquiring new knowledge and skills through purposeful play. Evans (2000), has conducted numerous research studies examining the effects of the physical environment on children's well-being. Evans' large and diverse body of research reveals that the effects of the physical environment are as significant for children's development as socio-emotional characteristics. The environment profoundly influences developmental outcomes including academic achievement, cognitive, social and emotional development as well as parenting behavior (Krzewina, 2012).

Intellectual development involves the processes of learning, problem solving, reasoning, imagining, and perceiving, many studies in the area of intellectual development produce inconsistent and contradictory findings. In an update of the effects of preschool a compilation of studies are compared and although some report correlations between preschool attendance in infancy and lower test scores, others fissnd results to be quite contrary. Peisner-Feinberg (2001) conducted extensive research on day-care children's intellectual development and assessed the children's outcomes in second grade. Evaluations were made of the quality of the preschool received and outcomes of the children were calculated through parent surveys, standard test procedures and teacher ratings. The research that finds positive effects of preschool on children's social and intellectual development suggest that perhaps preschool centers encourage more social interaction than the environment of a home. There may be more stimulation in preschool and more communication and sharing to be learned, therefore enhancing these abilities of the children who attend them (Peisner-Feinberg, 2001).

Another area of children's holistic development that can be enhanced by the environment is the physical development of the child. In a study of Giagazoglou (2008), the influence of preschool-type setting (public vs. private) on children's gross motor development was examined. Three hundred preschool children enrolled at the two aforementioned types of preschool centres were administered the Locomotors scale of the Griffiths Test No II (Griffiths, 1984). Results revealed that children who attended the private preschool type-setting, having plenty of space for play, equipment and including daily exercise physical activity programs, displayed a higher gross motor score than

children who participated in public preschool centers that had limited spaces for movement and free play and did not include any physical activity lessons into their schedule. It is known that the process of development occurs according to the pattern that is established by the genetic potential and also by the influence of environmental factors(Kambas et al, 2009) Taking into consideration the large amount of time that present day children spent at preschool settings, their significance for children's motor development is obvious. Preschool centres with adequate equipment and appropriate care, as well as a specific pedagogic methodology for the age group, provide more opportunities for an appropriate development of children's motor abilities development is the use of movement programs. Use of motor activities planned according to each child's needs and a safe and opportunity-rich environment favour the normal motor development (Kambas, 2009).

Research has confirmed that rapid learning occurs at the formative years more than at any other time of development (Ajayi, 2009). Allen (2002), pointed out that the period from birth to age seven is a period of most rapid growth and learning takes place, which determine the extent or limit the learner can achieve in later life. The implication is that the periods need to be harnessed for human capacity building providing environment rich enough to cater for children's different developmental stage. Though it might appear as an uphill task when the peculiar characteristics of the learners in this age bracket are considered, children between 3-5 years are very inquisitive, curious, arid restless and use all their senses to acquire meanings.

More importantly, they depend largely on their 'environment for the proper nurturing of their physical, social, emotional and intellectual. This then necessitates the provision of appropriate environment for children to bring about effective learning. Preschool physical environment comprises human and material resources within the home as well as the school (Adeyemo, et al, 2009). The physical elements of a preschool environment establish the foundation for optimal learning process conditions characteristics of the classroom space, physical appearance, instructional materials, for example, are physical elements. The square footage required for each child, the amount and kind of outdoor/indoor space, the requirements for furniture, sinks, toilets, windows, flooring material, and myriad other details related to the classroom, kitchen facilities, bathrooms, and diaper-changing areas are included in this category. The adult–child interactions are all structural elements of child care, (Barbour Barbour, & Scully, 2008).

Activities that take care of personal care routine shows children are respected, nurtured, and challenged. Such classroom, children enjoy close warm relationships with the adults and other children in their classroom, they frequently interact and communicate with peers and adults; they do not spend long periods of time waiting, being ignored, or isolated. Such interesting activities make children enjoy and look

forward to school (Kruif, et al, 2000). Children activities have ongoing opportunities to learn important skills, knowledge, and dispositions. Classrooms are busy with conversations, projects, experiments, reading and building activities.

Sadu (2004) argues that developmentally appropriate child care environment can enhance children intellectual abilities as children are active participants in the development of their own intelligence. In order to do that, the physical environment must invite participation and offer a wide variety of choices. Children must be free to explore and discover, to hypothesize and experiment to increase their knowledge about the world around them. The classroom must include space for children to work comfortably and to have their materials close at hand.Bronfenbrenner (1986) advocates that the physical facilities, equipment and materials present in the environment in which children live, and the interpersonal relationships of the persons with whom they interact, influence children's development.

However, Ajayi (2009) observes that Nigerian classroom do not have what it takes to provide social interaction and all round development for children, because the classroom creates boredom, no material for children to manipulate and teachers use of rote learning instead of engaging the children in active learning. The physical facilities lack materials, equipment for children, no learning corners but a classroom with chairs and tables for children with no painted walls, decorations, attractive pictures and colours, in some schools chairs are hardly enough to serve all children and teachers have to bring their chairs from home (Osakue, 2011).

The need for education that would lead to the holistic development of the child is appreciated globally and a corresponding right granted to children, to secure this right, the conditions necessary for optimal development of children need to be secured within children's environment-physical space and furnishing of the classroom, learning activities, routine care, care giving and the responsiveness to children socio-emotional needs, deliberateness, and supportiveness of adult-child interactions. Early care settings must address the interdependency of physical, socio-emotional, and intellectual domains in order to provide high-quality, developmentally appropriate care; based on the fore going the study assessed the Preschool physical and socio-emotional environment and children's holistic development.

Research Questions

The following research questions were raised and answered.

1. What is the state of preschool physical environment in terms;
   a. Space and furniture?
   b. Personal care routing?
   c. Children activities?

2. What is the Socio-emotional condition in the preschool setting in terms of;
a. Language use?
b. Teacher-child interaction?
c. Care giving?
3. What is the level of children holistic development in terms of'
a. Intellectual development?
b. Physical development?
c. Socio-Emotional development

Methodology

The study adopted ex-post facto, a type of casual comparative. The population for this study consisted of all preschoolers in public school in Ibadan Metropolis. Multi stage sampling procedure were used to select 10 schools from the five local government areas and intact classes of age three to five children and their class teachers were selected from each school. Making the sample of the study a total of 256 children and20 teachers selected. Five standardized instruments were adapted and used for the study; they include Early Childhood Environment Rating Scale (ECERS) Vineland Social Maturity scale (VSMS), Denver Prescreening Developmental Questionnaire (DPDQ) and Slosson Intelligent Test (SIT-R3). ECERS-R which yielded reliability coefficient of 0.95 was adapted for this study to measure the physical environment of the preschool classroom, it consists of the following subscales; Space and Furnishings, Personal Care Routines, Language-Reasoning, Activities, VSMS yielded reliability coefficient 0.89 was adapted to measure children socio-emotional development, the information from children was elicited through interview; the scale consists of 117 items grouped into age levels. DPDQ yielded reliability coefficient of 0.87 consist of test items in four developmental areas namely; the gross motor, fine motor, personal, social and language. The Caregiver Observation Form and Scale (COFAS) yielded reliability coefficient of 0.96 was used to record behaviors of caregivers while interacting with children in a classroom setting, there are five key constructs of the COFAS: Language, Socio-emotional, Motor, Cognitive, and Care giving and subscales of 29 items. COFAS is measured against 3 levels namely, level1-good, fair and poor at level 2 and 3 respectively. Slosson was adapted to measure children intellectual development, the reliability coefficient yielded 0.96 SIT-R is designed to be an individual test for use in screening or estimating the cognitive ability of an individual Items on the SIT-R are not presented in a subtest format, because the scale is comprised of 187 questions presented in a unidimensional arrangement with age appropriate starting markers. Items were derived from six cognitive domains (Nicholson and Hibpshman, 1990): Vocabulary, General Information, Similarities and Differences, Comprehension, Quantitative, and

Auditory Memory. Scores from these instruments were analyzed using Statistical package for Social science (SPSS). Frequency count, percentage, mean and standard deviation were used to answer the research questions while multiple regression analysis was used to test the null hypotheses

The researcher went to the selected schools to get the consent and cooperation of the head teacher and the class teachers. The researcher intimated the preschool class teachers of the nature of the study, the significance of the study and their roles in the study. With the help of the teachers; letters were sent to parents for their consent to allow their children participate in the exercise. The teachers who participated in the administration of the test instrument were trained; the training was to equip the teachers with the knowledge and skill in the administration of the holistic development test and how to assess the responses of the children. The training was given before administration of each test at various schools and teachers were tested to make sure they could administer the test instruments. Each of the instruments was administered per week, collated, scored and Frequency count, percentage, mean and standard deviation were used to answer the research questions while multiple regression analysis was used to test the null hypotheses.

Results

What is the state of preschool classroom environment in terms of

a) Space and furniture?

b) Personal routines?

c) Children activities

Table 1a

Space and Furniture in Preschool Classroom Environment

	Space and Furnishings	**1-2**	**3-4**	**5- 6**	**7**	**Mean**	**Std.D**
1	Indoor space	6 (60.0)	4 (40.0)	- (0.0)	- (0.0)	2.70	.95
2	Furniture for routine care, play, and learning	8 (80.0)	2 (20.0)	- (0.0)	- (0.0)	2.20	.42
3	Furnishings for relaxation and comfort	4 (40.0)	5 (50.0)	1 (10.0)	- (0.0)	3.20	1.14
4	Room arrangement for play	8 (80.0)	2 (20.0)	0 (0.0)	- (0.0)	2.00	.67
5	Space for privacy	5 (50.0)	3 (30.0)	2 (20.0)	- (0.0)	2.90	1.37
6	Child-related display	10 (100.0)	- (0.0)	- (0.0)	- (0.0)	1.40	.52

7	Space for gross motor play	10 (100.0)	- (0.0)	- (0.0)	- (0.0)	1.40	.52
8	Gross motor equipment	1 (0.4)	4 (1.6)	5 (2.0)	-	4.30	1.34
	Weighted Average	***2.26***					

Table 1a reveals that availability of furniture for routine care, play and learning is minimal (mean= 2.70); furniture for relaxation and comfort is inadequate (mean=2.20); extent of room arrangement for play is minimal (mean=3.20); space for privacy is inadequate (mean=2.00); child related display is minimal (mean=2.9); space for gross motor play is inadequate (mean=1.40) and gross motor equipment is also inadequate (mean=1.40).

Table 1b

Personal Care Routines in Preschool Classroom Environment

	Personal Care Routines	**1-2**	**3-4**	**5- 6**	**7**	**Mean**	**Std.D**
9	Greeting/departing	1 (10.0)	4 (40.0)	5 (50.0)	- (0.0)	4.30	1.34
10	Meals/snacks	1 (10.0)	4 (40.0)	5 (50.0)	-	4.30	1.34
11	Nap/rest	2 (20.0)	4 (40.0)	3 (30.0)	(0.0)	3.40	1.78
12	Toileting/diapering	1 (10.0)	5 (50.0)	3 (30.0)	-	3.70	1.70
13	Health practices	1 (10.0)	3 (30.0)	5 (50.0)	(0.0)	3.90	1.79
	Weighted Average	3.92					

Table 1b shows that the level of greetings and departing is minimal (mean=4.3); meals and snacks is minimal (mean=4.3); nap and rest is also minimal (mean=3.4); health practices is minimal (mean=3.7) and safety practices is minimal (mean=3.9). The weighted average of the tale is 3.92 which can be translated to be minimal. Therefore, the state of preschool classroom environment in terms of personal care routine is minimal.

Table 1c

Children Activities in Public Preschool Environment

		1-2	3-4	5- 6	7	Mean	Std.D
14	Fine Motor	5 (50.0)	1 (10.0)	4 (40.0)	- (0.0)	3.10	1.97
15	Art	9 (90.0)	1 (10.0)	- (0.0)	- (0.0)	1.60	0.70
16	Blocks	10 (10.0)	- (0.0)	- (0.0)	- (0.0)	1.30	0.48
17	Dramatic play	10 (10.0)	- (0.0)	- (0.0)	- (0.0)	1.30	0.48
18	Sand/water	10 (10.0)	- (0.0)	- (0.0)	-	1.10	0.32
19	Promoting acceptance of diversity	1 (10.0)	4 (40.0)	5 (50.0)	-	4.30	1.64
20	Nature/science	9 (90.0)	1 (10.0)	- (0.0)	-	1.90	1.55
21	Math/number	2 (20.0)	1 (10.0)	7 (70.0)	-	4.40	1.65
22	Use of TV, video, and/or computers	9 (90.0)	1 (10.0)	-	-	1.40	1.27
	Weighted Average	2.26					

Table 1c shows that the fine motor activities are minimal (mean=3.10); art activities are inadequate (mean=1.60), activities with blocks are also inadequate (mean=1.60), dramatic play is inadequate (mean=1.30), sand and water activities are inadequate (mean=1.10), promoting acceptance and diversity is minimal (mean=4.40), activities on nature and sciences are inadequate (mean=1.55) activities with numbers are minimal (mean=4.40) and use of TV, video and or computer is also inadequate (mean=1.40).

The weighted average of the table is 2.26 which can be translated to be inadequate. Therefore, the states of preschool classroom environment in terms of the activities exposed to children are inadequate.

Table 2a

Language Use in Preschool Classroom

	Items	Good	Fair	Poor	Mean	Std.D
1	Speak unsolicited to child	4	10	6	1.90	.72

		(30.0)	(50.0)	(30.0)		
2	Use the child‘s dialect	9	10	1	2.40	.60
		(45.0)	(50.0)	(5.0)		
3	Respond verbally to child‘s speech	7	12	1	2.30	.57
		(35.0)	(60.0)	(5.0)		
4	Read or identify pictures to a child	-	6	14	1.30	.47
		(0.0)	(30.0)	(70.0)		
5	Sing or play music with a child	-	9	11	1.45	.51
		(0.0)	(45.0)	(55.0)		
6	Speak slowly and clearly to a child at all times	8	10	2	2.30	.66
		(40.0)	(50.0)	(10.0)		
7	Interrupt or cut off a child‘s verbalization	2	16	2	2.00	.46
		(10.0)	(80.0)	(10.0)		
8	Scream or yell at children	2	14	3	1.85	.67
		(10.0)	(70.0)	(15.0)		
9	Allow noise level to become too high that it becomes hard to understand children	6	8	6	2.00	.80
		(30.0)	(40.0)	(30.0)		
	Weighted Average	**1.94**				

Table 2a reveals that teachers speaking unsolicited to the children is rated fair (mean=1.90); extent of using the child dialect is rated fair (mean=2.40); respond verbally to the children speeches is fair (mean=2.30); read or identify pictures to children poor (mean=1.30). Sing or play music to the children is fair (mean=1.45), Speak slowly and clearly to a child at all times to the children is fair (mean =2.30) Interrupt or cut off a child‘s verbalization is also fair (mean=2.00), Scream or yell at children is fair (mean=1.85) and not allow noise level to become too high is fair (mean=2.00)

The weighted average of the table is 1.94 which can be translated to fair. Therefore, the level of teacher-children interaction in the public preschool setting in terms of the language use is fair

Table 2b

Socio-Emotional Condition of Public Preschool Classroom Environment

	Socio-emotional	**Good**	**Fair**	**Poor**	**Mean**	**Std.D**
10	Give affectionate physical contact to child	6 (60.0)	8 (80.0)	6 (30.0)	1.90	0.72
11	Make activity suggestion to child	-	7	13	1.35	0.49

			(35.0)	(65.0)		
12	Physically punish child	5 (25.0)	14 (70.0)	1 (5.0)	2.20	0.52
13	Use food as a reinforcement	17 (85.0)	8 (15.0)	_	2.85	0.37
14	Make fun of or ridicule a child	20 (100.0)	_	_	3.00	0.00
15	Let other children make fun of or ridicule a child	20 (100.0)	_	_	3.00	0.00
16	Verbally criticize, scold or threaten a child	14 (70.0)	5 (25.0)	1 (5.0)	2.66	0.59
17	Isolate a child physically	14 (70.0)	5 (25.0)	1 (5.0)	2.66	0.59
18	Ignore a child‘s request	10 (50.0)	6 (30)	4 (20.0)	2.30	0.80
19	Interrupt a child‘s activity and prevent its completion	5 (25.0)	12 (60.0)	2 (10)	2.05	0.76
20	Leave the child alone	7 (35.0)	7 (35.0)	5 (25.0)	2.0	0.92
	Weighted Average	**2.37**				

Table 2b reveals that the extent to which teachers give affectionate physical contact to the children is minimal (mean=1.90); activity suggestion to children is poor (mean=1.35); physical punishment for children is poor (mean=2.20); use food as a reinforcement is poor (mean=2.85); make fun of or ridicule a child is high (mean=3.00) and Let other children make fun of or ridicule a child is high (mean=3.00); verbally criticize, scold or threaten children is high (mean=2.66); isolate a child physically is also rated high (mean=2.66); Ignore children‘s request is poor is rated high (mean=2.30), Interrupt a child‘s activity and prevent its completion also shows poor interaction (mean=2.05), and the extent the children are left alone in the classroom is fair (mean=2.0)

The weighted average of the table is 2.37 which can be translated to be fair. Therefore, the level of teacher-children interaction in the public preschool setting in terms of the socio-emotional condition of the classroom is fair.

Table 2c

Care Giving in Public Preschool Classroom Environment Setting

Care giving	**Good**	**Fair**	**Poor**	**Mean**	**Std.D**

21	Prepare or serve food for a child	7 (35.0)	6 (30.0)	7 (35.0)	2.00	0.86
22	Prepare activities or arrange the room	3 (15.0)	10 (50.0)	7 (36.0)	1.80	0.70
23	Do nothing	4 (20.0)	11 (55.0)	5 (25.0)	1.95	0.69
24	Talk with other adults	2 (10.0)	10 (50.0)	8 (10.0)	1.70	0.66
	Weighted Average	**1.86**				

Table 2c reveals that the rate at which teachers prepare or serve food for children is fair (mean 2.00); prepare activities or arrange the room is fair (mean = 1.80); teachers doing nothing in classroom is fair (mean = 1.95) and teacher talking with adults is fair (mean = 1.70).

The weight average of the table is 1.86 which can be translated to be fair. Therefore, the level of teacher-children interaction in the preschool setting in terms of the care given in the public preschool classroom is fair.

Table 2d: Intellectual Enrichment in Public Preschool Classroom Environment

	Items	**Good**	**Fair**	**Poor**	**Mean**	**Std.D**
25	Show impatience or annoyance with child‘s questions	3 (15.0)	9 (45.0)	2 (10.0)	1.95	0.69
26	Use terms which are above a child‘s reasoning ability	11 (55.0)		-	2.55	0.51
27	Deal in abstract concepts without concrete examples	2 (10.0)	15 (57.0)	3 (15.0)	1.95	0.51
28	Show intolerance with a child‘s mistakes	3 (15.0)	15 (75.0)	1 (5.0)	2.00	0.65
	Weighted Average	**2.12**				

Table 2d reveals that the rate to which the teacher’s show impatience or annoyance with children‘s questions is fair (mean=1.95); use terms which are above a child‘s reasoning ability is poor (mean =2.55); deal in abstract concepts without concrete examples is fair (mean=1.95) and show intolerance with a child‘s mistakes is also fair (mean=2.00)

The weight average of the table is 2.12 which can be translated to be fair. Therefore, the level of teacher-children interaction in the preschool setting in terms of the Intellectual enrichments is -fair.

What is the level of child development in terms of:

1. Intellect?
2. Physiology?
3. Social emotion?

Table 3a

Intellectual Development of Children in Public Preschools

Ability level	Translation	Frequency	Percentage
4	Borderline	20	7.8
5	Below average	79	30.9
6	Average	153	59.8
7	Above average	2	0.8
No score		2	0.8
Total		**256**	**100.0**

Table 3a shows that largest proportion of the children has average intellectual development (60%); 31% of them were below average and 8% were at borderline and only 1% is above average. Therefore, the intellectual development of the children is average.

Table 3b

Physical Development of the Preschool Children in Public School

	Gross motor development	25% 1	5% 2	(75) 3	90 4	100 5	Mean	Std.D
1	Balance on one foot 10secons	89 (34.8)	30 (11.7)	29 (11.3)	64 (25.0)	42 (16.4)	2.74	1.56
2	Walk without watching feet	54 (21.1)	40 (15.6)	76 (29.7)	51 (19.9)	33 (12.9)	2.86	1.33
3	Heel to toe walk	39 (15.2)	45 (17.6)	55 (21.5)	74 (28.9)	36 (14.1)	3.01	1.38
4	Stop accurately when running	36 (14.1)	57 (22.3)	72 (28.1)	61 (23.8)	26 (10.2)	2.89	1.25
5	Hop on one foot	58 (22.7)	19 (&.4)	46 (18.0)	97 (37.9)	34 (13.3)	3.10	1.40
6	Catches bounce ball	48 (18.8)	42 16.4	70 (27.3)	57 (22.3)	30 (11.7)	2.82	1.38
7	Jump in place	49 (7.2)	39 (15.2)	62 (24.2)	81 (31.6)	16 (6.3)	2.78	1.36

8	Draw person with three parts	47 (18.4)	11 (4.3)	71 (27.7)	68 (26.6)	57 (22.3)	3.28	1.40
9	Copy a triangle	50 (19.5)	46 (18.0)	71 (27.7)	58 (22.7)	29 (11.3)	2.86	1.31
10	Hold crayon	65 (25.5)	45 (12.6)	43 (16.8)	68 (26.6)	33 (12.9)	2.82	1.43
11	Pour water from pitch	46 (18.0)	84 (13.3)	35 (13.7)	73 (28.5)	49 (19.1)	2.95	1.61
12	Unbutton shirt	41 (16.0)	52 (20.3)	63 24.6)	71 (27.7)	15 (5.9)	2.71	1.33
13	Copies square	44 (17.2)	35 (13.7)	75 (29.3)	86 (33.6)	14 (5.5)	2.94	1.21
14	walk along a line for a short distance	57 (22.3)	7 (3.5)	105 (41.0)	30 (11.7)	3.15	1.37	
15	Tie shoe lace	42 (16.4)	37 (14.5)	93 (36.3)	54 (21.1)	28 (10.9)	2.94	1.23
	Weighted Average	2.92						

Table 3b reveals that the children are good in balancing on one foot for 10 seconds (mean=2.74); they are good in walking without watching feet (mean=2.86) they are good in heel to toe walk (mean=3.01), they are good in Stopping accurately when running (mean2.89), they are good in Hopping on one foot (3.10), good in Catching bounce ball (mean=2.82), good in Jumping in place (mean=2.78), the children are good in Drawing person with three parts (mean=2.28)they are good in copying a triangle (mean=2.95),they are good in holding a crayon (mean=2.71), Pour water from pitch (mean=2.95), Unbutton shirt (mean=1.33), good in Copying square (mean=2.94),, walk along a line for a short distance(mean=3.15) and they are good in Tying shoe lace (mean=2.94), The weighted average is 2.92 which can be translated to 75%. This implies that the level of physical development of children in public preschool is good.

Table 3c

Socio-Emotional Development of the Preschool Children in Public School

	Items	**1-2**	**3-4**	**5**	**Mean**	**Std.D**
1	Cares for self at toilet	75 (29.3)	66 (25.8)	115 (44.9)	3.54	1.69
2	Washes face unassisted	32 (12.5)	155 (60.6)	69 (27.0)	3.7	1.10
3	Goes about classroom unattended	41	103	102	3.83	1.25

		(16.0)	(44.2)	(39.8)		
4	Dresses self	69 (27.0)	93 (36.3)	94 (13.7)	3.77	1.21
5	Ask for permission to go to toilet	46 (18.0)	93 (36.4)	51 (19.9)	3.79	1.34
6	Plays competitive exercise games	60 (23.5)	145 (56.6)	51 (19.9)	3.44	1.16
7	Plays cooperatively	64 (25.0)	140 (54.7)	52 (20.3)	3.43	1.14
8	Performs for others	54 (21.1)	169 (66.0)	33 (12.9)	3.31	1.06
9	Washes hand unaided	70 (27.3)	129 (60.4)	55 (21.5)	3.33	1.34
10	Seeks comfort from adult	94 (6.8)	111 (43.4)	44 (17.2)	3.10	1.38
11	Display good habits e.g. wash hands after toilet	162 (63.2)	81 (31.6)	13 (5.1)	2.24	1.21
12	Shows ability to separate from family	45 (17.5)	98 (38.3)	104 (40.6)	3.72	1.38
13	Plays well with others	87 (34.0)	132 (51.6)	37 (14.5)	3.19	1.23
14	Respect and takes care of classroom materials	63 (24.6)	153 (59.7)	40 (15.6)	3.54	1.13
15	Follows class routines and rules	59 (23.0)	149 (58.2)	48 (18.8)	3.36	1.25
16	Is able to make friends	58 (22.6)	158 (61.7)	40 (15.6)	3.53	1.16
17	Expresses self appropriately	45 (17.6)	163 (63.6)	48 (18.8)	3.57	1.21
	Weighted Average	3.44				

Table 3c reveals that the children needs minimal assistance to care for self at toilet (mean=3.54), are able to wash face with minimal assistance (mean=3.70), are able to Go about classroom with minimal attendance (mean=3.83), are able to Dresses self with minimal assistance (mean=3.77), children are able to ask for permission to go to toilet (mean=3.79), they are able to Plays competitive exercise games with minimal assistance (mean=3.44), needs minimal assistance to Performs for others (mean=3.43), Plays cooperatively with minimal assistance (mean=3.72), Washes hand with minimal aid

(mean=3.33), children Seeks comfort from adult with minimal assistance (mean=3.10), Display good habits minimally (mean=2.244), Shows ability to separate from family (mean=3.72) Plays well with others with minimal assistance (mean=3.19), Respect and takes care of classroom materials (mean=3.54), children are able to follow class routines and rules with minimal assistance (mean=3.36), are able to make friends (mean=3.53), and are able to express self appropriately (mean=3.57). The weighted average is 3.44 which can be translated to mean able to exhibit behaviour with minimal assistance. This implies that the level of socio-emotional development of children in public preschool is good.

Discussion

The first finding of this study shows that the state of preschool classroom environment in terms of space and furniture is inadequate. This finding could be as a result of long neglect from the Nigerian Government and as a result of government inability to see the need for investment in preschool education especially on facility like furniture, on the other hand it could be as a result of teachers stereotyped behaviour and lack of creativity in class organization in terms of management of space; and creation of one in the classroom. And also it could be as a result of lack of maintenance by the school authority and school heads, and their inability to control children enrolment. This finding is in support of the UNESCO report (1999) on Nigerian Early Childhood Education, which stated that preschools classroom is overcrowded and having a limited number of teachers and absent of infrastructural facilities. This is also in line with Salami (2012) who asserted that the Nigerian preschool is a baby prison with inadequate furniture and unmotivated teachers and Oduolowu (2012) who also noted that in public schools children sit on bare floors because of lack of chairs in the classroom. This finding is also supported by Shikaru (2009) who noted that Nigerian education system has continued to suffer acute inadequacies also identified inadequate infrastructural facilities as a challenge in preschool setting. Again this finding supports the finding of Aguokogbuo (2001) who observed that availability and adequacy of space and materials in Nigeria schools is better imagined than described. Also, Osakue's (2011) findings also noted that in some Nigerian schools chairs are hardly enough to serve all the children and teachers have to bring chairs from home and the finding also supports the finding of Olds (2001) who noted that current research has continued to support only fourteen to sixteen preschool children should occupy a classroom at a time whereas in Ibadan public preschools there are over twenty-five children while some schools like St. Paul's Anglican school Iyabunle, H.LA Ojo, the children are over thirty.

The second finding from this research reveals that the state of preschool classroom environment in terms of personal care routine in preschool classroom

environment is minimal. This finding could be as a result of overcrowding in the classroom, lack of teachers, lack of motivation for teachers, lack of commitment and unskilled teachers in child care. This finding is in line with Ajayi (2009) who noted that Nigerian preschool classroom is crowded, limited in space, cannot cater for personal routine care, the teacher –child ratio in the preschool do not afford the teachers the opportunity to give personal routine care, for example, most of the teacher ask the whole class to go out to urinate, teachers barely have time to give individual attention to each child Care routines are the events that happen regularly throughout the day. Personal Care routines involve routines for general personal care. These may involve toileting (nappy/diaper changing), meal time and dressing. Care routine could have blocks time for children to develop their play, and explore their environment. Child routines often center on dressing, mealtime, homework, clean-up, and bedtime, routines often involve instructive communication and require an allotted time committed to complete the tasks. Care routine will also provide a lot of time for interactions between teachers and children.

The third finding from the research reveals that state of preschool classroom environment in terms of activities exposed to children in public preschool environment which were discovered to be inadequate. This finding could be as a result of lack of an appropriate pedagogical orientation for the teachers, or lack of materials for class activities and lack of commitment by the government toward Early Childhood Education. This finding is supported by Giagazoglou (2008) research findings which revealed that children, who attended the private preschool, were exposed to more activities than children who are in public preschool centres. This finding is in harmony with the report of Onyeike and Agbankwuru (2012) that the Nigerian preschoolers suffer deprivation of quality learning experiences in terms of lack of materials for learning activities. However, this finding contradicts Olaleye, et al, (2009) studies on quality of early childhood education in Ekiti. Their findings showed that learning activities was found to be average.

The fourth finding from the research reveals that the level of teacher-children interaction in the public preschool setting in terms of language use, socio-emotional condition, Intellectual enrichment and care giving is fair. This finding could be a result of government and individual researchers' campaign on national policy on language and the children inability to communicate in any other language except their mother tongue. Language use in the classroom refers to the use of approved language by the national policy which is mother tongue. This finding is supported by Salami and Oyaremi (2012) finding which concluded that pre-primary and primary school teachers agreed that teaching with Yorba language is relevant to the children's' development. Also the finding of Fgatabu (2012) noted that teachers interviewed said that children language

develops when there is ample opportunity for teacher and child interaction in the classroom. However, Justice (2008) research results showed that in public schools the quality of language and literacy instruction in classrooms was low, and Nakpodia (2011) noted that in most of our existing pre-primary and primary institutions, the medium of instruction is English language. Bamgbose (1991) cited the SixYear Primary Project started in 1970 in Nigeria to establish the effectiveness of the first language as compared with English (L2). Results of the experiment clearly showed that the indigenous languages facilitated more meaningful learning than English.

In terms of socio-emotional condition the result showed that it is fair. This finding could be as a result of lack of professional ECE teachers in the public school centres, since those caregivers either studied PES in colleges or university, also it could be as a result of lack of commitment by teachers. And it could also be as a result of some teachers who are able to respond to children by showing affections and making children feel safe and secure. This finding supports the finding of Ajayi (2009) observes that Nigerian classroom do not have what it takes to provide social interaction. Also the findings of Salami and Peluola (2012) on quality of preschool, observed that the setting of preschool environment, the teaching strategies and interactions that permeate the preschools is limited.

In terms of care giving, the result showed that it is fair. This finding could be as a result of the preschool classroom arrangement in which a particular teacher sees to the meal time of children, it could also be as a result of some teachers in the classroom who are insensitive to children need, for instance in some schools while some teachers are loving, affectionate and caring some other teachers are unable to demonstrate that, some could barely hold the child or give attention to a needy child. And it could be that such teachers are in the profession by "accident". This finding supports the finding of Salami (2012) who asserts that there is lack of the socio-emotional atmosphere where there is warmth interaction between the teacher and the children. Care giving is described as sensitive, consistently responsive, comforting and appropriate generally interaction with the teacher and the children that results in an attachment that is stable, enduring and secure. It is within the security of this relationship that children feel safe and confident, able to explore the learning with curiosity and enthusiasm. Care giving includes feeding the children, holding the child, providing the child with learning experiences and children routine care.

In terms of Intellectual enrichment, the result showed that it is fair. This finding may be as a result of shortage of highly qualified and passionate early childhood teachers and general lack of understanding about how children learn. It could also be as a result of teachers focusing on cognitive domain of the children. This finding is in line with Onu, et al, (2010) finding that showed that preschool teachers agreed that formal

academic instruction is important in early childhood education. Two measures of quality that are especially associated with intellectual enrichment for children are responsive, sensitive care giving and frequency of language stimulation. Responsive teacher-child relation nurtures young children's dispositions to learn and their emerging abilities. Good teachers acknowledge and encourage children's efforts, model and demonstrate behaviors, create challenges and support children in extending their capabilities, and provide specific directions or instructions. Explaining words and sounds, talking to children about objects and their names (labeling), and using expanded vocabulary are all ways in which caregivers and teachers can help to build children's knowledge. Ultimately, academic learning takes place in a social and emotional context. According to the findings of Onu, et al (2010), closeness of the relationships between children and preschool teachers have a significant and lasting impact on intellectual and social abilities.

The fifth finding from the research reveals that the level of intellectual development of the children in public preschool setting is average. This finding could be a as a result of preschool teachers believe in all children as learners and have over time concentrated in the cognitive domain of the children. This finding supports the finding of Peisner-Feinberg (2001). He reported that quality preschool seemed to have an impact on the intellectual development of the children and that those who received higher quality care tended to have higher and more positive ratings in most of the skills assessed especially on cognition. Also the finding supports Hughett, et al (2012) longitudinal studies finding, which showed that children who attended preschool improved more in their intellectual development. This finding negates the finding of Lamb (1996), who reported that there is no correlation between preschool attendances and children intellectual development.

The sixth finding from the research reveals that the level of physical development of children in public preschool is good. This finding could be as a result relative outdoor space and outdoor activities the children are involved in, or it could be as a result of home environment, it seems that it is not only the amount of motor activity but its type that results in higher performance. This finding supports the finding of Paqette and Ryan (2001), which states that the school environment in terms of availability of space and resources play a very significant role in giving physical development to the children. This result however negates the finding of Danica, et al, (2006) which states that results of research in early childhood education and development reveals that in the majority of cases, there has been improvement in the cognitive development of the children but not in physical development.

The seventh finding from the research reveals that the level of socio-emotional development of children in public preschool is good. This finding could be as a result of

children nature that is; they always like to be in the company of other children, and since child-peer interaction improves children socio-emotional development. This finding disagrees with the finding of Onyeike and Agbankwuru (2010) who asserts that many pre-school children continue to exhibit signs of social maladjustment, this finding also contradicts Boyd,et al, (2009) finding, they reported that kindergarten teachers argued that many of their students are not socially or emotionally prepared for the challenges of the new environment after attending preschool.

Conclusion and Recommendations

Based on the findings of the study, it is concluded that the state of preschool physical classroom environment in terms of personal care routine, space and furniture is inadequate, the space in the preschool classroom is not good enough for age and developmental appropriateness of the child, for such classroom does not give room for routine activities like circle times or story times for children, secondary with such limited space children who in their nature are active and mobile are restricted in movement hence hindering their physical development which in turn affects, socio-emotional and intellectual development. Also, it is concluded that the level of teacher-children interaction in the public preschool setting is fair. In terms of language use, socio-emotional condition, care giving and intellectual enrichment. The interaction in public preschool is fairly good.

Therefore, it is recommended that teachers should pay a close attention to effective classroom management as it set the stage for exciting possibilities for children's learning and teachers should be creative and innovative in organization of the classroom. Secondly, the government should spur teachers to the paradigm shift from traditional classroom environment to a developmentally appropriate classroom environment by giving teachers technical training, Government should provide competitive teacher compensation and benefits to attract and retain good teachers and well-prepared teachers. Teachers should be encouraged to have an ongoing professional development in order to be informed about trends in early childhood education.

References

Ajayi, H.O. (2009). Classroom environment: another teacher of the preschool children. *International Journal of Contemporary Issues in Education Sp., 193-196*

Belsky, J. & Steinberg, L. (2001). Infant day care and socio-emotional development: The United States. *Journal of Child Psychology and Psychiatry, 29*.(4) 397–406.

Bronfenbrenner, U. (2005). *Interacting systems in human development.*Thousand Oaks: Sage Publications.

Dobbs, J., Greta, L.D., Paige, H.F. & David, H.A. (2006). The association between preschool children's socio-emotional functioning and their cognitive. *Journal of Applied Developmental Psychology*, 27(2) 97–108.

Evans, J.L. (2000). Working with parent for all preschools and caregivers to support children from birth to three years of age. *Coordinator Notebook 24*: 4-10.

Isbell, R. and Exelby, B. (2001). *Early learning environments that work.* Beltsville, MD: Gryphon House.

Krzewina, J.M. (2012). Effect of preschool classroom quality on social and language development.*Retrievedon*18February,2013,from http://www.nap.edu/readingroom/books/

Lally, R. (2003). Caring for Infants and toddlers in groups: Developmentally appropriate practice**.** SausalitoCalifornia:*Laboratory for Educational Research and Development*.

Melhish, E.C. (2001). The quest for quality in early day care and preschool experience. *International Journal of Behaviour Development*, 28 (10) 1-6.

Olaleye, O., Florence. O and Omotayo, K.A. (2009). Assessment of quality in early. childhood. *World Applied Sciences Journal*, 7 (5)683-688

Onyeike, V.C & Agbankwuru, C. (2010). *Psychosocial deprivation of pre-school children*. Retrieved on 08 February 2013 from https://euujournal.org/index.phd/esj/articles/view/53/58

Osakue, S.O. (2011). Repositioning early childhood education in Nigeria: The children's theatre approach. *Academic Research International*, 1 (2)

Sadu, B. (2004). *Preschool education and an integrated preschool curriculum.* New Delhi: Dominant publishers and Distributors**.**

Salami, I.A and Peluola, G.T. (2012). Implementation of ECE policy in Nigeria: Effect of preschool education on primary school pupil total development in public primary schools in Odeda local government of Ogun state. *Journal of Psychological thought* 5(1) 105-119

Salami, I.A. (2011). Early childhood education in Nigeria compared to Reggio Emilia approach. *Contemporary Issues in Education, Health and Sports: The Way Forward, 163-169.*

UNESCO (2007). Strong Foundations: Early childhood care and Education (EFA global monitoring report). Paris: UNESCO

UNICEF (2001). *The state of the fund.*

Exploring Preservice Teachers' Elements With Providing Students with Classroom Test Feedback

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Abstract
Several evidences from the literature have suggested that test feedback either from formative or summative test processes is an integral aspect of classroom testing that can facilitate positive overall student learning development and outcomes. Given this, this study aimed to explore 126 preservice teachers' elements (beliefs, feedback literacy and emotional experiences) with providing students with classroom test feedback. To this end, items with reliability coefficients of .91, .85 and .70 were adapted from Brown et al., (2012), Boud and Dawson (2023), and Frenzel et al., (2016) to constitute this study's instruments, with regards to answering the six research questions. Study findings which were analysed using percentages, frequencies and t-tests showed that teachers had positive conceptions about test feedback, had moderate feedback literacy as well as mixed emotions with the test feedback practice. In light of these, discussion, recommendations and further study suggestions relative to the study results were made.

Keywords: Teachers' Elements; Test Feedback; Feedback Conception; Feedback Literacy; Feedback Emotions; Gender

Introduction

Feedback from formative or summative testing processes has been emphasized throughout the literature as the lifeblood of learning and an essential part of classroom testing that can support positive overall student learning progress and outcomes. Feedback which comprises five types distinguished as process, metacognitive, task, personal, and social (Hattie & Timperley, 2007), can perform many functions for students, teachers and institutions (Winstone & Carless, 2021). Winstone and Carless noted that for students, feedback can provide validation of effort and guidance for future development; it can provide information about how the grading decision was reached; as well as identify errors in students' skills or understanding. For teachers, feedback is a frequently used mode of communication with students, while for institutions, feedback is a crucial component of proving academic excellence. Feedback can improve student's sense of self-efficacy and self-regulated learning (Mahmood et al., 2021; Smith et al., 2016), by allowing them to complete tasks and assess their performance, thereby,

making students actively engaged learners, responsible for their learning (Hattie & Timperley, 2007). So, feedback can lead to substantial gains in learning, by facilitating the delivery of high-quality information to students about their learning; enhancing students' self-esteem, positive motivational beliefs, teacher-student-peer dialogue around learning; and providing students with opportunities to close the gap between current and desired performance (Nicol & Macfarlane-Dick, 2006). Given this, test feedback is crucial for student learning, as without feedback, students will find it difficult to assess what they already know, what they don't know, and what they need to learn (Boud & Molloy, 2013).

Various scholars (Black & Wiliam, 2009; Irving et al., 2011) have hinted that a few instructors may give feedback for a few other reasons such as emotive ones, to support student effort and perseverance or to moderate negative evaluation of their work. Others may utilise feedback as a task punishment or learning reinforcement, a guide or rule, or serve as a discriminating or motivating stimulus for students. Therefore, while test feedback is universally agreed upon to be of essence to students, what is presumed to be good feedback is contested by many (Shute, 2008), as the nature, form and purposes of test feedback vary among educators.

Good test feedback could be in the form of suggestions for improvement, explanations to help understand better, and words of encouragement (Ghazali, et al., 2020) and could be provided with the notion of improving students' performance, or simply to provide information about their performance (Hyland, 2000). It can also be in the form of spoken (oral/verbal) or written comments about learning, or marks (Irving et al., 2011), and these spoken or written comments may be very judgmental, authoritarian, detached, personal or empathetic (Higgins, 2004). Many authors have also opined that test feedback can be positive (praise) or negative (criticism), depending on how it is given and what type of feedback it is (Hattie & Timperley, 2007). However, when teachers give positive feedback (praise), they say good things about students' work. And when they give negative feedback (criticism), they inform students about something they did or got wrong in their learning or give them instructions on how to fix their mistake.

Notwithstanding, even though many have debated about how positive feedback affects students' motivation and confidence, and how it can improve teachers-students-peer relationships (William, 2011), some experts (see Shute, 2008; William, 2011) have opined that giving feedback that only includes praise is not as good as it seems. This is because it does not help students learn more, nor give them adequate information on how to improve their learning (William, 2011). This vague and or little information, praise (feedback) contains can make students wonder why they are always being praised by the teacher (Hattie & Yates, 2014). This could cause them to become uninterested in their work (Hattie & Timperley, 2007), which can make them feel frustrated,

dissatisfied, and unsure. Similarly, test feedback, when provided to students inappropriately (criticism), can lead to students' accurate self-reflection of their learning (see Kim & Lee, 2019) or adverse negative effects (Brown et al., 2012); sometimes associated with confusion, angst, denial, dread, anxiety, fear, demotivation, and decreased student performance; with students rarely feeling encouraged to think about the feedback as they do not understand the feedback provided (Boud & Molloy, 2013; Dawson et al., 2019). Moreover, if students receive feedback repeatedly, they may start to believe that they need lots of feedback because they are unable to do tasks independently; this may result in students' dependency on teachers (Ding, 1997). However, regardless of its nature, form or type, the kind of feedback provided to learners, should impact their learning (Wiliam, 2011), by helping the students realize their learning goals, and the gap that exists between their current performance and the desired goal (Nicol & MacFarlene-Dick, 2006). The feedback should be easy to understand and accurate (Ghazali et al, 2020), but not too broad or too easy, otherwise, it yields too little. Also, feedback needs to be good in terms of form, content, tone, and timing (Evans, 2013). If feedback is given too late after students have finished a course or task, they often do not do anything with it (Boud & Molloy, 2013), because the course is already over and grades awarded (Dawson et al., 2021) and students probably might have moved on to other courses. This means that the feedback may not be useful for their next new task.

What Constitutes Test Feedback?

Significant contributions have been made by many authors regarding what constitutes test feedback. According to Evans (2013) some view feedback as an end product, the consequence of performance: information provided by varying agents such as teachers, learners, peers, parents, self, and experience concerning aspects of one's performance (Hattie & Timperley, 2007). For others, (Archer, 2010; Cramp, 2011), it is an essential aspect of learning, supported by a sequential process rather than a series of unrelated events. Traditionally, teachers have been responsible for giving feedback (Brown et al., 2012), and teacher feedback are conventionally considered more accurate and the most commonly preferred feedback type (Brown et al., 2012). Hence, historically, feedback has been described as a one-way transmission of information (mostly from the teacher to students) (Ajjawi & Boud, 2017).

Nevertheless, in recent times, there has been a shift in the literature to reframe feedback in terms of what students are active participants in rather than what teachers do (Winstone et al., 2022). This reframing has led to feedback being reconceptualised by certain scholars (Carless et al., 2011; Nicol & Macfarlane-Dick, 2006) as a process of constructive dialogue between the student and their wider learning community (self,

peers and educators). These ideologies and contemporary views on feedback recognizing it as a reciprocal exchange of information provided by an agent (e.g., lecturer, peer, learners) (Hattie & Timperley, 2007) focused on knowledge building versus the arbitrary delivery of information (Archer 2010). Therefore, whilst there is a growing appreciation that the true impact of feedback comes from varying other agents and not just what the teacher does, this does not mean that the role of teachers in providing feedback is redundant (Pitt & Winstone, 2023). These recent work around feedback suggest that teachers not only be active promoters of dialogues; but also help students develop skills to recognise the value of feedback, to assess their work to act to improve, whilst managing their feelings (Carless & Boud, 2018; Molloy et al, 2020). So, teacher test feedback which traditionally constitutes a teacher providing (oral or written) comments to a student concerning his or her performance on a learning or testing task (Carless, 2015) can be described as a complex interactional pattern between teachers and students (Charon, 2009), that is not just about communicating but also includes power dynamics, emotions, and the way messages are understood and acted upon (Ajjawi & Boud, 2018). Given the relevance of the nature of test feedback to students' improved learning, the reframing, and the fact that teachers' feedback is most preferred, it has become crucial to explore teacher elements (teacher feedback conceptions, feedback literacy and emotional experiences) that can mitigate the process as their actions and content of their feedback (spoken or written) can make students lose sight of the huge derivable test feedback practice holds for them.

Teacher Feedback Conceptions

Teacher conceptions of feedback refer to how teacher perceive or views feedback as an integral aspect of the instructional and assessment process. These conceptions consisting of beliefs, attitudes, and intentions that teachers have (Brown, 2008), help them define and understand the world and their place within the world, functioning as a lens through which they interpret new information (Huisman et al., 2020). As such, conceptions play an important role in shaping an individual view, behaviours and thought patterns. Considering conceptions as precursors to shaping an individual view, behaviours and thought patterns, a teacher's conceptions about test feedback greatly impact their actions. as these conceptions of feedback are reflected in how they interact with others, based on their ideas about feedback.

These views are held by numerous scholars including Xu and Brown (2016) who asserted that teachers' conceptions of feedback influence their implementation of testing and instructional practices, which in turn, may influence students' performance. Moreover, these conceptions can filter teachers' learning and prevent them from putting new knowledge and practical experiences into practice (Xu & Brown, 2016). Since

teachers are to provide feedback in a manner that can promote the instructional and testing process, it is essential that teachers have positive conceptions about the test feedback practice. As teachers who conceptualise feedback positively will tend to promote student's self-efficacy and confidence thereby enabling them to evaluate themselves on what they know, what they do not know, and what they need to know (Boud & Molloy, 2013). Also, teachers' positive beliefs about feedback will make them seek avenues to facilitate student's active engagement with feedback thereby aiding student's development in the instructional process, life-long learning skills and feedback literacy.

Teacher Feedback Literacy

Giving feedback to students in a manner which enhances, rather than extinguishes their self-esteem (Lekoko & Koloi, 2007), is a complicated and often problematic process (Boud & Molloy, 2013), with many considerations, as ineffective feedback can create tension in the teacher-student relationship and impede student learning achievements (East et al., 2012). Juwah et al. (2004), noted that good test feedback helps students think about their performance, have conversations about it, understand what they need to learn, improve their current performance, feel motivated and also helps teachers know how to help students. Consequently, teachers being able to give and receive effective feedback requires some form of skills, knowledge or expertise to design feedback processes in ways which enable student uptake of feedback and seed the development of student feedback literacy (Carless & Winstone, 2020). This specific type of knowledge or competency covering cognitive, social, and emotional domains is described as feedback literacy - the understanding, abilities, and attitudes to make sense of information and use it to improve one's work or learning strategies (Carless & Boud, 2018).

The notion of teacher feedback literacy has arisen out of a broader movement in the literature to reconceptualise feedback from something only teachers give to focusing on how learners can also give feedback (Boud & Molloy 2013). This shift in the feedback conceptualisation has raised the issue of whether teachers are skilled and competent in facilitating student active participation in the feedback process. As an effective feedback practice, is only feasible when learners can obtain, understand and make use of feedback (Dawson et al., 2021). Because of this, a feedback-literate teacher must be competent enough to design feedback environments that facilitate feedback uptake, consider student emotions around feedback (relational sensitivities) and manage practicalities around feedback dialogues (Carless & Winstone, 2020). They must also be skilled at both providing feedback information to students and designing feedback opportunities, demonstrate characteristics that enable beliefs about their competencies

with the feedback practice and can draw on a wide range of experience in feedback so that they have a multi-faceted view of what is involved (Boud & Dawson, 2023). As failure to attain these competencies will result in teachers being unaware of their students' problems and continuing to provide feedback which students cannot use.

Emotions in Teacher Test Feedback

Despite its potential value, "feedback is not quite rosy or simple" (Shute, 2008, p. 153), as both giving and receiving feedback are often associated with varying complex emotions (Boud & Molloy, 2013; Dawson et al., 2019), and these complex emotions are a vital component of existence that permeate all social interactions. Fried et al. (2015) opined that teacher emotions are linked to both their intrapersonal and interpersonal aspects through five functions: informing (Yuan & Lee, 2016), motivating (Berkovich & Eyal, 2017), giving quality to experience (Chang, 2009), influencing cognition (Linnenbrink & Pintrich, 2002), and regulating one's emotion and others (Izard, 2010). These five functions, alone or in combination, enable teacher emotions to enhance or inhibit the classroom instructional process (Yuan & Lee, 2016), and it can promote or affect students' social-emotional development and social acceptance (Schwab et al., 2022), which invariably, creates an ample room progress, misunderstanding or conflict between teacher and student (Zhao et al., 2022). Therefore, attempts to improve feedback are sometimes accompanied by calls to make feedback less emotional for all involved (Shields, 2015). As giving and receiving feedback are intricate forms of social interaction that are influenced by factors including authority, discourse, and identity for both the teacher and the student (Rowe, 2017); and could present emotion-ridden situations for all agencies involved.

Studies have hinted that teachers experience many emotions during test feedback, from joy, pride, and love to anger, exhaustion and hopelessness (Frenzel, 2014). As such, an evaluation of the literature on teachers' experienced emotions concerning feedback is reported on two dimensions: positive and negative emotions (Frenzel, et al., 2009). Positive emotions consist of happiness, love and pride while negative emotions comprise anger, anxiety, shame and guilt (Frenzel, 2014; Sutton & Wheatley, 2003). These varying emotions with feedback can trigger teachers' emotional reactions (Ilgen & Davis, 2000), which can support students' school well-being (for positive emotions) (Schwab et al., 2022), or create anxiety for them leading to burnout (for negative emotions) (Frenzel et al., 2009). From these foregoing, it can be deduced that teachers' emotional experiences with the test feedback practice have the power to influence many professionalisms in classroom management, classroom climate, instructional behaviours, and testing practices (including feedback) (Frenzel, 2014).

Literature Review

Authors such as Kelly (1988), have argued that the teacher's element described in this study could be influenced by teacher demographic variable gender. Over the years, there have been varying conceptualisations of gender. Nonetheless, this study draws on the traditional psychological researchers' views of gender as the biological differences between males and females (Stewart & McDermott, 2004). Several works of literature hold the notion that males and females are composed of varying biological, psychological and emotional differences hence they differ in their approaches, tendencies and reactions to phenomena. Given this, it is important to ascertain whether these biological, psychological and emotional differences hold significance to the teacher when providing students with test feedback.

Studies such as (Evans, 2013; Hattie & Timperley, 2007) have hinted at test feedback as a major influence on learning and achievement. But despite its potential value, several studies (e.g. Shute, 2008) have noted that feedback is not quite so rosy or simple. It appears that providing effective test feedback is complicated and often problematic (Boud & Malloy, 2013). Rots et al. (2007) found that quality feedback provided by teachers correlated to higher levels of self-efficacy in pre-service teachers. Sellberg et al., (2020) showed that giving feedback to students was a part of continuous development, that facilitated professionalism, social networking and skill in handling emotions in social interactions between instructors and students. Kleij (2019), demonstrated that teachers were more proficient in their traditional role of providing feedback than in supporting students to participate in the feedback process. Harris et al., (2008) study which identified three types of feedback and four main purposes for the identified types of feedback, articulated that some feedback teachers give served no purpose whatsoever to students. Evans (2013) suggested that teachers had difficulty providing effective feedback. Studies (Buck et al., 2010; Ropohl & Rönnebeck, 2019) indicated that only a substantial number of pre-service teachers could correctly provide test feedback that improved student's achievement and facilitated student's active engagement in their learning. Generally, reviewed literature shows that there exists limited research that provides insight into the ability, strengths and weaknesses of pre-service teachers' feedback and how that feedback addresses students' needs (Ropohl & Rönnebeck, 2019).

Studies like Ghazali, et al (2020), while revealing that there is a relatively limited body of research relating to teacher conceptions of feedback, highlighted that teacher's conception is an important factor that can contribute to improved knowledge and skills of students. Authors (Brown, 2007; Carless, 2006) reported that tutors typically perceive feedback as being more valuable than their students do, thus some teachers utilise it to realign their teaching strategies and teaching materials during the instructional process

(Young & Giebelhaus, 2005). Literature (Boud & Molloy, 2013) have hinted that there exists a gap between instructor and students' perceptions of feedback with instructors reporting the provision of feedback and students denying receiving it. Ding, (1997) revealed that many teachers are reluctant to expend much energy on feedback because they fear feedback may foster student dependency. Findings of interviews conducted by Mahmud (2016) in Malaysian schools showed that teachers believed feedback could enhance students' writing, however, teachers do not always provide the most appropriate feedback (Hattie, 2012). Wei and Yanmei (2018) examining the changes in teacher feedback practices in China revealed that teachers perceived feedback to be time-consuming.

Nicol, (2010) study demonstrates that students are dissatisfied with the feedback they receive from teachers, as it is not detailed enough, not given promptly, and does not help them understand the content. Nonetheless, Kim and Lee's (2019) study indicated that negative feedback provided students with the opportunity for more accurate self-reflection. Studies (Carless & Boud, 2018; Carless & Winstone, 2020), have reiterated that teachers require knowledge, expertise or competencies spanning over cognitive, social and affective domains to design feedback processes in ways which enable student uptake of feedback and seed the development of student feedback literacy. Boud and Dawson, (2023) reported that teaching personnel require multi-faceted and wide-ranging competencies to conduct effective feedback. Jiang and Yu's (2021) findings highlighted the importance of teacher feedback literacy in mediating the changes and call for attention to how constructive feedback-giving practices can be better supported. Mahmud, (2016) reported that some studies found that teachers did not have specific guidelines for giving feedback, so their comments could be inadequate. While, authors (Baumert & Kunter, 2013; Park & Oliver, 2008) concluded that providing effective feedback is a challenging task for pre-service teachers because it requires different types of knowledge: content, curriculum and testing knowledge.

Chen, (2016) opined that although studies on teacher emotions have been increasingly conducted in the last two decades, limited attention has been paid to teachers' emotions in giving feedback. Conversely, numerous other study reports have indicated that teachers' emotions can influence their professional behaviour and development. Sutton and Wheatley, (2003) paper reiterated that teachers' emotions are an indicative factor influencing cognition and behaviour. Meyer and Turner (2006) argued that emotions are ubiquitous in education and are important for understanding instructional interactions. Prior studies (see Stough & Emmer, 1998) have shown that teachers' emotions can also be evoked by feedback. Researchers (Boud & Molloy, 2013; Dawson et al., 2019) have noted that both giving and receiving feedback are often associated with different emotions. Pekrun et al. (2014) revealed that anticipated

feedback has substantial effects on students' achievement. Pekrun et al., (2002) examining the impact of (feedback) emotions concluded that while teacher negative deactivating emotions take a negative toll in the classroom, positive activating emotions render a positive effect on student learning, therefore, giving and receiving feedback is inherently emotional, permeating the wider learning experience positively and negatively (Hill, et al 2021). Additionally, the study conducted by Stough and Emmer (1998) explored the emotional experience of teachers when giving feedback. They found that teachers experience different intensities of emotions such as being scared of confronting students, feeling angry at how students react to feedback, and feeling guilty when they think they showed their emotions inappropriately. However, Kim and Lee's (2019) study showed that negative feedback produced negative emotional responses and less self-efficacy in students, as this unclear, too brief, or unhelpful feedback left many students disappointed, frustrated and unable to comprehend the provided feedback (Hyland, 2013). Subsequently, Bratkovich (2014) found that an inappropriate amount of feedback used in the classroom could cause students anxiety instead of confident feelings.

Studies such as Kelly (1988), have argued that the gender of the teacher did influence the way the teachers interacted with students. Stough and Emmer's (2010) study suggests that both male and female teachers during test-feedback sessions experienced a variety of negative emotions, while Good, et al (1973) claimed teachers treated male and female students differently in their interactions. Spender (1982) study hinted that teachers believed male students are more difficult to manage than females hence, they direct more negative feedback to them. This belief is also true with Brophy (1985), who reported that male students received a greater proportion of negative interactions. Similarly, Kelly (1988) found that male students receive more teaching interactions, more difficult questions, more academic criticism, and a bit more praise than female students from teachers - all of which would seem potentially valuable in terms of facilitating learning. Contrarily, Gong et al (2018) paper showed evidence that female teachers provided feedback differently to students. Golombok and Fivush's (1994) study indicated that teachers praise female students more while criticising male students. However, Watson, (1992) observed no significant discrimination against students of either gender in the proportion and type of feedback received from teachers. While Caires et al., (2012) highlighted that female teachers experienced more socio-emotional difficulties than male student-teachers.

Theorising Test Feedback

Many scholars (Hattie & Timperley 2007; Nicol & MacFarlane-Dick 2006; Shute 2008) have theorised about what constitutes quality feedback (Harris et al., 2014).

Nonetheless, to situate this study theoretically, this paper draws upon Jean Piaget's (1972) constructivist learning theory. Piaget's (1972) constructivist learning theory posit that knowledge is constantly been built up by individuals, and this built-up knowledge is revised when new knowledge and experiences are encountered. Piaget argued that in the course of building up knowledge, individuals either assimilate or accommodate knowledge. By assimilation, Piaget noted that individuals take in new information into the existing framework while accommodation involves individuals modifying their knowledge framework to permit (accommodate) new information that threatened previously held views. In line with constructivist learning theory, this is the goal of test feedback, to provide students with new knowledge that they can incorporate (assimilate) into what they already know. In simple words, this means giving students new information to help them to learn better and do well in their studies, as well as providing students with the opportunity to challenge their understanding of what they know based on the new information, to learn better and do better on future task.

Test feedback hinging on the constructivist learning theory, promote approaches to active learning where students are often required to make connections between new information and to extend their understanding, allowing them to confront misconceptions, and reconstruct knowledge frameworks to have a more accurate understanding (Brame, 2016). It also suggests that teachers do not merely transmit knowledge; rather they facilitate activities (e.g. classroom testing) (Barrett & Long, 2012) including feedback to allow students to demonstrate and extend their learning beyond more than just what is taught in class. Thus, test feedback within the corridors of the constructivist learning theory is facilitative as it involves the teacher's provision of comments and suggestions to students, to enable them to make their revisions and, through dialogue, helps them to gain new understandings without dictating what they should understand or learn (Archer, 2010).

Preservice Teachers' Perspectives

Globally, teacher education programmes have been heralded as a veritable tool for advancing teacher pedagogical and professional competencies. In Nigeria for example, teacher training programmes are offered at various postsecondary institutions (teacher institutes, colleges of education and universities). In this study, preservice teachers in a university's faculty of education were examined. The pre-service teaching process begins for these student-teachers mostly in their pen-ultimate academic year. For the success of this professionalising experience, these students are posted out to schools (primary or secondary) for a given period (usually between 4-6 months or one year) where they are assigned by the accepting schools to undertake various classroom instructional and testing practices including provision of feedback. Consequently, these

programmes are grounded on the tenets of the National Policy on Education … to produce highly motivated, conscientious and efficient classroom teachers for all levels of our education system… (and) teachers with the intellectual and professional background adequate for their assignment and to make them adaptable to any changing situation not only in the life of their country but in the wider world… (NPE, 2004, p. 39) Hence, the goal of teacher preparation is simple: to create teachers who are well-equipped and prepared with the knowledge and skills to emphatically impact school students at all levels.

As part of preservice teachers' professional preparation, they are expected to gain knowledge and understanding about instructional and testing practices including the provision of feedback (Grainger & Adie, 2014). Because of this, practicum experiences are embedded throughout teacher preparation programs to provide preservice teachers with meaningful exposure to varied concepts within the instructional and testing process in various subject areas, and opportunities to develop their ability and knowledge of effective instructional practices to participate effectively in the educational system (Adeosun, 2014). As such, these field experiences in classrooms serve as critical resources for preservice teachers' construction of professional identity (Yuan & Lee, 2015), facilitation of specific pedagogies practice with students (Cheng, et al., 2012), as well as opportunities to design and carry out testing practices for various purposes in the classrooms, which ultimately culminate at providing students with feedback to their test outcomes.

In line with this understanding, it is apparent that preservice teachers may take on instructional practices in various school settings in their bid to achieve their professionalizing experience and identities. Hence, it is plausible that they may run into situations that could in turn affect their instructional practices. Therefore, it is important to gain a better understanding of preservice teacher instructional practices and concerns to help them contribute to a better understanding of the classroom climate with feedback. Also, there is a need to ensure the quality of training given to preservice teachers as they are expected to translate intended educational policies into action within the classroom.

Despite the power that preservice teachers commonly exercise over the instructional practice and delivery of feedback within the classroom climate, there have been major concerns from stakeholders. Scholars (Obanya, 2004, Ololube, 2006) have questioned the efficacy of the teacher training programmes in Nigeria over its inability to prepare teachers grounded in 21st-century pedagogy and content as well as having the ability to collaborate professionally (peers and students) in a working environment. Literature such as Frey (2014) has highlighted that most teacher training programmes have little or no testing course modules, hence teachers receive little or no testing

training or support in classroom testing practices. Nevertheless, even when these programmes include testing course modules, they often major mostly on large-scale standardized testing rather than classroom test strategies teachers need to excel in classroom testing processes (Frey, 2014). However, some other studies (see Okoli & Agu, 2021; Okoli & Ifejika, 2022) have hinted that while some teachers may lack classroom testing competencies, including feedback, some other teachers may have the required competencies.

Problem Statement

A large body of literature has indicated the usefulness of feedback, describing it as a crucial component that can foster students learning, improved performance and positive teacher-student dialogue and relationships. Despite these, some studies depict that providing effective feedback is complicated and often problematic, resulting in students' dissatisfaction with the process, and this could be due to several issues including teacher elements (teacher feedback conceptions, feedback literacy and emotional experiences) discussed in this study.

Notwithstanding, studies on these identified teacher elements are few if any. According to Ghazali, et al (2020), there is a relatively limited body of research relating to teacher conceptions of feedback. Some authors reported that providing effective feedback is a challenging task for teachers because it requires different types of knowledge: content, curriculum and testing knowledge. While some others, hinted that although studies on teacher emotions have been increasingly conducted in the last two decades, limited attention has been paid to teachers' emotions in giving feedback. Additionally, studies relative to Nigeria's context concerning teacher feedback, conceptualisations, literacy and emotional experiences are limited. Hence, considering these issues, and how relevant test feedback is to the classroom instruction and testing process, it has become critical to explore teacher elements relative to feedback as already discussed in this paper.

Consequently, the present study aimed to explore preservice teachers' elements (beliefs, feedback literacy and emotional experiences) by providing students with classroom test feedback. To this end, six research questions were raised in the study:

1. What are pre-service teachers' beliefs regarding test feedback practice?
2. Are preservice teachers literate in providing students with feedback?
3. What are pre-service teachers' emotional experiences with providing test feedback?
4. Are there significant differences between preservice teachers' beliefs and their gender regarding providing students with feedback?

5. Are there significant differences between preservice teachers' feedback literacy and their gender regarding providing students with feedback?
6. Are there significant differences between preservice teachers' emotional experiences and their gender regarding providing students with feedback?

Method

This study conveniently sampled 126 preservice teachers (females = 72 [57%], males = 54[43%]) from the Faculty of Education, Nnamdi Azikiwe University, Awka. The study adapted three instruments respectively from Brown et al., (2012), Boud and Dawson (2023), and Frenzel et al., (2016) and grouped them into a single instrument titled: Teachers Elements With Providing Students with Classroom Test Feedback Questionnaire (TEWPSWCTFQ).

The first section of TEWPSWCTFQ obtained participants' background information including gender. The second section comprised the Brown et al., (2012) instrument consisting of 37 items assessing teacher conceptions of feedback and scaled on six points ranging from one (strongly disagree) to six (strongly agree). The third section consisted of items adapted from Boud and Dawson's (2023) analysis of the competencies of feedback-literate teachers. From their analysis Boud and Dawson (2023) developed what they termed the Teacher Feedback Literacy Competency Framework consisting of 19 inductively-derived competencies split into three levels macro (programme design and development), meso (course module/unit design and implementation) and micro (feedback practices relating to individual student assignments). Therefore, it was from these 19 inductively-derived competencies that this study author derived and grouped items to develop the study instrument. These 19 inductively-derived competencies items were then ranged by the study author from one -(Never) to five (Always) to measure teachers' feedback literacy. The fourth section constituted Frenzel et al., (2016) study instrument. This instrument comprises 12 four-point Likert items ranging from one (strongly disagree) to four (strongly agree). This instrument, originally evaluating teachers' emotions (joy, anger and anxiety) with teaching was adapted to assess teachers' emotional experiences with test feedback. For the instrument's adaption to assess teachers' emotional experiences with test feedback, its original items were reworded in content to suit the present study. For example, (*N=1*) original item, "I generally enjoy teaching" was adapted to "I generally enjoy giving students feedback". Additionally, while the psychometric properties of these three instruments can be found in Brown et al., (2012), Boud and Dawson (2023), and Frenzel et al., (2016) respectively, in this study the reliability coefficient of the three instruments were .91, .85 and .70 respectively. Besides, this present study maintained all the original scaling points of the instruments, and data collected with these three instruments were

analysed using frequencies, percentages and t-tests. The TEWPSWCTFQ was directly delivered to each respondent to increase its rate of return.

Results

Research Question One: What are pre-service teachers' beliefs regarding test feedback practice?

Table 1

Teacher Candidates' Beliefs Regarding Test Feedback Practice (N=126)

S/N	Teacher Conceptions of Feedback Scale	SD		MD		SA		MDA		MOA		SA	
		F	%	F	%	F	%	F	%	F	%	F	%
1	Feedback is pointless because students ignore my comments and directions	58	46.0	20	15.9	30	23.8	8	8.3	4	3.2	6	4.8
2	Students rarely make changes in their work in response to my feedback	28	22.2	30	23.8	32	25.9	20	15.9	4	3.2	12	9.5
3	I seldom give written feedback because students throw it away	44	34.9	14	11.1	30	23.8	6	4.8	4	3.2	28	22.2
4	Time spent giving feedback is a wasted effort	64	50.8	10	7.9	14	11.1	12	9.5	10	7.9	16	12.7
5	Students use the feedback I give them to improve their work	18	14.3	20	15.9	18	14.3	18	14.3	16	12.7	36	28.6
6	I can see progress in student work after I give feedback to students	4	3.2	16	12.7	28	22.2	10	7.9	26	20.6	42	33.3
7	Students use comments I give them to revise their work	6	4.8	22	17.5	22	17.5	14	11.1	22	17.5	40	31.7
8	Giving students feedback is important because it helps them learn	8	6.3	6	4.8	22	17.5	18	14.3	20	15.9	52	41.3
9	Parents can tell how well their child is learning from my feedback	16	12.7	10	7.9	22	17.5	22	17.5	16	12.7	40	31.7

10	At my school, teachers are expected to give both spoken and written feedback to students	2	1.6	16	12.7	28	22.2	22	17.5	18	14.3	40	31.7
11	Feedback practices at my school are monitored by school leaders	12	9.5	28	22.2	30	23.8	20	15.9	14	11.1	22	17.5
12	Feedback should be full of encouraging and positive comments	26	20.6	10	7.9	30	23.8	18	14.3	6	4.8	36	28.6
13	Teachers should always include praise in their feedback about student work	6	4.8	14	11.1	30	23.8	22	17.5	16	12.7	38	30.2
14	The goal of giving feedback is to protect and enhance the student's self-esteem	4	3.2	18	14.3	22	17.5	14	11.1	28	20.6	42	33.3
15	Good feedback praises students	12	9.5	10	7.9	22	17.5	32	25.4	16	12.7	34	27.0
16	My feedback includes comments on the effort students put into their work	12	9.5	8	6.3	26	20.3	26	20.3	26	20.3	26	20.3
17	The point of feedback is to make students feel good about themselves	12	9.5	20	15.9	26	20.6	18	14.3	20	15.9	30	23.8
18	My feedback helps students decide what to include and/or exclude in their Work	8	6.3	18	14.3	24	19.0	26	20.6	20	15.9	30	23.8
19	My feedback is specific and tells students what to change in their work	4	3.2	8	6.3	30	23.8	26	20.6	18	14.3	40	31.7
20	My comments help students create the kind of work I expect from them	8	6.3	8	6.3	30	23.8	28	22.2	26	20.6	26	20.6
21	I organise time in class for students to revise, evaluate, and give themselves	12	9.5	22	17.5	36	28.6	8	63	24	19.0	24	19.0

	feedback about their work												
22	In feedback, I describe student work to stimulate discussion about how it could improve	8	6.3	12	9.5	42	33.3	10	7.9	22	17.5	32	25.4
23	I give students opportunities to respond to my feedback	4	3.2	10	7.9	42	33.3	18	14.3	22	17.5	30	23.8
24	Feedback is a two-way process between my students and me	8	6.3	8	6.3	32	25.4	14	11.1	20	15.9	44	34.9
25	My feedback reminds each student to self-assess his or her work	10	7.9	18	14.3	18	14.3	10	7.9	28	20.6	44	34.9
26	My students generate ideas about improving their learning independently of me	8	6.3	12	9.5	20	15.9	30	23.8	38	30.2	18	14.3
27	Feedback is about helping students evaluate their work	8	6.3	12	9.5	20	15.9	30	23.8	38	30.2	18	14.3
28	My students analyse their work with little direction from me	8	6.3	6	4.8	26	20.6	14	11.1	28	22.2	44	34.9
29	I encourage students to correct/revise their work without my prompting	10	7.9	10	7.9	24	19.0	28	22.2	28	22.2	26	20.6
30	Students can provide accurate and useful feedback to each other and themselves	16	12.7	20	15.9	28	22.2	14	11.1	22	17.5	26	20.6
31	Students can be critical of their work and can find their own mistakes	14	11.1	16	12.7	30	23.8	24	19.0	20	15.9	22	17.5
32	Peers are the best source of feedback	26	20.6	12	9.5	28	22.2	16	12.7	22	17.5	22	17.5
33	I give students feedback immediately after	16	12.7	24	19.0	28	22.2	6	4.8	20	15.0	32	25.4

	they finish												
34	Students should not have to wait for feedback	18	14.3	26	20.6	32	25.4	20	15.9	18	14.3	12	9.5
35	I aim to deliver feedback to students within two days of receiving their work	14	11.1	22	17.5	32	25.4	22	17.5	20	15.9	16	12.7
36	Quality feedback happens interactively and immediately in the classroom while students are learning	4	3.2	6	4.8	14	11.3	38	30.6	22	17.7	40	32.3
37	Feedback that takes more than a week to get to the student is useless	22	17.5	16	12.7	28	22.2	20	15.9	12	9.5	28	22.2

Table 1 indicates that teacher candidates have positive beliefs regarding test feedback practice.

Research Question Two: Are teacher candidates' literate in providing students with feedback?

Table 2
Teacher Candidates' Feedback Literacy Level in providing students with feedback (N=126)

S/N	Teacher Feedback Literacy Scale	NV		RA		ST		OF		AW	
		F	%	F	%	F	%	F	%	F	%
1	Plans feedback strategically to improve student achievement	30	23.8	16	12.7	20	15.9	24	19.0	36	28.6
2	Uses available feedback resources to the most effect	12	9.5	32	25.4	28	22.2	32	25.4	22	17.5
3	Can create authentic feedback-rich environments for students	8	6.3	14	11.1	54	42.9	22	17.5	28	22.2
4	Uses feedback process to facilitate student development of feedback literacy	16	12.7	14	11.1	34	27.0	14	11.1	48	38.1
5	Facilitates colleges' success with feedback practices with students	10	7.9	24	19.0	34	27.0	30	23.8	28	22.2
6	Manages feedback pressures (for self and others)	24	19.0	24	19.0	28	22.2	32	25.4	18	14.3
7	Improves feedback processes for students' learning achievements	12	9.5	14	11.1	38	30.2	222	17.5	40	31.8
8	Utilises feedback opportunities with students to maximum effect	20	15.9	18	14.3	28	22.2	30	23.8	30	23.9
9	Ensures feedback is timely and sequential to influence student learning	6	4.8	20	15.9	32	25.4	24	19.0	44	35.0
10	Able to design feedback dialogues and cycles	14	11.1	22	17.5	34	27.0	30	23.8	26	20.6

11	Facilitates feedback activities to enable students self-assess	10	7.9	26	20.6	28	22.2	16	12.7	46	36.5
12	Elicit feedback information from students concerning instructional/testing aims	14	11.1	20	15.9	34	27.0	28	22.2	30	23.8
13	Utilises feedback processes to enable students not to be distracted by marks or grades	16	12.7	22	17.5	34	27.0	30	23.8	24	19.1
14	Use technological tools to enable more efficient/scalable feedback	22	17.5	20	15.9	32	25.4	30	23.8	22	17.5
15	Develop strategies that facilitate student's incorporation of feedback responses into subsequent assignments	16	12.7	28	22.2	28	22.2	32	25.4	22	17.5
16	Facilitates feedback strategies that promote peer assessment	12	9.5	22	17.5	34	27.0	32	25.4	26	20.6
17	Designs feedback processes that promote tutor-student interactions	18	14.3	20	15.9	30	23.8	34	27.0	24	19.1
18	Crafts feedback that aids student's identification of needed improvements	20	15.9	32	25.4	22	17.5	24	19.0	28	22.3
19	Design feedback to meet students varying needs	12	9.5	26	20.6	34	27.0	22	17.5	32	25.3

Table 2 reveals that teacher candidates have feedback literacy at a moderate level in providing students with feedback

Research Question Three: What are teacher candidates' emotional experiences with providing test feedback?

Table 3

Teacher Candidates' Emotional Experiences With Providing Test Feedback (N=126)

S/N	Teacher Emotion Scale	SD		D		A		SA	
		F	%	F	%	F	%	F	%
1	I generally enjoy giving feedback to students	24	19.0	14	11.1	38	30.2	50	39.7
2	I generally have so much fun giving feedback to students that I gladly prepare myself to give feedback	16	12.7	24	19.0	42	33.3	44	34.9
3	I often have reasons to be happy when I give feedback to students	6	4.8	20	15.9	58	46.0	42	33.3
4	I generally give feedback to students with enthusiasm	10	7.9	26	20.6	54	42.9	36	28.6
5	I often have reasons to be angry when I give feedback to students	58	46.0	40	31.7	20	15.9	8	6.3
6	I often feel annoyed while	52	41.9	30	24.2	26	21.0	16	12.9

	giving feedback to students								
7	Sometimes I get really mad while giving feedback to students	62	49.2	32	25.4	18	14.3	14	11.1
8	Giving feedback to students generally frustrates me	64	50.8	30	23.8	20	15.9	12	9.5
9	I generally feel tense and nervous while giving feedback to students	50	39.7	48	38.1	18	14.3	10	7.9
10	I am often worried that my feedback practices are not going so well	24	19.0	46	36.5	46	36.5	10	7.9
11	Preparing myself to give feedback to students often causes me to worry	34	27.0	36	28.6	42	33.3	14	11.1
12	I feel uneasy when I think about giving feedback to students	40	32.3	36	29.0	34	27.4	14	11.3

Table 3 shows that teacher candidates experienced mixed emotions with providing test feedback to students.

Research Question Four: Are there significant differences between teacher candidates' beliefs and their gender regarding providing students with feedback?

Table 4

Descriptive Statistics of Male and Female Teacher Candidates' Beliefs Regarding Providing Students With Feedback

Variable	Gender	N	x̄	SD	T	df	Sig	Remark
Beliefs	Males	54	146.6	29.5	2.310	124	.024	Significant
	Females	72	134.4	29.2				

Significant differences exist between teacher candidates' beliefs and their gender regarding providing students with feedback

Research Question Five: Are there significant differences between teacher candidates' feedback literacy and their gender regarding providing students with feedback?

Table 5

Descriptive Statistics of Male and Female Teacher Candidates' Feedback Literacy Regarding Providing Students With Feedback

Variable	Gender	N	x̄	SD	T	Df	Sig	Remark
Feedback	Males	54	66.3	21.5	1.843	124	.068	Not Significant
Literacy Level	Females	72	59.7	17.7				

There are no significant differences between teacher candidates' feedback literacy and their gender regarding providing students with feedback.

Research Question Six: Are there significant differences between teacher candidates' emotional experiences and their gender regarding providing students with feedback?

Table 6
Descriptive Statistics of Male and Female Teacher Candidates' Emotional Experiences Regarding Providing Students With Feedback

Variable	Gender	N	x̄	SD	T	Df	Sig	Remark
Emotional Experiences	Males	54	28.8	5.9	1.692	124	0.93	Not Significant
	Females	72	27.1	5.1				

There are no significant differences between teacher candidates' emotional experiences and their gender regarding providing students with feedback.

Discussion

Findings from Table 1 depict that preservice teachers' have positive beliefs regarding test feedback practice. They believe that feedback is a two-way process that helps students to self-assess and self-regulate their learning. This result reveals that these pre-service teachers view test feedback as crucial to students learning achievements, thus they are more likely to engage effectively in the practice. Also, Table 4 indicated a significant difference between preservice teachers' beliefs and their gender regarding providing students with feedback. Male pre-service teachers had better mean values than their female counterparts. This denotes that although male and female pre-service teachers had varying positive conceptions of feedback, male teachers had more positive conceptions of feedback. And these views may indulge them in taking varying instructional and assessment approaches towards attaining their test feedback goals than their female counterparts. These findings, are in line with Ghazali, et al (2020) who highlighted that teacher's conception is an important factor that can contribute to improved knowledge and skills of students, hence tutors typically perceive feedback as being more valuable than their students do (Brown, 2007; Carless, 2006). Therefore, these varying conceptions about test feedback might have been why these teachers viewed male students as being more difficult to manage than girls hence, they direct more negative feedback interaction to them (Brophy, 1985; Golombok & Fivush, 1994; Spender, 1982) or why opined that male students received a significantly greater quantity of praise (Sadker & Sadker, 1986) more teaching interactions, more difficult questions, more academic criticism, and a bit more praise than females' students (Kelly, 1988).

Results from Table 2 reveal that pre-service teachers' have moderate feedback literacy in providing students with feedback. Also, Table 5 reported no significant differences between preservice teachers' feedback literacy and their gender regarding providing students with feedback. These findings show that these pre-service teachers regardless of their gender have some level of skill, knowledge or expertise to give feedback that is devoid of tension, but rather promotes teacher-student relationships and student learning achievements. Consequently, they can design feedback processes in ways which empower understudy take-up of input and seed the advancement of understudy input education (Carless & Winstone, 2020).

Table 3 indicated that pre-service teachers experience mixed emotions with providing test feedback to students. Findings show that although pre-service teachers generally enjoy giving feedback to students, they also experience negative emotions such as uneasiness and worried that their feedback may not go down well with students. This means that though pre-service teachers may be keen to undertake the test feedback practices, these inherent negative emotions relative to feedback practice may hinder their involvement in the practice and as such their general pedagogical and assessment practices within the classroom. Furthermore, Table 6 showed no significant differences between preservice teachers' emotional experiences and their gender regarding providing students with feedback. This also means that male and female teachers are not different in their emotional experiences with test feedback as they tend to experience similar positive and negative emotions with the practice. These findings are supported by Shute's (2008) position that despite test feedback potential value, feedback is not quite rosy or simple, as it is often associated with varying emotions (Boud & Molloy, 2013; Dawson et al., 2019), either positive and negative ranging from joy, pride, love to anger, exhaustion and hopelessness ((Frenzel, et al., 2009; Frenzel, 2014). And Stough and Emmer (2010) posited that both male and female teachers during test-feedback sessions experience a variety of emotions. And with Watson, (1992) observed no significant discrimination against students of either gender in the proportion and type of feedback received from teachers. Given these, teachers' emotional experiences have the power to influence many professionalising experiences in classroom management, classroom climate, instructional behaviours, and testing practices (including feedback) (Frenzel, 2014).

Conclusion and Recommendations

From the above study results, the study concludes that preservice teachers' have positive beliefs regarding test feedback practice. However male teachers were more optimistic in their feedback beliefs than female teachers. Pre-service teachers have moderate feedback literacy in providing students with feedback. Pre-service teachers

experience mixed emotions with providing test feedback to students. Significant differences exist between preservice teachers' beliefs and their gender regarding providing students with feedback, while no significant differences between preservice teachers' feedback literacy and emotional experiences concerning their gender regarding providing students with feedback.

Based on these, this study recommends that since test feedback could foster effective student learning accomplishment, teacher education programmes should strive more to train these pre-service teachers in various classroom instructional and testing practices for them to be able to effectively help their students attain these learning accomplishments. Also, these teacher education programmes should seek out avenues to encourage these pre-service teachers to undertake test feedback practices for them to develop better conceptions, attain feedback literacy as well as have positive emotional experiences with the practice over time.

Limitation and Suggestions

This study has limitations as well. Firstly, the study utilised a small sample size (126) hence these findings cannot even be generalised to a larger population. Similarly, the study was a descriptive design study, maybe a more robust design that allows for more than one data source could reveal more exciting findings. Given these limitations, other studies could aim to incorporate large sample sizes. Also, other studies could utilise more robust designs that allow for the use of more than one data source.

References

Adeosun, O. (2014). *Teacher education programmes and the acquisition of 21st-century skills: Issues and challenges in Nigeria*. Available at https://home.hiroshima-u.ac.jp/icce/wp-content/uploads/2014/03/4-2-91.pdf

Ajjawi, R., & Boud, D.J. (2017). Researching feedback dialogue: An interactional analysis approach. *Assessment and Evaluation in Higher Education, 42*(2), 252-265.

Ajjawi, R., & Boud, D. (2018). Examining the nature and effects of feedback dialogue. *Assessment and Evaluation in Higher Education.*

Archer, J.C. (2010). State of the science in health professional education. Effective feedback. *Medical Education, 44*, 101-108.

Barrett, L.K., & Long, B.V. (2012). The Moore method and the constructivist theory of learning: Was R. L. Moore a constructivist? *Primus: Problems, Resources, and Issues in Mathematics Undergraduate Studies, 22*(1), 75-84.

Baumert, J., & Kunter, M. (2013). The COACTIV model of teachers' professional competence. *Cognitive Activation in the Mathematics Classroom and*

Professional Competence of Teachers: Results From the COACTIV Project, 25-48.

Berkovich, I., & Eyal O. (2017). The mediating role of principals' transformational leadership behaviors in promoting teachers' emotional wellness at work: A study in Israeli primary schools. *Educ. Manag. Adm. Leadersh.* 45, 316-335.

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 21*(5), 5-31.

Boud, D., & Dawson, P. (2023). What feedback literate teachers do: an empirically-derived competency framework. *Assessment & Evaluation in Higher Education, 48(*2), 158-171

Boud, D., & Molloy, E. (2013). Rethinking models of feedback for learning: The challenge of design. *Assessment & Evaluation in Higher Education, 38*(6), 698-712.

Brame, C. (2016). *Active learning.* Vanderbilt University Center for Teaching. Retrieved from https://cft.vanderbilt.edu/active-learning/

Bratkovich, M.O. (2014). Assessment and feedback: Examining the relationship between self-assessment and blind peer-and teacher-assessment in TOEFL writing. *Studies in Applied Linguistics and TESOL, 14*(2), 100-127.

Brophy, J. (1985). Interactions of male and female students with male and female teachers. In Wilkinson, L.C. & Marrett, C.B. {Eds.). *Gender Influences in Classroom Interactions (pp. 115-142).* London: Academic Press.

Brown, G. T. L. (2008). *Conceptions of assessmen*t: *Understanding what assessment means to teachers and students*. New York: Nova Science Publishers.

Brown, G.T., Harris, L. R., & Harnett, J. (2012). Teacher beliefs about feedback within an assessment for learning environment: Endorsement of improved learning over student well-being. *Teaching and Teacher Education, 28*(7), 968-978.

Brown, J. (2007). Feedback: The student perspective. *Research in Post-Compulsory Education, 12,* 33-51.

Buck, G. A., Trauth-Nare, A., & Kaftan, J. (2010). Making formative assessment discernable to pre-service teachers of science. *Journal of Research in Science Teaching, 47*(4), 402-421

Caires, S., Almeida, L., & Vieira, D. (2012). Becoming a Teacher: Student Teachers' Experiences and Perceptions about Teaching Practice. *European Journal of Teacher Education, 35,* 163-178.

Carless, D. (2006). Differing perceptions in the feedback process. *Studies in Higher Education, 31,* 219-233

Carless, D. (2015). *Excellence in University Assessment: Learning from Award-Winning Practice.* London: Routledge.

Carless, D., & Boud, D. (2018). The development of student feedback literacy: Enabling uptake of feedback. *Assessment and Evaluation in Higher Education, 43*(8), 1315-1325.

Carless, D., Salter, D., Yang, M., & Lam. J. (2011). Developing sustainable feedback practices. *Studies in Higher Education 36*(4), 395-407.

Carless, D., & Winstone, N. (2020). Teacher feedback literacy and its interplay with student feedback literacy. *Teaching in Higher Education, 28*(1), 150-163.

Chang, M.L. (2009). An appraisal perspective of teacher burnout: Examining the emotional work of teachers. *Edu. Psychol. Rev.* 21, 193-218.

Charon, J. M. (2009). *Symbolic interactionism: An introduction, an interpretation, an integration.* 10th ed. Upper Saddle River, NJ: Prentice Hall.

Cheng, M.M., Tang, S. Y., & Cheng, A.Y. (2012). Practicalising theoretical knowledge in student teachers' professional learning in initial teacher education. *Teaching and Teacher Education, 28*(6), 781-790.

Cramp, A. (2011). Developing first-year engagement with written feedback. *Active Learning in Higher Education, 12*, 113-126.

Dawson, P., Carless, D., & Lee, P. P.W. (2021). Authentic feedback: supporting learners to engage in disciplinary feedback practices. *Assessment & Evaluation in Higher Education, 46*(2), 286-296.

Dawson, P., Henderson, M., Mahoney, P., Phillips, M., Ryan, T., Boud, D. & Molloy, E. (2019). What makes for effective feedback: Staff and student perspectives. *Assessment & Evaluation in Higher Education 44*(1): 25-36.

Ding, L. (1997) Improving assessment feedback in higher education: voices from students and teachers. Paper presented at the: *British Educational Research Association Annual Conference*, University of York, 11-14 September.

East, M., Bitchener, J. & Basturkmen, H. (2012). What constitutes effective feedback to postgraduate research students? The students' perspective. *Journal of University Teaching & Learning Practice 9*(2), 1-16.

Evans, C. (2013). Making sense of assessment feedback in higher education. *Review of Educational Research, 83*, 70--120.

Frenzel, A. C. (2014). Teacher emotions. In L. Linnenbrink-Garcia & R. Pekrun (Eds.), *Handbook of emotions in education (pp. 494-519).* New York: Routledge.

Frenzel, A.C., Goetz, T., Stephens, E.J., & Jacob, B. (2009). Antecedents and effects of teachers' emotional experiences: An integrated perspective and empirical test. In P. A. Schutz and M.s Zembylas (Eds.), *Advances in teacher emotion research (pp. 129-151).* Dordrecht: Springer.

Frenzel, A.C., Pekrun, R., Goetz, T., Daniels, L. M., Durksen, T. L., Becker-Kurz, B., & Klassen, R. M. (2016). Measuring teachers' enjoyment, anger, and anxiety: The

Teacher Emotions Scales (TES). *Contemporary Educational Psychology*, *46*, 148-163.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*, 81-112.

Frey, B.B. (2014). *Modern classroom assessment*. Thousand Oaks, California: Sage Publications, Inc.

Fried, L., Mansfield, C., & Dobozy, E. (2015). Teacher emotion research: Introducing a conceptual model to guide future research. *Issues Educ. Res.* 25, 415-441.

Ghazali, N.H.C.M., Abdullah, N., Zaini, S. H., & Hamzah, M. (2020). Student teachers' conception of feedback within an assessment for learning environment: Link to pupil aspiration. *Jurnal Cakrawala Pendidikan, 39*(1), 54-64.

Golombok, S., & Fivush, R. (1994). *Gender development*. New York, NY: Cambridge University Press.

Gong, J., Lu, Y., & Song, H. (2018). The effect of teacher gender on students' academic and noncognitive outcomes. *Journal of Labor Economics, 36*(3), 743-778.

Good, T.L., Sikes, J.N. & Brophy, J.E. (1973). Effects of teacher sex and student sex on classroom interaction. *Journal of Educational Psychology, 65*(1), 74-87.

Grainger, P.R., & Adie, L. (2014). How do pre-service teacher education students move from novice to expert assessors? *Australian Journal of Teacher Education, 39*(7), 89-105.

Harris, L.R., Brown, G.T.L. & Harnett, J.A. (2014). Understanding classroom feedback practices: A study of New Zealand student experiences, perceptions, and emotional responses. *Educational Assessment, Evaluation and Accountability*, 26(2), 107-133.

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning.* Routledge

Hattie, J., & Yates, G. (2014). *Visible learning and the science of how we learn*. Routledge.

Higgins, R.A. (2004). *The meaning and impact of assessment feedback for students in higher education*. Sheffield Hallam University (United Kingdom).

Hill, J., Berlin, K., Choate, J., Cravens-Brown, L., McKendrick-Calder, L., & Smith, S. (2021). Exploring the emotional responses of undergraduate students to assessment feedback: Implications for instructors. *Teaching and Learning Inquiry: The ISSOTL Journal*, *9*(1), 294-316.

Huisman, B., Saab, N., Van Driel, J., & Van Den Broek, P. (2020). A questionnaire to assess students' beliefs about peer-feedback, *Innovations in Education and Teaching International, 57*(3), 328-338,

Hyland, P. (2000) Learning from feedback on assessment, in: Hyland, P. & Booth, A. (Eds.).*The Practice of University History Teaching* .Manchester: Manchester University Press.

Hyland, K. (2013). Student perceptions of hidden messages in teacher written feedback. *Studies in Educational Evaluation, 39*(3), 180-187.

Ilgen, D., & Davis, C. (2000). Bearing bad news: Reactions to negative performance feedback. *Applied Psychology*, *49*(3), 550-565.

Irving, S., Harris, L., & Peterson, E. (2011). One assessment doesn't serve all the purposes' or does it? New Zealand teachers describe assessment and feedback. *Asia Pacific Education Review, 12*(3), 413-426.

Izard, C.E. (2010). The many meanings/aspects of emotion: Definitions, functions, activation, and regulation. *Emot. Rev. 2,* 363-370.

Jiang, L., & Yu, S. (2021). Understanding Changes in EFL Teachers' Feedback Practice During COVID-19: Implications for Teacher Feedback Literacy at a Time of Crisis. *Asia-Pacific Edu Res 30,* 509-518.

Juwah, C., Macfarlane-Dick, D., Matthew, B., Nicol, D., Ross, D., & Smith, B. (2004). Enhancing student learning through effective formative feedback. *The Higher Education Academy 140,* 1-40.

Kelly, A. (1988). Gender differences in teacher-pupil interactions: A meta-analytic review. *Research in Education, 39,* 1-23.

Kim, E.J., & Lee, K.R. (2019). Effects of an examiner's positive and negative feedback on self-assessment of skill performance, emotional response, and self-efficacy in Korea: A quasi-experimental study. *BMC Med Educ 19,* 142.

Kleij, F.M. (2019). Comparison of teacher and student perceptions of formative assessment feedback practices and association with individual student characteristics. *Teaching and Teacher Education 85,* 175-189.

Lekoko, R.N. & Koloi. S. (2007). Qualms in marking university students' assignments by teaching staff: Does correlation of student's expectations and teacher's feedback matter? *Bostwana institute of administration and commerce, 1(4),* 34-45,

Linnenbrink E.A., Pintrich P.R. (2002). Achievement goal theory and affect: An asymmetrical bidirectional model. *Edu. Psychol. 37,* 69-78.

Mahmud, N. (2016). Investigating the practice of providing written corrective feedback types by ESL teachers at the upper secondary level in high performance schools. *Malaysian Online Journal of Educational Sciences*, *4*(4), 48-60.

Mahmood, S., Mohamed, O., Mustafa, S. M. S., & Mohd Noor, Z. (2021). The influence of demographic factors on teacher-written feedback self-efficacy in Malaysian

secondary school teachers. *Journal of Language and Linguistic Studies*, *17*(4), 2111-2122.

Meyer, D.K., & Turner, J. C. (2006). Re-conceptualizing emotion and motivation to learn in classroom contexts. *Educational Psychology Review*, *18*(4), 377-390. doi:10.1007/s10648-006- 9032-1

Molloy, E., Boud, D & Henderson, M (2020). Developing a learning-centred framework for feedback literacy. *Assessment & Evaluation in Higher Education, 45*(4), 527-540,

Nicol, D. (2010). From monologue to dialogue: improving written feedback processes in mass higher education. *Assessment & Evaluation in Higher Education, 35*(5), 501-517.

Nicol, D.J., & Macfarlane-Dick, D. (2006). Formative assessment and self- regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education, 31*, 199-218.

Obanya, P. (2004). The dilemma of education in Africa. Ibadan: Heinemann Educational Books.

Okoli, O.D., & Agu, N.N. (2021). Extent of teachers' adherence to test scoring practices in the classroom testing practices. *Journal of Academy of Education,17*(2), 33-44

Okoli, O.D., & Ifejika, E. (2022) Investigating teachers grading perceptions, current grading habits and their views towards classroom assessment grading practice. *Jurnal Pendidikan Dan Pembelajaran, 29*(1), 22-31

Ololube, N.P. (2006). The impact of professional and non-professional teachers' ICT competencies in secondary schools in Nigeria. *Journal of Information Technology Impact*, *6*(2), 101-118

Park, S., & Oliver, J.S. (2008). Revisiting the conceptualisation of pedagogical content knowledge (PCK): PCK as a conceptual tool to understand teachers as professionals. *Research in Science Education, 38*(3), 261-284.

Pekrun, R., Cusack, A., Murayama, K., Elliot, A.J. & Thomas, K. (2014). The power of anticipated feedback: Effects on students' achievement goals and achievement emotions. *Learning and Instruction 29,* 115-126.

Pekrun, R., Goetz, T., Titz, W., & Perry, R.P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Journal of Educational Psychology, 37*, 91-106.

Pitt, E., & Winstone, N.E. (2023). Enabling and valuing feedback literacies. *Assessment & Evaluation in Higher Education, 48*(2), 149-157,

Ropohl, M., & Rönnebeck, S. (2019) Making learning effective - quantity and quality of pre-service teachers' feedback. *International Journal of Science Education, 41*(15), 2156-2176,

Rots, I., Aelterman, A., Vlerick, P., & Vermeulen, K. (2007). Teacher education, graduates' teaching commitment and entrance into the teaching profession. *Teaching and Teacher Education, 23*(5), 543-556.

Sadker, M. & Sadker, D. (1986). Sexism in the classroom: From grade school to graduate school. *Phi Delta Kappan, Ql*(7), 512-515.

Schwab, S., Markus, S., & Hassani, S. (2022). Teachers' feedback in the context of students' social acceptance, students' well-being in school and students' emotions. *Educational Studies*, 1-18.

Sellberg, M., & Roaldsen, K., Nygren-Bonnier, M., & Halvarsson, A. (2020). Clinical supervisors' experience of giving feedback to students during clinical integrated learning. *Physiotherapy Theory and Practice. 38,* 1-10.

Shute, V., (2008). Focus on formative feedback. *Review of educational research,* 78 (1), 153-189.

Smith, K., Gamlem, S. M., Sandal, A.K., & Engelsen, K.S. (2016). Educating for the future: A conceptual framework of responsive pedagogy. *Cogent Education, 3*(1), 1-12.

Spender, D. (1982). *Invisible women - the schooling scandal*. London: Writers and Readers Publishing.

Stough, L. & Emmer, E. (2010). Teachers' emotions and test feedback. *International Journal of Qualitative Studies in Education. 11.* 341-361.

Sutton, R.E., & Harper, E.M. (2009). Teachers' emotion regulation. In L. J. Saha & A. G. Dworkin (Eds.), *International Handbook of Research on Teachers and Teaching*. New York: Springer.

Sutton, R.E., & Wheatley, K.F. (2003). Teachers' emotions and teaching: A review of the literature and directions for future research. *Educational Psychology Review, 15*(4), 327-358.

Watson, P.R. (1992). *A gender analysis of teacher feedback in coeducational secondary physical education lessons.* https://ro.ecu.edu.au/theses_hons/428

Wei, W., & Yanmei, X. (2018). University teachers' reflections on the reasons behind their changing feedback practice. *Assessment & Evaluation in Higher Education, 43*(6), 867-879.

William, D. (2011). *Formative assessment: Definitions and relationships*.

https://discovery.ucl.ac.uk/id/eprint/1507217/1/Wiliam2011What2.pdf?msclkid=6b8684a9c 811ec962db8aa2c265b6f

Winstone, N.E., Boud, D., Dawson, P., & Heron, M. (2022). From feedback-as-information to feedback-as-process: A linguistic analysis of the feedback literature. *Assessment & Evaluation in Higher Education, 47*(2), 213-230

Winstone N.E., & Carless, D. (2021) Who is feedback for? The influence of accountability and quality assurance agendas on the enactment of feedback processes, Assessment in Education: Principles, Policy & Practice, 28:3, 261-278,

Xu, Y., & Brown, G.T.L. (2016). Teacher assessment literacy in practice: A reconceptualization. *Teaching and Teacher Education* 58: 149-162.

Yuan, Rui & Lee, Icy. (2016). I need to be strong and competent: A narrative inquiry of a student-teacher's emotions and identities in teaching practicum. *Teachers and Teaching, 22*. 1-23.

Zhao, X, Cox, A., Lu, A., & Alsuhaibani, A. (2022). A comparison of student and staff perceptions and feelings about assessment and feedback using cartoon annotation. *Journal of Further and Higher Education, 46*(5), 586-604.

Currency Redesign in Nigeria: Impact on Psycho-Social Development of the Citizens

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Abstract

The currency redesign held in Nigeria in 2022 was evidently accompanied with numerous challenges which had multi-dimensional impact on the citizens. This paper investigated the psycho-social impact of currency redesign in Nigeria on the citizens. Specifically, the paper examined the impact the economic policy wheeled on the cognitive, emotional and social development of the citizens. The paper also suggested possible strategies that could be adopted to prevent untold hardship and suffering meted on the masses during this period in event of future occurrence.

Introduction

Economic policy has a huge impact on the advancement, growth and development of any economy OR simply put, on how any an economy functions. Currency revamp is part of economic policy. For instance currency revamp/redesign is anticipated to increase a currency's security by checkmating counterfeiting, boost the economy, lower cash management costs, control inflation and aids monitoring of money supply among others. Many nations across the globe including Nigeria had in one time or the other embarked on currency revamp. Esegi (2023) narrating the case of Nigeria and currency revamp asserted that from independence to date, Nigerian currency has been redesigned four times. The first time was in 1965 when Nigeria became a republic and so the redesign was paramount to reflect Federal Republic of Nigeria as the legal tender owner. Second time was in 1968 following the outbreak of civil war as a war tactic to counteract the misuse of the nation's currency during the period. Third currency revamp took place in 1973. Esegi observed that Nigerian government embarked on this to replace the imperial system inherited from the British colonial administration and fourthly another currency redesign occurred in 2007.

Although as opined by economists that the global best practice is for the Central Bank to redesign, produce and circulate new legal tender every five to eight years, the Nigerian currency (naira) had not been revised in the last 15 years. Nigerian currency has witnessed great depreciation for the past decade. Currency depreciation in this context implies loss of value of country's currency with respect to one or more foreign reference currencies typically in a floating exchange rate system in which no official

currency value is maintained. For better understanding, below is the exchange rate of naira to some foreign currencies in the previous years:

1. Exchange rate of naira to dollar is between 748-755
2. Exchange rate of naira to pounds is between 905- 915
3. Exchange rate of naira to euro is between 890-922 among others.

The above analysis suggests inflation because of loss of value in naira. Santander (2022) observed that when a legal tender loses value, people's purchasing power declines, imported products become very costly and there is a general rise in prices of goods and commodities. One economic policy that could help in control of inflation is currency redesign. It was in recent past precisely October 26, 2022 that the Central bank governor, Mr Godwin Emefiele announced that the highest denominations of the naira notes which include 1000, 500 and 200 would be revised. Describing the modalities, the Central Bank governor stated that the apex bank will be pulling out the old designs of above mentioned denominations starting from December 15, 2022 and the process will culminate on January 31, 2023.

Tope (2023) noted that in line with provisions of sections 2 (b), section 18 (a) and section 19 , sub-sections (a) and (b) of the CBN Act 2007, the management of the CBN sought and obtained the approval of the president of Nigeria, Muhammadu Buhari to revise, produce and circulate new copies of bank notes of 1000, 500 and 200 denominations. Following the approval there was a nationwide broadcast compelling the citizens to pay in the old currency into the bank before the time line given. It was clearly stated in the broadcast that at the expiration of the deadline any individual still in possession of the old naira notes will no longer make such payments into their personal or corporate accounts but directly to CBN through generating of remittal and of course the deposit alert will be expected after one month from the time of deposit as it is no longer an ordinary deposit. Of course a lot of Nigerians fall victim of this and the process was very tedious and stressful.

At this point the writers wish to state that the CBN failed completely in all they told the masses. As at December 15, 2022 the rate of replacement of the old currency was very slow. Nothing seems to be on ground and that was the beginning of suffering and untold hardship on Nigerian citizens. Despite expressed concerns and appeal to the CBN from some organizations like Nigerian Governors Forum (NGF), Bank Customers Association of Nigeria (BCAN), House of Representatives and the Senate, the CBN governor maintained his ground. It was indeed a terrible situation. At this point money failed everywhere in Nigeria as in the days of "Biblical Egypt". Scarcity of naira became glaring at the commercial banks both in the counter and ATM's as well as POS centers. The masses especially the down-trodden were thrown into thick darkness and gross darkness which affected all spheres of life while the elites still have more than enough

money to spend luxuriously and stock in their house. An unfortunate situation indeed which fuelled the anger of the masses but nothing could be done about it. Most Nigerians at this point become "night guards without pay" as they live their houses as early as 3am in the morning to take queue in the banks and stand aimless at the bank's gate till evening. Some bank staff at this point engaged in dubious/criminal deals with POS operators by releasing the available cash to them for partnership business. It turned to a period of "using naira to buy naira" and no longer using naira to buy other foreign currencies. The worst part of it is that people are ready to buy naira for their survival but it is nowhere to be found, a situation worse than Covid-19 pandemic era. The suffering of Nigerian masses was intensified on daily basis as there was no better yesterday or today.

Money became scarcely available only at POS centers, with drivers of commercial buses/tricycle and some traders in the market. Whichever way, it become necessary for the citizens to have an economically valid ATM cards or transfer app in phones to buy food or other items. POS operators which are the only surviving point turned to "Shylocks" and exacerbated the suffering of the masses. An interest rate of 300 naira was charged for withdrawal of 1000 naira and interest rate of 4000 naira for each withdrawal of 10,000 naira. Of course not everybody could afford this and the consequence was increased death rate, afflictions, hunger, physical and mental illnesses.

There was chaos everywhere and on January 30, 2023, the CBN governor announced the extension of the deadline by 10 days on the order of President Muhammadu Buhari. The extension did not improve the situation but rather from worse to worst. On April 10, 2023, there was a nationwide broadcast declaring the reversal back to the use of old currency. Gradually the masses were paid maximum of 1000 to 2000 in some banks once a week specifically for their customers and as the time of writing this paper, most banks restrict daily withdrawal from between 10, 000 to 40,000 daily for their customers. Nigerians are still trying to adjust from the ugly experience of the period.

Impact of Currency Revamp on Psychological Development of Nigerians

Many Nigerians are yet to recover from the impact of 2022 currency revamp as they were badly affected all round such as physically, physiologically and mentally. Psycho-social development in the context of this study implies the behavioural and social functioning of an individual OR the development of a person's cognitive, emotional, mental and social functioning over the course of a normal lifespan. A renowned psychologist, Erikson (1968) who is best known for his famous theory of psychosocial development noted that the development of pro-social behavior and anti-social behaviour describes psychosocial development. Erikson further explained

psychosocial development as involving changes not only in individual's overt behaviour but also in their social cognition, the role of biological (nature) and social factors (nuture) in the development of personality. Giving credence to the above assertion is Madariaga, Arribillaga and Zulaika (2014) who asserted that psychosocial development implies a person's capacity to adapt and respond to the demands of his/her environment thus accomplishing his/her goals and objectives. Hunger, starvation, frustration, anger, depression, anxiety, fear, sleepless nights, aimless queue in the banks and fuel stations from morning to night, POS operator's exorbitant charges which were the features that characterized the period affected the psychological and social lives of the masses in the following ways:

- **Fear**- Imagined dangers give rise to fear as in the case of currency redesign. Fear is a primal emotion that involves a universal biochemical response and a high individual emotional response. Fear alerts us to the presence of danger or the threat of harm whether the danger is physical or psychological (Fritscher, 2023). Olivia (2023) opined that fear is a very natural human response that arises as a defense mechanism in the face of potential danger or harm. The currency revisit wheeled tremendous fear on the masses. There was fear of the known and unknown such as fear of death, next minute survival for the family, fear of coping with need like payment of house rents, electricity bills and communication bills among others.
- **Aggression**- Aggression can be caused by hunger, inability to meet up with personal desires, low self esteem and scarcity/want which were the dictates of currency redesign. Kendra (2022) explained aggression as a range of behaviours that can result in both physical and psychological harm to oneself, others or objects. Balaji (2021) supported the above explanation but added that aggression is the act of beginning a quarrel, accidentally injuring someone or attempting and committing suicide. The writers wish to point out that aggression centers on hurting another person either physically or mentally. This was evidenced during the period of currency redesign mostly in form of quarrelling, pushing, fighting, hitting, boxing and exchanging abusive words at queue in the banks, fuel stations, in market places as a result of poor air waves for transfer of payments. During the period in question, almost all commercial activities were made through transfer with POS machines and Nigeria being an undeveloped nation in technology, there are frequent poor air waves which often result in hanging of payment. This brought a lot of misunderstanding between buyers and sellers and buyers were made to pay two times for a particular item bought and to worsen the situation many people lost their money during this period because of the

inability of the banks to reverse it. This heightened aggressive behaviours among some Nigerians.

- **Frustration**- Frustration is the thwarting of one's desires or needs. It is the blocking of a desire or a need. It implies failure to satisfy a basic need because of conditions either in the individual or external obstacles. Frustration makes a person highly uncomfortable. Scott (2022) defined frustration as a type of emotional reaction to stress Scott observed that frustration occurs when one encounters stressors for example at home, in school, work places and in relationship. Smitha (2022) explained frustration as the feeling of irritability or anger because of the inability to achieve something. During the period of currency revamp, there were unaccomplished needs, goals and aspirations resulting in people getting frustrated. The stress of queue in banks and fuel stations, standing at bank gates without eating from morning to night, being pushed around while on queues, no food and money in the house are more than enough causes of frustration which affects mental and health well-being of an individual. Smitha (2022) given credence to this assertion frustration can lead to other emotions that affect one's well-being and health such as loss of confidence, stress, anger, aggressive behaviours, irritability and depression.
- **Anxiety**- Anxiety may be defined as apprehension, tension or uneasiness that results from the anticipation of danger which may be internal or external. American Psychological Association (2022) defined anxiety as an emotion characterized by feelings of tension, worried thoughts and physical changes such as increased blood pressure. Anxiety leads to intrusive thoughts or concerns. Yolanda (2022) described anxiety as severe feeling of worry, unease and fear. Challenging situation like the period of currency redesign erupted anxiety in some individuals. People avoided certain places, situations and events out of worry.
- **Low self esteem-** Smitha (2022) asserted that low self esteem is when someone lacks confidence about who they are and what they can do, feeling of incompetent, unloved or inadequate. People who struggle with low self esteem are consistently afraid about making mistakes. Whalley and Kaur (2021) defined low self esteem as not holding oneself in high regard. One with low self esteem tends to have negative feelings about himself/herself, the world and his/her future. At the face of any challenge a low esteem individual has doubt of withstanding or overcoming the situation. The writers point out here that low self esteem can also be referred to as loss of confidence. The negative experiences, sufferings and untold hardship that

were experienced during the era of currency redesign in Nigeria lowered people's self esteem. People lost confidence in who they are and in what they can do. Also negative thinking during the period such as thoughts of how to accomplish personal, family, social, economic and financial needs led some individuals to develop low self esteem.

- **Violence**- Violence is any intentional conduct that seriously impairs another person's psychological integrity through coercion or threat. Kristine (2023) explained violence as an act of physical force causes or is intended to cause harm. The damage inflicted by violence may be physical, psychological or both. The naira scarcity added to fuel scarcity affecting the social and economic life of the masses. Most people become violent at this period especially the adolescents who beat up some unfortunate bank staff and destroy buildings and properties of some banks.
- **Behavioural problems**- There was heightened behavioural problems during the period of naira design in Nigeria. Armed robbers and kidnappers could no longer thrive in their criminal adventures because of scarcity of money but other criminal vices such as fraud, snatching of mobile phones, snatching of ATM cards at gun points and forcing the owner to reveal his/her bank pin code, hacking of people's account became rampant.
- **Mental and Health well being**- The Holy Scripture emphasized that money is a defense and answer to all things. Scarcity of money can affect one's mental health. Certain situations such as stress, hunger and starvation might trigger feelings of anxiety and panic. Worrying about money can lead to sleepless nights which can result in some health challenge. Because many people at this period could not afford the things they need to stay fit such as good food, balanced diet, fruits, drugs, therapy, medication and supplement, their health were badly affected while some lost their lives.

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- **Limits people's movement**- Scarcity of naira during the currency redesign in Nigeria added to scarcity and high cost of fuel. People's movement was seriously restricted such as attendance to work places, church services and visit to loved ones or important places. During this period most churches in Nigeria witnessed low turn-out of worshippers as well as sharp decrease in offerings, tithes and other kingdom advancement seeds as a result of cashless economy. But the story is different for churches who has been worshipping on-line and such people electronically give their offerings through some on-line giving channels.

- **Burials were boycotted**- Most bereaved were emotionally affected. The reason is no longer the dead of a loved one but inability to schedule the burial service. They are left with the option of burying the dead person immediately and scheduling the burial ceremony later against the wish of the family members or leaving the dead in the mortuary till condition improves. Not with standing, the later accrued extra burden, cost and pains for the bereaved than expected.
- **Inability to take care of loved ones**- Some relationship got broken during this period. Some dependants suffered pains, neglect and hunger, house rents were unpaid, debts were unpaid and there are outstanding school fees and other social contributions. These increased emotional problems of some individuals.
- **Misunderstanding erupted in some homes**- The period generated quarrels, chaos and misunderstanding in some homes. For example people could no longer spend like before and therefore urgent need for some "mathematical calculations" in spending. An Igbo adage says "You cannot start learning to use left hand at old age where you have been using the right hand all along" and such where a spouse or the children could not easily adjust there was breakout of quarrels and the likes.
- **Economic and social activities were paralyzed**- Business, market sales, social gatherings such as wedding ceremonies, traditional marriages, cultural festivals, town meetings and club meetings were paralyzed.
- **Social lives of people were badly affected**- There is no doubt that lack of money affect social life and relationships. During the period of currency redesign some people could no longer buy card and data to recharge their Wi-Fi, televisions and mobile phones and such could no longer watch films, make video calls, send text messages, chat on WhatsApp and even put calls across to friends and well wishers. All these ways of easing tension and stress could not be accessed easily and thus affected the mood, joy and dispositions of people.

Conclusion

The research concludes as follows:

- The impact of currency redesign on the psychological development of Nigerians includes fear, aggression, frustration, anxiety and violence among others.
- Limitation of movement, boycott of burials, eruption of misunderstanding in homes and inability to take care of loved ones among others were some of the impact of currency redesign on the social development of the citizens.

Recommendations

The following suggestions were made by the researchers:

- Every economic policy such as currency redesign should be properly timed, planned and budgeted for to avoid unleashing hardship and suffering on the masses.
- Nigerian government had always displayed inconsiderate, insensitive, non-challant and rascal approach to issues affecting the masses. It is a long time they should have a re-think of their actions and the attendant repercussions and make a change as Nigerians have lost confidence in them.
- Nothing pays like integrity, honesty and responsibility. The government in their own interests is advised to build their integrity to secure trust and confidence of the citizens. An Igbo adage says that "Multitude cannot be affected by charm". Many Nigerians understands their lies, tricks, pranks and political jamboree and so can no longer be deceived.

References

American Psychological Association (2022). *Anxiety*. https://www.apa.org

Balaji, N. (2021). *What is aggression? Its meaning, nature and causes.* Retrieved from https://www. careershodh.com

Erikson, E. H. (1968). *Identity: Youth crisis* (2nd edition). New York: Norton.

Esegi, M. (2023). *Naira redesign policy: What you need to know.* trustedadvisorslaw.com

Fritscher, L. (2023). *The psychology of fear*. https://www.verywellmind

Kendra, C. (2022). *What is aggression?* https://www.verywellmind

Kristine, M. J. (2023). *Violence*. https://www.britannica.com

Madariaga, J. M., Arribillaga, A. & Zulaika, L. M. (2014). Components and relationships of a structural model of psychosocial adjustment in adolescence. *International Journal on Developmental Educational Psychology*, (6), 303-310.

Olivia, G. E. (2023). *Fear: Definition, symptoms, traits, causes and treatment.* simplypsychology.org

Santander, B. (2022). *What is devaluation and how does it affect my finances?* https://www.santander.com

Scott, E. (2022). *How to deal with frustration.* https://www.verywellmind

Smitha, B. (2022). *Signs of frustration*. https://www.webmd.com

Tope, F. (2023). *Nigeria's currency redesign 2022: A case study approach.* www.premiumtimesng.com

Whalley, M. & Kaur. H. (2021). *Low self esteem.* psychologytools.com

Yolanda, W. (2022). *What is anxiety? Definition, symptoms and causes.* https://study.com

Paper and Pencil Test (PPT) Versus Computer-Based Test (CBT): Research Controversies of its Effects on Students' Achievement across Selected Variables

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Abstract

Testing is central to the practice of education and a fundamental activity in the learning process. It is not only used in obtaining information on learners' knowledge, understanding, abilities and skills but also, can be used to determine the learning outcome itself, advancing the learning procedure through appropriate feedback mechanisms. Results obtained through testing provide the ways to measure individual and institutional success, and so can have a profound driving influence on systems they were designed to serve. This paper therefore, examined various research controversies surrounding the effects of Paper and Pencil Test (PPT) and Computer Based Test (CBT) on students' academic achievement. The paper explored various advantages and disadvantage of both PPT and CBT. Research controversies on the effects of PPT and CBT on students' academic achievement based on computer familiarity, mode of administration, high and low attaining students, as well as gender were extensively reviewed. The findings of various studies reviewed showed that PPT and CBT have both positive and negative effects on students' academic achievement. Again, this study finding revealed that students' academic achievement is the same when assessed with either PPT or CBT. The researchers therefore concludes that no assessment mode (PPT or CBT) can be said to be superior or better than the other. PPT or CBT can be used for assessment of students' academic achievement. The researchers recommended among others that examination bodies, institutions' authorities and other stake holders in education can adopt the use of either PPT or CBT for assessment of students' academic achievement. Curriculum planners on the other hand should make and implement

policies that will ensure that schools use either of the assessment modes (PPT or CBT) for assessment of students' academic achievement without any doubt on its effectiveness.

Keywords: Test, Paper-and-Pencil Test, Computer-Based Test, Students, Academic Achievement

Introduction

Test as well as examinations at all stages of education have been considered an important and powerful tool for decision making in the present dynamic and competitive society, with students being evaluated with respect to their achievement, skills and abilities. Test has been defined as an assessment intended to measure the test-takers' knowledge, skill, aptitude, intelligence, physical fitness, or classification in many other topics. It is also a device or tool or an instrument used to determine whether a testee possesses or does not possess a given attribute or behavior (Abanobi, 2022). This implies that test is a form of examination to reveal what an individual possesses or does not possess with respect to intelligence, personality, aptitude or achievement. Students' academic achievement can be assessed using either paper and pencil test or computer based test. This study explored previous research findings controversies surrounding effects of Paper and Pencil Test (PPT) and Computer-Based Test (CBT) on students' academic achievement. Observations have shown that arguments exist in literature among researchers and many other stakeholders in education about the effects of the use of either PPT or CBT on students' academic achievement. Over time, the question has always been, which of these tests (PPT or CBT) affects students' academic achievement positively or otherwise? The researchers therefore, examined some of these research controversies on the effect of PPT and CBT on students' academic achievement based on selected variables such as computer familiarity, mode of test administration, high and low attaining students, as well as students' gender.

Paper-and-Pencil Test (PPT), Its Advantages and Disadvantages

Paper-and-Pencil Test (PPT) refers to a general group of assessment tools in which candidates read questions and respond in writing. It is a type of assessment in which questions are presented on a paper and testees are expected to respond in writing using paper and pen or pencil. PPT has been defined by Psychology Dictionary (2015) as a test wherein the problems or queries are penned, printed, or drawn and the answers are penned too. Because many candidates can be assessed at the same time with a PPT, such test is believed to be an efficient method of assessment. PPT is available for traditional classroom situations, where computer access is limited or where a controlled testing environment is required (Public Commission of Canada, 2011). The advantages

of PPT include: its portability and can be used in any setting. This means that PPT can be used in a rural, semi-urban or urban area where there is electricity or no electricity as opposed to a test administered electronically. Additionally, there is nothing such as database crashes in PPT because the students' responses to the questions are made in writing and documented and therefore, could not be lost as compared to electronic tests. Also, PPT does not lead to equity issues in the sense that it can be administered to the students irrespective of their skills or background knowledge of computer. PPT sometimes makes it easier for testees to think logically which gives them a sense of purpose when writing tests (Abanobi, 2022).

Furthermore, ASC (2021) reported that there is no need for internet because paper and pencil test do not require use of internet as compared to computer based testing. This is especially true in areas of the world that do not have the internet bandwidth or other technology necessary to deliver computer-based testing. Another advantage of paper exams is that it can often work better for students with special needs, such as blind students which need a reader. Paper and pencil testing is often more cost-efficient in certain situations where the organization does not have access to a professional assessment platform or learning management system. It is very affordable in the sense that some schools do not have the much needed resources to use computer based test.

Nevertheless, PPT has various problems which has question on its validity. The disadvantages of PPT has been explored by ASC (2021); as follows;

i. **Need for lots of resources to scale*:*** Delivery of paper-and-pencil testing at large scale requires a lot of resources. There is need for printing and distribution of the questions. This requires lots of logistics before and after the examinations.
ii. **Prone to cheating*:*** Most paper and pencil exams count on invigilators and supervisors to make sure that cheating does not occur. However, many pen-and-paper assessments are open to leakages. High candidate-to-ratio is another factor that contributes to cheating in paper and pencil exams.
iii. **Poor student engagement*:*** Unlike online exams which have options to keep the students engaged, offline exams are open to constant destruction from external factors
iv. **Time to score:** Traditional methods of hand-scoring paper tests are slow and labor-intensive. Instructors take a long time to evaluate tests. This defeats the entire purpose of assessments and may affect accuracy, and consistency of the scores
v. **Poor result analysis*:*** Pen-and-paper exams depend on instructors to analyze the results and come up with insight. This requires a lot of human resources and expensive

software. It is also difficult to find out if the learning strategy is working or needs some adjustments.

vi. Time to release results: Waste of time in scoring paper and pencil test also gives room to further waste time in the release of the results unlike computer based testing can be immediate.

vii. Slow availability of results to analyze: Similarly, psychometricians and other stakeholders do not have immediate access to results. This prevents psychometric analysis, timely feedback to students/teachers, and other issues.

viii. Accessibility: Unlike paper and pencil test, computer based test can be built with tools for zoom, color contrast changes, automated text-to-speech, and other things to support accessibility.

ix. Convenience: Online tests are much more easily distributed. If you publish one on the cloud, it can immediately be taken, anywhere in the world.

x**. Support for diversified question types:** Paper and pencil test have few options when it comes to question types unlike computer based test which comes in various forms and types. Unlike PPT which are limited to a certain number of question types, computer based test offer many question types. Videos, audio, drag and drop, high-fidelity simulations, gamification, and much more are possible.

xi. **Lack of modern psychometrics:** Paper exams cannot use computerized adaptive testing, linear-on-the-fly testing, process data, computational psychometrics, and other modern innovations.

xii. Environmental friendliness: Sustainability is an important aspect of modern civilization. Online exams eliminate the need to use resources that are not environmentally friendly such as paper. Other disadvantages of PPT may include students conniving with supervisors and school authorities to cheat, body writing or tattoo in which students especially females write on hidden parts of their bodies. The above disadvantages of PPT does not in any discredit its usefulness in school system. Apart from using PPT for students' assessments in school, students can also be assessed using computer based test in schools.

Computer-Based Test (CBT), Its Advantages and Disadvantages

Computer Based Test (CBT) is a method of administering tests in which questions are presented through or on a computer on one hand and on the other hand, testees are expected to respond to the questions through the same computer. CBT refers to tests or assessments that are administered by computers in either standalone or dedicated network, or by other technological devices linked to the internet or worldwide web, most of them using multiple-choice questions (Sorana-Daniela & Lorentz in Abanobi, 2022). This method of testing is important because it can measure different

skills or sets of knowledge in order to provide new and better information about individuals' abilities. Individuals can take CBT even with minimal or no previous computer experience; since, instructions provided in a basic computer tutorial before the test will provide the experience needed to take the test using a mouse. One may spend much time on the tutorial to ensure mastery of the computer before the official timed examination.

The advantages of CBT have been extensively documented in literature in the following ways:

i. CBT are capable of including more interactive and engaging question types, such as simulations, on-line experiments, and graphing, allowing for the measurement of skills not easily assessed by PPT. In addition, proponents of computerized tests argue that they are a better match with the way students are accustomed to learning (Csapó, Ainley, Bennett, Latour, & Law, 2010).

ii. CBT can be adapted to individual students' ability levels. Computer-adaptive tests adjust item difficulty based on students' responses to previous items. Incorrect responses evoke less difficult items, while correct responses evoke increasingly difficult items. This results in a more refined profile of skill levels for each student (Education Commission of the States, 2010).

iii. CBT allows educators to collect data on students' testing strategies, intermediate progress, amount of time spent on each question, and thought processes, in addition to their final answers. This information is based on analyses of times and sequences in data records that track students' path through each task, their choices of which materials to access, and decisions about when to begin responding to items (Csapó et al., 2010).

iv. CBT can be more easily designed to meet the needs of special populations, including students with disabilities and those from diverse linguistic backgrounds

v. Quicker scoring of tests provides timely feedback to inform future instruction (Education Commission of the States, 2010;).

vi. Computerized administrations result in greater standardization of test administrations. For example, computers manage test timing very accurately.

vii. Additional educational tools can be made available on an item-specific basis. For example, dictionaries can be made available for certain questions and turned off for others; one part of a test might require a full scientific calculator while another part might require only a simple four-function calculator

viii. CBT provide several security advantages. Instead of storing testing materials at school sites for days before a test administration, tests can be sent over the Internet at the last minute, reducing the possibility of questions being exposed prior to the test. In addition, item sequences can be randomly scrambled for each student. When adaptive

tests are used, students respond to different subsets of items so there is not one specific set of test questions that can be copied and distributed.

ix. Electronic delivery is less expensive than printing and mailing large quantities of testing materials. In addition, errors found in test booklets or answer sheets can be quickly and easily corrected, instead of reprinting and reshipping testing materials at considerable expense (Van Lent, 2009).

x. Upon completion of the test, answer sheets and test booklets do not have to be mailed back to a central location for scoring, eliminating the chance that materials will be lost or damaged (Bridgeman, 2009).

xi. CBT reduce the costs associated with entering, collecting, aggregating, verifying, and analyzing data (Buško, 2009; Kozma, 2009).

xii. Computerized tests reduce teachers' assessment demands in the classroom. Staff time is reduced because there is no longer the need to process vast amounts of paper

xiii. CBT significantly reduce the consumption of paper (Kikis-Papadakis & Kollias2009).

However, the advantages available in CBT do not mean that CBTs are intrinsically better than PPTs (John, Cynthia, Judith & Tim in Abanobi, 2022). Efforts to computerize tests have been hindered by a number of challenges in the following ways:

i. Computer crashes are more difficult to resolve than broken pencils. There is the potential that an entire testing session, along with all students' responses, could be lost. Back-up procedures are essential, both in terms of storing student responses and having alternative means to administer the test (Education Commission of the States, 2010; Bridgeman, 2009). Kyllonen (2009) stated: "Computers add an extra layer of complication, require extra reviews, advanced set-ups, and tryouts."

ii. There are significant start-up costs for CBT which include hardware, software, and network purchases, connectivity, item banking, staff training, and technical support (Education Commission of the States, 2010; Kikis-Papadakis & Kollias, 2009; Kozma, 2009; Kyllonen, 2009; Lee, 2009).

iii. CBT can lead to equity issues if some students have more access to computers and greater computer literacy skills than others. Research suggests that students with more computer skills perform at higher levels on CBT than students with lower levels of computer skills (Csapó et al., 2010; Education Commission of the States, 2010; Thompson & Weiss, 2009).

iv. Security concerns associated with CBT center around staggered administrations of the same assessment (Kozma, 2009; van Lent, 2009). In addition, "a simple push of a button could send 'secure' test forms literally around the world." They concluded that states need to create multiple forms of each test, which will require the development of much larger item banks than most states currently have available.

v. School computing facilities vary considerably and it is often difficult to ensure that students are provided with uniform testing environments. Equipment often varies from one school to the next and sometimes from one machine to the next within the same school. Variability in testing conditions and procedures, such as Internet connection speeds and hardware and software specifications, must be addressed (Csapó et al., 2010). Bennett (2003) suggested that equipment variations be controlled by establishing hardware and software standards, directly manipulating resolution and font characteristics through the test delivery software, and designing items so that they display adequately at the lowest likely resolution.

vi. When large numbers of students take an assessment simultaneously, issues of scale must be addressed, such as network and server congestion, fluctuations in speed, and possible disruptions in service (Kozma, 2009; Kyllonen, 2009; Thompson & Weiss, 2009).

vii. Many schools lack the technical support needed to keep computerized systems functioning properly and equipment running smoothly (Bennett, 2003; Buško, 2009; Education Commission of the States, 2010).

viii. Most schools don't have the capacity to test all students on computers in one session. Therefore, administration of computer-based assessments usually involves significant changes to existing teaching schedules, as well as room, student, and personnel assignments. States, districts, and schools must decide how many testing sessions are needed, how many and which students will test during each session, and the specific dates and times of the testing window (Buško, 2009; Kozma, 2009; van Lent, 2009).

ix. Considerable numbers of staff need to be trained in the administration of computerized tests. Test administrators need knowledge related to loading and/or accessing files, ensuring uniform assessment conditions, disabling software features (such as grammar checker for a writing test), and storing and transmitting files. (Buško,

2009) noted that states must not underestimate the amount of staff training that is required in the early years of new programs.

x. Scoring interactive design problems with open-ended responses is much more difficult than developing an answer key for multiple-choice questions (Bridgeman, 2009).

Based on the above, one may argue rightly that despite the merits of CBT, it does not mean that it is better than PPT in all sense i.e neither of the two modes of testing can be said to better than the other.

Research Controversies on the Effects of PPT and CBT on Students' Achievement

There are lot of controversies surrounding comparability of PPT and CBT in terms of how it affects students' academic achievement in several studies. Many studies conducted to compare effects of PPT and CBT have been quite varied in the literature. For instance, Abanobi (2022) conducted a study on comparative analysis of academic achievement scores of students exposed to CBT and PPT in Economics. Three research questions were raised and answered. Three null hypotheses were tested at 0.05 level of significance. The study utilized pretest-posttest non-randomized control group design involving experimental and control groups. The study was carried out in Asaba, capital of Delta State, Nigeria. 973 SS II students who offered Economics in ten co-educational secondary schools in the study area comprised the population of the study. The sample was 107 students who offered Economics in the schools selected. Economics Achievement Test (EAT) was the instrument for data collection. The instrument was validated by experts in Educational Measurement and Evaluation. The reliability coefficient of EAT was 0.9. Mean statistics was used to analyze the research questions while the null hypotheses were tested using ANCOVA. The findings revealed the that students' mean achievement scores in PPT was slightly higher than students' mean achievement scores in CBT and the students' mean achievement scores were significantly different.

Abdulkadi, Onibere, and Odion (2019) investigated whether the students from mathematical science-based undergraduate degree programmes in Kaduna State University perform academically better when either the Computer-Based Test (CBT) or the Paper-Pencil Test (PPT) is used to write the Unified Tertiary Matriculation Examination (UTME), which is conducted annually by the Joint Admissions Matriculation Board (JAMB). The study adopted a quantitative approach to research. A purposive sample of one thousand and twenty-three (1023) first-year students constituted the population for the study. This population was drawn from Computer Science, Mathematics and Physics undergraduate degree programmes in the Kaduna

State University who were admitted from the 2010/2011 to 2012/2013 and 2015/2016 to 2016/2017 academic sessions respectively. The instruments used for data collection were the UTME scores and the academic standing of first-year Cumulative Grade Point Average (CGPA) results, which were coded and analysed with the aid of Computational Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics and Analysis of Variance (ANOVA) were the statistical tools used to answer the four (4) research questions raised. The results revealed a majority of the students who performed academically better were those who used the PPT as their test medium in writing the UTME. It concluded that the majority of the students who wrote the UTME using PPT performed better than those who used CBT.

Similarly, Alabi, Samuel and Sabitu (2023) conducted a study on effectiveness of Computer Based and Paper Pencil Test on the achievement of secondary school chemistry students, was studied using causal comparative design, a sample size of 178 was used. Instrument for data collection was the Chemistry Achievement Test, (CAT). The CAT was validated using Test-retest and it was found with reliability coefficient of 0.89. Research questions were answered using mean and standard deviation while hypotheses, were analyzed using independent sample t-test. The findings revealed that Chemistry students who were administered Paper and pencil test (PPT) perform better than their peers in computer base test (CBT).

Furthermore, Smolinsky, Marx, Olafsson, and Ma (2020) examined Computer-Based and Paper-and-Pencil Tests in Calculus for STEM Majors. Three sections with 324 students were employed: paper-and-pencil testing, computer-based testing, and both. Computer tests gave immediate feedback and allowed multiple submissions and pooling. Paper-and-pencil tests (PPTs) required work and explanation allowing inspection of high cognitive demand tasks. Each test mode used the strength of its method. Students were given the same lecture by the same instructor on the same day and the same homework assignments and due dates. The design was quasi-experimental, but students were not aware of the testing mode at registration. The results indicate that CBTs are as consistent with PPTs as CBTs are with themselves. Results are also consistent with classes using PPTs having slightly better outcomes than fully computer-based classes using only computer assessments.

Sheu and Evanero (2022) carried out a study on comparability of Computer Based Test (CBT) and Paper-Pencil Test (PPT) on students' scores in Educational assessment course at Federal University Gusau, Zamfara State. The study adopted the repeated measures design. The population for this study comprised of all undergraduate students of Federal University Gusau. The target population comprised of all the 450 registered 300 level undergraduate students from Faculty of Education, Federal University Gusau during 2021/2022 academic session. All the students were

purposively selected for the study. Two instruments were used for data collection: The Multiple Choice Test in Test and Measurement (MCTTM) used for PPT and CBT had acceptable content validity coefficient of correlation of 0.69 percent and split-half reliability coefficient of 0.81, while the ICT Competence Questionnaire developed for obtaining information on students' competence in and attitude to ICT had test re-test reliability coefficient of 0.78 and 0.81 respectively. Data collected were analyzed using descriptive and inferential statistics. The hypotheses formulated for the study were tested at 0.05 alpha level of significance. The findings of the study revealed that Federal University Gusau undergraduate students have little competence in ICT. It also revealed significant difference in students' scores in CBT and PPT in an educational assessment course. The difference is in favour of PPT with mean score of 48.72. The study also revealed no significant effect of gender on students' scores on the two modes of testing. In addition, significant relationships also exist among students' competence in, attitude to ICT and their performance in CBT. Other studies ((Dermo & Eyre, 2008; George, 2011; Clariana & Wallace, 2002) found out that students believed the PPT enhanced their performance while CBT had a negative effect. Computer familiarity was examined as another important factor that may have an impact on students CBT performance, but the results were not consistent. Some studies suggest that computer familiarity was not related to performance difference between CBT and PPT groups (Clariana & Wallance, 2002; Bennett, Braswell, Oranje, Sandene, Kaplan, & Yan, 2008). Little or no performance difference was shown associated with students' computer familiarity, suggesting that computer experience does not affect students' CBT scores (Edit; Taylor, Kirsch, Eignor, & Jamieson in Robert, Hong, Chao, Ming & Yoon, nd; Leeson, 2006). On the other hand, other studies reported the opposite findings. For example, Goldberg and Pedulla (2002) found that students' computer familiarity was significantly associated with test performance in CBTs. Students with lower computer familiarity scored lower on CBTs than students with moderate and higher computer familiarity.

Contrast to the findings of the earlier reviewed empirical studies; Flowers, Kim, Lewis, and Davis (2011) examined academic performance and preference of students with disabilities for two types of test administration conditions, computer-based testing (CBT) and pencil-and-paper testing (PPT). Data from a large-scale assessment program were used to examine differences between CBT and PPT academic performance for third to eleventh grade students with a read-aloud accommodation in reading, mathematics, and science. Since random assignment was not possible, propensity score analyses were used to establish equivalent groups and to test for differences in performance. Students in the PPT condition with an adult reader had higher mean scores in almost all academic content areas than those with the CBT read-aloud condition, with effect sizes ranging from extremely small ($d = .02$) to moderate ($d = .69$). Differential

item functioning (DIF) analyses suggested that most items had negligible DIF and did not favor either the CBT or the PPT conditions. Students and staff reported that students preferred the CBT to the PPT, and students believed they performed better using the computer

On the same note, Okocha (2022) examined the perception of undergraduate students towards computer based testing by comparing several modules studied by Undergraduate students in Nigeria which constitutes a major gap in literature. Results showed that majority of students preferred computer based testing to paper based testing but were not willing to adopt this technique in all courses. Results further showed majority of students had preference to paper based tests in Mathematics more than 50% of students had below average grades when the CBT technique was implemented. Similarly, students showed poor grades in Mathematics, Chemistry and Physics. Results further showed the relationship between computer and anxiety and performance in in Mathematics .This study has implications for university administrators in the creation of policies for Computer based testing.

Similarly, Osadebe, and Esegbue (2018) investigated students' academic performance in JAMB chemistry test under the computer based testing and paper pencil media in Delta State University. Five research questions were raised and answered; five null hypotheses were formulated and tested to guide the study. Review of literature covers the conceptual framework, concept of computer based testing and paper pencil testing and empirical findings related to the study. Ex post facto methods were used, 10 % of the total populations were used which is 2098 students result scores for both years. The instrument used is chemistry JAMB raw scores for 2012 and 2015 result. Experts from JAMB and Department of Guidance and Counseling (measurement and Evaluation) in Delta State University validated the instruments. The reliability was done by JAMB experts with a reliability coefficient of 0.83 for paper pencil test and 0.87 for computer based testing. The analysis of data was carried out using the mean to answer calculate the research questions and Z-test statistic was used to analyze the hypothesis. The findings revealed that there was a significant difference between the students' academic performance in computer based test and paper pencil testing in JAMB chemistry for Delta State University. The results showed that students performed better with the use of computer based testing than the paper pencil media in Delta State University.

Garas and Hassan (2018) examined whether the use of technology-based assessment tool affects the examinations' scores of students from both genders. The study, therefore, ascertains whether the mode of student testing (computer-based or paper-based) in an introductory-level financial accounting course impacted students' scores (a direct measure of learning). A simple difference in means statistics test shows

that there is no statistically significant difference between the students' paper-based and computer based scores. However, benchmark regression analysis showed that males performed better than females on CBT, and females outperformed males on PBT. A triangulation of other studies (Telia & Bashorun in Alabi, Issa and Oyekunle, 2012; Ayo, Akinyemi, Adebiyi & Ekong, 2007) also found that students perform better in CBT than PPT.

Research Controversies on Effects of PPT and CBT on Students' Academic Achievement Based on Computer Familiarity and Mode of Test Administration

Controversies also exist in literature on the effect of familiarity and mode of administration of PPT and CBT on students' academic achievement. Computer familiarity was examined as another important factor that may have an impact on students CBT performance, but the results were not consistent. Some studies suggest that computer familiarity was not related to performance difference between CBT and PPT groups (Clariana & Wallance, 2002; Bennett, Braswell, Oranje, Sandene, Kaplan, & Yan, 2008). Little or no performance difference was shown associated with students' computer familiarity, suggesting that computer experience does not affect students' CBT scores (Edit; Taylor, Kirsch, Eignor, & Jamieson in Robert, Hong, Chao, Ming & Yoon in Abanobi, 2022; Leeson, 2006). On the other hand, other studies reported the opposite findings. For example, Goldberg and Pedulla (2002) found that students' computer familiarity was significantly associated with test performance in CBTs. Students with lower computer familiarity scored lower on CBTs than students with moderate and higher computer familiarity. Horkay et al (2005) reported that sample of eighth grade students participating in the National Assessment of Educational Progress' Writing Online (WOL) study showed that students reporting more computer familiarity scored higher on the computer-based test than those reporting less computer familiarity. Computer familiarity added about 11 percentage points over PPT writing scores to the prediction of performance. Studies indicate that students with more computer skills receive higher scores on computer-based tests than students with fewer computer skills. Conversely, students with fewer computer skills and those who don't use computers on a regular basis have been found to perform better on CBT (Bridgeman, 2009; Csapó et al., 2010; Education Commission of the States, 2010; Gamire & Pearson, 2006; Kyllonen, 2009; Paek, 2005; Poggio et al., 2005). In a study by Schmiddt, Ralph, and Buskirk (2009), it was indicated that the online exams provided an opportunity for students to complete the exam at a time that was best for them. Several researchers have noted that the replacement of PPTs with CBTs introduces equity issues into the testing situation. In the U.S., for example, surveys conducted for Pew Research Center's Internet & American Life Project in 2009 found that only 35 percent of low-income Americans

(household income reported at $20,000 or less) stated that they had no broadband connections, while 85 percent of upper-income Americans (household incomes reported at over $75,000) stated that they had access to these services (Horrigan, 2009). It is therefore possible that higher-income students have more familiarity and experience with computers.

In contradiction to the above findings, a few studies have found no evidence that students with less computer experience score lower on computer-based assessments (Florida Department of Education, 2006; Paek, 2005; Wang & Shin, 2009). Higgins, Russell, and Hoffmann (2005) comparison of Vermont students randomly assigned to complete a reading comprehension test on CBT or PPT found no significant differences in test scores based on students' self-reported levels of computer fluidity (ability to use the mouse and keyboard) or computer literacy (familiarity with computing terms and functionality).

Overall, research on the comparability of computerized and paper-and-pencil assessments suggests that mode of administration has very little effect on students' performance (Bennett et al., 2008; Horkay et al., 2005; Moe, 2009; Schroeders, 2009; Sórenson & Andersen, 2009; Wang et al., 2007; Poggio et al., 2005). For example, the Agency pointed out that a mode difference of even one point on a test can result in a substantial number of students not passing because they took the test in a different mode. Several studies have also found that even when overall test score differences between the two modes of administration are not significant, certain items may be more affected by mode of administration than others (Choi & Tinkler, 2002; Johnson & Green, 2004; Kim & Huynh, 2007; Higgins et al., 2005).

Similarly, Higgins, Russell, and Hoffmann (2005) examined the test scores of fourth grade students who were randomly assigned to complete the same computer-based reading comprehension test in one of three modes: on paper; on computer with scrolling reading passages; or on computer with passages divided into sections that were presented as whole pages of text. They found that students completing the test on paper received the highest mean score, followed by the whole page group, and then by the scrolling group, although there were no significant differences among the scores of the three groups. The researchers concluded: "Overall, students were neither advantaged nor disadvantaged by the mode of test delivery" p.23. Interestingly also, there is a research controversy on the effect of PPT and CBT on High and low attaining students' academic achievement. For example, Clariana and Wallance (2002) found higher-attaining students benefited most from CBTs relative to higher-attaining students under PPTs. Similarly, Leeson (2006) found that high-ability students' performance appeared to be advantaged by CBT.

Research Controversies on Effects PPT and CBT Students' Achievement Based on Gender

The results of the effect of demographic attributes on students' CBT performance are not always consistent. For example, some studies indicate that gender was not related to performance differences between CBT and PPT (e.g., Alexander, Bartlett, Truell, & Ouwenga, 2001; Clariana & Wallance, 2002), while other studies suggest that gender is associated with the test mode (Abanobi et al, 2023, Abanobi, 2022; Gallagher, Bridgeman, & Cahalan, 2000; Leeson, 2006), with male examinees benefiting from the CBT format more than female examinees who showed slightly poorer performance on CBTs. In the same vein, Gaskell and Marshall (2007) found a significant difference in Numeracy multiple-choice assessment with students doing significantly better in the paper mode than the electronic (online) mode of the assessment. In this study the researchers reported "that the difference between paper and electronic modes was greater for males than females", but much of the gender difference is "attributed to some larger school having considerable gender differences", p.4. The opposite is the case of other studies' results which have shown both positive attitude and high regard to CBT, with more positive perception by female students in the studies done by Ayo, et al. (2007), Bebetos and Antonio (2008) as well as Kadel (2005). Another separate study investigating the difference in performance between CBT and PPT in terms of gender, race and age, found no significant difference (Bennett, Braswell, Oranje, Sandene, Kaplan & Yan, 2008). Whereas, in some other studies, gender was related to performance difference between CBT and PPT (Gallagher, Bridgeman, Cahalan, 2002; Lesson, 2006) with male examinees benefitting from CBT format more than female examinees who scored slightly lower in CBTs. The rise in technology has seen the emergence of a social issue called the "digital divide". The digital divide refers to individual or group inequalities in technological knowledge, accessibility, skill, self-efficacy and anxiety, these differences are often due to factors such as gender, age, race and socio-economic status.

Jones, Johnson-Yale, Millermaier and Perez (2009) as well as Cooper (2006) conducted a meta-analysis on the past 20 years of research studying gender differences and the digital divide. He found out that girls and women expressed greater anxiety and more negative attitudes toward computers than boys and men. According to Cooper (2006), girls learn from an early age that computers are an educational medium designed with boys in mind; this perception creates greater stress and anxiety whenever girls and women interact. As a result of gender roles assigned by different cultures, many women have been brought up to see technology and its use as exclusively reserved for the male gender. Asuquo and Onasanya (2006) reported that women look at computers and see more than machines, thus considering computers as masculine and

complicated to use. According to Munusamy (2009), many factors in and outside the classroom result in girls being turned away from computer technology. These factors include the media depicting men as experts in technology, societal expectations of different goals for boys and girls, the structure of learning tasks, the nature of feedback in performance situations and the organization of classroom sitting. Because these factors are often restrained, they go unnoticed. It is little wonder why boys are more knowledgeable in computer than girls.

Some studies have found that, regardless of gender, students perform at similar levels when they take tests on computers versus on paper (Florida Department of Education, 2006; Paek, 2005; Poggio et al., 2005; Sim & Horton, 2005). On the other hand, a number of studies have found that boys outperform girls when tested on the computer, while girls perform significantly better on paper-and-pencil tests (Csapó et al., 2009; Halldórsson et al., 2009; Lee, 2009; Martin & Binkley, 2009; Sórenson & Andersen, 2009).

Researchers have hypothesized several reasons for this finding. Some suggest that although gender gaps in volume of computer usage have closed rapidly over the last few years, boys are much more likely to play online games and use game-type software that are similar to the flash animations and video footage used with many computer-based test items. These activities expose boys more frequently to the content that appears in computerized tests. Others theorize that boys' higher performance on computerized tests may partially be explained by computer-based tests' lower reading load or a bias toward boys in the content of items included on computerized tests (Crusoe, 2005; Halldórsson et al., 2009; Martin & Binkley, 2009; Sórenson & Andersen, 2009;). Horkay et al (2005) used the National Assessment of Educational Progress' (NAEP) Writing Online (WOL) study to examine differences in students' performance on computer-based and paper and-pencil tests, based on their gender, ethnicity, parents' education level, income level (based on eligibility for free or reduced price lunch), and school location. WOL groups were composed of nationally representative groups of eighth grade students drawn from the main NAEP assessments. The researchers found no significant differences in either boys' or girls' performance on computer-based versus paper-and-pencil tests.

Discussion

The findings of previous studies which examined the effects CBTs and PPTs on academic achievement based on computer familiarity, mode of test administration, high and low attaining students, as well as gender seemed inconsistent, providing no strong support whether students' academic achievement is better when either of the assessments (PPT or CBT) is used. These controversies are somehow expected due to the fact that there have been so many studies to different groups of examinees

with different designs and data collection techniques in a wide range of content areas and a variety of item formats. Again, these controversies on the effect of PPT and CBT on students' academic achievement may also be due to the fact that various examination conditions in which the examinees where exposed in the different studies differed, and, this may have contributed to one assessment (PPT or CBT) proving to be better than the other in such studies. Given the above scenario, one cannot argue authoritatively with facts that either of the assessments (PPT or CBT) is better. Again, there are a number of factors which also may have influenced the research outcomes of these various studies reviewed. These factors may include, the interest (premonition) of the researcher in the study, students' knowledge, students' socio-economic background, students' school background factors among others. When either of the above mentioned factors differ or are not the same, students' academic achievement is likely to differ when assessed with PPT or CBT. This equally indicates that PPT and CBT have both positive and negative effects on students' academic achievement if these factors remain differently. Furthermore, another insight from the findings of various studies reviewed, is that students' academic achievement is the same when assessed with either PPT or CBT. Summarily, all things being equal, students' academic achievement irrespective of computer familiarity, mode of administration, high and low attaining students, as well as gender is more likely to be the same when assessed with either PPT or CBT.

Conclusion

Based on the findings, the researchers therefore conclude that no mode of assessment (PPT or CBT) can be said to be superior or better than the other. Either PPT or CBT can be used for assessment of students' academic achievement.

Recommendations

The following recommendations were made;

1. Examination bodies, institutions' authorities and other stake holders in education can adopt the use of either PPT or CBT for assessment of students' academic achievement in various internal and external examinations
2. Curriculum planners should make and implement policies that will ensure that schools use both PPT or CBT for internal assessment of students' academic achievement
3. Government and various stakeholders in education should ensure that there is enabling environment for PPT or CBT to be used for assessment of students' academic achievement

References

Abanobi, C. C., Agu, N. N., Eleje, L. I., Mbelede, N. G., Metu, I. C., & Ezeugo, N. C. (2023). Effects of Computer-Based Test (CBT) and Paper and Pencil Test (PPT) on academic achievement and test anxiety of secondary school students' in economics. *Innovare Journal of Education, 11*(1), 35-41. DOI: https://dx.doi.org/10.22159/ijoe.2023v11i1. 45960.

Abanobi, C. C. (2022). Comparative analysis of academic achievement scores of secondary school students exposed to Computer-Based Test (CBT) and Paper and Pen Test (PPT) in economics in Nigeria. *Asian Journal of Advances in Research 16(*1), 11-21.

Abdulkadir, S., Onibere, E. A., & Odion, P. O. (2019). Assessment of students' academic performance using admission entry requirements under the computer-based test and paper pencil-based test in Kaduna State University, Kaduna – Nigeria. *International Journal of Modern Education and Computer Science(IJMECS), 11*, (8), 48-60, DOI: 10.5815/ijmecs.2019.08.06

Akman Yesilel, D. B. (2012). Test anxiety in elt classes. *Frontiers of Language and Teaching,* 3, 24-31.

Akinleke W. O., & Adeaga, T. M. (2014). Contributions of test anxiety, study habits and locus of control to academic performance. *British Journal of Psychology Research, 2* (1), 14-24.

Akinsola, E. F., & Nwajei, A. D. (2013). Test anxiety, depression and academic performance: Assessment and management using relaxation and cognitive restructuring techniques. *Scientific Research Psychology 4*(6A1), 18-24. Retrieved from www.scirp.org/journal/psych or http://dx.doi.org/10.4236/psych.2013.46A1003

Alabi, A., Samuel, K., & Sabitu, A. (2023). Effectiveness of computer based and paper pencil tests on the achievement of senior secondary school chemistry students in Kano metropolis. *AJSTME, 9*(2), 97-102. https://www.ajstme.com.ng ISSN: 2251-0141 (Print), 2971-623 (Online)

Alabi, A.T., Issa, A. O. & Oyekunle, R. A. (2012). The use of computer based testing method for the conduct of examinations at the university of Ilorin. *Ife Journal of Educational Leadership, Administration and Planning (IJELAP), 1*(1), 226.

Al-amri, S. (2009).*Computer-based testing vs. paper-based testing:Establishing the comparability of reading tests through the evolution of a new comparability model*

in a Saudi EFL context. Thesis submitted for the degree of Doctor of Philosophy in Linguistics. University of Essex.

Alderson, J. C. (2000). Technology in testing: The present and the future. *System, 28*(4), 593-603.

Alexander, M., Bartlett, J., Truell, A., & Ouwenga, K. (2001). Testing in computer technology courses: An investigation of equivalency in performance between online and paper and-pencil methods. *Journal of Career and Technical Education, 18*(1), 69-77.

Ali, N., Jussof, K., Ali, S., Mokhtar, N., Syafena, A., & Salamat, S. (2009). The factors influencing students' performance at universiti Teknologi MARA Kedah, Malaysia. *Management Science and Engineering, 3(4),* 81-90.

Alisa, E. S. (2014). *The impact of assessment delivery method on student achievement in language arts.* Unpublished Ph.D thesis submitted to the Graduate Department and Faculty of the School of Education of Baker University.

ASC (2021*). Paper-and-pencil testing: Still around?* https://assess.com/paper-and-pencil-testing/#:~:text=Some%20advantages%20of%20paper%2Dand,from%20technical%20gli tches%2C%20and%20affordability.

Asuai, N. C., & Adeleye, B. A. (2013). Impact of peer assessment on performance in mathematics among senior secondary school students in Delta State, Nigeria. *Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS) 4*(5), 719-725

Asuquo, E. N., & Onasanya, S. A. (2006). Gender differences and students' achievement in computer technology instruction. *West African Journal of Educational Research, 9*(1&2),1-8.

Ayo, C. K., Akinyemi, I .O., Adebiyi, A. A., & Ekong, U. O. (2007). The prospects of e-examination implementation in Nigeria. *Turkish Online Journal of Distance Education, 8* (4), 125-134.

Balkin, R. S. (2010). Experimental designs. In C. J. Sheperis, M. H. Daniels & J. S. Young (Eds.). *Counseling Research: Quantitative, Qualitative, and Mixed Methods*. Retrieved from http://www.learningace.com/doc/7712017/2dc45e674a546e03434921b1b9caf16/chapter-5-experimental-designs-richard-s-balkin

Bebetos, C., & Antonio, S. (2008). Why use information and communication technology in schools? Some theoretical and practical issues. *Journal of Information Technology for Teacher Education, 10*(1&2), 7-16.

Bennett, R. E., Braswell, J., Oranje, A., Sandene, B., Kaplan, B., & Yan, F. (2008).

Does it matter if I take my mathematics test on computer? A second empirical study of mode effects in NAEP. *Journal of Technology, Learning, and Assessment, 6*(9).

Bennett, R. E. (2003). *Online assessment and the comparability of scores: Meaning and educational testing service.* Princeton: NJ Publishers.

Bridgeman, B. (2009). Experiences from large-scale computer-based testing in the USA. In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for official publications of the European communities.

Buško, V. (2009). Shifting from paper-and-pencil to computer-based testing: Requisites, challenges and consequences for testing outcomes. A Croatian perspective. In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for official publications of the European communities.

Calaguas, G.M. (2011). Academic achievement and academic adjustment difficulties among college freshmen. *Journal of Arts, Science and Commerce, 2*(3), 72-76.

Choi I., Kim, K.., & Boo, J. (2003). Comparability of a paper-based language test and a computer-based language test. *Language Testing, 20*(3), 295-320.

Choi, S. W., & Tinkler, T. (2002). *Evaluating comparability of paper-and-pencil and computer-based assessment in a k-12 Setting.* Paper presented at the annual meeting of the National Council on Measurement in Education, New Orleans, LA, April 2002. Retrieved from http://www.ncme.org/repository/incoming/100.pdf

Chuah, S. C., Drasgow, F., & Roberts, B. W. (2006). Personality assessment: Does the medium matter? No. *Journal of Research in Personality, 40*, 359–376.

Clariana, R, & Wallance, P. (2005). Paper-based versus computer-based assessment: Key factors associated with the test mode effect. *British Journal of Educational Technology, 33*(5), 593-602.

Csapó, B., Ainley, J., Bennett, R., Latour, T., & Law, N. (2010). Draft white paper 3: Technological issues for computer-based assessment. *Assessment and Teaching of 21st Century Skills, The University of Melbourne, Australia.* Retrieved from http://www.atc21s.org/GetAssets.axd?FilePath=/Assets/Files/dc7c5be7-0b3a-4b7d-8408-cc610800cc76.pdf

Cooper, J. J. (2006) . The digital divide. The special case of gender. *Journal of Computer*
Assisted Learning, 22(5), 320-334.

Davey, T. (2011). *Practical considerations in computer-based testing.* ETS white paper.
Retrieved from http://www.ets.org/research/policy_research_reports/ publications/white_paper/2011/impw

Dermo, J., & Eyre, S. (2008). Secure, reliable and effective institution-wide e-assessment:
Paving the ways for new technologies. In F. Khandia (Ed.), *Proceedings of 12th International CAA Conference,* (95 –106). Loughborough: University of Loughborough.

Dorland, S. (2009). *Exam stress? No worries!* Milton, Queensland: Wrightbooks.

Eden, S., Shamir, A., & Fershtman, M. (2011). The effect of using laptops on the spelling skills of students with learning disabilities. *Educational Media International, 48*(4), 249-259. doi:10.1080/09523987.2011.63227

Education Commission of the States. (2010). *Assessment: Computer-based*. Retrieved from http://www.ecs.org/html/issue.asp?issueID=12&subIssueID=76.

Erle, L., Benjamin, O., Einar, W. S., & Raymond, S. (2006). Computer-based versus pen and-paper testing: Students' perception. *Ann Acad .Med. Singapore, 35*, 599-603.

Fadeyi, O., Desalu, O. O., Ameen, A., & Adeboye, A. N. M. (2010). The reported preparedness and disposition by students in a Nigerian university towards the use of information technology for medical education. *Annals of African Med, 9*(3), 129-134.

Farcot, M., & Latour, T. (2009). Transitioning to computer-based assessments: A question of costs. In F. Scheuermann & J. Bjórnsson (Eds.), *The transition to computer-based assessment: New approaches to skills assessment and implications for large-scale testing.* Luxembourg: Office for official publications of the European communities.

Florida Department of Education. (2006). *What do we know about choosing to take a high-stakes test on a computer?* Retrieved from
http://www.fldoe.org/asp/k12memo/pdf/WhatDo
WeKnowAbout ChoosingToTakeAHighStakesTestOnAComputer.pdf

Flowers, C., Kim, D.-H., Lewis, P., & Davis, V. C. (2011). A Comparison of computer-based testing and pencil-and-paper testing for students with a read-aloud accommodation. *Journal of Special Education Technology, 26*(1), 1–12. https://doi.org/10.1177/01626 4341102600102

Gallagher, A., Bridgeman, B., & Calahan, C. (2002). The effect of computer-based test on racial-ethnic and gender groups. *Journal of Educational Measurement, 39*(2), 133-147.

Gamire, E., & Pearson, G. (Eds.). (2006). *Tech tally: Approaches to assessing technological literacy*. Washington, DC: The National Academies Press.

Garas, S., & Hassan, M. (2018). Student performance on computer-based tests versus paper-based tests in introductory financial accounting: UAE evidence. *Academy of Accounting and Financial Studies Journal, 22*(2), 1-14. 1528-2635-22-2-168. https://www.abacademies.org/ articles/Student-Performance-on-CBT-versus-PBT-Introductory-Financial-Accounting-1528-2635-22-2-168.pdf

Gary, V. M., Jones. P., McNeil, H. P., & Kumar. R. K.. (2008). Integrated online formative assessments in the biomedical sciences for medical students: Benefits for learning. *BMC Med Educ, 8*, 52.

Gaskill, J., & Marshall, M. (2007). Comparisons between paper and computer based tests. *British Columbia, Canada: Society for the Advancement of Excellence in Education*, 1-50

Gavin, S. & Matthew, H. (2005). *Performance and attitude of children in computer based versus paper based testing.* Paper presented at the 7th International computer assisted assessment conference. Loughborough

George, Y. (2011). *Students' perception of computer-based assessment in the university of llorin, llorin, Nigeria*. Retrieved from www.scribd.com/doc/71979150

Glaister K. (2009). The presence of mathematics and computer anxiety in nursing students and their effects on medication dosage calculations. *Nurse Education Today, 27*(4),341-347.

Goldberg, A., & Pedulla, J. J. (2002) Performance differences according to test mode and computer familiarity on a practice GRE. *Educational & Psychological Measurement, 62*(6), 1053-1067.

Gwen, G. (2013). *Does the use of computer-based assessments produce less text anxiety symptoms than traditional paper and pencil assessments?* Unpublished Master's Research Project, Faculty of the College of Education, Ohio University

Halldórsson, A. M., McKelvie, P., & Björnsson, J. K.. (2009). Are Icelandic boys really better on computerized tests than conventional ones? Interaction between gender, test modality and test performance. In F. Scheuermann & J. Bjórnsson (Eds.), *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for official publications of the European communities.

Hassanzadeh, R., Ebrahimi, S., & Mahdinejad, G. (2012). Studying test anxiety and its relationship with self-efficacy, metacognitive beliefs and some effective predictable variables. *European Journal of Social Services, 30*(4), 511-522.

Higgins, J., Russell, M., & Hoffmann, T. (2005). Examining the effect of computer-based

passage presentation on reading test performance. *The Journal of Technology, Learning, and Assessment, 3*(4). Retrieved from http://escholarship.bc.edu/cgi/viewcontent.cgi?article=1054&context=jtla

Hills, J. P. & Benlow, H. (2008). *Effective study skills:* London: Ben Book Co.

Horkay, N., Bennett, R.E., Allen, N., & Kaplan, B. (2005). Part II: Online assessment in writing. In B. Sandene, N. Horkay, R.E. Bennett, N. Allen, J. Braswell, B. Kaplan, & A. Oranje (Eds.). *Online Assessment in Mathematics and Writing: Reports From the NAEP Technology-Based Assessment Project,* 457. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Horrigan, J. B. (2009). *Home broadband adoption*. Pew Internet and American Life Project. Retrieved from http://www.pewinternet.org/~/media//Files/Reports/2009/Home-Broadband-Adoption-2009.pdf.

Hosseinia, M., Abidinb, M., & Baghdarnia, M. (2014). Comparability of test results of computer based tests (cbt) and paper and pencil tests (ppt) among English language learners in Iran. *Social and Behavioral Sciences 98*, 659 – 667. https://cyberleninka.org/article/n/1159712

Huberty, T. J. (2009). Test and performance anxiety. *Principal Leadership, 10*(1), 12-16.

Jimoh, R. G., AbdulJaleel, K. S., & Kawu, Y. K., (2012). Students' perception of computer-based test (cbt) for examining undergraduate chemistry courses. *Journal of Emerging Trends in Computing and Information Sciences, (3)*2, ISSN 2079-8407.

Johnson, M., & Green, S. (2004). On-line assessment: The impact of mode on students' strategies, perceptions and behaviours, university of cambridge. Computing, Information Systems. *Development Informatics & Allied Research Journal, 6* (2). Retrieved from www.cisdijournal.net

Johnson, M., & Green, S. (2006). On-line mathematics assessment: The impact of mode on performance and question answering strategies, *The Journal of Technology, Learning and Assessment, 4*(5), 1-33.

Jones, S., Johnson-Yale, C., Millermaier, S., & Perez, F. (2009). U.S. college students' internet use: Race, gender and digital divides. *Journal of Computer-Mediated Communication, 14(*2), 244-464.

Joshua, M. T., Joshua, A. M., & Ikiroma, B. (2014). *Computer-based testing in Nigeria's university entrants' matriculation examination: Readiness and acceptability of critical stake-holders*. Retrieved from www.iaea.info/../paper_371f29eed.pdf

Kadel, C. (2005). *Innovation in education: The increasing digital world-issue of today and tomorrow*. New Jersey: Lawrence Erlbaum Associates

Karadeniz, S. (2009). The impacts of paper, web and mobile based assessment on students' achievement and perceptions. *Scientific Research and Essay, 4*(10), 984–991.

Kikis-Papadakis, K., & Kollias, A. (2009). Reflections on paper-and-pencil tests to e-assessments: Narrow and broadband paths to 21st century challenges. In F. Scheuermann & J. Bjórnsson (Eds.), *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for official publications of the European communities.

Kim, D., & Huynh, H. (2007). Comparability of computer and paper-and-pencil versions of algebra and biology assessments. *The Journal of Technology, Learning, and Assessment, 6*(4). Retrieved from http://escholarship.bc.edu/cgi/viewcontent.cgi?article=1111&context=jtla

Kozma, R. (2009). Transforming education: Assessing and teaching 21st century skills. assessment call to action. In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment And Implications for Large-Scale Testing.* Luxembourg: Office for official publications of the European communities.

Kyllonen, P.C. (2009). New constructs, methods, & directions for computer-based assessment. In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for official publications of the European communities.

Lee, M. (2009). CBAS in korea: Experiences, results and challenges. In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for official publications of the European communities.

Leeson, H.V. (2006). The mode effect: A literature review of human and technological issues in computerized testing. *International Journal of Testing, 6*(1), 1–24.

Lim, E., CH., Ong, B., Wilder-Smith, E., PV., Seet, R., & CS., (2006). Computer-based versus pen and-paper testing: Students' perception. *Ann Acad Med Singapore, 35*(9), 599-603.

Martin, R. (2009). Utilising the potential of computer-delivered surveys in assessing scientific literacy. In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and*

Implications for Large-Scale Testing. Luxembourg: Office for official publications of the European communities.

Martin, R., & Binkley, M. (2009). Gender differences in cognitive tests: A consequence of gender-dependent preferences for specific information presentation formats? In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for official publications of the European communities.

Miller, M. D., Linn, R. L., & Gronlund, N. E. (2009). *Measurement and assessment in teaching (10thed.)*. Upper Saddle River, NJ: Pearson Education, Inc.

Millsap, C.M. (2000). *Comparison of computer testing versus traditional paper and pencil*

testing. PhD Thesis. University of North Texas.

Moe, E. (2009). Introducing large-scale computerised assessment: Lessons learned and future challenges. In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for official publications of the European communities.

Mubashrah, J., Tariq, R.H., & Shami, P.A. (2012). Computer-based vs paper-based examinations: Perceptions of university teachers. *The Turkish Online Journal of Educational Technology (TOJET), 11*(4), 371-381.

Mulvaney, J. (2011). *Computer-based assessment and the effects it has on middle school aged students.* Unpublished Masters of Science Degree In Education, The Graduate School University of Wisconsin-Stout

Munusamy, K. (2009). Ismail influence of gender role on internet usage pattern at home among academics. *Journal of International Social Research, 2*(9), 309-318.

Nadeem M, Akhtar A, Saira M, and Syeda U, Zaidi I,(2012) Impact of anxiety on the academic achievement of students having different mental abilities at university level in Bahawalpur (Southern Punjab) Pakistan. *International Online Journal of Educational Sciences, 4* (3), PP 519-528

Nelson, J. M., & Harwood, H. R. (2011). A meta-analysis of parent and teacher reports of

depression among students with learning disabilities: Evidence for the importance of multi-informant assessment. *Psychology in the Schools, 48,* 371–384. doi: 10.1002/pits.20560

Nunathap, G. (2007). *Gender analysis of academic achievement among high school students*. Thesis submitted to the University of Agricultural Sciences, Dhaward. Retrieved from http://www.etd.uasd.edu/ft/th9534.pdf

Oduntan O.E., Ojuawo O.O., & Oduntan E.A. (2015). A comparative analysis of student performance in paper pencil test (PPT) and computer based test (CBT) examination
system. *Research Journal of Educational Studies and Review, 1* (1), 24-29.

Office of Assessment Services (2015). *What is assessment?* Retrieved from http://www.niu.edu/assessment/manual/overview.shtml

Okocha, F. (2022). Student perception of computer-based testing in Kwara State, Nigeria. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT), 17*(1), 1-11. http://doi.org/10.4018/IJWLTT.294575

Osadebe, P. U., & Esegbue, T. O. (2018). Evaluation of students' academic performance in jamb chemistry test under the computer based testing and paper pencil media in Delta State University. *International Journal of Advanced Research 6*(5), 415-426https://doi.org/10.5281/zenodo.1293507. DOI:10.21474/IJAR01/7048

Osuji, U. S. A. (2012). The use of e-assessment in the Nigerian higher education system. *Turkish Online Journal of Distance Education (TOJDE), 11*(4).

Owolabi, J., & Dahunsi O. R. (2014). A study of the interaction between computer related
factors and anxiety in a computerized testing situation (A case study of national open university, nigeria). *International Journal on Integrating Technology in Education (IJITE), 3*(1), 43 – 51.

Paek, P. (2005). *Recent trends in comparability studies*. Retrieved from http://www.pearsonedmeasurement.com/downloads/researc h/RR_05_05.pdf

Pindiprolu, S. S., & Forbush, D. (2009). Computer-based reading programs: A preliminary investigation of two parent implemented programs with students at risk for reading failure. *Journal of the International Association of Special Education, 10*(1), 71-81.

Poggio, J., Glasnapp, D. R., Yang, X., & Poggio, A. J. (2005). A comparative evaluation of score results from computerized and paper & pencil mathematics testing in a large scale state assessment program. *The Journal of Technology, Learning, and Assessment, 3*(6). Retrieved from http://escholarship.bc.edu/cgi/viewcontent.cgi?article=1057&context=jtla

Psychology Dictionary (2015). *What is paper-and-pencil test?* Retrieved from http://psychologydictionary.org/paper-and-pencil-test/

Public Commission of Canada (2011). *Paper-and-pencil instruments: An efficient method of assessment.* Retrieved from http://www.psc-cfp.gc.ca/ppc-cpp/acs-cmptnce-evl-cmpinc/pp-instrmnt-pc-eng.htm

Rabinowitz, S., & Brandt, T. (2001). *Computer-based assessment: Can it deliver on its promise?* West Ed Knowledge Brief. ERIC Document Reproduction Service No. ED462447.

Salend, S. J. (2011). Addressing test anxiety. *Teaching Exceptional Children, 44*(2), 58-68.

Sanni, A. A., & Mohammad, M. F. (2015). Computer based testing (cbt): an assessment of student perception of jamb utme in nigeria. *Computing, Information Systems, Development Informatics & Allied Research Journal, 6*(2) 14-28

Sarason, I. G., & Sarason, B. R. (2009). A*bnormal psychology: The problem of maladaptive behaviour (11thed.)* New Delhi: PHI Learning Private Limited.

Scheuermann, F., & Bjornsson, J. (2009). *The transition to computer-based assessment: New approaches to skills assessment and implications for large-scale testing*. Luxembourg: Office for Official Publications of the European Communities.

Schmidt, M. P., Raplh, D. L. & Buskirk, B. (2009). Using online exams: A case study. *Journal of College Teaching & Learning, 6*(8), 1-8

Schult, C. A., & McIntosh, J. L. (2004): Employing computer-administered exams in general psychology: Student anxiety and expectations. *Teaching of Psychology, 31*(3), 209-211.

Schumacker, R.E. (2005). *Classical test analysis.* Retrieved from http://www.appliedmeasurementassociates.com/white%20papers/....

Schroeders, U. (2009). Testing for equivalence of test data across media. In F. Scheuermann & J.

Bjórnsson (Eds.), *The transition to computer-based assessment: New approaches to skills assessment and implications for large-scale testing*, Luxembourg: Office for Official Publications of the European Communities.

Segool, N. (2009). *Test anxiety associated with high-stakes testing among elementary school children: Prevalence, predictors, and relationship to student performance.* ProQuest, LLC

Seo, Y., & Woo, H. (2010). The identification, implementation, and evaluation of critical user interface design features of computer-assisted instruction programs in mathematics for students with learning disabilities. *Computers & Education, 55*(1), 363-377.

Sheu , L. A., & Evanero, V. O. . (2022). Comparability of computer based and paper & pencil test on students' performance in educational assessment course at the Federal University Gusau, Nigeria. *Journal of Educational Research in Developing Areas*, *3*(2), 114-126. https://doi.org/10.47434/JEREDA.3.2.2022.114

Sim, G., & Horton, M. (2005). *Performance and attitude of children in computer based versus paper based testing.* Proceedings of the World Conference on Educational Multimedia, Hypermedia and Telecommunications 2005. Chesapeake, VA: AACE.

Skinner, E., Furrer, C., Marhcund, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology, 100*(4), 765-781.

Smolinsky, L., Marx, B. D., Olafsson, G., & Ma, Y. A. (2020). Computer-based and paper-and-pencil tests: A study in calculus for STEM majors. *Journal of Educational Computing Research, 58*(7), 1256–1278. https://doi.org/10.1177/0735633120930235

Soonhwa, S., DaCosta, B., Kinsell, C., Poggio, J. C., & Meyen, E. L. (2010). Computer mediated intersensory learning model for students with learning disabilities. *Techtrends: Linking Research & Practice to Improve Learning, 54*(2), 63-71.

Sorana-Daniela. B., & Lorentz, J. (2007). Computer-based testing on physical chemistry topic: A case study. *International Journal of Education & Development using Information and Communication Technology. 3*(1), 94-95.

Sørensen, H., & Andersen, A. M. (2009). How did Danish students solve the pisa cbas items? Right and wrong answers from a gender perspective. In F. Scheuermann & J. Bjórnsson (Eds.), *The transition to computer-based assessment: New approaches to skills assessment and implications for large-scale testing*, Luxembourg: Office for Official Publications of the European Communities.

Stavros, A. N.. & Anastasios, A. E. (2013). Student achievement in paper, computer/web and mobile based assessment. *BCI'13 September 19-21, Thessaloniki, Greece* 107 – 114

Stowell, J. R., & Bennett, D. (2010). Effects of online testing on student exam performance and test anxiety. *Journal of Educational Computing Research, 42*(2), 161-171.

Stringfield, S., Reynolds, D., & Schaffer, E.C. (2008). *Improving secondary school students' academic achievement through a focus on reform reliability*. Retrieved on 16-12-2011 from http://www.cfbt.com/evidenceforeducation/PDF/HighReliability

Tahir, M. (2012). Impact of formative assessment on academic achievement of secondary school students. *International Journal of Business and Social Science, 3*(17)

Thompson, N. A., & Weiss, D. J. (2009). Computerized and adaptive testing in educational

assessment. In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for Official Publications of the European Communities.

Tucker, B. (2009). The next generation of testing. *Educational Leadership, 1*, 48-53.

Van Lent, G. (2009). Risks and benefits of cbt versus pbt in high-stakes testing: introducing key concernsand decision making aspects for educational authorities. In F. Scheuermann & J. Bjórnsson (Eds.). *The Transition to Computer-Based Assessment: New Approaches to Skills Assessment and Implications for Large-Scale Testing.* Luxembourg: Office for Official Publications of the European Communities.

Wang, H., & Shin, C. D. (2009). *Computer-based & paper-pencil test comparability studies*. Retrieved from http://www.pearsonassessments.com/NR/rdonlyres/93727FC9-96D3-4EA5-B807-5153EF17C431/0/Bulletin_9.pdf

Computerized Supervision for Cost Effective Postgraduate Research in Education in Nigerian Public Universities

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Abstract
Research is the most tasking component of postgraduate studies. Some students tends to drop out in their postgraduate studies after course work especially due to high cost of research. Therefore, there is need to discuss the approaches to reducing the cost of postgraduate report writing in education. This paper explored the ways postgraduate research report could be made cost effective through computerized supervision. It explained the major variables in the work such as computerized supervision, research and others at the introductory stage. Further, the paper discussed the various ways academic research supervision in education can be computerized for cost effectiveness under the following headings: correction of reports in soft copy through Microsoft word comments, verifying literature and plagiarism checks, verifying data analyses and online presentation of reports. The paper concluded that the use of computer for research supervision is the new normal and there is need for all supervisors to be economically conscious by imbibing the trend in computerized supervision. The paper further recommended that; all schools should make policies that supports greater percentage of the research report process to be done through soft copies in computer; all the lecturers need to update themselves with computer application so they can be able to read and correct postgraduate students' research report in soft copy through computers in order to reduce cost and that Students should ensure they are competent in the use of computers.
Keywords: Postgraduate Studies, Computerized Supervision, Postgraduate Research Report, Cost Effective

Introduction
The move from analogue to digital system is effective in every aspect of human activities especially in institutions of higher learning. No academic programme can be effective in total ignorance of computer application in the emerging world. In fact, most academic institutions have switched from physical learning to online learning while

some are gradually planning their academic programme to allow greater percentage of their learning activities online and lower percentage in physical classroom. These are made possible through the advent of technology such as Google classroom, zoom, webina and others. All these digital resources make it possible to carry out academic activities more conveniently and less costly than the traditional method of physical activities within the university environment.

A computer is a digital machine or system designed to aid human activities at various capacities. Computers are used to deliver many services across various disciplines. In education institutions, computers connected to the internet are used to send and receive electronic mails, keep records, type information, design programme, management dashboard for academic activities and lots more. In academics, computers are used to prepare lecture materials for students, send and receive assignments from students, prepare students result, supervise students' research report, presents research report and lots more.

Research is an ultimate search for solution to an identified problem. Nworgu (2015) defined research as an empirical method of inquiry or investigation into the unknown. Research is a fundamental aspect of university education. An academic research is a careful study of a subject with a view to discovering new ways of doing things. According to Nworgu (2006), it is a controlled enquiry which is directed towards solving identified problems and its outcome provides basis for societal development. In the opinion of Kulbir (2013), a research is a scientific investigation which is meant to discover new idea, correct old practice and suggest solutions to existing problems. It is a careful search for solutions to problems which incapacitate mankind.

According to National Universities Commission NUC (2016), the core mandates of universities are **r**esearch, teaching and community service. For this reason, research has become an indispensable part of the university from where findings and recommendations about issues in the society are made. As pointed out by Ajala (2002) many students lack ability to apply the knowledge of research-related courses which they acquire at lower stage of their academic journey to the practical aspect of research process while some have phobia for research study. The postgraduate students therefore require sufficient guidance and motivation by their supervisors. Postgraduate programme is a stage of higher education obtained after completing a first degree at a university or polytechnic. NUC (2016) classified Postgraduate education in Nigeria to include the following degrees: Postgraduate Diploma (PGD), Master (MSc, MBA, MEd, and MA), MPhil, MPhil/Phd, and PhD. All of these postgraduate degrees require students to complete projects, dissertations, or thesis as a compulsory and major requirement for their graduation. Producing a good project, dissertation, or thesis involves supervision by a lecturer at the university who is expected to have extensive

knowledge in the field of study in which the candidate is interested.Therefore the success or otherwise of a postgraduate programme is to a great extent based on the supervisor's effectiveness, efficiency, encouragement, commitment and most importantly, competency in general computer application and for research purposes.

In universities, postgraduate students are assigned to professors and senior lecturers who are specialists in their field of study to supervise their research project (Fasasi, Awodiji&Adewale, 2016).Academic research supervision is the process of overseeing the progress of student's research project. Supervision is a process of stimulating, guiding, improving, refreshing, encouraging and overseeing activities of a group with the hope of seeking their cooperation towards accomplishment of a given task (Awodiji, Famaye, &Afolabi, 2015). In the opinion of Albar (2012), it refers to direction, guidance and coordination of the activities of the supervisees concerning their academic research topic. Further, Hase and Kenyon (2000) maintained that supervision can be described as heutagogy, thus recognizing the need for flexible and autonomous learning environments. In academic research supervision, students are able to determine their paths of learning while teachers or supervisors provide attendant resources to support them in the process. Thus supervision is an administrative function which is directed towards ascertaining that efforts in all units of an organization are in line with set goals. Imperial College (2014)insinuated that supervision of academic research work is an activity that facilitates students' development towards becoming independent and critical scholars in their respective fields of study. For this to be achieved, supervisors are expected to demonstrate expertise in the supervisees' supervision especially as regards to use of digital facilities such as computer.Though supervision takes a form of physical interaction between the supervisor and the supervisee, Fasasi and Alabi (2015), has noted that this traditional nature of supervision is been challenged by the advent of technologies which is fast providing a credible and reliable alternative. Making this traditional method of supervision more difficult is the worsening economic crisis in most developing countries such as Nigeria where students do not enjoy free tuition, research grant and other benefits that would ease the financial burden of postgraduate programme. There is thus a severe need for an alternative mode of carrying out this function

The digital era commonly regarded as computer generation has introduced several platforms and internet software that would conveniently guarantee electronic (E) supervision of postgraduate students' academic research report at the most cost effective manner. E supervision through the internet connected computers enables a supervisor to perform supervisory duties at a geographical distant location. This reduces the cost of transportation, cost of printing and still achieving good outcome. In the same vein, Albar (2012) noted that computerized academic research supervision gives the supervisors

accessibility, continuous and open support to their supervisees (students) which will reduce their stress. The use of online discussion software and hardware sharing and networking has proved to facilitate supervision to a greater extent. These can be achieved today through e-mail, Mobile Phone, Skype, Twitter, Face book, WhatsApp, IMO, Instagram, Viber, among others. Hence, the supervisors and their supervisees can use any of these components or platforms in the course of research writing (Albar, 2012). This implies that all supervisors would require efficient computer application skills and computer usage for research purposes in order to contribute their quota in ensuring a cost effective and timely postgraduate programme.

Academic research as a component of postgraduate programme has always been a source of delay in students' graduation mostly due to the cost of research. This cost ranges from sourcing materials, renting specimens for experiment, sourcing data from the respondents, typing and printing of the report for supervisors to correct and for presentation. Greater percent of these activities can be done online through computer. Indeed computer has provided a very convenient platform for carrying out academic services by lecturers in universities. All the services provided by the lecturer to produce quality graduates can be aided by computers. Despite all these opportunities provided by computer in research project supervision, many lecturers (supervisors) still rely on physical printed papers thereby increasing the cost of carrying out academic research and the entire programme. This situation has caused a lot of students to abandon the programme after course work due to high cost of transport to and fro school and other logistics such as printing hard copies for corrections and presentation.

The cost of producing hard copy of research reports across universities in Nigeria remains a big challenge to all postgraduate students especially during this era of fuel subsidy removal which has affected human activities requiring the use of electronic gadgets.Curbing this situation to make academic research supervision cost effective in Nigeria public universities requires that educational research report writing supervision be computerized. Thus this paper shall hereunder discuss the various ways academic research supervision in education can be computerized for cost effectiveness.

Correction of Reports in Soft Copy through Microsoft Word Comments:

The most expensive part of postgraduate research is printing of reports for supervisors to read and correct. At each chapter of the project, the student has to print and submit to the supervisor(s) to read and correct, then effect the corrections and print again. This continues till the supervisor is satisfied with the report thus increasing the amount of money spent on the programme. Through computer connected to the internet, students can send the soft copy of their report to the supervisor in mail, WhatsApp etc and they correct through Microsoft corrections and send back to the students. The same

correction traditionally done by supervisors using red biro is done through ms word comment in the computer and the supervisee view them and effect accordingly. This is done by highlighting the content to be commented on, right clicking, and clicking on new comment. This colours the highlighted content and provides a space for the comments to be typed. When a supervisor adds a comment in Word, it appear in the right margin as close to the insertion point in the text as possible. In this view, all active comments are visible in context. When you select a comment, a border appears around it and its position is closer to the page. This therefore avoids the traditional method of continuous printing of hard copy to the supervisors with money. It is pertinent to point that lecturers who adopt this method in supervision of postgraduate students report contributes to making postgraduate programme cost effective. A research conducted by J.M consult Ltd (2005) found a 28% reduction in the total cost of postgraduate programme when supervisors adopt computer based research report correction for PhD and master students in education courses. This is true as the students will only have to print one hard copy after the supervisor is satisfied and approved the report. This way, the student saves the cost or continuous reprinting and transportation to submit and receive corrections from the supervisor(s).

Verifying Literature and Plagiarism Checks:

In this computer era, it is simple to verify citations, references, and general plagiarism of research report through computer. These were initially difficult for students and contributes to the duration and money spent by students in carrying out research. There are many softwares which help ICT compliant research supervisors to easily monitor the citations made by their supervisees and ensure their research is with minimal plagiarism. They include the following:

Trinka: The citation checker helps corroborate the research argument and improve the citation list. It carries out automated citation analysis by identify strong citations which are capable of making the research hold a firm ground and weaken the arguments against the issues raised in a research paper. According to Taiba (2022), the Trinka Citation checker specifically does the following:

- Identifies retracted citations after publications
- It helps eliminate non-standard citations
- Recognizes low visibility citations
- Suggests old references to ensure high relevance and validity
- Identifies unintentional bias toward a journal

Scribbr: This software is used to bring quality to the APA, MLA, and Chicago citations by spotting hard-to-identify and tricky mistakes. Through artificial intelligence, scrbbr reduces the time consumed in finding citations so that you are left to focus on refining the contents of your research paper. The tool can easily spot missing punctuations, incorrect use of et al., and inconsistencies between citations and references. It also detects the missing references in a research paper in few seconds.

Citation Machine: The tool allows writers to cite content from sources like books, magazines, newspapers, journals, films, and others and is equipped with a feature-rich library having 7000 additional citation styles. The tool is known for its vast citation style variety, which greatly benefits the eLearning content developers' reference of all four main styles, which are. APA, MLA, Chicago, Turabian. It scans the research paper in depth to dig out plagiarism if missed out unintentionally.

Zotero: It offers immense help to the developers in gathering, managing, annotating, and sharing research resources. It is compatible with Android, as such, supervisors can easily use it through their phones. The tool automatically senses what citations you will need to support your research as you browse through the web and allows you to collect them with a single click. Thus the supervisors can look out for this in reading the students report. Zotero provides all the research assistance needed right from the university libraries to a new websites, and allows writers to store the resources of any kind of library (Taiba, 2022).

EndNote 20: The tool integrates well with Microsoft Word enabling writers to write faster and insert in-text citations as bibliography is being created.EndNote 20 software helps supervisors to:

- Explore hundreds of online resources to identify references and PDFs.
- Use manuscript matcher to match paper with relevant, reputable journals.
- Access full-text research articles with a single click.
- Check if references are well organized by creating rules.
- Insert in-text citations from the pre-designed 7000+ reference types or customized styles.

Mendeley Cite: This is a brand new citation add-in for Micro Soft Word. It help check and insert individual or multiple citations and bibliographies in the editor. It is cloud based and offers seamless search and management capabilities for individual and multiple references.

BrightLocal: It is used to find, fix and track local citations from a single place. Thus saving time in managing the citations. The software is built with trackers which scours the web to find relevant citations from important websites and eliminate the need for guesswork and legwork in finding the best citations. It has the ability to audit the name, address, and phone number of the citation and identify duplicate listings.

Checker X or Turnitin: The supervisor can easily download and install the free trial software or buy the license then run a plagiarism check of their students projects by uploading the content onto their servers and it analyzes the authenticity of the uploaded content within "16 billion published pages then produces the uniqueness or the plagiarism percent. According to Tegan and Jack (2022), a plagiarism checker uses advanced database software to scan for matches between the uploaded text and existing texts.

Verifying Data Analyses

Data analyses is a process of inspecting, cleansing, transforming and modeling data with the purpose of discovering useful information for conclusion and decision making. Data analyses is a critical part of students' research project writing. Because it involves lots of calculation, most students finds it difficult and usually resort to manipulation of figures just to scale through the supervisor and the panel during the presentation. When these errors are dictated during presentation and the students asked to go back and redo the analyses and return for another presentation, it adds to the cost and time of completing the programme. It is the duty of a competent supervisor to dictate these lapses especially in this modern era where research data analyses are done using various computer software. When the supervisor is competent in the use of computer for research data analyses. It becomes easy to verify the result presented by students through statistical packages for data analyses. Manual calculation is prone to mistakes and errors which might alter the intended result and it would be difficult tracing the sources of the error. With computerized data analyses, the supervisor can verify by applying same statistical software on the data to check if the results are true or false.

Online Presentation of Report

In most of the universities in Nigeria, postgraduate presentation are segmented into proposal defense, internal defense/exit seminar and oral/external defense. At each of these stages, the students produce numerous hard copies of the report and appear physically for the presentation. According to a survey by JM Consult (2005), an average of postgraduate students in public universities carry out their research presentation physically even when there are better and more convenient and cost effective alternatives.The author further reported that in majority of the schools surveyed, student print between to 10 to 20 copies of the hard copies while few schools require that students produce about 6-8 copies and make as many as possible of the abridged copies even when there is projector to project the content for all members of the board or panel to view. This does not only add more unnecessary expenses to the students but makes

the process appear awkward and analogue. In another study by Kayode and Afolakemi (2023), it was found that most universities in developed countries and some private universities in Nigeria have moved totally to digital presentation where students can submit only soft copy of their completed projects and present online to the panel through zoom, webina, and others. The situation is not same in public universities. Students who could not meet up with the financial requirements of producing these hard copy documents would step down their presentation till they are ready. Many eventually drop while some spend much more time before graduation than expected. This and other issues such as incessant industrial actions by the academic staff union of universities (ASUU) accounts for the reason why students in public universities tends to spend more time in their programme than their counterparts in private universities.

Conclusion

The need for computerization of academic services in Nigerian public universities amidst this period of economic recession is sacrosanct. This is especially necessary because digital facilities are continuously emerging, thus providing opportunities for academicians to utilize and make their job more convenient and still produce better result. The use of computer for research supervision is the new normal and there is need for all supervisors to be economically conscious by imbibing the trend in computerized supervision. In achieving this, this paper has discussed the various ways postgraduate students' supervisors can utilize the advent of computer technology in research supervision and reduce the cost of achieving the desired aim of the programme. Thus supervisors can utilize computer in correction of reports in soft copy through ms word comments; verifying literature and plagiarism, verifying data analyses and in result presentation. When a greater percent of these services are delivered by the supervisor through digitalized platforms, cost will be reduced and postgraduate students in Nigerian public universities can finish their programmes within the stipulated duration as done by their counterparts in foreign and local private universities.

Suggestions

Based on the discussions so far in this paper, the following were suggested

1. All schools should make policies that support greater percentage of the research report process to be done through soft copies in computer
2. All the lecturers need to update themselves with computer application so they can be able to read and correct postgraduate students' research report in soft copy through computers in order to reduce cost.
3. Students should ensure they are competent in the use of computers.

References

Afolakemi, O. O & Kayode, S.A. (2023). Comparative Analysis of Postgraduate Students' Thesis Supervision in Oyo State Nigeria. *Journal of Research & Method in Education (IOSR-JRME) 13* (1) 63-70

Ajala, V. O. (2002).*Scholarly writing guide for researchers.* Ibadan: May Best Publishers

Albar, A. M. (2012). An Electronic Supervision System Architecture in Education. *European Journal of Business and Management, 4*(8), 140-148

Awodiji, O. A., Famaye, E. O., &Afolabi, R. A. (2015). Instructional supervision in Nigeria: Challenges and Prospects. *Al-hikmah Journal of Education, 2*(1), 46-53.

Fasasi, Y. A. &Alabi, S.A. (2015). Information and communication technology: A tool for enhancing supervisory effectiveness in Nigerian educational institutions. *Journal of Educational Foundations 5(1),* 103-110.

Fasasi, Y. A., Awodiji, O. A and Adewale, S. (2016). E-supervision of students' research writing in NigerianOpen and distance educational institutions:Challenges and prospects. *International Journal of Distance Education and E-Learning (IJDEEL) 2* (1)1-8

Hase, S., & Kenyon, C. (2000). From Andragoy to Hentagy. *Ultibase Article, 5*(3), 1-10

Imperial-College, I. (2014, July 2). *Research-Degree-Supervisor.* Retrieved 20/06/2016, from https://www.imperial.ac.uk/media/imperial-college/administration-and-supportservices/ registry/qa/public/good-practice/roles-and-responsibilities/Research-Degree Supervisor.pdf

J. M Consulting Ltd (2005).*Costs of training and supervising postgraduate research students*. Bristol. J M Consulting Ltd publication

Kulbir, S. S. (2013). *Methodology of research in education*. New Delhi: Sterling Publishers Private Limited.

National Universities Commission NUC (2016). *Approved postgraduate programmes in Nigeria Universities*. Abuja; NUC publication

Nworgu, B. G. (2006). *Educational research: Basic issues and methodology*. Ibadan: Wisdom Publishers Limited.

Nworgu, B.G. (2015). *Educational research: Basic issues and methodology, 3rd Edition.* Nsukka, University trust publishers

Taiba, H. (2022). *Best citation checker tools for improving research*. Retrieved 24/7/23 from https://geekflare.com/citation-check

Tegan, G. and Jack, C.R (2022). *How plagiarism checker works*. Retrieved 24/7/23 from https://www.scribbr.com/plagiarism/how-do-plagiarism-checkers-work

Effect of Peer and Self Assessment Techniques on Students' Academic Achievement in Map Geography in Secondary Schools

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Abstract

Educators have now considered other forms of assessment like peer and self-assessment to be very important as they are capable of raising interest in learning and improving academic achievement. The focus of this paper is on the effect of peer and self-assessment techniques on students' academic achievement in map geography using a mixed method approaches. An embedded mixed methods design was employed. Four hypothesis guided the study from the quantitative perspective with the adoption of Solomon six groups research design while one research question from the qualitative perspective with focus on thematic content analysis. The target population is 5,321 SS II students in Ika South L.G.A of Delta State. The quantitative data were collected with Map Reading Achievement Test (MRAT) with reliability of .86 using K-R 20 formula, while qualitative data were collected with interview schedule. The quantitative data were analyzed with mean, standard deviation, and ANCOVA; while the qualitative data were analyzed using thematic approach. The researcher found out that after controlling for the covariate, peer and self- assessment have significant effect on students' academic achievement in map reading geography. The mean academic achievement post test scores of students in peer and self-assessment groups were higher than those expose to the control group.

Key Words: Assessment, Geography, Achievement, Peer assessment, Self-assessment, Mixed method.

Introduction

Geography is a very important subject in secondary school curriculum. A credit pass in the subject is a critical for students to get admission to study courses like Surveying, Geographical Information System, Climatology, Estate Management, Architecture and Environmental Management. A review of academic performance in Geography in Delta State revealed that students achievement in geography decline from 56% in 2020, 41% in 2021 and 39% in 2022 (WAEC, 2022). The poor academic achievement in the subject has been attributed to several factors such as poor teaching method, poor learning environment, shortages of experience teachers and shortage of

instructional materials among others. Many researchers have recommended different strategies for enhancing students' academic achievement in Map Geography include: employment of more teachers, provision of instructional materials, and use of students centred teaching method, fieldwork studies and review of curriculum (Obior & Adegbaye, 2021). However, in spite of the aforementioned recommendations and practices in most of the schools, the academic achievement seem not to have improve significantly. Therefore some other variables like model of assessment used by teachers should also be considered as well.

Assessment is traditionally viewed as a separate process from teaching and learning. Assessment entails the outcome of education and extent to which a student, teacher or institution has achieved educational goals. Narael and Abullah (2016) defined assessment as the knowledge gained which is assessed and marked by a teacher and/or educational goals set by students and teachers to be achieved over a specified duration.. In the opinion of Yunlok (2014), assessment is a measure of knowledge and skills that students have mastered in a subject or a course. Assessment manifested in the form of tests and exams that come at the end of the study course. In fact, for years, educators used to see assessment as a means for measuring learning final outcomes which is commonly done via summative format (Looney, 2011). However, now this view has changed radically, and educators have begun to widen their scope of assessment to cover all types of activities that improve learning (Rabinowitz, 2010).Educators have now considered other forms of assessment like peer, formative, diagnostic and self-assessment to be very important as they are student centered approach to assessment which are capable of raising interest in learning and improving academic achievement. The focus of this paper is on peer and self-assessment techniques.

Peer-assessment is the appraisal of students' work by other students of equal status. Students who undertake peer-assessment always show interest in teaching and learning process (Obilor & Adegbeye, 2021). They reflect on their own efforts, and extend as well as enrich this reflection by exchanging feedback on their own and their peers' works. It also equips them with skills to self-assess and improve their life (Race, 2011). Peer-assessment strategy is the process whereby students grade assignments or tests, of their mates or peers based on a teacher's benchmarks. Peer assessment is the process of students evaluating each other's work using performance criteria (Falchikov, 2007). Peer assessment has effect on academic achievement on learning outcomes and it has been widely applied across diverse academic contexts, such as teacher education (Li, 2012), computer science (Wang, et al, 2012), medicine (Violato & Lockyer, 2006), engineering (Hersam, et al, 2004), second language learning (Cheng & Warren, 2005), biology (Orsmond, et al, 1996), business (Brutus et al, 2013).Using a two-way factorial quasi-experimental design, Li and Gao (2015) found out that low-and average-achieving

students showed significantly improved performance right after the integration of a peer assessment model in teaching and learning. Similarly, Jhangiani (2016) found out that participation in the peer assessment activity enhanced subsequent exam performance in all three cases, even after accounting for online mastery quiz performance and attendance.

Self-assessment is a process in which students criticize their own work according to clearly stated expectations, usually provided in the form of goals or criteria, and then revise their work (Andrade &Valtcheva, 2009). Self-assessment is an excellent formative assessment strategy that provides students with immediate feedback on their performance according to established standards and criteria, and gives them information about how to make adjustments to improve what they learn and how they learn (Crooks, 2007). Harrison and Harlen (2006) also point out that self-assessment is one of the critical elements of formative assessment because it helps students participate directly in learning objective activities. Self-assessment is one way for students to comment on other own work (Topping, 2009). Self-assessment is influential in creating a more participatory learning culture within the learning environment (Kollar & Fischer, 2010).According to Obilor and Ikpa (2022), self-assessment provides a structured learning process for students to critique and provide feedback on their work. It helps students develop lifelong skills in assessing and providing feedback to other own work and thus equip them with skills to self-assessment and improve their own work. It has been repeated found that self-assessment has significant effect on students' academic achievement in schools (Karaman, 2021; Obilor & Ikpa, 2022; Udechukwu, 2021).Similarly, research studies have shown that some relationship exists between self-assessment and students' academic achievement (Brown & Harris, 2013; McDonald & Boud, 2003).Generally providing a self-assessment tool with rubrics, checklists, or scripts can guide students to understand the tasks deeply and monitor their own tasks for achievement (Andrade &Valtcheva, 2009; Panadero, et al, 2012; Vasu et al., 2020; Veenman, 2011).

The aforementioned reviewed studies have demonstrated that peer and self-assessment have significant effect on students' academic achievement. However, previous studies did not consider the effect pretest sensitization could have on the treatments as well as its interaction effect with the treatment on academic achievement. A pretest, according J. Creswell and D. Creswell (2022) is observation made in experimental studies before the introduction of an intervention. A pretest could sensitize participants on the post measurement. To address the effect of pretest and its interaction effect with treatment or intervention Solomon introduces Solomon four groups' experimental research design in 1946. According to Edmond and Kennedy (2017), Solomon four group could be extended to six, eight and even 12 groups. The major

benefit of using Solomon six groups is that a researcher can examine the effect of pretest on outcome variables or dependent variables, main effect of two intervention programmes and the interaction effect of the pretest with intervention programmes on the outcome variable as well.

Based on the above, the focus of this study is to look at the effect of peer and self-assessment using Solomon six groups design as well as how the research participants view the treatments. Specifically, this study aimed at determining:

- the main effect of pretest on students' academic achievement in Map Geography,
- the interaction effect of the pretest and the interventions on students' academic achievement in Map Geography,
- the main effect of peer assessment on students' academic achievement in Map Geography,
- the main effect of self- assessment on students' academic achievement in Map Geography and
- The view of research participants on the interventions.

Hypotheses

The following hypotheses were tested at .05 guided the study

1. The pretest scores has no significant effect on students' academic achievement in map reading geography
2. The interaction effect of the pretest and the interventions on students' academic achievement in map reading geography is not significant
3. Peer assessment mode has no significant effect on students' academic achievement in map reading geography
4. Self-assessment mode has no significant students' academic achievement in map reading geography

Qualitative Research question

How do the research participants view the interventions?

Method

This study is a mixed method approach. Mixed method approaches help researchers integrate both quantitative and qualitative data in their analyses and interpretations to provide a broader picture for a researched phenomenon (Creswell, 2014).Specifically in this study, an embedded mixed methods design was employed. This design occurs when the researcher collects and analyzes both quantitative and qualitative data with more emphasis on quantitative and lower emphasis on qualitative design (Creswell & Plano Clark, 2011,). Firstly, the experimental phase was carried out to obtain the quantitative data. Next, the inferences drawn from the integration of the

quantitative and qualitative phases were included, with a focus on how the qualitative findings helped explain the quantitative findings at the discussion section.

Quantitatively, the researcher adopted Solomon six groups design. According to Edmonds and Kennedy (2017), Solomon six groups design involves four experimental groups and two control groups. Two of the experimental groups are given pretest while two do not receive pretest. One of the control groups receives pretest while the other control group does not receive pretest. The six groups were all post tested on the dependent variable or variables. Diagrammatically, it is represented below

Fig 1

Solomon Six Group Design

Group	Pretest	Treatment	Posttest
1	O_1	X_A	O_2
2	O_3	X_B	O_4
3	___	X_A	O_5
4	___	X_B	O_6
5	O_7	___	O_8
6	___	___	O_9
	Time →		

Source: Edmonds and Kennedy (2017, P 96)

Where X_A =Peer assessment mode, X_A= Self-assessment

The study was carried out in Ika South L. G. A. of Delta State. The target population for this study comprises of all SS 2 students numbering 5,231 from all the 8 approved secondary schools in Ika South local government area in Delta state (Ika South L. G.A, Education Authority Statistics Unit, 2023). The sample of this study was made up of 212 SSII students comprising 92 boys and 120 girls drawn from 6 schools that were randomly sampled. The six groups (Group 1=33, Group 2=30, Group 3=37, Group 4=35, Group 5=40 and Group 6=37) in the study represent an intact from each school.

Instrument for data collection was map reading geography achievement test developed by the researcher. The researcher constructed 50 multiple choice questions in map reading geography (2marks for each correct answer). The items have only one correct option. The students were expected to select only one option for each question and write the letter corresponding to that option on the answer sheet that would be provided to them. A test blue print which specifies the level of objectives and course content was constructed and used to select the test items that formed the instrument. Validation of the instrument was established suing both face and content approach. Three copies of the initial draft of 50 items with the table of specification were given to three experts in measurement, evaluation and research for validation. These resource

persons were requested to vet the items in terms of clarity of words, appropriateness to the class level and plausibility of the distracters. Reliability of the instrument was computed using the K-R 20 coefficient of internal consistency. The K-R 20 was used because Kline (2018) argued that it required single administration of instrument and is dichotomously scored. The reliability coefficient of the instrument is 0.86, hence the instrument was considered reliable for the study.

The experimental procedures were executed into three broad phases namely pre-test, intervention and post-test. During the pretest phase, the researcher informed the students in the groups on the approach that would be taken for the course. Thereafter, the research assistants administered the instrument to students in two of the experimental groups (Group 1 and Group 2) and one control group (Group 3) to get the pre-test scores. The experiment took place for a period of five weeks after the pre-test phase. In the five weeks, students were taught five topics for three hours in each week. Students in the groups were given classwork at the end of each class to work on. After the class, students in the self-assessment group were provided with the scoring rubrics and asked to grade themselves. On the other hand, students in the peer-assessment group were given the rubrics and required to grade their peers while also making feedbacks on the content. Students in both groups were allowed to reflect on the feedback obtained, either from self or from peers. Students' scores during the process of the treatment were not collected, but only served the purpose of feedback and reflection. At the end of the fifth week, the test was administered again to collect data for the post-test.

To enhance validity of the findings, the researcher made use of research assistants for the study. The same units of instruction were used for the groups. The researcher organized two days training for the research assistants so that differences in the effectiveness of individual teachers do not affect the findings of the study. The control groups and experimental groups were far apart to avoid compensatory rivalry (John Henry effect) and resentful demoralization. The study was kept short to avoid history and attrition effect. Pre-test sensitization was addressed using Solomon Six group design.

Mean and standard deviation were used to summarize the data; while ANCOVA were used to test the hypotheses formulated to guide the study at .05 level of significance. The assumptions of ANCOVA namely homogeneity of the variances, linearity of the relationship between the variables, homogeneity of the regression slopes, were tested to ascertain suitability of the data for the analysis.

For the qualitative part of the study, a purposeful sampling method was used to select the participants in line with goal of sampling in qualitative research. A total of 8 students were selected for the interview. Two groups were formed in accordance with the last test scores of the students in peer and self-assessment. Pseudonyms were used

for the students. The students in the peer assessment groups were named Participant 1, 2, 3 and 4, while those from self-assessment groups were named participant 5, 6, 7 and 8. Pseudonyms were used for the students to ensure confidentiality.

Data triangulation was adopted to explore different perspectives on the research question in order to gain richness in data collection. The participants were encouraged to talk about what had happened and their feelings about the two intervention programmes. The interviews were audio-recorded and lasted between 4 and 20 mins. A focus group interview with the students was conducted. This audio-recorded interview for focus group lasted for 65mins.

The data were analyzed using thematic analysis (Creswell, 2014). Braun and Clarke's (2006) six phase approach to analyzing qualitative data was followed: The researcher: (1) began reading the transcripts to become familiar with the data, (2) generated initial codes in a systematic fashion, (3) searched for themes, (4) reviewed themes and generated a coding tree with primary and secondary codes, (5) defined and labeled themes, and (6) produced the report. Consistent with the estimates from other studies (Hagaman & Wutich, 2017), data saturation was reached through first 4 interviews for major themes in peer and self-assessment groups respectively.

The participants were asked to express their views on how peer and self-assessment approach improved their achievement in map reading using the following questions: (a) Do you enjoy the assessment approach? Why? (b) Do you feel that you can learn better in map reading when you are using the assessment approach? Why? (c) In your opinion, as a student offering geography in the senior secondary school, tell me what you like in the assessment approach?

Transcripts were provided by a researcher who then independently reviewed the data (credibility, dependability, transferability). The primary researcher went through the interview Transcripts line by line to identify patterns. These patterns were initially color coded for ease of retrieval and were later categorized (dependability). Patterns and themes were submitted to the co-researchers in order to prompt discussions and establish consensus (dependability, credibility). Audit trails were created through detailed field notes and audiotaped memo notes (confirmability). Member checks were conducted with 4 student participants (confirmability).

Results

Quantitative Findings

IBM SPSS Version 27 was used to analyze the quantitative data. The data were first screened for missing values and irregularities. In group 1, 3 students did not have pretest scores and were removed from the analysis. This reduced the sample from 33 to 30. In group 2, six did not have pretest scores as such they were removed, the sample of

this group was reduced from 30 to 24.In group 3, one students did not show up on the day of the posttest and this reduce the sample size from 37 to 36. In group 4, five students did not show up on the day of posttest and this reduce the sample size from 35 to 30. In group 5, one student did not have pretest scores as such her score was removed, the sample of this group was reduced from 40 to 39.While in group six, six students did not have posttest scores as such they were removed, the sample of this group was reduced from 37 to 31. A total of 190 cases with complete data was used for analysis.

First, it was determined whether the collected data met the assumptions of normality. The kurtosis and skewness values of all the measurements were found to be between -1 and +1. The values of the central tendency measurements showed that the values of mean, median and mode resembled each other. For this purpose, the assumptions of ANCOVA namely homogeneity of the variances, linearity of the relationship between the variables, homogeneity of the regression slopes, were tested. As a result, it was established that the data were suitable for analysis.

A 2 by 3 factorial between subjects' was performed on one dependent variable. The dependent variables is academic achievement in map reading geography, while the independent variables are Pretest sensitization (present and absent), treatment (conventional, peer and self-assessment groups). The covariates is pretest academic achievement in geography for ANCOVA analysis.

Hypothesis 1: The pretest has no significant effect on students' academic achievement in map reading geography.

To test the aforementioned hypothesis, a two-way interactions and main effect of the pretest variables on the dependent variables were investigated. The researcher found out that there was no significant effect of pretest on the outcome variable [$F(2,190) = .126$; $p = .723$]. Therefore, taking the pretest did not affect the results of the posttest. Given that no pretest sensitization was found, pretest and treatment groups' interaction effect was then examined.

Hypothesis 2: The interaction effect of the pretest and the interventions on students' academic achievement in map reading geography is not significant.

A two-way interaction of the pretest variable and treatments on the dependents variable was investigated. The researcher found out that there was no significant interaction of the treatments with the pretest on the outcome variable [$F(2,190) = .034$; $p = .967$].Given that no pretest sensitization interaction with treatments was found, treatment groups was examined. The treatments were significant, $P<.05$. A post hoc was conducted, results show that there was a significance difference between peer assessment and the control group, $p<.05$. Self-assessment with control group was also

significant, p<.05. There was no significance difference between peer assessment and self-assessment, p=.076.

Table 1

Pretest Effect and its Interaction with the Treatments in the Study

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	29799.185[a]	5	5959.837	72.115	.000
Intercept	430642.554	1	430642.554	5210.821	.000
Pretest	10.385	1	10.385	.126	.723
Treatments	28539.338	2	14269.669	172.665	.000
Pretest * Treatments	5.553	2	2.776	.034	.967
Error	15206.478	184	82.644		
Total	513230.000	190			
Corrected Total	45005.663	189			

a. R Squared = .662 (Adjusted R Squared = .653)

Table 2

Scheffe Multiple Comparison of the Various Treatments Groups

(I) GROUP	(J) GROUP	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
PEER	SELF	3.87	1.668	.071	-.25	7.98
	Control	27.89*	1.647	.000	23.82	31.95
SELF	PEER	-3.87	1.668	.071	-7.98	.25
	Control	24.02*	1.560	.000	20.17	27.87
Control	PEER	-27.89*	1.647	.000	-31.95	-23.82
	SELF	-24.02*	1.560	.000	-27.87	-20.17

Based on observed means.

The error term is Mean Square(Error) = 82.644.

*. The mean difference is significant at the 0.05 level.

Table 3

Descriptive Statistics Pretest and Posttest Scores of the Various in the Study

Groups	Pretest		Posttest		Mean Gain	Remark	Name
	M	SD	M	SD			

Group (N=30)	1	26.15	4.10	59.60	1.33	33.45	High	Peer
Group (N=24)	2	29.20	4.02	61.58	2.34	32.38	High	Self
Group (N=36)	3	----	------	55.56	1.84	-----	-----	Peer
Group (N=30)	4	----	------	61.10	1.51	------	-----	Self
Group (N=39)	5	32.11	3.62	33.38	1.23	.67	Low	control
Group (N=31)	6	-----	-----	33.23	1.42	-----	---	Control

Hypothesis 3: Peer assessment mode has no significant effect on students' academic achievement in map reading geography

To test the above hypothesis, Analysis of Covariance was performed with the pretest scores as covariate. Table 5 shows that after controlling for the covariate, peer assessment has significant effect on students' academic achievement in map reading geography [$F(1,136) = 260$; $p < .05$]. The mean academic achievement post test scores of students in peer assessment (M=59.60, SD=1.33) was higher than those expose to the control group (M=33.38,SD=1.23). In other words, per assessment was more effective than the traditional mode of assessment used by teachers in the classroom.

Table 4

Analysis of Covariance of the Effect of Peer Assessment on Academic Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	19735.333[a]	2	9867.667	130.088	.000
Intercept	135393.643	1	135393.643	1784.930	.000
Pretest	131.551	1	131.551	1.734	.190
Peer assessment	19722.429	1	19722.429	260.006	.000
Error	10088.549	133	75.854		
Total	305584.000	136			
Corrected Total	29823.882	135			

a. R Squared = .662 (Adjusted R Squared = .657)

Hypothesis 4: Self-assessment has no significant students' academic achievement in map reading geography

To test the above hypothesis, Analysis of Covariance was performed with the pretest scores as covariate. Table 6 shows that after controlling for the covariate, Self-assessment has significant effect on students' academic achievement in map reading geography[$F(1,124) = 313.202$; $p < .05$]. The mean academic achievement post test scores of students in self-assessment (M=61.58, SD=2.34) was higher than those expose to the control group (M=33.38, SD=1.23). In other words, self-assessment was more effective than the traditional mode of assessment used by teachers in the classroom.

Table 5

Analysis of Covariance of the Effect of Self- Assessment on Academic Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	23729.460[a]	2	11864.730	157.563	.000
Intercept	137853.213	1	137853.213	1830.678	.000
Pretest	21.206	1	21.206	.282	.597
Self-Assessment	23584.645	1	23584.645	313.202	.000
Error	9111.508	121	75.302		
Total	289734.000	124			
Corrected Total	32840.968	123			

a. R Squared = .723 (Adjusted R Squared = .718)

Qualitative Findings

The analyses of the students' answers for the unstructured interview questions on effect of peer assessment on students' academic achievement revealed that overall, all the participants reported a positive attitude towards peer assessment. Almost all of them consider the process of peer assessment quite fair, valuable, enjoyable and helpful in improving their learning skills and should be sustained by the school. They reported that the instructions and assessment criteria were quite clear for them to carry out peer assessment.

In summary, almost all the students noted the following learning value attached to this type of assessment:

1. If students are informed that by the completion of the group work they will have peer evaluation, most of them might seriously approach the task for group work. In this case

each group member will know that his performance is being assessed by his peer. Moreover, each student will be quite aware that the teacher will get all the results.

2. Also peer assessment of group work allows students to get acquainted with some assessment criteria and the process itself. This type of assessment ensures Transparency- one of the principles of assessment.

3. Peer assessment also provides the opportunity for students to learn from their peers.

4. It improves communication, participation and group skills in the classroom.

The views of the participants on peer assessment and self assessment are presented below.

Participant 1 said that "it helped me to know the mistakes of my classmates and this has help me to avoid such mistakes in my work. In fact, I would like this assessment approach to be sustained by the school".

Participant 2 said "I am happy to grade my classmate work classwork. My partner and I worked together. He helped me with my mistakes and I helped her as well. Reading his mistakes and good points in her work, I learned a lot. I got some fresh ideas. It's good to have your classmate read your work and grade it. It's good to see it from a different perspective".

Participant 3 said "to be honest at initial stage I had strong doubts about this whole idea of peer assessment. It wasn't easy for me to understand how my classmate can become teachers and grade my work. Now I feel I learned a lot from them. I still need peer assessment feedback in other subjects taught in the school".

Participant 4 said " it allow me the opportunity to take a more active role in assessing my classmates works and know mistakes made by them, this class is the only class where we are allowed to work in pairs and share knowledge and ideas".

Participant 5 said "I like self-assessment method because it help me to learn my mistakes and to avoid them in subsequent tasks in map reading. Before I used to think that the teacher is wicked in grading my work now that I am doing it by myself my perception has changed".

Participant 6 said "it was really interesting to me. Grading my work has really made me to learn from my mistakes and avoid them in subsequent test. It should be continue as it reduce the bias and wrong perception I had about my teacher grading. I really like it because it helps me know why I performed poorly in map reading in the past".

Participant 7 asserted "Yes. When I graded my work based on the rubrics given to me by my teacher, this triggers me to learn more ... It helps me to know where my defects are so I can try to correct them before the next lesson."

Participant 8 reported, "learning from my own mistakes through self-grading was the most interesting part to me. I have opportunity to grade my work for the first time as a student. I used to think that my teacher just give me any grade she likes. Now that I grade myself I am very happy and satisfied. I wish it will continue like this in other subject".

The analyses of the students' answers for the unstructured interview questions on effect of self-assessment on students' academic achievement revealed that:

1. Self-assessment promotes positive attitude towards learning in the classroom and this makes students to perform better in the treatment group than in the control group.
2. Self-assessment provides a structured learning process for students to critique and provide feedback on their work.
3. It helps students develop lifelong skills in assessing and providing feedback to other own work and thus equip them with skills to self-assessment and improve their own work.

Discussion

A two-way interactions and main effect of the pretest variable on the dependent variable were investigated. The researcher found out that there was no significant effect of the pretest on the outcome variable. Therefore, taking the pretest did not affect the results of the posttest. Given that no pretest sensitization was found, pretest and treatment groups' interaction effect was examined. The researcher found out that there was no significant interaction of the treatments with the pretest on the outcome variable. Given that no pretest sensitization interaction with treatments was found, treatment groups was examined. The treatments were significant. A post hoc was conducted, results show that was a significance difference between peer assessment and the control group. Self-assessment with control group but no significance difference was found between peer assessment and self-assessment groups.

The researcher found out that after controlling for the covariate, peer assessment has significant effect on students' academic achievement in map reading geography. The mean academic achievement post test scores of students in peer assessment was higher than those expose to the control group. In other words, per assessment was more effective than the traditional mode of assessment used by teachers in the classroom. The above findings are in line with Obilor and Adegbeye (2021), and Race (2011) who found out that peer assessment help students to reflect on their own efforts, and extend as well as enrich this reflection by exchanging feedback on their own and their peers' works. It also equips them with skills to self-assess and improve their life. Li and Gao

(2015) and Jhangiani (2016) also found out that low-and average-achieving students showed significantly improved performance right after the integration of a peer assessment model in teaching and learning. The results from the qualitative findings also supported the quantitative results, all the students reported a positive attitude towards peer assessment. Almost all of them consider the process of peer assessment quite fair, valuable, enjoyable and helpful in improving their learning skills and should be sustained by the school. They reported that the instructions and assessment criteria were quite clear for them to carry out peer assessment and this help them to learn the topics taught by the teacher faster.

The researcher also found out that after controlling for the covariate, self-assessment has significant effect on students' academic achievement in map reading geography. The mean academic achievement post test scores of students in self-assessment were higher than those expose to the control group. In other words, self-assessment was more effective than the traditional mode of assessment used by teachers in the classroom. The above findings are in line with Karaman (2021), Obilor and Ikpa, (2022) and Udechukwu (2021) who found that self-assessment has significant effect on students' academic achievement in schools. Similar studies also demonstrated that self-assessment tool with rubrics, checklists, or scripts can guide students to understand the tasks deeply and monitor their own tasks for achievement (Andrade &Valtcheva, 2009; Panadero, et al, 2012; Vasu et al., 2020; Veenman, 2011). The above findings was supported with the participants opinions that self-assessment approach enabled them to understand the map reading lessons better because the assessment make them to know their own mistakes, correct them and prepare for the next lessons. The assessment helped them understand the lesson better and not to repeat mistakes made in subsequent lesson. In addition, the assessment was very clear to them, and at each step of the assessment, the teachers asked questions and encouraged students to ask questions about what they have seen and heard in the assessment. At the end of each assessment, students were asked to perform tasks and their teachers guide them properly on how to perform the tasks, thereby enabling their better off performance in map reading.

Conclusion

The findings suggested that the peer and self-assessment approach were effective for enhancing the map reading achievement of secondary school students compared to the conventional assessment approach. The process of peer and self-assessments are quite fair, valuable, enjoyable and helpful in improving their learning skills by students. The results of the qualitative corroborated that of the quantitative findings.

Recommendations

The researcher wish to recommends the following:

1. Teachers should undertake peer assessment in schools as it promote collaborative learning among students
2. Teachers should also adopted peer assessment in schools as it self-confidence in learning among students
3. Government should organize workshops and seminars on peer and self-assessment for teachers at all level of education.
4. Assessment experts should stress the use of peer and self-assessment for teachers at all level of education.
5. School evaluators should demand for report of peer and self-assessment report from schools.

References

Andrade, H., &Valtcheva, A. (2009). Promoting learning and achievement through self-assessment. *Journal of Theory to Practice*, *48* (1), 12-19.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(4), 77-101.https://doi.org/10.1191/1478088706qp063oa

Brown, G. T. L., & Harris, L. R. (2013). Student self-assessment. In J. McMillan (Ed.), *The SAGE Handbook of Research on Classroom Assessment* (pp.367-393). Thousand Oaks, CA: SAGE.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage.

Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage Publications.

Creswell. J.W., &Creswell, J.D. (2022). *Research Design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). Sage Publication.

Crooks, T. (2007, April). Key factors in the effectiveness of assessment for learning. *Paper presented at the meeting of the American Educational Research Association, Chicago*, IL.

Edmonds, A. W., & Kennedy, T, D. (2017.*An applied guide to research designs: Quantitative, qualitative, and mixed methods.* SAGE.

Falchikov, N. (2007). The place of peers in learning and assessment. In D. Boud & N. Falchikov (Eds.). *Rethinking Assessment in Higher Education: Learning for the Longer Term* (pp. 128-143). Routledge.

Hagaman, A. K.,&Wutich, A. (2017). How many interviews are enough to identify meta-themes in multisite and cross-cultural research? *Landmark Study. Field Methods, 29*(1), 23-41.

Hagaman, A.K., &Wutich, A. (2017). How many interviews are enough to identify meta- themes in multisite and cross-cultural research? *Journal of Mathematics Education, 4*(2), 90-110.

Harrison, C., &Harlen, W. (2006). Children's self– and peer–assessment. In W. Harlen (Ed.), *Guide to Primary Science Education* (pp. 183–190). Association for Science Education Publication.

Hersam, M. C., Luna, M., & Light, G. (2004). Implementation of interdisciplinary group learning and peer assessment in a nanotechnology engineering course. *Journal of Engineering Education, 93*(1), 49-57.

Jhangiani, R. S. (2016). The impact of participating in a peer assessment activity on subsequent academic performance. *Teaching of Psychology, 43*(3), 180–186.

Karaman, P. (2021). The impact of self-assessment on academic performance: A meta-analysis study. *International Journal of Research in Education and Science, 7*(4), 1151-1166. https://doi.org/10.46328/ijres.2344

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). The Guilford Press.

Kollar, I., & Fischer, F. (2010). Peer assessment as collaborative learning: A cognitive perspective. *Learning and Instruction, 20* (3), 344–348.

Li, L., & Gao, F. (2015). Effect of Peer assessment on project performance of students at different learning levels. *Visual Communication and Technology Journal, 4*(5), 71-79.

Li, L. (2012). How do students of diverse achievement levels benefit from peer assessment? *International Journal for the Scholarship of Teaching & Learning, 5*(2), 34-45. Available at: http://digitalcommons.georgiasouthern.edu/ij-sotl/vol5/iss2/14

Looney, S. (2011). Effective language assessment methods. *International Journal of Language Teaching, 5*(2), 34-45.

McDonald, B., & Boud, D. (2003). The impact of self-assessment on achievement: The effects of self-assessment training on performance in external examinations. *Journal of Assessment in Education: Principles, Policy & Practice, 10*(2), 209-220.http://dx.doi.org/10.1080/0969594032000121289

Narael, H., & Abullah, O. (2016). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education, 31*(2), 199–218.

Obilor, E. I., & Ikpa, A. I. (2022). Self-assessment as correlate of academic achievement among financial accounting students in public senior secondary schools in Rivers State. *International Journal of Academia and Educational Research, 6* (2), 83-93.

Obilor, E.I.,&Adegbeye, A. O. (2021).Influence of peer-assessment on students' academic performance in home management in public senior secondary schools in Akwa Ibom State. *International Journal of Innovative Education Research, 9*(4), 112-125.

Panadero, E., Alonso-Tapia, J., & Huertas, J. A. (2012). Rubrics and self-assessment scripts effects on self-regulation, learning and self-efficacy in secondary education. *Learning and Individual Differences, 22*(6), 806–813. http://dx.doi.org/10.1016/j.lindif.2012.04.007

Rabinowitz, F. K. (2010). *Self- assessment: From theory into practice.* CA: CRESST

Race, P. (2011). *A briefing on self, peer and group assessment.* LTSN Generic Centre Assessment Series.

Topping, K. J. (2009). Peer assessment. *Journal of Theory into Practice, 48*(1), 20–27. http://dx.doi. org/10.1080/00405840802577569

Udechukwu, J. (2021). Effect of self-assessment and peer-assessment techniques on the performance of undergraduate students in a basic statistics course. *International Journal of Innovative Mathematics, Statistics & Energy Policies, 8*(3):69-75.

Vasu, K. A., Mei Fung, Y., Nimehchisalem, V., &Md Rashid, S. (2020). Self-regulated learning development in undergraduate ESL writing classrooms: Teacher feedback versus self-assessment. *RELC Journal,5*(4), 1-15. https://doi.org/10.1177/0033688220957782

Veenman, M. V. J. (2011). Learning to self-monitor and self-regulate. In R. Mayer & P. Alexander (Eds.). *Handbook of Research on Learning and Instruction* (pp. 1197–1218). Routledge.

Violato, C., & Lockyer, J. (2006). Self and peer assessment of pediatricians, psychiatrists and medicine specialists: implications for self-directed learning. *Advances in Health Sciences Education, 11*(3), 235-244.

Wang, Y., Li, H., Feng, Y., Jiang, Y., & Liu, Y. (2012). Assessment of programming language learning based on peer code review model: Implementation and experience report. *Computers & Education, 59*(2), 412-422.

West African Examination Council (2022). *Chief examiners report: May/ June West African senior school certificate examination*. Lagos: WAEC.

Yunlok, F. (2014). Student self-assessment in higher education: Alone or plus. *Paper presented at the CPLA Conference Lebanese American University, Lebanon.*

Effect Of Insecurity And Socio-Economic Development Of Orlu Local Government Area Of Imo State (2021-2023)

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Abstract
This paper investigated the effects insecurity and socio-economic development in Orlu Local Government Area of Imo State (2021-2023). Three research questions guided the study. Three hundred and ninety nine (399) adults were sampled from the communities in Orlu Local Government Area. The instrument for data collection was a self-developed structured questionnaire. 12 item structured questionnaire for respondents was also developed. Data were analyzed using mean ratings. The study found out that insecurity caused unemployment, relative deprivation and frustration, menace of fake and illicit drugs in Orlu L.G.A. It was recommended that there is need for government at all levels to urgently address the root causes of insecurity in the country such as poverty, unemployment, menace of fake and illicit drugs, uneven distribution of infrastructural facilities and others through good governance.

Keyword: Insecurity, Effects, Solution, Socio-economic Development

Introduction

Security of lives and property have been accorded priority attention by governments of different countries of the world, be it democratic or military administration. This is so because an atmosphere devoid of fear, anxiety, threat, harm etc. to citizens' lives and property is a sure means to bring about socio-economic development. It is generally believed that development cannot thrive in the atmosphere of conflicts, violence, anxiety, fear and waton destruction of lives and property. Therefore, it follows that there is a strong link between security and development in any social setting. Security is seen as a situation in which citizens of any country is at liberty

to go about their normal daily activities without threat to their lives and means of livelihood; safety from bodily harm, disease and human rights violations wherever they may find themselves (Adeleke, 2020).

The centrality of security in enhancing peaceful co-existence and promoting conducive environment for viable economic activities to thrive has been recognized by successive angering governments. This may have partly explained the establishment of security agencies that are fully staffed with qualified officers and men with operational equipment to rip in the bud any perceived threat to lives and properties in the country. In addition, there is a national security policy formulated to ensure internal security which is enshrined in the constitution with obvious objective to secure effectively the lives and properties of the Nigerian citizenry. Section 14 (2) (B) of the 1999 constitution of the Federal Republic of Nigeria as amended specifically states that the security and welfare of the people shall be the primary purpose of government. Government at all levels has always carried out constant public enlightenment programmes on the need to give peace and security a chance by being law abiding.

Regrettably, in recent time, Nigeria has been passing through difficult security situation. There has been so many security challenges that have consistently threatened the corporate, existence of the country. It has been argued that since Nigerian independence, in 1960, there has been centrifugal forces that have continued to work against our collective desire to have a strong indivisible country. Nigeria is a heterogeneous state with over 250 ethnic nationalities or groups (Echiegu, 2021). These nationalities as argued by Nwali (2011) were forcefully merged in the popular amalgamation of the strong ethnic group over the weaker minority group which eventually degenerated into security challenges that are now a regular feature in the Nigeria state. Security challenges imply situations when citizens are not free to walk peacefully or harmoniously without fear of intimidation, molestation, infliction of bodily injuries wherever they find themselves (Iwundu, Thom, & Otuya, 2019). In other words, they constitute conditions that create or cause anxiety, fears, intimidation, threat, harm etc. to lives and property. Insecurity has continued to show an upward trend as they have taken different forms and dimensions ranging from acts of militancy and vandalisation of oil installations in South-South, massive robbery in South-West, kidnapping in the South-east and terrorist acts, herdsmen, attacks on farmers as well as cattle rustling especially, in Northern Nigeria (Adebakin, 2012). Other manifestations, of threat to national security or insecurity include drug trafficking violence, political violence, communal strife, natural disasters and pervasive acts of normlessness (Darmer, Baird & Rosebaum, 2021).

Statement of the Problem

The high risk of insecurity in communities in Imo State mostly in Orlu L.G.A has halted community development projects in recent years. The incessant killings, kidnapping, armed robbery, cult activities and political violence recorded in Orlu L.G.A since 2021 to present day have left the thriving area to be desolate as most people living in the area fled for their dear lives. Small and medium scale businesses left the Orlu L.G.A for safety. The insecurity in the area has also resulted in the abandonment of projects to be carried out in the Orlu LGA by the state government and the local government authority.

This insecurity and socio-economic development has led to anarchy and are capable of consuming the economy in Orlu L.G.A and is likely to be attributed to bad leadership, bad governance, poverty, poor justice system and poor service delivery. Hence, there is urgent need to evaluate the insecurity and socio-economic development in Orlu L.G.A and also find out their root causes and the way out of the problem.

Purpose of the Study

The primary purpose of the study is to ascertain the effect of insecurity on socio-economic development of Orlu L.G.A, Imo State between 2021-2023. Specifically the paper seeks to address the following objectives:

1. To examine the causes of insecurity in Orlu L.G.A.
2. To ascertain the effect of insecurity on socio-economic development in Orlu L.G.A.
3. To proffer possible solutions to insecurity on socio-economic development in Orlu L.G.A.

Research Questions

The following research questions give direction to the study:

1. What are the causes of insecurity in Orlu L.G.A?
2. What are the effects of insecurity on socio-economic development in Orlu L.G.A?
3. What are the possible solutions to insecurity on socio-economic development in Orlu L.G.A?

Methodology

The paper adopted descriptive survey design. According to Ali (2005), descriptive survey design studies are mainly concerned with describing events as they are without any manipulation of what is being observed. The design was therefore suitable for this study because it aided us in effective descriptive and analysis of observable data from the field. The area of the study is Orlu L.G.A of Imo State.

The population for the study is 127,213 (one hundred and twenty seven thousand, two hundred and thirteen) according to 2006 census in Orlu L.G.A, Imo State.

In view of the large of number of the population that is involved in the study, the researcher adopted Taro Yamani (1964) statistical standard formula for sampling determination, hence the researcher used a sample which was randomly drawn from the total population as stated below. The size is 400.

Table 1

Population and Sample Distribution of Respondents

Gender	Population	Sample Size
Male	62,558	196
Female	64,655	204
Total	**127,213**	**400**

The major instrument for data collection in this paper is the questionnaire. The questionnaire was structured using the 4 point Likert-type scale with options

Strongly Agreed (SA) = 4 points
Agreed (A) = 3 points
Disagreed (D) = 2 points
Strongly Disagreed (SD) = 1 point

The questionnaire contains two sections "A and B". section A consisted of bio-data of respondents, while section B consisted of questions intended to elicit information regarding the topic of this research derived from the research questions. The instrument was validated by two experts in the department of measurement and evaluation in Alvan Ikoku Federal College of Education Owerri and the observed correction was effected. The method of data collection used for this study was the survey method of data collection where a questionnaire was used as the instrument for data collection. The questionnaire was administered directly to the respondents and collected back to avoid loss of any questionnaire. The data collected was analyzed using the mean method. Therefore, mean score 2.5 and above was acceptable while below 2.5 was rejected for the cumulative mean, while necessary explanations accompanied it.

Results

Research Question One

What are the causes of insecurity in Orlu L.GA during the period 2021-2023?

Table 2

Responses to Causes of Insecurity in Orlu L.G.A

S/N	Items-Causes of Insecurity	SA	A	D	SD	Total	$\bar{X}$	Decision
1	Unemployment in Orlu L.G.A	252 1008	102 306	25 50	11 11	390 1375	3.5	Accepted
2	Relative deprivation and frustration led to insecurity	217 868	112 336	44 88	17 17	390 1309	3.3	Accepted
3	Menace of fake and illicit drugs in Orlu L.G.A	197 788	122 366	48 96	23 23	390 1273	3.2	Accepted
4	Low income increased insecurity	118 472	208 624	57 114	5 7	390 1217	3.1	Accepted

Cumulative Mean = $\frac{3.5 + 3.3 + 3.2 + 3.1}{4} = \frac{13.1}{4} = 3.2$

In table 2 above, item 5,6,7 and 8 have the means of 3.5, 3.3, 3.2 and 3.1 respectively which shows that the respondents accepted the issues raised with cumulative mean of 3.2. This indicates that the respondents accepted that insecurity was caused by unemployment. Relative deprivation and frustration menace of fake and illicit drugs in Orlu L.G.A and low income increased insecurity.

Research Question Two

What are the effects of insecurity on socio-economic development in Orlu L.G.A?

Table 3

Responses to Effects of Insecurity on Socio-Economic Development

S/N	Items Insecurity	SA	A	D	SD	Total	$\bar{X}$	Decision
5	led to loss of human resources	317 1268	64 192	5 10	4 4	390 1474	3.7	Accepted
6	led to low productivity	72 288	290 870	15 3	13 13	390 1201	3.0	Accepted
7	led to decrease of business both local and foreign	265 1060	78 234	32 64	15 15	390 1373	3.5	Accepted
8	Affected academic activities	229 916	101 303	43 86	17 17	390 1322	3.3	Accepted

Cumulative Mean = $\frac{3.7 + 3.0 + 3.5 + 3.3}{4} = \frac{12.5}{4} = 3.3$

From the above table, item 1 showed that 317 strongly agreed, 64 agreed, while 5 disagreed and 4 strongly disagreed that insecurity led to loss of human resources.In item 2, 72 strongly agreed, 290 agreed, while 15 disagreed and 13 strongly disagreed that insecurity led to low productivity during the period 2021 to 2023.

Item 3, 265 strongly agreed, 78 agreed, 32 disagreed and 15 strongly disagreed that insecurity led to decrease of business both local and foreign ones during the period under study. In item 4, 229 strongly agreed, 101 agreed, 43 disagreed and 17 strongly disagreed that insecurity affected academic activities. The cumulative mean of 3.3 affirmed the research question one, that insecurity affected socio-economic development through loss of life and property, low productivity, decrease in business activities and so.

Research Question Three

What are the possible solutions to insecurity on socio-economic development in Orlu L.G.A?

Table 4

Responses to Solution to Problems of Insecurity and Socio-Economic Development

S/N	Items	SA	A	D	SD	Total	$\bar{X}$	Decision
9	Massive job creation can reduce insecurity	151 604	222 666	13 26	4 4	390 1300	3.3	Accepted
10	Empowerment of small and medium business	190 760	153 459	36 72	11 11	390 1302	3.3	Accepted
11	Improvement on socio-economic infrastructure	187 748	140 420	42 84	21 21	390 1273	3.2	Accepted
12	Giving of entrepreneurship training to the youths	197 788	148 444	27 54	18 18	390 1304	3.3	Accepted

Cumulative Mean = $\frac{3.3 + 3.3 + 3.2 + 3.3}{4} = \frac{13.1}{4} = 3.2$

From the above table, item showed that 151 strongly agreed, 222 agreed, 13 agreed and 4 strongly disagreed that job creation is part if the solution to insecurity.

Item 10, 190 strongly agreed, 153 agreed, 36 disagreed and 11 disagreed that empowerment of small and medium business can reduce insecurity.

In item 11, 187 strongly agreed, 140 agreed, 42 disagreed and 21 strongly disagreed that improvement of socio-economic infrastructure reduced insecurity in Orlu L.G.A.

In item 12, 197 strongly agreed, 148 agreed, 27 disagreed and 18 strongly disagreed that giving of entrepreneurship training to the youths helps in reducing insecurity.

The cumulative mean of 3.2 accepted that massive job creation, empowerment of small and medium scale businesses improved socio-economic infrastructure and giving of youths entrepreneurship training to solve the problem of insecurity and socio-economic development in Orlu Local Government Area.

Discussion of Findings

The findings of the above research question show that insecurity led to loss of human resources, low productivity, decrease of business both local and foreign, and equally affected academic activities. This finding is in agreement with James (2021) who said that no investor whether local or foreign will be motivated to invest in an unsafe and insecure environment. In a globalized world, investors are not only looking for high returns on their investments but also safe haven for their investments. Thus, the alarming level of insecurity in Nigeria has made the economy unattractive to foreign investors and development.

It was deduced from the above research that insecurity causes unemployment, relative deprivation and frustration, menace of false and illicit drugs and affected source of income in Orlu LGA. These findings is in line with Adagba et al (2012) who said that unemployment/poverty among Nigerians especially the youths is a major cause of insecurity and violent crimes in Nigeria. Hence, youth unemployment has contributed to rising cases of violet conflict in Nigeria.

The findings showed that job creation,, empowerment of small and medium business improvement of socio-economic infrastructure and giving of entrepreneurship training to the youths can reduce insecurity. The findings are in line with Keane (2010) who stated that sustained and rapid economic growth would create new jobs, business opportunities, higher incomes and increased wealth. However, this requires capable and effective management of macro economy by the public sector and of industries by the private sector as well as close agreement between the two sectors.

Conclusion

The findings of the study have revealed the effect of insecurity on socio-economic development of Orlu L.G.A, Imo State 2021-2023. The conclusion of this study shows that, insecurity has influenced socio-economic development negatively and gave birth to issues like ethno religious crisis, terrorism, weak security system has scared away investors which have brought about reduced growth in the economy.

Also, circumstance that encourages and propels insecurity is poverty. Taking the perception of respondents in Orlu L.G.A, insecurity brought about poverty, menace of fake and illicit drugs which as a result caused disruption of business activities and communal life in the society and it hindered investment. To solve this problem, job creation and entrepreneurship skills would be a good measure to reduce insecurity and reduce crime in Orlu L.G.A.

Recommendations

1. The security architecture of the state should be properly trained and overhauled to be proactive through intelligence gathering so as to nip any perceived security threats in the bud, since the reactive posture maintained by these security agencies in crisis situation has not curbed security challenges in the country.
2. There is need for government at all levels to urgently address the root causes of insecurity in the country such as poverty, unemployment, menace of fake and illicit drugs, uneven distribution of infrastructure etc, through good governance.
3. Imo State government should evolve policies and programmes capable of promoting state consciousness and state loyalty as it will help to eliminate the centrifugal factors that are always at work to tear the state apart.

References

Adagba, G., Kimber, B.,Adeyemi, A.O., & Olaleye, A.A.(2012). *Civil liberties versus national security in a post 9/11 world.* Kaduna: Raffaith Publishing Company

Adebakin, M.A. (2012). National security challenges and sustainable economic development: Evidence from Nigeria. *Journal of Studies inSocial Sciences*1(1), 1-30.

Adelekem A. (2020). Insecurity: A threat to human existence and economic development in Nigeria. *Public Policy and Administration Research*,3 (6), 8-13.

Ajodo, F., Adebanjoko, B, & Ugwoke, N. (2014). *Sovereignty as responsibility conflict management in Africa*. Washington DC.:The Brooking institute.

Ake, C. (2001). *Democracy and development in Africa.* Ibandan: Spectrum books limited.

Darmar, M.K.B., Baired, R.M., & Rosenbaum, S.E. (2021). *Civil liberties versus national security in a post 9/11 world*. New York: Prometheus books.

Echiegu, A.O.U. (2021). *Inter-ethnic vengeance: The bane of enduring peace in multi-ethnic nation state.* Abakaliki: Citizens advocate press.

Iwundu, J. & Igbuzor, O. (2002). *Memorandum submitted to the presidential committee on national security in Nigeria.*

James, H. (2021). *Democracy and development in West Africa.* Owerri: Spectrum books limited.

Keane, J. (2010). Does democracy have a violent heat. In D. Pritchard (Ed). *War Democracy and Culture in Classical Arthens.* Cambridge press.

McGrew, T. (1988). Security and order. In S. M. Smith, S. & B. White (Eds.).*British Foreign policy: Tradition, Change and Transformation.* London: Allen and Union

Nwali, T.B. (2011). *Nigerian government and administration: Current problems and energy issues.* Abakaliki: De Oasis communication and Publishers.

Fostering the Development of Digital Pedagogical Skills of Teacher in Africa: A Case Study from Tanzania

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Abstract
The concept of digital literacy and digital competence is conceptualized in the curriculum for compulsory education in the teacher education program. However, how the two terms are put into practice by the implementers remain to be unclear. The attention given to the two terms by the corresponding practitioners does not correlate to the increasing digital transformation to enable learners and educators positively adapt to changes in all areas of academic, social and individual life. This research analyses twofold: the level of digital competence of educators perusing masters of education program, and their ability to design and use digital resources. The study employed a quantitative research approach to administering the digital competence self- assessment survey (DCSAS) on 64 masters of education educators. The statistics analysis measured were mean, standard deviation, frequencies and percentages. The findings indicate that the level of educators' digital competence including their understanding, using, finding and creating various information using digital technologies was moderate. Likewise, DCSAS results adequately explain that educators prefer the use of available digital resources mostly to prepare lesson notes, exams, students' grades and personal data; than creating their digital resources and monitoring students' activities and interactions in a collaborative online environment. Thus, understanding the factors that interplay with the educators' acceptance, preference and use of various digital technologies is important to inform the designing of the teacher education program to enhance the successful integration of technology in teaching and learning.

Keywords: Digital Competence, Digital Literacy, Digital Resources And Teacher Education Program

Introduction

The COVID-19 induced school lockdown saw countries adopt different measures to continue academic engagements while schools remained closed. This caused a rushed digitalization of education. The group most affected by the sudden switch to online school are the primary and secondary school teachers, with a greater demand on the latter (Jackman, Gentile, Cho, *et al.* 2021). During the emergency, we

saw a first response to the provision of tools for remote or online learning before digital pedagogical trainings, if any, for teachers. This led to teacher's unpreparedness for remote learning and the exposing of the widening digital skill gaps of African educators. The Human Rights Watch (2020) conducted a study across various countries in Africa on the impact of COVID-19 on children's education, it cited among one of its major findings the need for digital literacy education, noting that this is increasingly recognized as an indispensable element of children's rights to education. To corroborate this, the E-learning Africa (2020) reports, based on the survey of 1650 respondents from 52 countries in Africa noted that, while the need for distance learning was clear from the onset of the pandemic, achieving effective reach was more complex. For the majority, the teachers had no prior experience teaching outside the classroom and using digital resources, while 71% of the respondents said they had no training prior to COVID-19 on how to adjust to providing distance-based learning for students. The report also noted that the main impediment for teachers was lack of appropriate training to design and manage distance learning program. (E- Learning Africa, 2020).

A review of recent studies that examined the impact of COVID-19 on the educational systems of Africa, show a common thread of unpreparedness of teachers to adjust to the need to provide distance-based learning for their students and this was primarily due to the lack of adequate professional development and trainings prior to COVID-19. (Human Right Watch, 2020;, OECD; 2020;, E-Learning Africa, 2020;, Olurinola, 2021;, Thorvaldsen & Madsen, 2021). This period exposed a digital pedagogical skill gap of African Teachers, highlighting the need not only for technological know how for our teacher but also an acquisition of technology pedagogical knowledge to address the need for today's and future classrooms. There is a concern that this digital competency skill gap may worsen if we do not act now to address the problems and bridge the gap, not only for the now but for future emergencies. It is on this premise that this project, in collaboration with the ICT Research and Development Group of the IED-EA, Aga Khan University, Tanzania, aimed at evaluating the digital pedagogical competence of educators on the M.Ed program, to precede the implementing of innovative digital pedagogical trainings aligned with the digital pedagogical needs analysis and determining the impact of the trainings on the digital pedagogical competence and confidence of the teachers.

Teacher education programs are generally related to the development of teacher competence and proficiency that supports and empower the teacher to attain the requirements of the profession and face the challenges therein. Teacher education, also teacher training, are the rules, processes, and resources meant to provide teachers with the knowledge, attitudes, behaviours, and skills they need to do their jobs well in the classroom, school, and community. The curriculum, instructional tools, and faculty that

contribute to the quality of instruction and the acquisition of information, skills, and competencies required for a professional teacher to perform effectively in public schools are referred to as a teacher education program. A general and professional education, as well as a specialization, is required for teacher education programs. Literature highlights that, although teacher education varies across countries common patterns do emerge (Korthagen, 2010; Mgaiwa, 2018; Pereira, 2013). Similarly, Beauchamp et al. (2015) asserts that teacher education programs in most countries include initial teacher training, induction, continuing professional development reaching teachers at all levels of education namely pre-primary, primary, secondary , colleges and universities. Toohey and Smythe (2022) asserts that learners' needs vary in all levels of education; hence stage and level specific teacher preparation programs are paramount. Consequently, teacher education should be a prominent component of the entirety of organized education, including both formal and non-formal sub-systems.

According to Korthagen (2010), changes occur in the curriculum of most countries, ranging from the ground level reform initiated by small groups and institutions to restructuring of teacher education by policymakers. The reforms and curriculum changes are done to embrace and accommodate the diversified needs of both teachers and learners. In this matter, the Tanzania National Curriculum Framework for Basic and Teacher Education emphasizes the need for learning to be mediated by effective integration of technology into teaching-learning across learning areas (URT, 2019). The concept of digital competencies largely refers to skills, knowledge, creativity, and attitudes that is required to study and function in the knowledge society using digital media. Yet, the level of implementation of digital competence training is still a parable with multitude of misconceptions (E-Learning African, 2020). Morris (2020) asserts that digital pedagogy is largely misunderstood to be the transference of classroom pedagogy online. That is, digitizing whatever the teacher had employed in the classroom. He posits that there is a difference between digital pedagogy and teaching online and that digital pedagogy was not a mere work of relocation but rather using the digital to innovate further, where digital pedagogue would work around limitations of digital platforms, using it as a portal to expand the learning environment and increase mindful teaching (Morris, 2020).

Reviewed literature has revealed the computer related courses to be more confined to administration purposes with limitation of basic ICT pedagogical skills (Kafyulilo, 2014; Mselle & Kondo, 2013; Mtebe & Twaakyondo, 2012; Njiku et al., 2021). In most cases ICTs have not been incorporated as a medium of instruction (Kafyulilo et al., 2015) but, only teaching learners on how to switch on and off the computer, orienting them the basic computer program of the Microsoft office such as Word, PowerPoint and Excel. In this regard, learners can also be taken through the

internet applications in areas where internet connection is not a problem (Kafyulilo, 2014). Nonetheless, the use of ICT in enhancing learning of subject content is noted to be minimum. Addressing the inadequacy in ICT integration in teacher education, the government through the ministry of education (MoEVT) initiated the Information, Communication Technology for teachers through professional development (ICT-TPD) framework (MoEST, 2017). The framework was meant to address the challenges related to ICT and technology in pre-service and in-service programs as well as the on-going learning of teachers.

The concepts of digital literacies and digital competence are conceptualized in curricula for compulsory education in the Teacher education program. Being digitally literate means being able to go through much information, the ability to understand a message and communicate it effectively to others in different formats. It also means creating, communicating and understanding when, if and how technology should be used to reach efficiently an objective, so digital literacy involves the use of technology. Carvarni et al (2008) states that digital competence is the ability to use and openness to new technological solutions in constantly improving ways. It comprises the ability to scrutinize, select, and critically evaluate information and data, as well as the ability to use technology to demonstrate and solve problems, develop shared and collaborative knowledge, and focus attention on personal commitments and that of others.

The origin of the competency-based teaching and learning method may be traced back to the social changes that have occurred over the last few decades. However, it has only been in the last few years that we have seen the rapid expansion of globalization which aided better advocacy of digital literacy of teachers and students. Digital competence and digital literacy are interchangeably used because sometimes both concepts are used to underpin each other, such as in the EU framework of essential competencies for all citizens (European Commission, 2006), where digital competence is specified as one of eight important competencies. Teacher training program need to equip teachers to use the technology innovatively, effectively, safely and ethically. Thus, providing teachers with sufficient digital competence is a key factor to be considered in teacher training programs. Teachers should possess and use Information Communication and Technology (ICT) skills not just at a basic level, but also utilize critical thinking and problem-solving skills and apply ethical knowledge. Basically, effective use of technologies for leisure, work and social inclusion are some of the tenets of digital competences training in teacher education program.

According to Jorgen (2017) Digital pedagogical competencies is the capacity to continuously use the attitudes, knowledge, and abilities necessary to plan and conduct, as well as analyze and update ICT- teaching model, current research, and proven experience to support students. The primary attribute of digital pedagogical

competence is the ability to develop/improve pedagogical work utilizing digital technology in a professional setting (Maussumbayev, Toleubekova, Kaziyev, Baibaktina, & Bekbauova, 2022). In contemporary society where education demands active and participatory educational models, digital pedagogical competence has risen to prominence in the educational context, becoming one of the main competences that teachers must master. The prevalent implementation of digital technology in professional and everyday life has increased the need for future teachers to be trained in order to prepare the next generation to participate effectively in modern society. Acquiring digital pedagogical competence is one of the vital competences that are necessary for lifelong learning, it is therefore imperative to understand the factors that interplay with the educators' acceptance, preference and use of various digital technologies as this information is key to informing the designing of the teacher education program to enhance the successful integration of technology in teaching and learning.

Numerous efforts including formulation of models, frameworks, and literacies have been devoted over the years to enable the integration of technology in teaching and learning as results develop the needed digital competencies in today's emerging technology and future classrooms. Yet, literature and experience show that the professional learning provided to educators does not efficiently enable them to acquire the digital pedagogical competencies required to take forward learning (Yazon et al., 2019; Esteve-Mon et al., 2016; Ghomi & Redecker, 2019). When the training needs are not identified, the desired digital pedagogical and instructional purposes are not met. With this context, therefore, the DCSAS was designed and administered to M.ed educators to establish their level of digital competence and determine the training needs before the implementation of the UNESCO MGIEP course.

Research Questions

This research addressed the following questions

1. At what level do educators use digital technologies in their professional practice?
2. What are the identified digital pedagogical gaps and training needs of the teachers?

Methodology

The study employed a quantitative research approach in a positivist philosophical worldview (Gray & Webb, 2012; Hothersall, 2019) to establish the educators' digital pedagogical competence levels and their training needs.

The study involved 64 educators who were enrolled for M.ed at the Aga Khan University in the year 2022/2023 selected to participate in the UNESCO Digital Teachers courses as an intact class. Among the 64 educators, 42 (66.5%) were male and

20 (33.5%) were female and were enrolled on ICT in Education course as an intact class. The participants were from the three East African countries i.e., 17 (27.1%) from Tanzania, 38 (65.5%) from Kenya and 9 (11.9%) from Uganda. In addition, the participants had a mean age of 39 years and an average of 13 years of teaching experience at levels such as 6(8.5%) Primary (grades K - 2), 9 (13.6%) Middle School (grades 6 - 8), 24 (39.0%) High School (grades 9 - 12), 12 (18.6%) Higher / Professional education. The other 9 (13.6%) were teaching at the K-12 level while the other 4 (6.8%) course participants did not specify the levels they teach.

A competency level rating scale (DCSAS) was administered to the selected participants where all the items were designed as a Likert scale based on the competencies to be developed. This instrument was the Selfie For Teachers, a self-evaluation instrument created by the (Ghomi & Redecker, 2019) based on the DigCompEdu framework, teachers can test their digital competence, reflect on their digital capabilities, and determine their training and professional development needs. The development of the tool was guided by three principles: (i) to condense and simplify the framework's key concepts; (ii) to translate competence descriptors into concrete activities and practices; and (iii) to provide targeted feedback to teachers based on their level of competence for each of the 22 indicators. Each item comprises a statement expressing the core of the competence in tangible, practical statements, as well as three to five possible responses that are cumulatively structured and mapped to the proficiency levels. Then, a response that best matches the focus of this research were chosen (Abbott, 2011) and checked for content validity thereafter (Reid et al., 2014).

The data were descriptively analyzed to obtain mean, standard deviations, frequencies and percentages guided by (Pallant, 2020). First, the mean and standard deviation were computed to deduce the general overview of the educators' digital pedagogical competence. Then, the frequencies and the percentages for each parameter included in the DCSAS were calculated to interpret the level of participants' digital pedagogical competence and training needs.

Table 1

Educators' Digital Competence Level in Terms of Mean and Standard Deviation

S/No	Rating Parameters	Mean	SD	Rank
1	I use different internet sites and search strategies to find and select a range of different digital resources	1.94	1.052	Moderate
2	I create my own digital resources and modify existing ones to adapt them to my needs	2.34	0.996	Moderate

3	I effectively protect sensitive content; e.g. exams, students' grades, personal data	2.31	0.871	Moderate
4	I carefully consider how, when and why to use digital technologies in teaching, to ensure that they are used with	1.73	0.696	Moderate
5	I monitor my students' activities and interactions in the collaborative online environments we use	1.81	0.924	Moderate
6	When my students work in groups or teams, they use digital technologies to acquire and document evidence	1.97	0.959	Moderate
7	I use digital technologies to allow students to plan, document and monitor their learning themselves; e.g. quizzes for self-	2.23	0.955	Moderate
8	I use digital assessment formats to monitor student progress	2.73	0.859	High
9	I analyze all data available to me to timely identify students who need additional support; "Data" includes: students'	1.88	1.031	Moderate
10	I use digital technologies to provide effective feedback	2.59	0.849	High
11	When I create digital assignments for students I consider and address potential digital problems; e.g. equal access to digital devices and resources; interoperability and conversion problems; lack...	1.63	0.826	Moderate
12	I use digital technologies to offer students personalized learning opportunities; e.g. I give different students	2.20	1.086	Moderate
13	I use digital technologies for students to actively participate in classes	2.36	0.861	Moderate
	OVERALL	2.132	0.920	Moderate

Legend: 2.50 – 3.00 – High; 1.50 – 2.49 – Moderate; 1.00 – 1.49 – Low

Results and Discussion

This work presents a need assessment results obtained from DCSAS that was administered before the implementation of the UNESCO MGIEP digital teacher course. The DCSAS was conducted to assess Med educators' level of digital competence i.e., knowledge, skills and digital gaps in using digital tools and creating digital resources. Table 1 presents the results of how the educators rated themselves in various parameters. The overall mean and standard deviation were (= 2.132; SD = 0.920) which indicates the average digital competence. As presented in Table 1 the educators were seen to be quite competent in using different internet sites and search strategies to find different digital resources, create their digital resources, understand how to protect important content and know how to use digital resources. Moreover, the educators revealed that they can monitor students' interaction through an online environment, use digital assessment formats to assess students' progress and later provide feedback to them. They also revealed to have limited competence to address potential digital problems and ability to analyze digital data.

Table 2

Factored Rating Parameters Based on the CB Lesson Stages in Terms of Mean and Standard Deviation

The aspect of CB lesson	Parameter's number	Average Mean	Average SD	Rank
Preparation/planning	1, 2, 11	1.97	0.958	Moderate
Implementation	4, 5, 12, 13	2.025	1.142	Moderate
Assessment	3, 6, 7,8,9	2.224	0.935	Moderate
Feedback	10	2.59	0.885	High

Legend: 2.50 – 3.00 – High; 1.50 – 2.49 – Moderate; 1.00 – 1.49 – Low

The results in this analysis were factored further into the four aspects of a competence-based (CB) lesson i.e., lesson preparation, implementation, assessment and feedback stages as seen in Table 2. Items 1, 2 and 11 were factored in the first stage with (= 1.97; SD = 0.958), items 4, 5, 12 and 13 factored in the second stage with (= 2.02; SD = 1.14), items 3, 6, 7, 8, and 9 were factored in the third stage with (= 2.22; SD = 0.935) and item 10 was the only item factored in the fourth stage with (= 2.59; SD = 0.88). The average mean and standard deviation obtained for the first three stages was noted to be moderate level which implies that the educators were quite competent in the application of digital skills in the first three stages of a CB lesson. The fourth stage

exhibited high average mean and standard deviation which implies that the educators were highly competent in the aspect of giving feedback using digital technology.

Table 3

The Frequencies and Percent of all the Items on the Rating Parameters Falling on the CB Lesson Preparation Stage

Rating Parameter	Sub-rating Parameter	Frequency	Percent	Rank
I use different internet sites and search strategies to find and select a range of different digital resources	"I evaluate and select resources on the basis of their suitability for my learner group"	31	48.4	Moderate
	I compare resources using a range of relevant criteria, e.g. reliability, quality, fit, design, interactivity, appeal	12	18.8	Low
	I only rarely use the internet to find resources	15	23.4	Low
	I advise colleagues on suitable resources and search strategies	6	9.4	Low
I create my own digital resources and modify existing ones to adapt them to my needs	I do not create my own digital resources	14	21.9	Low
	I do create lecture notes or reading lists with a computer, but then I print them	23	35.9	Moderate
	I create digital presentations, but not much more	19	29.7	Moderate
	I create and modify different types of resources	7	10.9	Low
	I set up and adapt complex, interactive	1	1.6	Low
When I create digital assignments for students I consider and address potential digital problems; e.g. equal access to digital devices and resources;	I do not create digital assignments;	38	59.4	High
	I discuss possible obstacles with students and outline solutions	12	18.8	Low
	I allow for variety, e.g. I adapt the task, discuss solutions and provide alternative ways for completing the task;	14	21.9	Low

interoperability and conversion problems; lack...				

Legend of Ranking: 50 – 100 – High; 25 – 49 Moderate; 1 – 24– Low

Further, the analysis was done on the items falling under each analysis parameter and the results are presented based on the items indicated in each step of a CB lesson. The frequencies and percentages for the items included in the preparation/planning of the CB lesson are presented in Table 3. The results indicated that 31 educators (48.4%) evaluate and select resources based on their suitability and 15 (23.4%) confessed to rarely using the internet to find resources. This finding is contrary to the findings of Yazon et al.(2019) who found that the educators were competent and preferred finding information online. Further, 23 educators (35.9%) highlighted creating lecture notes and reading lists using computers and 19 educators (29.7%) only end up on creating digital presentations. This finding is in line with the finding that the majority of participants exhibited excellent competence in creating and formatting documents as well as generating tables, pictures and images(Shopova, 2014). Based on the highlighted aspects of digital resources in the DigCompEdu, the results revealed that educators still needed professional learning programs for the selection, creating and modifying as well as managing and sharing of digital resources(Ghomi & Redecker, 2019).

Table 4

The Frequencies and Percent of All the Items on the Rating Parameters Falling on the CB Implementation Stage

Rating Parameter	Sub-rating Parameter	Frequency	Percent	Rank
I carefully consider how, when and why to use digital technologies in teaching, to ensure that they are used with	I do not or only rarely use technology in class	26	40.6	Moderate
	I make basic use of available equipment, e.g. digital whiteboards or projectors	29	45.3	Moderate
	I use digital tools to implement innovative pedagogic strategies	9	14.1	Low
I monitor my students' activities and	I do not monitor student activity in the online environments we use	31	48.4	Moderate

interactions in the collaborative online environments we use	I regularly monitor and analyze my students' online activity	17	26.6	Moderate
	I occasionally check on them and their discussions	13	20.3	Low
	I regularly intervene with motivating or corrective comments	3	4.7	Low
I use digital technologies to offer students personalized learning opportunities; e.g. I give different students	I do provide students with recommendations for additional resources	24	37.5	Moderate
	In my work environment, all students are required to do the same activities, irrespective of their level	11	17.2	Low
	Whenever possible, I use digital technologies to offer differentiated learning opportunities	21	32.8	Moderate
	I systematically adapt my teaching to link to students' individual learning needs, preferences and interests	8	12.5	Low
	In my work environment it is not possible to actively involve students in class	9	14.1	Low
	When instructing, I use motivating stimuli, e.g. videos, animations, cartoons	30	46.9	Moderate
I use digital technologies for students to actively participate in classes	I do involve students actively, but not with digital technologies	18	28.1	Moderate
	My students engage with digital media in my classes, e.g. electronic worksheets, games, quizzes	7	10.9	Low

Legend of Ranking: 50 – 100 – High; 25 – 49 Moderate; 1 – 24– Low

Table 4 indicates that 26 (40.6%) educators were not or rarely used digital technology in class, and 29 (45.3%) educators were capable of making basic use of available digital equipment like projectors and whiteboards. They also highlighted that they were not monitoring students' activie 4ties in an online environment 31 (48.4%). Meanwhile, 24 (37.5%) educators confessed to giving their students recommendations for additional resources, and 21 (32.8%) educators highlighted that they use digital technologies to offer differentiated learning opportunities whenever possible. In addition, 30 (46.9%) educators rated themselves to use motivating stimuli, e.g. videos, animations, and cartoons when instructing. Again, 18 (28.1%) educators agreed to involve students actively during the teaching and learning process, but not with digital technologies. All these findings imply that the educators demonstrated quite a competence in preferring the engagement of their students in the use of digital resources than it was to them. Thus, these findings called for more professional learning programs which can develop educators' competencies in the use of digital resources and not only availing the resources to their colleagues and students.

Table 5

The Frequencies and Percent of All the Items on the Rating Parameters Falling on the CB Assessment Stage

Rating Parameter	Sub-rating Parameter	Frequency	Percent	Rank
I effectively protect sensitive content; e.g. exams, students' grades, personal data	I do not need to do that, because the department takes care of this	6	9.4	Low
	I password protect some personal data	43	67.2	High
	I avoid storing personal data electronically	4	6.3	Low
	I comprehensively protect personal data, e.g. combining hard-to-guess passwords with encryption and frequent software	11	17.2	Low
When my students work in groups or teams, they use digital technologies	Not possible in my work environment	18	28.1	Moderate
	Sometimes I use, for example, quizzes for self-assessment	18	28.1	Moderate
	My students do reflect on their learning, but not with digital technologies	23	35.9	Moderate

to acquire and document evidence	I systematically integrate different digital tools to allow learners to plan, monitor and reflect on their progress	5	7.8	Low
I use digital technologies to allow students to plan, document and monitor their learning themselves; e.g. quizzes for self-	Not possible in my work environment	18	28.1	Moderate
	Sometimes I use, for example, quizzes for self-assessment	18	28.1	Moderate
	My students do reflect on their learning, but not with digital technologies	23	35.9	Moderate
	I systematically integrate different digital tools to allow learners to plan, monitor and reflect on their progress	5	7.8	Low
I use digital assessment formats to monitor student progress	I do not monitor students' progress	5	7.8	Low
	Sometimes I use a digital tool, e.g. a quiz, to check on students' progress	18	28.1	Moderate
	I do monitor students' progress regularly, but not with digital means	31	48.4	Moderate
	I use a variety of digital tools to monitor student progress	9	14.1	Low
	I systematically use a variety of digital tools to monitor student progress	1	1.6	Low
I analyze all data available to me to timely identify students who need additional support;	I only analyze academically relevant data, e.g. performance and grades	27	42.2	Moderate
	I also consider data on student activity and behaviour to identify students who need additional support	26	40.6	Moderate
	I systematically analyze data and intervene in a timely manner	6	9.4	Low

"Data" includes: students'	These data are not available and/or it is not my responsibility to analyze them	2	3.1	Low
	I regularly screen all available evidence to identify students who need additional support	3	4.7	Low

Legend of Ranking: 50 – 100 – High; 25 – 49 Moderate; 1 – 24– Low

As shown in Table 5, the majority of the educators i.e., 43 (67%) mentioned effectively protecting sensitive content like exams, students' grades and personal data by using the password. In the other attempt 18 (28.1%) educators mentioned that students' effective use of digital technology when doing various activities in groups or teams is not possible in their working environment. This is perhaps because most the learning environments lack facilities that can enhance learning using technology (Kafyulilo, 2014; Pates & Sumner, 2016). Easily accessible gadgets like a mobile phone that the majority of students of this era has are still strictly prohibited to be seen in the classroom environment (Njiku et al., 2019, 2021). Moreover, a digital network that could enhance both teacher's and student's easy interaction at the same time is yet to be integrated into ordinary classrooms(Mtebe & Raphael, 2018). Again, 18 (28.1%) educators highlighted that they sometimes use digital assessment for their students like quizzes for self-assessment. Additionally, 23 (35.9%) educators agreed that their students do reflect on their learning but not using digital technologies, and 31 (48.4%) educators monitor students' progress but not with digital resources. This finding did not only indicate limited access to digital technology by the educators but also the training on its use. Similar concern has been raised by other scholars. For instance, it has been seen that poor integration of technology in training colleges affects further technological integration in schools (Njiku et al., 2021; Pates & Sumner, 2016). It is important, therefore, to improve technology integration and training for educators to address the issues related to technology integration in a classroom environment.

On the issue of analysis of academic data, Table 5 indicates that 27 (42.2%) educators highlighted that they only analyze relevant data like performance and grades. Moreover, 26 (40.6%) educators rated to consider data from students' various activities to identify the students who need additional support. Students' assessments should not solely end only on classroom activities, performance and grades(Pettersson, 2018). Kaya-Capocci et al.(2022)argued that the use of formative assessment that has all features of a digital learning environment can the assessment of students' progress. According to them, this kind of assessment is effective when digital technology and digital assessment are drawn together. The commentators like Bearman et al.(2022)

mentioned that instant and effective formative digital assessment through course management systems and virtual learning environments like Edmodo, Moodle, Pocket Study, Canvas, Edsby, and WebCT and classroom response systems can help to improve teachers digital pedagogical practices. With clickers, student response systems, personal response systems, audience response systems, and classroom performance systems like Socrative, Kahoot!, and Plickers, students' participation can be improved, save time, give students equal participation opportunities, and create fun and exciting learning environment (Kaya-Capocci et al., 2022). This result ignites the educators' professional learning on aspects of effective formative digital assessment.

Table 6

The Frequencies and Percent of all the Items on the Rating Parameters Falling on the CB Feedback Stage

Rating Parameter	Sub-rating parameter	Frequency	Percent	Rank
I use digital technologies to provide effective feedback	Sometimes I use digital ways of providing feedback, e.g. automatic scores in online quizzes, comments	12	18.8	Low
	I use a variety of digital ways of providing feedback	5	7.8	Low
	I do provide feedback to students, but not in digital format do provide feedback to students, but not in digital format	44	68.8	High
	I systematically use digital approaches to provide feedback	3	4.7	Low

Legend of Ranking: 50 – 100 – High; 25 – 49 Moderate; 1 – 24– Low

Generally, it can be noted from the results in Table 6 that the majority of educators 44 (68.8%) provide feedback to their students but not a digital format of feedback. It was also noted that some educators 12 (18.8%), sometimes use digital ways of providing feedback like automatic scores in online quizzes and comments. This result is striking how little attention is given to feedback by educators. Feedback as a consequence of performance has a large effect on students' learning (Tärning, 2018). Students should often receive feedback as the measure of the quality of their actions in various classroom activities, tests, quizzes and exams (Maier & Klotz, 2022). However,

effective feedback does not only focus on errors which is the common practice by most educators (Caena & Redecker, 2019). According to Lee & Cha(2022)when feedback is effectively done it can provide the students with encouragement, corrective information, clarification of ideas, provide alternative strategies, and provide the students with accuracy regarding their responses.Feedback which has information about the task/activity i.e., how to do it more effectively supports learning (Tärning, 2018) and enables learners to achieve their learning goals (Langenfeld et al., 2022). All this evidence and the finding on the educators' practice in giving feedback suggested training which may develop their competence in giving effective feedback using digital technology.

Despite the overall mean and standard deviation to have shown moderate educators' digital competence, further analysis of each item for all rating parameters gave insight into the level of the educators' competence to still be low. This is to say that increasing educators' competence in understanding, finding, creating, and using information through digital technologies is paramount (Yazon et al., 2019). Likewise, the educators exhibited only basic skills like the use of videos, animations, use of projectors and whiteboards, and putting passwords on their gadgets to protect education-related information. This level of competence is considered to be only ICT integration skills (Nowak, 2019) which calls for more advancement of these skills to attain the desired digital pedagogical literacy and competence. Reflecting on the results the educators revealed the spirit of sharing their digital competencies with their colleagues and students, which may hinder the authenticity of what is shared with low competence (Ghomi & Redecker, 2019).

With all the deduced findings, the study recommends the following; continuous implementation of the UNESCO MGIEP to M.Ed educators can highly bridge the gap between the basic use of ICT in teaching and learning and the development of educators' digital pedagogical and instruction competencies. The training implementation should go hand in hand with the measure of educators' confidence in the use of digital technology as well as searching and designing digital resources.

Conclusion

The digital pedagogical landscape is ever evolving, and if African is to meet the current demands from our educational systems, it's imperative to shift focus from just ICT skills training for teachers. While it is important to know how to use digital technology, it is significantly important as well, to know how to use it pedagogically. The results of this study show the need for teachers to increase their digital competence level through specific training, especially as regards the pedagogical use of technology, in particular more practical, experimental training. As African educators, we need to

work more systematically at local levels to increase the repertoire of effective pedagogical use of ICT. It is our hope that this project would help provide the data needed to address the urgent need for a digital pedagogical skills education for teachers in Tanzania and the different regions of Africa. In addition, hopefully, it will provide guidelines for policies and coordinated response that would help these teachers acquire the needed skills to keep pace with the digitally evolving educational landscape.

References

Abbott, M. L. (2011). *Understanding educational statistics using Microsoft Excel and SPSS*. Wiley.

Bearman, M., Nieminen, J. H., & Ajjawi, R. (2022). Designing assessment in a digital world: An organising framework. *Assessment & Evaluation in Higher Education*, 1–14. https://doi.org/10.1080/02602938.2022.2069674

Caena, F., & Redecker, C. (2019). Aligning teacher competence frameworks to 21st century challenges: The case for the European Digital Competence Framework for Educators (*DIGCOMPEDU). European Journal of Education*, *54*(3), 356–369. https://doi.org/10.1111/ejed.12345

Digital Competence Framework for Educators (DigCompEdu). (n.d). *The European commission's science and knowledge service.*

Yazon, A., Ang-Manaig, K., Buama, C. A. C., & Tesoro, J. F. B. (2019). Digital Literacy, Digital Competence and Research Productivity of Educators. *Universal Journal of Educational Research*, *7*(8), 1734–1743. zzzhttps://doi.org/10.13189/ujer.2019.070812

E-Learning African. (2020). The Effect of Covid-19 on Education in Africa and its Implications for the Use of Technology. A Survey of the Experience and Opinions of Educators and Technology Specialists September 2020 DOI 10.5281/zenodo.4018774. Available from http://www.guninetwork.org/files/the_effect_of_covid19_on_education_in_afric apdf

Esteve-Mon, F. M., Cela-Ranilla, J. M., & Gisbert-Cervera, M. (2016). ETeach3D: Designing a 3D Virtual Environment for Evaluating the Digital Competence of Preservice Teachers. *Journal of Educational Computing Research*, *54*(6), 816–839. https://doi.org/10.1177/0735633116637191

European Commission. Joint Research Centre. (2017). *European framework for the digital competence of educators: DigCompEdu.* Publications Office. https://data.europa.eu/doi/10.2760/159770

Ghomi, M., & Redecker, C. (2019). Digital Competence of Educators (DigCompEdu): Development and Evaluation of a Self-assessment Instrument for Teachers'

Digital Competence: *Proceedings of the 11th International Conference on Computer Supported Education*, 541–548. https://doi.org/10.5220/0007679005410548

Gray, M., & Webb, S. (2012). *Social work theories and methods*. Sage.

Hothersall, S. J. (2019). Epistemology and social work: Enhancing the integration of theory, practice and research through philosophical pragmatism. *European Journal of Social Work*, *22*(5), 860–870.

Human Rights Watch. (2020), Impact of Covid-19 on Children's Education in Africa. https://www.hrw.org/news/2020/08/26/impact-covid-19-childrens-education-africa

Jackman, J.A., Gentile, D.A., Cho, N.J.(2021) Addressing the digital skills gap for future education. *Nat Hum Behav* 5, 542–545 https://doi.org/10.1038/s41562-021-01074-z

Kafyulilo, A. (2014). Access, use and perceptions of teachers and students towards mobile phones as a tool for teaching and learning in Tanzania. *Education and Information Technologies*, *19*(1), 115–127. https://doi.org/10.1007/s10639-012-9207-y

Kaya-Capocci, S., O'Leary, M., & Costello, E. (2022). Towards a Framework to Support the Implementation of Digital Formative Assessment in Higher Education. *Education Sciences*, *12*(11), 823. https://doi.org/10.3390/educsci12110823

Langenfeld, T., Burstein, J., & von Davier, A. A. (2022). Digital-First Learning and Assessment Systems for the 21st Century. *Frontiers in Education*, *7*, 857604. https://doi.org/10.3389/feduc.2022.857604

Lee, H. W., & Cha, Y. M. (2022). The Effects of Digital Written Feedback on Paper-based Tests for College Students. *The Asia-Pacific Education Researcher*, *31*(4), 489–497. https://doi.org/10.1007/s40299-021-00592-8

Maier, U., & Klotz, C. (2022). Personalized feedback in digital learning environments: Classification framework and literature review. *Computers and Education: Artificial Intelligence*, *3*, 100080. https://doi.org/10.1016/j.caeai.2022.100080

McKnight, K., O'Malley, K., Ruzic, R., Horsley, M. K., Franey, J. J., & Bassett, K. (2016). Teaching in a Digital Age: How Educators Use Technology to Improve Student Learning. *Journal of Research on Technology in Education*, *48*(3), 194–211. https://doi.org/10.1080/15391523.2016.1175856

Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record: The Voice of Scholarship in Education*, *108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Morris, S. M (2021). Decoding Digital Pedagogy, pt. 1: Beyond the LMS. Available from : https://hybridpedagogy.org/hybrid-teaching/

Mtebe, J., & Raphael, C. (2018). *A Critical Review of eLearning Research Trends in Tanzania*. *5*(2), 163–178.

Njiku, J., Maniraho, J. F., & Mutarutinya, V. (2019). Understanding teachers' attitude towards computer technology integration in education: A review of literature. *Education and Information Technologies*, *24*(5), 3041–3052. https://doi.org/10.1007/s10639-019-09917-z

Njiku, J., Mutarutinya, V., & Maniraho, J. F. (2021). Building Mathematics Teachers' TPACK Through Collaborative Lesson Design Activities. *Contemporary Educational Technology*, *13*(2), ep297. https://doi.org/10.30935/cedtech/9686

Nowak, B. M. (2019). Development Of Digital Competences Of Students Of Teacher Training Studies—Polish Casus. *International Journal of Higher Education*, *8*(6), 262. https://doi.org/10.5430/ijhe.v8n6p262

Olurinola O.D, Hassan O.A and Omoniyi T. (2020) Assessment of Nigerian Teachers Readiness for RemoteTeaching-Learning. *Journal of Psychometry and Assessment Techniques* 1(1), 98 – 105.

Organization for Economic Cooperation and Development -OECD, (2020). The Future of Education and Skills. Education 2030.

https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf

Pallant, J. (2020). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS* (7th ed.). Routledge. https://doi.org/10.4324/9781003117452

Pates, D., & Sumner, N. (2016). E-learning spaces and the digital university. *The International Journal of Information and Learning Technology*, *33*(3), 159–171. https://doi.org/10.1108/IJILT-10-2015-0028

Pettersson, F. (2018). On the issues of digital competence in educational contexts – a review of literature. *Education and Information Technologies*, *23*(3), 1005–1021. https://doi.org/10.1007/s10639-017-9649-3

Redecker, C. (2018). *The European framework for the digital competence of educators.* https://ec.europa.eu/jrc/sites/default/files/digcompeduorg-en-2018-11_a4new.pdf

Reid, A. D., Hart, E. P., & Peters, M. A. (Eds.). (2014). *A Companion to Research in Education*. Springer Netherlands. https://doi.org/10.1007/978-94-007-6809-3

SELFIE for Teachers. (n.d) https://ec.europa.eu/jrc/en/digcompedu/self-reflection-tools

Shopova, T. (2014). Digital Literacy of Students and its Improvement at the University. *Journal on Efficiency and Responsibility in Education and Science*, *7*(2), 26–32. https://doi.org/10.7160/eriesj.2014.070201

Shulman, L. S. (1986). Those Who Understand: Knowledge Growth in Teaching. *Educational Researcher*, *15*(2), 4–14. https://doi.org/10.3102/0013189X015002004

Tärning, B. (2018). Review of Feedback in Digital Applications – Does the Feedback They Provide Support Learning? *Journal of Information Technology Education: Research*, *17*, 247–283. https://doi.org/10.28945/4104

Thorvaldsen, S. & Madsen S. S. (2021). Decoding the Digital Gap in Teacher Education: Three Perspectives across the Globe. In M. J. Hernández-Serrano (Ed.). *Teacher Education in the 21st Century - Emerging Skills for a Changing World.* Available from: https://www.intechopen.com/chapters/75224#B40

Challenges to Thesis Writing among Postgraduate Students in Anambra State

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Abstract
It will rather be disheartening for a student who willingly commenced a postgraduate programme, paid relatively high school fees and successfully completed course works to abandon the programme at the stage of thesis writing for one reason or the other. Thus, the purpose of the study is to examine the challenges to thesis writing among postgraduate students in Anambra State. Three research questions were posed to guide the study. Survey research design was used for the study. The population of the study comprised 6, 180 (2020/2021 session) postgraduate students in Nnamdi Azikiwe University, Awka and Chukwuemeka Odumegwu Ojukwu University, Igbariam in Anambra State. The sample size for the study comprised 309 postgraduate students (2020/2021 session) obtained through simple random sampling and proportionate sampling techniques. Challenges to Thesis Writing among Postgraduate Students 20-item Questionnaire (CTWPSQ) was used to collect data. CTWPSQ was validated by three experts in the Department of Educational Foundations. Data collected were analyzed using mean. The findings of the study revealed that poor attention span is the major student-related factor that poses a challenge to thesis writing among postgraduate students among others. In addition, it was revealed that inability of supervisors to allow for e-supervision to save them the cost of regular coming for a face to face interaction is the major supervisor-related factor that poses a challenge to thesis writing among postgraduate students among others.
Key Words: Thesis Writing, Postgraduate Students, Nnamdi Azikiwe University, Postgraduate Programme

Introduction

Thesis writing is a research activity that is written by postgraduate students who wish to obtain postgraduate degree. Thesis writing generally involves an empirical investigation of specific question(s) within the field of one's study (James & Slater, 2013). James and Slater added that the cardinal essence of thesis writing is to expand the students' understanding within the field of study and be equipped with the knowledge and skills in conducting research, teaching, textbook and paper writing. The processes involved in thesis writing include: Identification of problem, formulation of research

questions and hypotheses, research design, presentation and analysis of data and report writing. However, thesis writing procedure considerably differs from one institution or faculty to the other, thereby making it difficult to describe procedures that apply to all students.

Thesis writing is quite a challenging piece of academic work. This is due to the fact that students must carry out research and write thesis that will result in a significant contribution to knowledge in the chosen discipline. Wei (2017) observed that students experience numerous challenges in their academic writings such as academic papers, proposals, theses and dissertation. Some of these challenges are very high, culminating in attrition among postgraduate students after passing their course works creditably. Bazrafkan, Shokrpour, Yousefi and Yamani (2016) asserted that challenges to thesis writing can include identifying a suitable topic, mastering new analytical and writing techniques, managing supervisory relationships, and in some cases juggling study with family and work commitments, and coping with financial difficulties, stress, anxiety, or depression. In the present study, focus was on the student, supervisor and institutional factors that pose challenges to thesis writing among postgraduate students.

Features of a Good Thesis

Thesis is an aspect of postgraduate education which students must pass satisfactorily to merit the award of postgraduate degree (Asogwa, Wombo and Ugwoke, 2014). Asogwa et al. added that thesis is an academic treatise written by a postgraduate student based on original research for the award of masters or doctorate degree. Thesis ought to be written in correct, coherent language, in an appropriate style, correctly in strict adherence to the conventions of citation. In terms of style, the thesis ought to be written in an appropriate formal academic style (Swarni, 2016). Swarni added that thesis has a logical and visible structure and development that is expected to assist the readers in the understanding of the argument being presented without obscuring it. Additionally, there must be clarity in text in thesis writing. There are five thesis main components of a thesis viz: Introductory chapter, review of related literature chapter, method chapter, presentation and analysis of result chapter, and discussion, conclusion and recommendation chapter.

It goes without saying that the art of thesis writing lends itself to complexity given the large number of linguistic errors made by students. This is evidently so given that most students are unable to use the foreign language forms and structures appropriately (Sahla, 2014). Sahla added that the majority of students are unable to reach this objective because they do not master the linguistic aspects like prepositions, punctuations, spelling, tenses, and so on. It can be logically deduced that the mastery of

the art of thesis writing can be challenged by negative interference of the mother tongue, the Intra-lingual and inter-lingual errors.

It is interesting to note that postgraduate research work and coursework are distinguishable in at least four ways viz: duration, focus, teacher–student interaction, and goals (Kleijn, 2013). First, in the Nigerian universities, the duration of a postgraduate research work is often at least half a year, whereas, life-span of a course is about three months. The longer duration for the research work makes it more tasking and by extension, offers the student more opportunity of creating depth than the general coursework as throughout this period, students concentrate on just one research work, which they devote their time and resources to constantly elaborate and fine-tune. The justification for the disparity in duration is premised on the fact that while research works carry a minimum weight of six credit units, a course has a weight of three or less credit units.

Second, the focus of the research that is done in a postgraduate research work is in vast majority of cases, considerably determined by the student, both in terms of topic and methodology. This makes it easy for students to explore research areas that match their interest and needs.

Third, the lecturer–student interaction in coursework can usually be characterized as one-on-many as often there will be one or two teachers and a large group of students (Kleijn, 2013). In contrast, the lecturer–student interaction in a postgraduate research work is on one-on-one basis. This offers the students the opportunity of driving the research process in such manner that their preferences in terms of research designs are given utmost consideration. One-on-one supervision still seems to be the current fad in postgraduate research supervision.

Challenges to Thesis writing among University Students

The attrition rate among postgraduate students who have creditably passed their course work and are faced with their thesis writing leaves so much to be desired. In universities in Anambra State, the researcher observed that some postgraduate students who have successfully completed their course work end up not completing their thesis on time and in some cases, get frustrated out of their programme. It is rather disheartening that a student who willingly commenced a postgraduate programme, paid relatively high school fees, successfully finished course works will abandon the programme at the stage of thesis writing for one reason or the other. This scenerio is rather worrisome given that the postgraduate students have unhindered access to university libraries and internet from where they can access valuable information that will accelerate the completion of their thesis writing. It beats one's imagination on what could be the reason for the state of affairs.

Several studies have looked at challenges to thesis writing. For instance, Divsar (2018) uncovered the PhD candidates' main challenges in writing a dissertation in Iran to include linguistic challenges, lack of knowledge about SPSS, APA and copyright law, poor planning and time management, finding novel topics, personal problems that impede them from the due schedule, finding the related literature, finding the participants and getting institutes to participate, negotiation with thesis supervisor and advisor, loss of interest and difficulty in finding the required instrument. More so, Claudius (2016) investigated challenges of writing theses and dissertations among postgraduate students in Tanzania and found inappropriateness in presenting different chapters of the reports and lack of academic writing skills. Going further, Dwihandini, Marhaeni, Suarnajaya (2013) examined the factors affecting undergraduate students' difficulties in writing thesis in English Department of Mahasaraswati University and found challenges such as psychological factors, sociocultural factors and linguistic factors.

Looking at the previous studies, it can be deduced that the challenges to thesis writing among postgraduate students were limited to psychological factors, sociocultural factors and linguistic. No attempt has been made to ascertain the student, supervisor and institutional factors that constitute challenges to thesis writing among postgraduate students. Thus, the researcher wishes to look at the challenges to thesis writing among postgraduate students in the light of student, supervisor and institutional factors. In this in view of the foregoing that the researcher considered the current study necessary in Anambra State. In line with the afore-mentioned, the following research questions are raised:

1. What are the student-related factors that pose challenges to thesis writing among postgraduate students?
2. What are the supervisor-related factors that pose challenges to thesis writing among postgraduate students?
3. What are the institutional factors that pose challenges to thesis writing among postgraduate students?

Method

Research Design: The present study utilized survey research design.

Participants: The population of the study comprised 6, 180 (2020/2021 session) postgraduate students in Nnamdi Azikiwe University, Awka and Chukwuemeka Odumegwu Ojukwu University, Igbariam in Anambra State. The sample size for the study comprised 309 postgraduate students (2020/2021 session) obtained simple random sampling and proportionate sampling techniques.

***Procedure*:** Challenges to Thesis Writing among Postgraduate Students Questionnaire (CTWPSQ) which was constructed by researcher was used for data collection. The response options are: Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with numerical values of 4, 3, 2 and 1. CTWPSQ was subjected to both face and content validations by giving it to two experts in measurement and evaluation, all of the Department of Educational Foundations, Faculty of Education, Nnamdi Azikiwe University, Awka. In testing the reliability of the CTWPSQ, the Cronbach Alpha method was used. The values obtained were 0.81, 0.84 and 0.83 respectively for the three clusters with an overall co-efficient value of 0.82 for the whole CTWPSQ. With these high coefficients, the CTWPSQ was deemed to be reliable since it falls in line with the recommendation of Nworgu (2015) who posited that an CTWPSQ is reliable and excellent when its reliability co-efficient is above 0.80 for quantitative research. CTWPSQ was administered to the respondents during the course of thesis supervision by 20 research assistants (research supervisors). The research assistants retrieved the CTWPSQ on the spot after completion. The exercise was completed within a month.

***Data Analysis*:** Mean was used to analyze the data. The mean of 2.50 was used as the cut-off point for decisions because of the four-point scale used in the study. The decision rule therefore was that any weighted mean score from 2.50 and above was taken as agree while weighted mean scores below 2.50 were taken as disagree.

Results

Table 1

Mean Scores of Respondents on the Student-Related Factors that Pose Challenges to Thesis Writing among Postgraduate Students

S/N	As a postgraduate student, I:	Mean	Remark
1.	do not have interest in field work.	2.30	Disagree
2.	feel stressed to write a proper literature review.	2.64	Agree
3.	have poor attention span in research method course.	2.72	Agree
4.	do not have confidence in my ability to identify a research problem.	2.58	Agree
5.	am not motivated to source relevant materials for my research topic.	2.51	Agree
6.	am worried that my research work may not be judged as a quality work.	2.43	Disagree

Data in Table 1 show that item 3 has the highest mean score of 2.72. This indicates that majority of the respondents are of the view that poor attention span in research method course poses a challenge to their thesis writing. This is followed by item 2 with a mean score of 2.64 which indicates that a good number of respondents are in agreement that that they feel stressed in writing a proper literature review. Item 1 has the lowest mean score of 2.30, an indication that interest in field work is the least of the challenges to thesis writing among postgraduate students.

Table 2

Mean Scores of Respondents on the Supervisor-Related Factors that Pose Challenges to Thesis Writing

S/N	As a postgraduate student, the following are the supervisor-related challenges I am experiencing in my thesis writing:	Mean	Remark
7.	Inability of my supervisor to allow for e-supervision to save me the cost of regularly coming for a face to face interaction.	3.02	Agree
8.	My supervisor hardly makes out time to read and guide me in the thesis writing.	2.90	Agree
9.	My supervisor asking me to write my thesis and submit to him/her without any guide or materials.	2.64	Agree
10.	Repeated modifications of my topic by my supervisor, proposal or seminar committee.	2.58	Agree
11.	Bitter politics among supervisors or readers during proposal/seminar is frustrating me.	2.50	Agree
12.	Collecting certification from my supervisors to continue was difficult.	2.66	Agree
13.	The demand for cash or gifts from my supervisor before giving due attention to my work.	2.12	Disagree
14.	The distance between my supervisor and I hinders regular contact.	2.57	Agree

Data in Table 2 show that item 7 has the highest mean score of 3.02. This indicates that majority of the respondents agreed that inability of their supervisor to allow for e-supervision to save them the cost of regularly coming for a face to face interaction is one

of the challenges to thesis writing. This is followed by item 8 with a mean score of 2.90 which indicates that a good number of respondents are in agreement that their supervisor hardly makes out time to read and guide them in the thesis writing. Item 13 has the lowest mean score of 2.12, an indication that demand for cash or gifts from their supervisor before giving due attention to their work is the least of the challenges to thesis writing among postgraduate students.

Table 3

Mean Scores of Respondents on the Institutional Factors that Pose Challenges to Thesis Writing among Postgraduate Students

S/N	As a postgraduate student, the following are the institutional challenges I experience in thesis writing:	Mean	Remark
15.	Poorly equipped departmental libraries.	2.10	Agree
16.	Poorly equipped central libraries.	2.53	Agree
17.	Unavailability of recommended research texts.	2.75	Agree
18.	Poor monitoring of the activities of supervisors by the university authorities.	2.58	Agree
19.	Poor access to internet facilities.	2.66	Agree
20.	Over-loaded curriculum.	2.52	Agree

Data in Table 3 show that item 17 has the highest mean score of 2.75. This indicates that majority of the respondents agreed that unavailability of recommended research texts is an institutional factor that poses a challenge to their thesis writing. This is followed by item 19 with a mean score of 2.66 which indicates that a good number of respondents are in agreement that poor access to internet facilities is an institutional factor that poses a challenge to their thesis writing. Item 15 has the lowest mean score of 2.10, an indication that poor equipped departmental libraries is an institutional factor that poses a challenge to thesis writing among postgraduate students.

Discussion

In line with the findings of the study, discussions were done. The discussion was done under the following sub-headings:

Student-Related factors that Pose Challenges to Thesis Writing Among Postgraduate Students

The findings of the study revealed that poor attention span in research method course, feeling stressed to write a proper literature review, difficulty in deciding the method that is applicable to topic for thesis writing, inability to discuss thesis findings, lack of motivation to source relevant materials for research topics and anxiety about the possibility of rejection of their topics by the defense panel are student-related factors that pose challenges to thesis writing among postgraduate students. The findings of this study are in agreement with Asogwa et al. (2014) who found that that difficulty in deciding the method that is applicable to topic for thesis writing, inability to discuss thesis findings, lack of motivation to source relevant materials for research topics constitute challenges to thesis writing among postgraduate students. The findings of the present study are consistent with the position of Dwihandini, Marhaeni and Suarnajaya (2013) that student-related factors that hinder thesis writing comprised lack of confidence in deciding thesis title, having prior knowledge due to thesis topic, and writing a good thesis.

Supervisor-Related Factors that Pose Challenges to Thesis Writing Among Postgraduate Students

The findings of the study revealed that inability of their supervisor to allow for e-supervision to save them the cost of regularly coming for a face to face interaction, insistence of supervisors to write thesis and submit to him/her without any guide or materials, regular modifications of topic by supervisor, proposal or seminar committee, bitter politics among supervisors or readers during proposal/seminar, difficulty in the collection of certification from their supervisor (s) to continue, distance issue between supervisors and students and demand of money by respondents are the supervisor-related factors that pose challenges to thesis writing among postgraduate students. It goes without saying that the disposition of the supervisor towards the supervisee could constitute a challenge to thesis writing among postgraduate students. The findings of this study are in consonance with Divsar (2018) that supervisor-related factor such as negotiation with thesis supervisor and advisor pose challenges to thesis writing. The findings of the present study further agree with the position of Claudius (2016) that inappropriateness in presenting different chapters of the reports poses a challenge to thesis writing. This may not be separated from the failure of the supervisor to provide appropriate guidance to the student.

Institutional factors that pose challenges to thesis writing among postgraduate students

The findings of the study revealed that poorly equipped departmental libraries, poorly-equipped central libraries, unavailability of recommended research texts, poor monitoring of the activities of supervisors by university authorities and poor internet access are the institutional factors that pose challenges to thesis writing among postgraduate students. This is understandably so, given that good thesis writing cannot be divorced from a vivid institutional framework. Additionally, it goes to show that the provision of adequate research facilities is a sine qua non for thesis writing. The findings of this study align with the position of Cotterall (2013) that an association existed between departmental factors and doctoral student satisfaction and progress. Garner (2013) further aligned that one issue that consistently arises is a mismatch in values and expectations between the student and the department.

Conclusion

Based on the findings of the study, it was concluded that poor attention span in research method course and inability of their supervisor to allow for e-supervision to save them the cost of regularly coming for a face to face interaction are the student-related and supervisor-related factors among others that pose challenges to thesis writing among postgraduate students. It was further concluded that poorly equipped departmental libraries and poorly-equipped central libraries are the institutional factors that pose challenges to thesis writing among postgraduate students.

Recommendations

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

1. The curriculum planners should ensure a holistic review of research methods courses offered in the universities, in terms of contents and teaching approaches. That way, the challenges experienced by students are likely to be minimized.
2. Universities authorities should strive to organize seminars and workshops for all research supervisors on the use of e-supervision with a view to reducing some of the challenges that are peculiar to the traditional style of face to face supervision.
3. Heads of departments should help students negotiate successful roles with their supervisors during the supervisory process as to entrench a cordial supervisor-supervisee relationship.
4. Research supervisors should adopt innovative methods of using e-supervision for ease of supervision. That way, students can write and submit their thesis using an electronic device and awaiting their supervisors' feedback.

References

Asogwa, V.C., Wombo, A.D. & Ugwuoke, U.C. (2014). Challenges and coping strategies adopted by postgraduate students of agricultural education in thesis writing in Nigerian Universities. *American Journal of Operations Research*, 4 (1), 311-318. Retrieved from http://dx.doi.org/10.4236/ajor.2014.45030.

Bazrafkan, L., Shokrpour, N., Yousefi, A. & Yamani, N. (2016). Management of stress and anxiety among PhD students during thesis writing: A qualitative study. *The Health Care Manager, 35*(3), 231-240.

Claudius, K.S. (2016). Challenges of writing theses and dissertations among postgraduate students in Tanzanian higher learning institutions. *International Journal of Research Studies in Education, 5* (3), 71-80.

Cotterall, S. (2013). More than just a brain: Emotions and the doctoral experience. *Higher Education Research and Development, 32* (1), 174-187.

Divsar, H. (2016). Exploring the challenges faced by Iranian TEFL students in their doctoral dissertation writing. *International Journal of English language and translation studies, 6* (3).

Dwihandini, L.A., Marhaeni, A.A.I.N. & Suarnajaya, I.W. (2013). The analysis of the factors affecting undergraduate students' difficulties in writing thesis in the English Department of Mahasaraswati University. *E-Journal Program Pascasarjana Universitas Pendidikan Ganesha, 1* (2).

James, E.A. & Slater, T. (2013). *A map for writing your dissertation: Proven methods for finishing faster*. New York: Sage Publications, Thousand Oaks.

Kleijn, R.A.M. (2013). Adaptive research supervision: Exploring expert thesis supervisors' practical knowledge. *Studies in Higher Education, 37*(8), 925-939.

Nworgu, B.G. (2015). *Educational measurement and evaluation: Theory and practice*. Nsukka: University Publishers.

Sahla, A.B. (2014). *Linguistic factors affecting students' written paragraphs case study: second year students of English Department*. Unpublished M.E.D. Dissertation, Department of Foreign languages, Faculty of Letters and Languages, Mohamed Kheider University of Biskra.

Swarni, B.R.(2016). *Students' problems in writing thesis: Case study at English Department, Mataram University*. Mataram University, 1-18.

Wei, M. (2017). Strategies for first-year university ESL students to improve essay writing skills. *Master's Projects and Capstones*, *5*(36), 536.

Confronting Big Data in Educational Assessment in Nigeria

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Introduction

In dealing with learners and other related issues in institutions a lot of data are generated. Data generation in institutions starts from students' documentations for placements, entrance or admission examinations, registration of admitted students, off and online learning activities, assessments and examinations for certification to other contingency activities. Data are also generated about staff employment, promotion and career development. With time and technological advancement particularly digital revolution, educational institutions begin to apply transaction processing systems, customer databases, emails, internet clickstream logs, mobile apps and social networks in their dealings. The information generated from these sources accumulate to what is referred to as big data.

The term 'Big Data' appeared for the first time in 1998 in a Silicon Graphics slide deck by John Mashey. It gained momentum in the early 2000s and has been variously defined and operationalized. Big data is gargantuan bulk of data that cannot be dealt with by traditional data-handling techniques. They encompass the use of technologies to capture process, analyze, and visualize potentially large datasets in reasonable timeframe (Esomonu, Esomonu, Eleje, (2020). Clearly, size often comes to mind when referring to big data. It is commonly defined as the astonishing amount of structured and unstructured data that are being generated, captured, and stored at an amazing speed. Davis and Patterson (2012) referred to big data as data that is too large to be analyzed by conventional database protocols. Big data is amalgam of large and varieties of data sets including structured data, semi structured data and unstructured data that are beyond the capability of traditional tools to capture, store, process and analyze. According to O'Reilly (2012), big data is data that exceeds the processing capacity of conventional database systems. Big data refers to the large and diverse sets of information that grows at ever-increasing rates. Bagiwa (2017) indicated that big data are high-volume, high-velocity, and/or high-variety information assets that require new forms of processing to enable enhanced decision making, insight discovery and process optimization. Banica and Raduleseau (2015) described big data in their study as very big collection of shareable data which originate from any form of public or private digital sources, and can stand for on its own source for the continuing discovery, analysis as well as business intelligence and forecasting. De Mauro et al. (2016) noted that Big Data

represents the information assets characterized by high volume, velocity and variety to require specific technology and analytical methods for its transformation into value.

Big data can be categorized into structure, semi-structured, or unstructured class. Structured data are in the form of a schema, having rows and columns which can be generated through applications such as Customer Relationship Management (CRM), and enterprises. Semi-structured data generally have meta-data which describe its structure. This type of data is generated through the sensors, web feeds, network, and security systems. There is no surety that this data will be present in the format of rows and columns. Finally, unstructured data consist of text, audio, video and images which are generated by the people (Rawat & Yadav, (2020). Big data in institutions accumulate through assessment. To Qin, Rusu & Glade, 2012 and Agneeswaran, (2012) big data is huge size of unstructured data produced by high-performance heterogeneous group of applications that spans from social network to scientific computing applications. The datasets range from a few hundred gigabytes to zetabytes that is beyond the capacity of existing data management tools to capture, store and analyze. Big data as discussed here will be more in relation with intuitional assessments

Assessment is a process of observing, quantifying and appraising the learners' change in behaviour in the cognitive, affective and psychomotor domains for decision making (Esomonu, 2021). It is a systematic and rigorous application of scientific method to determine the outcome of teaching and learning activities. Assessment involves the determination of subject's merit, worth and progress against objectives or a set of standards. Assessment data are used to determine leaning progress, improve teaching and motivate students. They are used to diagnose the learning difficulties of students, provide guidance and counseling services. Assessment as used here is comprehensive including formative assessment, summative assessment, assessment of learning, assessment as learning, assessment for learning and classroom assessment. Within the institutions the big data obtain through assessments accumulate.

Within the Nigerian educational institutions most of the generated big data are not applied as appropriate. For instance biometric information are not applied in the classrooms to address students' behavioural challenges. There is no real-time analysis of students' response time for examination questions, questions they skip or questions they have answered successfully. These will have provided students with much better feedback on their achievement that will significantly improve future results (Nix, 2020). There is no visible use of big data predictive analysis to gain enough insight into future students' behaviour in institutions. The insight will have helped institutions curb some unsatisfactory conditions like dropout.(Sharma, 2023). Big data

is not used in monitoring how graduates perform in job markets. The staff do not have the skill to handle big data. There is no significant effort to update the staff for the big data challenges.

Confronting big data contextually mean maximizing the advantages of big data in educational assessment. It is tackling the big data challenges in educational assessment. The discussion will proceed by highlighting the characteristics of big data, tools for big data analytics, assessment and data accumulations, importance of big data analytics in education assessment, challenges of big data analysis in education assessment and tackling the big data in assessment in education institutions.

Characteristics of Big Data

Big data have many characteristics and many of them begin with the letter 'V'. Hence, the appellation of big data Vs. However, there seems to be primary characteristics and others hence authors talk of 3Vs, 7Vs and so on. The characteristics include volume, velocity, variety, veracity, value, variability, visualization, validity, volatility, viability, virality and variability.

Volume

The first characteristic of big data is large volume. Volume refers to the size of the data which is typically in exabytes (EB). Volime is one of the characteristics which differentiates ordinary data from Big data and is the reason the traditional relational database management systems cannot deal with Big data (Vorhies, 2014). The data generation increases exponentially every day (Shukla et al., 2015).

Velocity

The second attributes of big data is velocity. As defined by Al-Nuaimi et al., (2015), velocity is the speed at which the data is generated, stored, analyzed and processed. In the case of big data, the data is generated at a very high velocity, and thus it is challenging to analyze.

Variety

Variety here means big diversity or different types of data sources with different structures. There are structured data, semi-structured data, and unstructured data. According to De Mauro, Greco & Grimaldi, (2016) Variety refers to the different data structures which are generated. In the case of traditional data, the data generated are structured, whereas in big data, the data generated are often semi-structured or unstructured, like images, audio, video, transactions, and log data (Owais & Hussein, 2016). For example, the advancement in internet enabled social media, such as Facebook, Twitter, and Instagram to generate data in the forms of pictures (JPEG, GIF, 3D), videos, audio, and increased the usage of hash tags. Sensors are used in research and industry for various purposes, and they generate different varieties of data such as temperature, air quality, water quality, traffic speed, and goods movement.

Veracity

Gandomi and Haider (2015) note that IBM coined "veracity" as the fourth V of big data. Uddin et al. (2014) define veracity as truthfulness of data. If the data is not trustworthy, analyzing such data will not yield valuable results.

Value

Value here refers to usefulness or worth of data. big data is stored and analyzed for a purpose, and that purpose depends on the organization or the user and the kind of data collected.

Variability

Owais and Hussein (2016) define variability as the inconsistency in the data flow rate. For example, consider social media where the rate of the data flow is highly inconsistent. In the case of Facebook and Twitter, people generate data almost every minute in the form of pictures, videos, and audio, but the rate of data generated is not the same all the time.

Visualization

Visualization is the process of making all that vast amount of data comprehensible in a manner that is easy to understand and read (Rijmenam, 2015). Owais and Hussein (2016) refers to visualization as a way to explore and understand data, in the same way that the human brain processes information. It enables decision makers to understand the meaning of different data values and to identify relationships and patterns easily.

Validity

According to Uddin et al. (2014), validity refers to correctness and accuracy of data with respect to the intended usage. They suggest that the data with no veracity issues may not be valid for a particular application if not understood correctly. The data set may be complete but does it tell the user what it purports to and is it valid for the current business context. If the data generated are not valid, the analysis will lead to erroneous results.

Volatility

Volatility in Big Data refers to how long data is valid and how long should it be stored (Cartledge, 2016; Maheshwari,2015).Volatility in Big Data also considers at what point the data is no longer relevant to the current analysis (Klarity, 2015). Big data is stored and analyzed for various purposes like research, entertainment, healthcare, business etc.

Viability

Viability refers to the process of careful selection of attributes and factors that are most likely to predict outcomes that matter most to businesses. It had been believed by data scientists that 5% of the attributes in the data are responsible for 95% of the benefits (Biehn, 2013).

Virality

Virality is a measure of the spread rate of data across the network (Vermeend, 2013). Virality describes how quickly information gets dispersed across people to people networks. Virality refers to rate at which the data spreads; how often it is picked up and repeated by other users or events (Vorhies, 2014).

Viscosity

Viscosity describes the latency or lag time in the data, relative to the event being described (Vorhies, 2014). Viscosity also refers to the slowness in navigating the data by the variety of sources (Vermeend & Ossyren, 2017)

Tools for Big Data Analysis

The major tools for big data analysis according to Jambunathan and Venkatesan (2016) Ratra and Gulia (2019), Abdulali and Gültepe (2020) are:

AWS, Microsoft Azure, Oracle

Business Intelligence tools are important for reporting, analysis and performance management, primarily with transactional data from warehouses and production information systems.

Hadoop

Hadoop is framework developed by the Apache foundation to solve the storage and distributed processing problems of big data.

R

R is a highly extensible open source software package to perform statistical analysis. It provides a wide variety of built-in as well as extended functions for statistical computing, machine learning, graphical techniques and visualization tasks.

Spark

Spark is an open source framework designed for faster analysis. Spark is drew up to promote and facilitate a wide range of data analysis tasks, from graphics processing to machine learning.

Map Reduce

Map reduce is a programming model for writing applications that can process big data in parallel on multiple nodes. Map Reduce provides analytical capabilities for analyzing huge volumes of complex data.

MongoDB

MongoDB is in the forefront of NoSQL databases, providing agility and scalability to businesses. More than thousand companies and new start-up companies have acquire and are using MongoDB to develop new applications, refine client experience, fast track marketing time and minimize costs. It is used by bigger web applications like Facebook, Amazon and Google.

RapidMiner

RapidMiner was previously known as YALE (Yet Another Learning Environment). Rapid Miner is a data science software platform that is used for business and commercial applications supporting machine-learning process.

SAP

SAP is enterprise software with the domain of providing business intelligence solutions and collaborative planning, supported by predictive analysis and machine learning technology. Its key features include data visualization, reporting and analysis, mobile data analytics and interactive role-based dashboards.

SAS

SAS is a collection of software that mines data, makes necessary changes, manages, and retrieves data from different sources whereby statistical analysis is performed on this data. Advanced options are provided to the users as well as graphical user interface for non-technical users.

Webhose.io

Webhose.io gives direct access to period of time. It provides the structured information from hundreds of online records. The online hand tool helps in extracting web information. It supports more than 240 languages and storing the output information in numerous formats.

Spinn3r

Spinn3r fetches the complete information from various social media application. It is distributed with the API of fire station and that manages ninety fifth of the assortment work.

Cloudera

Cloudera comes in hand with Hadoop. It is also an open source software which provides additional functionalities at an enterprise level.

Assessment and Big Data Accumulation

Assessments in educational institutions can be classified as summative and formative assessments. Summative assessment involves collection of information at the end of instruction to determine how successful the teaching was. Summative assessment can be called assessment of learning. Summative assessment also includes assessment at

the end of courses, or semesters or terms or end of programmes. Typically scores are collected for short and long time decision making. Summative assessment can be carried out internally by institutions. It can also be done by external bodies like public examination bodies examples West African Examination Council, Nursing and Midwifery Council of Nigeria (NMCN) and so on. In summative assessment apart from teacher-made tests used by institutions, instruments for high stake examinations are used these include standardized tests, moderated teacher-made tests, projects, rubrics and others. In these processes lots of data are generated particularly with use of digital technologies. Within a space of ten years, 2009 to 2018, WAEC generated a total of 138,900,564 scores from students registered for Senior School Certificate Examination. These excludes other data generated from the candidates. Within the same period, 2009 to 2018 JAMB generated 61,245,696 score from Unified Tertiary Matriculation Examination (UTEM). These also excluded other data generated from the candidates (Esomonu, Esomonu & Eleje, 2020)

Formative assessment is collecting information for use as part of teaching and learning. Assessment for learning is a type of formative assessment. Assessment for learning is intended to provide information to enhance learning when the teaching-learning process is still on-going. It can take place throughout the learning process. Assessment for learning provides the basis for descriptive feedback for students. The questions, assignments, class work, anecdotal records used during teaching fall in this category. Assessment as learning is another type of formative assessment. It is seen as an active process of cognitive restructuring that occurs when individuals interact with new ideas. Here students personally monitor what they are learning, and use what they discover from the monitoring to make adjustments, adaptations, and even major changes in their thinking (Earl and Katz 2006). The teacher does this by providing instrument such as models, exemplars, criteria, rubrics, frameworks, checklists that will provide images of successful learning. With these instruments lots of data are generated. These should be used to improve instruction, diagnose students' learning difficulties, guidance and counsel ling purposes. With the application of digital technologies in teaching and learning, lots of data are generated. These include structured, semi structured and unstructured big data

Importance of Big Data Analytics in Educational Assessment

Big data analytics handles increasing large amount of data and examines the data to uncover hidden patterns that can give insights to many issues. Big data analytics in institutions can be regarded as combination of academic data, arithmetical analysis and predictive modelling to create intelligence with which students, instructors or administrators can change the academic patter of their institutions (Sharma, 2023). Big data helps in development of resources, improving processes and workflows in schools and institutions. Some benefits of big data in education assessment as stated by Eguavoen, Okodugha and Ugbogbo (2022) and Sharma (2023) include:

Improvement of Course Content

Big data provides unbiased feedback on the structure and design of course and evaluation of course content. It helps the educators understand how efficient their

teaching methods are. Through big data the complexity and difficulty of course and materials can be analyzed against the students' needs. This can be done by correlating both the course content and the students' capabilities, their strengths and weaknesses.

Enhancing Learning Experience

Education targets to enhance the learners' experience, improve teaching effectiveness, and provide appropriate, efficient and effective teaching and learning environment. Big data contributes in forming expectations for achievement, accountability and access which are required for smart institutional development. This can be accomplished by providing the infrastructure and capacity for sustainable change that leads to the institutionalization of knowledge acquisition, creation and exchange.

Effective Decision Making

Big data analytics enables decision makers to detect, understand, analyze and predict learners' behaviour, staff progress and courses outcomes among other institutions operations. In the online learning environment, analyzing learners' behaviours can be achieved while they are engaging in the off-task behaviour or when failing to answer a question correctly despite having the required skill. Analyzing the students' participation rate can also be achieved while they are in discussion fora. These analyses assist in identifying the learners' weaknesses and strengths and predicting their progress.

Improvement of Quality of Education

The adoption of big data analytics in higher education is necessary because of increased competition, assessments and regulations which mandate institutions to work for the success of their students. Stakeholders are concerned about institutions' capabilities in identifying the learners learning difficulties, patterns and successes. Big data analytics can deal with the massive amount of educational data for analyzing and tracking learners' history from primary school to university. Big data analytics enables tracking of learners' progress to determine successful completion and dropouts. It creates a new paradigm for the stakeholders to select best practices that ensure that the institutions are accountable for learners' successes, satisfaction and attrition.

Gaining Attention

One of the most interesting and useful big data applications in education is process of gaining a student's attention. No matter how interesting the lecture is there will always be some inattentive students who are busy looking at their phones or at others. But a lecture can only be effective if everyone paid attention. Big data experts can use biometric data of students, such as heart rate, facial expressions and objects they touch during the lecture to analyze the activities of students during lectures. This information can be captured via a camera on the ceiling or a device such as a smart watch. This data can be used for analyzing how attentive each students is after sending the data back to the teacher, they can take the necessary steps to regain the students attention.

Enhancing Students Results

The most common methods of analyzing students' achievement are by their grades obtained in projects, assignments and examinations. These grades are accumulated throughout their period in schools and institutions. Analyzing these data will help teacher to understand the behaviour and performance of students. With these data, it is possible to monitor students' actions, such as response time for examination question, questions they skipped, questions they have answered successfully. The real-time analysis will help in providing enhanced feedback on their achievement. The feedback can significantly improve students' results, because students will be able to understand the areas they have excelled and where the lagged behind.

Guidance and counseling's Purposes

Big data helps the teachers to track the achievement of students. The analysis help in understanding the performance of an individual. The analysis of individual grade in tests will help to understand the areas of interest of a student. The grading system can be enhanced to highlight the key areas where the student has excelled. This system will also allow teachers to give valuable feedback to students and assist them in choosing the right career or where the student is likely to do better.

Predictive Modeling for Students' Admission

Big data can be used to predict better students' admission. It can be used to manage the size and admission pattern for new students' enrollment.

Employability of Graduates and Alumni Data

Big data analytics can help students to get information about the skills they need that can be suitable for their dream jobs. Alumni data can be analyzed through predictive models to identify and examine the alumni information to predict those most likely to be of help to institutions. These could come in form of ideas, materials or cash.

Challenges of Big Data Analytics in Education Assessment

Some of the challenges of big data analytics in education assessment in Nigeria are as stated.

Lack of Facilities

Many of educational institutions and schools are not big data compliant. There are no internet connectivity. They do not have required software. There are no e-classrooms in many schools and institutions.

Lack of Big Data Experts and shortage of skilled digital staff

Many institutions do not have big data experts. The shortage of digital skilled man power has not been addressed by many schools and intuitions. Skilled staff in ICT and emerging technologies that will drive big data applications have been in massive demand in education institutions and schools. However, not much have been done by institutions and their supervising bodies in internally up skilling the staff or getting from outside their systems.

Suitable Storage System

Finding a suitable storage system for massive amount of data is a big challenge. Intuitions may not have what it takes to handle massive data that increase on daily bases. It is easy for none experts in institutions to be disoriented when face with large volume of data. This happens easily when the database is not formidable.

Security

Data that are used for decision making need to be secure. Institutions deal with sensitive information particularly data that patterns to examinations. Students' data can be used to access other more sensitive data like health and financial data. So security needs to be addressed to ensure stakeholders' confidence and satisfaction in schools and institutions.

Tackling the Big Bata in Assessment in Education Institutions

- The teachers at all levels of education system should be made to believe and value self-development in ICT, big data analytics and big data usage. These will flourish if the teacher's welfare are at the front burner and the salaries are comparable globally.
- The institutional environment should be made digital and big data compliant. Connectivity and facilities should not be privately sourced by staff. Students should have unhindered access to internet anywhere within the institutions' premises.
- Training and retraining of data/ ICT experts and teachers in various institution should be targeted at equipping them with the skill and knowledge to apply biometric data in the classrooms to address students behavioural challenges, use of big data predictive analysis that will enhance achievement and curb undesirable behavior should also be targeted in their training.
- University and school managements through ICT department should create awareness on the various big data management tools assessments techniques through enlightenment campaign and other public platforms.
- There should be new policies on big data harnessing, mining and analytics and their in assessments. These policies should be driven by supervising agencies.
- Ugodulunwa and Esomonu, (2021) suggested that mining data for insights into students' behaviour, learning processes, and institutional practices using learning analytics technology; investing on big data architecture that is capable of connecting to data sources, data governance, systems management, and protecting quality of service; and setting up a functional data analysis process by creating a community website should be the concern of institutions. Also building a new generation of professionals and up-skilling the existing ones with interdisciplinary competences on big data should be a must for institutions.

Conclusion

The work looked at confronting big data in educational assessment in Nigeria. How do we maximize the advantages of big data in educational assessment? How would schools and institutions tackle the big data challenges in educational assessment? Big data is seem as a collection of data that is huge in volume and grows exponentially. It is a complex large data that none of the traditional data management tools can store or process efficiently. Big data have for years being generated in institutions through assessment and other concomitants activities. However, these big data are shelf off or predominantly not sufficiently used. Hence the big data analytics remains dull in

educational institutions in Nigeria. The effects and advantages of accumulating such data are not felt. Enhance students' development, skill acquisition and global competitiveness are not achieved as expected. The institutional environment should be digital and big data compliant. Training and retraining of teachers in various institution should be targeted at equipping them with the skill and knowledge of big data predictive analysis that will enhance achievement, address students' challenges, and curb undesirable behaviours.

References

Abdulali, A. A.S. & Gultepe, Y. (2020). Big data tools and technologies. *Research Journal of Mass Communication and Information Technology 6*(1), 53-58.

Agneeswaran, V., (2012). Big-data theoretical, engineering and analytics perspective. In Srinivasa, S., Bhatnagar, V. (Eds.). *Big Data Analytics. Lecture Notes in Computer Science*. Springer Berlin Heidelberg, pp. 8-15.

Al-Nuaimi, E., Al-Neyadi, H., Mohamed, N., & Al-Jaroodi, J. (2015). Applications of big data to smart cities. *Journal of Internet Services and Applications*, 6(1), 25-30.

Bagiwa, L. I. (2017). Big data: Concepts, approaches and challenges. *International Journal of Computer Networks and Communications Security,* 181-187.

Banica, L., & Radulescu, M. (2015). Using big data in the academic environment. *Procedia Economics and Finance,* 33, 277 – 286.

Biehn, N. (2013*). The missing Vs in big data: viability and value.* https://www.wired.com/insights/2013/05/the-missing-vs-in-big-data-viability-and-value/

Cartledge, C. (2016). *How many Vs are there in big data?, 1–4.* Retrieved from http://clc-ent.com/TBDE/Docs/vs.pdf

Choudhary, K., Gupta, I., Diwakar, M. & Manwal, M. M. (2021). A review on big data issues and challenges. *Elementary Education Online,* 2021; 20 (3), 3273-3277

Davis, K., & Patterson, D.D. (2012). *Ethics of big data.* https://www.commit-nl.nl/sites/default/files/Ethics%20of%20Big%20Data_0.pdf

De Mauro, A., Greco, M. & Grimaldi, M. (2016). A formal definition of Big Data based on its essential features. *Library Review*, *65*(3), 122-135.

Earl, L. M.; Katz, S. (2006). *Rethinking classroom assessment with purpose in mind.* Retrieved from http://www.edu.gov.mb.ca/k12/assess/wncp/full_doc.pdf.

Eguavoen, I., Okodugha, E. E. & Ugbogbo, S. N. (2022). The Relevance and the Use of Big Data in Tertiary Institutions in Nigeria. *Amity Journal of Management Research*, *3*(2), 34-55.

Esomonu, N. P. M. (2021). *Instrumentation: The glamour of evaluators.* The 65th Inuagural Lecture of Nnamdi Azikiwe University, Awka.

Esomonu, N.P.M., Esomonu, M.N & Eleje, I.L (2020). Assessment big data in Nigeria: Identification, generation and processing in the opinion of the experts. *International Journal of Evaluation and Research in Education* (IJERE), 9(2), 345-351.

Gandomi, A., & Haider, M. (2015). Beyond the hype: Big data concepts, methods, and analytics. *International Journal of Information Management*, 35(2), 137–144.

Geczy, P. (2014). Big data characteristics. *The Macrotheme Review*, 3(6), 94–104.

Goundar, S., Bhardwaji, A., Singh, S., Singh, M. & Guraraji, H. L. (2021). *Applications of big data in large- and small-scale systems*. USA: Longman Publication.

Jambunathan, V. & Venkatesan, S. (2016). A review on Big Data challenges and opportunities. *International Journal of Latest Technology in Engineering Management & Applied Science*, 5(11), 67–70.

Klarity, A. V. (2015). *Dimensions of big data.* Retrieved from http://www.klarity-analytics.com/2015/07/27/dimensions-of-big-data/

Maheshwari, R. (2015). *3 V"s or 7 V"s -What"s the value of big data?* Retrieved from https://www.linkedin.com/pulse/3-vs-7-whats-value-big-data-rajiv-maheshwari.

Nix (2020). *The value of big data in education.* https://nix-united.com/blog/how-big-data-is-transforming-the-education-process/

O'Reilly, M. (2012). *Big data now.* USA Media INC

Oguine, O.C. Oguine, K.C. & Bisallah, H. I (2020). *Big data and analytics implementation in tertiary institutions to predict students' performance in Niger*ia.https://www.scienceopen.com/document_file/99499997-ec87-4c0d-954b50fdb314ef27/ScienceOpenPreprint/research%20journal.pdf.

Owais, S. S., & Hussein, N. S. (2016). Extract five categories CPIVW from the 9V"s characteristics of the big data. *International Journal of Advanced Computer Science and Applications, 7*(3), 254–258.

Qin, C, Rusu, C. & Glade, F. (2012), Big data analytics made easy. *International Conference on Management of Data*, 6(4), 697–700.

Ratra, R. & Gulia, P. (2019).Big data tools and techniques: A roadmap for predictive analytics. *International Journal of Engineering and Advanced Technology*, 9(2), 2249-8958

Rawat, R. & Yadav, R. (2020). *Big data: Big data analysis, issues and challenges and technologies, materials science and engineering*. https://iopscience.iop.org/article/10.1088/1757-899X/1022/1/012014/meta

Rijmenam, M. V. (2015). *Why the 3V"s are not sufficient to describe big data.* https://datafloq.com/read/3vs-sufficient-describe-big-data/

Sharma, A. (2023). *Big data testing market – forecast* (2023 - 2028) https://www.linkedin.com/pulse/big-data-testing-market-forecast2023-2028-ananya-sharma

Shukla, S., Kukade, V., & Mujawar, S. (2015). Big data: Concept, handling and challenges: An overview. *International Journal of Computer Applications*, *114*(11), 56-60.

Uddin, M. F., Gupta, N., & Khan, M. A. (2014). *Seven V"s of big data understanding big data to extract value.* In Proceedings of 2014 Zone 1 Conference of the American Society for Engineering Education (ASEE Zone 1).

Ugodulunwa, C. A. and Esomonu, N. P. M.(2022) Big data analytics: An educational research agenda in higher education. *Journal of Evaluation, 7*(1), 220 – 229.

Vermeend, W. (2013). *The impact of the internet: How the internet is changing the way we think, learn, work, do business and make money.* Retrieved from http://www.ebusinessbook.nl/152.php

Vermeend, W., & Ossyren, A. (2017). *Revolution big data an exploration of the profound impact. Business web solutions BV.* Retrieved from http://www.bigdatawereld.nl/9

Vorhies, B. (2014). *How Many "V"s in Big Data--The Characteristics that Define Big Data.* New York. Prentice Hall,

Perceived Hand Washing Practices among Secondary School Students in Owerri Municipal Council of Imo State

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Abstract

The paper focused on the perceived hand washing practices among secondary school students in Owerri Municipal Council of Imo State. This paper was guided by five (5) objectives, five (5) research questions. The study adopted descriptive survey research design and target population of the study consisted of four thousand (4000) secondary school students in Owerri municipal council of Imo State.Simple size of four hundred (400) students was used. A self-structured and validated questionnaire was used for data collection and data collected was presented into contingency tables and analyzed using descriptive statistics of frequency and normative percentages. The results reviewed that Majority of the respondents attested to the research question confirmed to the hand washing practices: practice of hand washing with soap after waste disposal (69%), use non-antimicrobial soap in washing hands before eating (70.7%), use of water to wash hands after visiting the toilet (64.4%), hand washing using soap after playing (73.1%) and hand washing using soap after eating (73.1%).Based on the following findings, the researchers recommended among others that students in Owerri municipal council of Imo State should be made known the benefit of handwashing through the different mass media like radio, television as well as advertisement on the consequences of poor hand hygiene should be displayed on the television, so that children will learn to wash their hands always. Government should establish a facilities for hand washing should in schools and public areas in order to make the student wash their hands so as to prevent micro/macro organisms from entering their body through the hands.

Keyword: Handwashing Practices, Handwashing Hygiene Benefit, Students

Introduction

Prevention of infectious diseases has become one of the daunting challenges facing developing countries all over the world in varying degrees. One area of special concern is the control of diseases in a school population where students live in very close proximity with each other. One of the most important vehicles of transmission of diseases in such environment is the hand, spelling the need for appropriate hand hygiene (Gertler, & Orsola-Vidal, 2012). However, hand hygiene especially handwashing with soap and running water has been scientifically proven and recommended as a cost effective and high impact intervention in reducing morbidity and mortality due to infectious diseases (Ofenu, & Saidu, 2019).

Also, hand washing/hand hygiene is the act of cleaning the hands with water and soap or other sanitizers for the purpose of removing soil, dirts and microorganisms. Hygiene is essential to the public health mission of reducing the transmission and consequences of disease. The sharp decline in deaths from infectious diseases observed in developed countries during the last century could not have been achieved without vastly improved public hygiene. Raising living standards allowed people to become more hygienic once clean water was piped into their homes, and soap became cheap enough to put at every sink. Eventually, the collective efforts became a social norm (Catalina, Paul, and Yehuda, 2019).

Hence, hand hygiene has been identified as the simplest and the most cost effective method of preventing most common infections that cause mortality and morbidity in human population. Hand hygiene is a general term that applies to handwashing, with antiseptic, alcohol based hand rub or surgical hygiene/antiseptic (Nnabu, & Prasopa-Plaizier, 2014). Handwashing which is the easiest and commonest among these hand hygiene practices refers to washing hands with plain soap and running water and remains the most sensible and affordable strategy for hand hygiene among the general population.

However, awareness on hand washing practice is one of the most important tools on preventing infectious diseases. Hand washing with soap and water before eating and after defecation can reduce the risk of diarrheal illnesses and other infectious diseases. Hand washing, which provides protection against communicable diseases, is promoted by the government of Nigeria and included in the framework of the Nigeria Health

Sector Program. Moreso, International agencies and governments because of the obvious benefits of handwashing in infectious disease reduction have been mounting interventions to improve the adoption of handwashing as a standard practice among community members. In Nigeria, handwashing was introduced as one of the strategies for hygiene Promotion in the Federal Government of Nigeria (FGN) Programme in 2004, it was also relaunched on 20th May 2008 as one of the

programme designed to mark the International Year of Sanitation declared by the United Nations General Assembly (Agberemi, Ofenu, & Saidu, 2019). This programmes where designed focusing more on mothers, children and adolescents.

Also, According to Center for Diseases Control[CDC] (2018), teaching appropriate hand hygiene practices can promote wellness and have numerous benefits in a wide variety of settings including learning institutions such as child care centres, elementary and high schools and universities. Appropriate hand-hygiene practices such as hand washing can potentially result in reduction of the spread of diarrhoea diseases. Hand washing with soap is among the most effective and inexpensive ways to prevent diarrhoea diseases and pneumonia which together are responsible for the majority of child deaths globally each year. It is seldom practice despite its lifesaving potential. Hence, targeting students and young persons in the handwashing campaign will play a significant role in efforts to achieve the Millennium Development Goals (MDGs) connected to health improvements, education and discouraging of poverty and child mortality (Adams, Bartram, Chartier, & Sims, 2019). This will obviously lead to early internalization of handwashing principles and practice from the primary and secondary levels of education and ensure adherence to these practices all through life. Normally in a school setting these practices are internalized through the availability of sanitation facilities and hygiene education programmes which observed to be grossly inadequate in Nigerian Secondary Schools (Aremu, 2012). Olukanni (2013) in a study in South-Western Nigeria confirmed that the hygiene practices of secondary school students were grossly inadequate.

Indeed, the Nigeria Demographic and Health Survey (NDHS) revealed that diarrhoea and cholera outbreaks which are diseases of poor hygiene are common occurrences in Nigerian schools (National Population Commission, 2014). Diseases in a school population is a major limiting factor in the educational progress of any child, as it leads to absenteeism, poor classroom performance and early school dropout, and all these militate against the achievement of quality universal basic education. Furthermore, students have been consistently implicated in the spread of communicable diseases and that the school has been recognized as a vital setting for health promotion and that it can provide a relatively easy and sustainable route to long term behaviour change it should be the focus of hand washing learning and practice. Schools are the second places of socialization after households in which school children serve as medium of transfer of knowledge acquired to the community at large. They can serve as reservoir of infectious diseases like gastro-intestinal and Hepatitis A through ineffective hand washing practice to other siblings at home,United Nation International Children EmergencyFund (UNICEF, 2016).

Lastly, Bennell (2012) pointed out the school health and education programme will provide comprehensive health education and services as well as the availability and use of water and sanitation facilities in schools to facilitate the

practices of handwashing, adequate and well-functioning school sanitation and hand washing facilities which plays a major role in ensuring good hand washing practices producers; in addition the producers of dettol over the years have educated parents, guardians, schools and teachers through advertisement on radio and television on the need for clean hand which affirms to the world health slogan of "good health" in our hand that helps people especially secondary school students to und erstand that for them to prevent some illnesses, there is a need to keep their hands clean to avoid harmful germs and bacterial from getting into their body. This background motivated the researcher towards ascertaining the practice of hand-washing among secondary school students in Owerri Municipal council, Imo State.

Statement of the Problem

Burden of parasitic infections and poor sanitary condition including hand washing practices are of greater public health importance in government owned and private schools. School students have been consistently implicated in spread of communicable diseases and school has been recognized as a vital setting for health promotion, can also provide a relatively easy and sustainable route to long term behaviour change, thus it should be the focus of hand washing learning and practice. Hence the need for proper practices in school such as proper habit of handwashing after using the toilet, after eating and after cleaning the nose; as these good habits of hand washing helps to decrease the spread of infectious diseases like cholera and diarhoea.

In view of the need to reduce to the barest minimum the problems associated with poor hand washing practice among school children, this study seeks to investigate hand washing knowledge and practices among secondary school students who are likely victims of risk associated with poor hand washing practices. Similarly, findings from this study will help to determine possible health promotion behavioural interventions to be implemented to increase consistent hand washing practices among the target population. In the same vein, findings from the study will also help governmental ministries especially the Ministry of Education and non-governmental organizations to design appropriate hand washing campaigns in order to reduce burden of diseases such as diarrhoea and respiratory tract infections in the country.

Also studies have shown that proper hand-washing with soap or ash can reduce the incidence of diarrhoea diseases by 42-27 percent. However, lack of access to both pipe borne water supply and soap among others are barriers to hand washing (WHO, 2012). Furthermore some challenges that predispose poor habit of hand-washing among pupils includes poor knowledge of procedure for handwashing among students, equally many students do not know the benefits of hand washing due to nobody to teach them, poor handwashing facilities, equipment in school which include running tap, basin with adequate supply of clean potable water, soap and single towel among others. As many students sees

hand washing as a scam and time wasting which prevents them from even washing hands before eating. Thus, having a long term effect of reducing morbidity and mortality caused by ineffective hand washing practice in line with millennium development goal of combating communicable diseases such as diarrhoea and respiratory tract infections which are of public health concern.

Purpose of the Study

The main purpose of this study is to examine the perceived hand washing practices among secondary school students in Owerri Municipal council of Imo State.

Research Questions

The following research questions gives directions to the study:

1. What is the perceived hand washing practice with soap after picking papers/ substances from the environment in Owerri municipal council?
2. What is the perceived hand washing practices using soap before eating among secondary school students in Owerri municipal council?
3. What is the perceived hand washing practices using soap after toilet among secondary school students in Owerri municipal council?
4. What is the perceived hand washing practices with soap after playing among secondary school students in Owerri municipal Council?
5. What is the perceived hand washing practices using soap after eating among secondary school students in Owerri municipal council?

Methodology

The design adopted for the study was a descriptive survey design. The population of the study consisted of 4000 secondary schools students from ten public secondary schools in Owerri Municipal council, Imo State. However the researchers purposively Sampled 10% out of the secondary schools under the study. This gave a number of 400 students.The instrument for data collections was a well-structured questionnaire. The questionnaire consists of two sections (A and B). Section A contains questions on the respondent's demographic data. Section B contains ten (10) questions on hand washing practice among secondary school students in Owerri municipal Council. All the questions will be close ended and were patterned into positive (Yes) and negative (No).The instrument was validated by three (3) lectures in the department of Health Education of Alvan Ikoku Federal College of Education, Owerri Imo State.The reliability of the instrument was obtained as 0.81 using Pearson Product Moment Coefficient(r), and this was considered high enough in checking the internal consistency level of the item in the instrument. The four hundred (400) copies of the questionnaire were administered to the respondents by the researchers and were returned for data analysis. The data from the completed questionnaires forms were coded and analyzed using descriptive statistics of frequency count and percentages.

Results

Research Question 1: What is the perceived hand washing with soap after picking papers/ substances from the environment among secondary school students in Owerri Municipal Council, Imo state?

Table 1

Responses on Hand Washing With Soap After Picking Papers/ Substances from the Environment (N = 400)

S/N	Questionnaire items	Yes	No
1	Normally I always use Ariel soap to washing my hand after picking dirt from my surroundings	300 (82.5%)	100 (17.5%)
2	Usually I use non-anti microbial soap to wash my hands after picking	250 (62.5%)	150 (37.5%)
3	I don't feel happy anytime I wash my hands with soap after picking substance from my environment	320 (80%)	80 (20%)
4	I prefer washing my hands with only water after picking dirt from my from my surroundings	270(67.5%)	130 (32.5%)
5	I usually use liquid soap in washing my hand after picking dirt from my surroundings	240 (60%)	160 (40%)

Table 1 above revealed the perceived hand washing with soap after picking papers/ substances from the environment among secondary school students in Owerri municipal Council, Imo state. The result shows that 69% of the respondents said yes that they perceived hand washing with soap after picking papers/ substances from the environment while 31%of respondents said No on the same issue. This indicates that majority of the students in Owerri Municipal Council, Imo State know that washing with soap after picking papers/ substances from the environment is a perceived hand washing practices among students.

Research Question 2

What is the perceived hand washing practice using soap before eating among secondary school students in Owerri municipal council, Imo State?

Table 2

Responses on Perceived Hand Washing Practice Using Soap Before Eating Among Students (N = 400)

S/N	Questionnaire items	Yes	No
1	Usually I use non-antimicrobial soap in washing my hands before eating	350(87.5%)	50(12.5%)
2	I prefer using only water to wash my hands before eating	210(52.5%)	190(47.5%)
3	Normally I usually use soaps that are hand friendly to washing my hand before eating	274(68.5%)	126(31.5%)
4	I prefer using soap that are in liquid form to wash my hands before eating.	216(54%)	184(46%)
5	I don't use soap to wash my hand because it is unhygienic.	217(54.3%)	183(45.7%)

Table 2 revealed the perceived hand washing practice using soap before eating among secondary school students in Owerri municipal Council, Imo State. The result shows that 70.7% of the respondents said yes that washing practice using soap before eating among secondary school students, while29.3% of the respondents said No on the same issue. This indicates that majority of the students in Owerri Municipal Council know that washing with soap before eating is a hand washing practices among secondary school students in Owerri Municipal Council, Imo State.

Research Question 3: What is the perceived hand washing practice using soap after toilet among secondary school students in Owerri Municipal Council, Imo State?

Table 3

Responses Towards The Perceived Hand Washing Practice Using Soap After Toilet Among Students (N = 400)

S/N	Questionnaire Items	Yes (%)	No (%)
1	I prefer using water to wash my hands after visiting the toilet	270 (67.5)	130 (32.5)
2	Usually I use soap with good fragrance to wash my hands after visiting the toilet	240 (60)	165 (40)
3	I don't feel happy washing my hands with soap after visiting toilet because my culture bans me from doing so	279 (69.8)	121 (30.2)
4	I prefer washing my hands with detergent soap prevent microbial proliferation	210 (52.5)	190 (47.5)

5	Usually I wash my hands with soap to maintain a good personal hygiene that is free from toilet acquired infections	294 (73.5)	106 (26.5)

Results on table 3 above show the responses on perceived hand washing practice using soap after toilet among secondary school students in Owerri Municipal Council, Imo State. The result shows that 64.4% of the respondents said yes to washing of hands using soap after toilet among secondary school students, while 35.6% respondents that said No on the same issue. This indicates that majority of the students in Owerri Municipal Council know that washing with soap after toilet is a hand washing practices among students.

Research Question 4: What is the perceived hand washing with soap after playing among secondary school students in Owerri Municipal Council?

Table 4

Responses on Perceived Hand Washing With Soap After Playing Among Students (N = 400)

S/N	Questionnaire items	Yes	No
1	Usually I prefer using white soap than colored soap to washing my hand after playing	240 (60%)	160 (40%)
2	Usually I use anti microbial soap to wash my hands after playing	300 (75 %)	100 (25%)
3	I don't feel happy anytime I wash my hands with soap after playing	250 (62.5%)	150 (37.5%)
4	I prefer washing my hands with only water after playing	320 (80%)	80 (20%)
5	I usually use liquid soap in washing my hand after playing	350 (87.5%)	50(12.5%)

Table 4 above revealed the perceived hand washing with soap after playing among secondary school students in Owerri Municipal Council, Imo State. The result shows that 73.1% of the respondents said yes to washing of hands using soap

after playing among secondary school students, while 26.9 % of respondents said No on the same issue. This indicates that majority of the students in Owerri Municipal Council know that washing with soap after playing is a hand washing practices among students.

Research Question 5: What is the perceived hand washing practice using soap after eating among secondary school students in Owerri Municipal COUNCIL, Imo State?

Table 5

Responses on Perceived Hand Washing Practice Using Soap After Eating Among Students

S/N	Questionnaire items	Yes	No
1	Usually I prefer washing my hands when liquid soap is in the water	240 (78.2%)	160 (21.7%)
2	I don't like washing my hand with soap rather prefer licking and cleaning my hand on the cushion	300 (75.3%)	100 (24.7%)
3	I don't wash my hands with soap since there are no hand washing facilities that prevents recontamination	250 (63%)	150 (37%)
4	Washing of hands after eating is a taboo in my culture	320 (80.2%)	80 (19.8%)
5	I prefer using water that has been used by another person to wash my hands after eating; this is to show family love	350 (86.4%)	50(13.6%)

Table 5 above revealed the perceived hand washing practice using soap after eating among secondary school students in Owerri Municipal Council. The result shows that 73.1% of the respondents said yes to washing of hands using soap after eating among secondary school students, while 26.9% of respondents said No on the same issue. This indicates that majority of the students in Owerri Municipal Council, Imo State know that washing with soap after eating is a hand washing practices among students.

Discussion of Findings

The findings of the study in table 1 showed that greater number of respondents 69 % shows that majority of the students in Owerri Municipal Council knows that hand washing with soap after picking papers/substances from the environment such as use of Ariel soap, use of anti microbial soap, use of liquid soap, use of only water; is a perceived hand washing practices among students in Owerri Municipal Council. The finding of the study is not surprising as it is expected that majority of the respondents should know that washing of hands with soap after picking paper/substance is a

perceived hand washing practices among students; this shows that the health educators in this local government is well functional in educating and enlightening students on this vital information's. This tends to confirm the assertion of Kilander (2013) which stated that 86.0% of respondents in Western African especially Nigeria have knowledge that washing of hands washing of hands with soap such as Ariel, liquid soap, non antimicrobial soap after picking paper or other substances is a perceived hand washing practices observed among the respondents..

Also, in relation to research question 2, table 2 sought information on the perceived hand washing practices using soap after eating among secondary school students in Owerri Municipal Council. Majority of the respondents 70.7% of the respondents believed that the use non-antimicrobial soap in washing my hands before eating, prefer using only water to wash my hands before eating, usually use soaps that are hand friendly to washing my hand before eating, prefer using soap that are in liquid form to wash my hands before eating and don't use soap to wash hands because is against my religion. The findings agreed with Ignz (2010) who observed that 65% of students who do not use soap in washing of hand before and after eating poses a greater risk to diarrhoea. However, the findings of the study is contrary to that of Honrby (2011) who noted that students who faces most unsanitary diseases conditions like diarhoea, mouth odour and acute gastroentertitis are linked to unpracticed hand washing technique/practices of using soap before and after eating.

Furthermore, in relation to research question 3, table 3 sought to find the perceived hand washing practices using soap after toilet among students in Owerri municipal council of Imo State. Majority, 64.4% of the believed that using water to wash my hands after visiting the toilet, use of soap with good fragrance to wash my hands after visiting the toilet, washing my hands with detergent soap to prevent microbial proliferation and washing of hands with soap to maintain a good personal hygiene that is free from toilet acquired infections are ways use of soap after visiting toilet is a hand washing practices among students. The findings were expected and not surprising. The finding is in harmony with Alive (2012) who in their work found out among students in Abraka Delta state southern Nigeria that washing of hands with soap to maintain a good personal hygiene that is free from toilet acquired infections is a safe hand washing practices using soap after toilet. Thus, students in Owerri Municipal Council believed washing with soap after toilet is a hand washing practices.

Moreso, in relation to research question 4, table 4 sought to find the perceived hand washing practices using soap after playing among students in Owerri Municipal Council of Imo State. Majority, 73.1% of the respondents believed that using white soap than colored soap to washing my hand after playing, use of anti microbial soap to wash my hands after playing, prefer washing my hands with only water after playing and use of liquid soap in washing my hand after playing are ways use of soap after playing is a hand washing practices among students. The findings were expected and not surprising. The finding is in harmony with Catalina, Paul, and Yehuda (2009) who in their work

found out among students use of liquid soap and anti microbial soap to wash my hands after playing are hand washing practices among students.

Finally, in relation to research question 5, table 5 sought to determine perceived hand washing practices using soap after eating among students in Owerri Municipal Council of Imo State. Majority 73.1% of the respondents believed that washing of hands with soap after eating is a hand washing practices among secondary school students. The finding in table shows that the respondents prefer using water that has been used by another person to wash my hands after eating; this is to show family love, don't wash my hands with soap since there are no hand washing facilities that prevents recontamination and prefer washing my hands when liquid soap is in the water. The findings agreed with the researches of Nigus (2010), Langeri (2013) and Rabie and Curtis (2016) who in their work found out that majority of the students know that washing with soap after eating is a hand washing practices among students. Thus the need for more educative session on enlightening of students more on hand washing hygiene and environmental sanitation in their various schools.

Conclusion

Based on the findings, the following conclusions were drawn.

- Majority (69%) of the students in Owerri Municipal Council knows that hand washing with soap after picking papers/substances from the environment such as use of Ariel soap, use of anti microbial soap, use of liquid soap, use of only water; is a perceived hand washing practices among students in Owerri Municipal Council.
- Majority of the respondents (70.7%) believed that the use non-antimicrobial soap in washing my hands before eating, prefer using only water to wash my hands before eating, usually use soaps that are hand friendly to washing –my hand before eating, prefer using soap that are in liquid form to wash my hands before eating and don't use soap to wash hands because is against my religion
- Majority 64.4% of the believed that using water to wash my hands after visiting the toilet, use of soap with good fragrance to wash my hands after visiting the toilet, washing my hands with detergent soap to prevent microbial proliferation and washing of hands with soap to maintain a good personal hygiene that is free from toilet acquired infections are ways use of soap after visiting toilet is a hand washing practices among students.
- Majority (73.1%) of the believed that using white soap than colored soap to washing my hand after playing, use of anti microbial soap to wash my hands after playing, prefer washing my hands with only water after playing and use of liquid soap in washing my hand after playing are ways use of soap after playing is a hand washing practices among students.
- Majority (73.1%) of the respondents believed that washing of hands with soap after eating is a hand washing practices among secondary school students. The finding in table shows that the prefer using water that has been used by another person to wash my hands after eating; this is to show family love, don't wash my

hands with soap since there are no hand washing facilities that prevents recontamination and prefer washing my hands when liquid soap is in the water.

Recommendations

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

- The curriculum planners should include subject that teach hand hygiene in all level of secondary schools, to enable the students learn about hand washing/hand hygiene.
- The benefit of handwashing should be made known to the students through the different mass media like radio, television, posters should be taught the benefits of hand washing through debating about the need for clean hands on radio, advertisement on the consequences of poor hand hygiene should be displayed on the television, so that children will learn to wash their hands always.
- Facilities for hand washing should be made available at home and in schools, in order to make the student wash their hands so as to prevent micro/macro organisms from entering their body through the hands.

References

Adams, A., Bartram, A. Chartier, E & Sim Z. (2019). Formative research for hygiene promotion in Kyrgyzstan.‖ *Health Policy and Planning* 20(4) 213–221.

Agberemi, A. Ofenu, J. & Saidu, B. (2019). Evaluation of a School-Based Reproductive Health Education Program in Rural South Western Nigeria. *African Journal of Reproductive Health*11.2: 47-59.

Alive, P. G. (2012). Basic personal hygiene: Knowledge and Practices among school children aged 6-14 years in Abraka, Delta State, Nigeria, *Continental J. Tropical Medicine* 6 (1): 5 – 11. Pete, J.M. 1996. Handwashing practices among various school age students. *Health Education*.37-39.

Aremu, W.n(2012). Hand washing compliance by health care workers: Impact of introducing an accessible, alcohol based hand antiseptic. *Internal Medicine 160,* 201-214.

Bennell, P. (2012). Hitting the target; doubling primary school enrolments in sub-Saharan Africa by 2015. *World Dev.* 30(7) 1179-1194.

Catalina, L. Q., Paul, F. & Yehuda, N. (2009). Handwashing among school children in Bogota Colombia. *Am J. Public Health* 99(1) 94-101.

Centers for Disease Control and Prevention (2018). *Clean hands save lives.* Available at: http://www.cdc.gov/cleanhands. Accessed July 17, 2018.

Curtis,V. A., & Cairncross, R. V. (2013). Planned, Motivated and Habitual Hygiene Behaviour: An Eleven Country Review.‖ *Health Education Research.* Published online 13 March 2009.

Gertler, P. & Orsola-Vidal, A. (2012). Promoting handwashing behavior: The effect of massmedia and community level interventions. Water and Sanitation Program; forthcoming in *World Bank Policy Research Working Paper Series.*

Honrby, E. (2011). School *sanitation and hygiene education results from the assessment of a 6-country pilot project*. Delft, Netherlands: International Water and Sanitation Centre.

Ignz, E. (2010): Effect of washing hands with soap on diarrhoea risk in the community: A systematic review. *The Lancet Infectious Diseases*, 3, 275-281.

Langeri, E., (2013). Effect of several interventions on the frequency of handwashing among elementary public school children. *American Journal of Infection Control*, *26* (3) 263269.

Nigus, E. (2010). Practice of hand washing hygiene among school children in Angolela Ethopia. *African Research Journal 23*(13) 214-221.

Ofenu, C., & Saidu, A. (2019). UNICEF statement to hand washing with soap. *Jakarta, Indonesia, UNICEF*. Retrieved from: http://www.menkokesra.go.id/index2.php? option=com_ content &do_ pdf = 1&id=3788, (Accessed on: February 9, 2009).

Olukanni, E. (2013). Where and why are 10 million children dying every year? *Lancet, 361*, 2226–2234.

Rabie, T. & Curtis, V. (2016). Handwashing and Risk of Respiratory Infections: A Quantitative Systematic Review.‖ *Tropical Medicine & International Health (*11)258–67.

UNICEF (2008). *The state of the world's children*. Retrieved from http://www.Globalhand washingday.org/Lessons_UNICEF.asp Accessed on: February 20th, 2009.

World Health Organization (2018). *WHO guidelines on hand hygiene in health care (advanced draft)*. Retrieved 21 July 2009. World News, 2009. Hand Washing Marks Opening of Schools Today. 31st May. Retrieved from: www.com/.../Hand.washing_marks_opening_of_school_today, (Accessed on: July 23, 2009).

Assessment Feedback: What Was, What Is, and What Will Be

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Abstract

This study looked at the changes in the mode of assessment feedback from the 1950s to the present day, and what the future holds. Assessment feedback which is information provided by the teacher to the students about their performance after assessments, tests, or examinations dated back to the 1950s when Benjamin Bloom and his colleagues developed the Bloom's Taxonomy of Educational Objectives. In this work, the types of assessment feedback used in the early years were depicted, including written feedback, verbal feedback, one-on-one meeting, grade reports etc. These traditional methods are still in use today. Relevance of assessment feedback to education and challenges facing assessment feedback were outlined. Assessment feedback evolution in the years of information and communication technology was explored. Numerous impacts of ICT to assessment feedback were enumerated. State of assessment feedback in African schools was highlighted. The future of assessment feedback will involve more use of technology for personalised feedback and the use of Artificial Intelligence (AI) and machine learning to analyse patterns in students' responses and provide more targeted feedbacks to improve students' learning.

Keywords: Assessment, Education, Feedback, ICT, Learning

Introduction

Assessment feedback refers to the information provided to a person about their performance on a particular assessment such as tests, assignments, or projects. Feedback has a significant impact on learning; it has been described as the most powerful single moderator that enhances achievement. The main objectives of feedback according to Cohen & Singh (2020) are to: justify to students how their mark or grade was derived; identify and reward specific qualities in student work; guide students on what steps to take to improve; motivate them to act on their assessment; and, develop their capability to monitor, evaluate and regulate their own learning.

Within education, several shifts with conceptions of feedback have occurred overtime, from feedback merely as an information artefact which can be transmitted to be taken on board passively by students (i.e. feedback as input), to more student-oriented shifts which privilege feedback processes and actively engage the students in making sense of the feedback. Others make the relational, cultural and contextual dimensions the most important feature of feedback (Ajjawi et al. 2017; Esterhazy & Damsa, 2017). Some hold the notion that feedback only looks backwards towards the past, and therefore "feed forward" is also a necessary term to distinguish feedback that has advice for the future; others hold that feedback encompasses the entire notion and there is no need for "feed forward" as a separate item, since future action is a requirement of feedback. A further advance on the process-oriented approaches holds that feedback only occurs once action has been taken by the student; hence, impact (Henderson et al., 2019).

The term 'assessment and feedback' form a conjunction of activities that often go hand-in-hand: whenever assessment of learning takes place, feedback information should be provided to students, leading to feedback being 'intimately linked with marking' (Chalmers, Mowat, & Chapman, 2018). Assessment is primarily seen as serving an evaluation and certification function. While the process of undertaking a task can be a valuable learning opportunity in itself, assessment commonly focuses on summative evaluation of student performance against appropriate standards or criteria, in order to generate grades which are reliable, valid, and defensible. On the other hand, the primary function of feedback is to influence students' future work and learning strategies. Thus, within the same act of grading work and providing comments, the teacher is enacting two very different purposes: grade award and justification (considering past achievement) and the provision of feedback information (to influence future achievement). The primary goal of assessment feedback is to help the person improve their performance by providing information that is relevant, timely and useful. This can help to increase motivation, build confidence, and enhance learning. Boud and Molloy

(2013) provided a more refined definition of assessment feedback as a 'process whereby learners obtain information about their work in order to appreciate the similarities and differences between the appropriate standards for any given work, and the qualities of the work itself, in order to generate improved work'. Having seen the conceptions and definitions of assessment feedback from different perspectives, it has become necessary to take a closer look at the improvement in perception and use of assessment feedback over the years, especially with advancement in technology, and see what the future holds.

Concept of Assessment Feedback in Education

The concept of assessment feedback has been a part of education for many years although the way it was used and the importance placed on it have varied overtime. The origins of the term feedback are said to come from engineering or computer science; prior to educational use. Feedback was described in 1950 as "the control of a machine on the basis of its actual performance rather than its expected performance" (Wiener, 1967, p. 36). Its gradual adoption in education settings over the years has resulted in various understandings of what feedback entails, including its common English sense of "information about reactions to a product, a person's performance of a task, etc. which is used as a basis for improvement" (Oxford Dictionaries, 2015). In traditional educational system, the focus was often on testing and grading, with little emphasis placed on providing other forms of feedback to students. This era of testing was characterised by a complete separation of instruction and testing activities, by a measurement that was passively undergone by the students, by measurement of knowledge of subject matter that was unrelated to the student's experiences, and by measuring products solely in the form of a single total score (Wolf, 1993). It was not until the mid-20th century; (1930s to 1960s) that the concept of assessment feedback started to gain more attention and importance in education.

One of the pioneers in the area of assessment feedback was educational psychologist, Benjamin Bloom. Bloom's taxonomy which was proposed by Benjamin Bloom and his colleagues in 1956 identified three domains of learning; Cognitive (mental), Affective (emotional/feelings/attitude) and Psychomotor (physical ability or manual dexterity). This taxonomy outlined six hierarchical levels of cognitive complexity: knowledge, comprehension, application, analysis, synthesis, and evaluation. This category for 'evaluation' included the area of providing assessment feedback to the students on their performance (Bloom, Hastings, & Madaus, 1971).

Types of Assessment Feedback

There are several types of assessment feedback that can be used in an educational setting. These include:

1. Formative feedback: this type of feedback is given throughout the learning process (Assessment for learning) as the students are working on their assignments or projects. It is designed to help students to identify their strengths and weaknesses and to make adjustments to their learning strategies.
2. Summative feedback: This type of feedback is given at the end of an assessment, such as a test or examination. It provides an overall evaluation of a student's performance and can help to identify where the student needs to improve.
3. Peer feedback: this type of feedback is given by other students, either individually or in groups. It can provide a different perspective on a student's work and can help to identify areas of improvement.
4. Self-feedback: this type of feedback is given by the students themselves. It involves reflecting on their own learning process and evaluating their own performance. Self-feedback can help students to develop self-regulated learning skills and take ownership of their learning.
5. Rubric-based feedback: this type of feedback uses rubric which is a set of criteria for evaluating students' work. Rubrics (marking guide) can help to make feedback more objective and consistent, and can provide students with clear expectations for their work.
6. Written feedback: this type of feedback is provided in written form, either on the students' work (scripts) or in a separate document. It can be detailed and specific.
7. Verbal feedback. This type of feedback is provided by the teacher orally in class, individually or to a group.

Relevance of Assessment Feedback to Education

Assessment feedback is essential to education because it provides the students with information about their performance which can help to improve their understanding of the subject matter (content), develop new skills and make progress towards achieving their learning goals. The effectiveness of feedback in the educational assessment process necessitates that constant testing with no feedback be replaced for an improved achievement

(Eleje et.al, 2020). Here are some specific reasons why feedback is important in education:

- Clarifies expectations: feedback can help students to understand what is expected of them and how they are meeting those expectations. This can

help students to focus on the most important aspects of the subject matter and adjust their learning strategies accordingly.

- Motivates learning: feedback can be a powerful motivator for learning. When students receive positive feedback, it can boost their confidence and encourage them to continue learning. When they receive constructive criticism, it can help them to identify areas where they need to improve and motivate them to work harder.
- Reinforces learning: feedback can reinforce learning by helping students to consolidate and apply what they have learned. By providing feedback that is relevant to the learning objectives, teachers can help students connect new knowledge with what they already know, strengthening their understanding of the subject matter.
- Supports self-regulated learning: feedback can help students develop self-regulated learning skills, such as goal-setting, self-evaluation, and self-reflection. By providing feedback that is timely, specific and actionable, students can learn to assess their own performance and make adjustments to their learning strategies as needed.

Challenges Facing Assessment Feedback

One common response to concerns about assessment feedback has been to focus attention on the mechanics of the feedback process in what Ajjawi & Boud (2017) conceptualised as a cognitivist approach to feedback. For example, some universities have mandated maximum number of times for students to receive comments on completed assignments and have urged teachers to give greater attention to the provision of detailed feedback. However, this emphasis on one-way communication of written feedback comments represents what Carless(2015) terms the 'old paradigm' of feedback practice; one where the actions of the giver of information in a process of transmission are the primary focus. Whilst such initiatives have led to some improvements in students' ratings of feedback in opinion surveys (Williams & Kane, 2009), they have not shifted assessment and feedback from its place as the most important concern in almost all institutions (Nash & Winstone, 2017).

Alternative responses have questioned whether the ways in which feedback was typically conceptualised might have contributed to the problem, at least in part. New emphases in the literature started to appear, with feedback being positioned as a form of formative assessment which leads to self-regulation (Ibarra-Sáiz, Rodríguez-Gómez, & Boud, 2020), as an aspect of sustainable assessment which aims to build students' capacities to judge their own work (Carless, Salter, Yang, & Lam, 2011), and as part of a dialogic process through which students learn to appreciate and produce good work

(Nicol, 2010). Price, Handley, and Millar (2011) espoused a view of the feedback process that moved away from the technicalities of delivery, towards a focus on student engagement with feedback.

The most important part of this socio-constructivist view of feedback was to shift it from an act undertaken by teachers, to a process which had an effect on students that could be seen in their work (Boud & Molloy, 2013). This 'new paradigm' represented a very different way of thinking, with an expectation of students' active engagement with feedback information they receive, and a focus on the resulting improvements in subsequent tasks (Naomi & Boud, 2018). These two paradigms represent two very different 'feedback cultures'; one where the student is a passive receiver of information, and one where they are a proactive recipients (Winstone et al., 2017). The latter approach results in a more sustainable assessment process that develops skills of self-regulation and promotes dialogue. Increasingly, scholars in the area of assessment and feedback argue that it is time for an active, utilisation-focused model of feedback to supersede the transmission model (Nash & Winstone, 2017; Zhu & Carless, 2018). According to Nicol (2010), the process of providing feedback does not have to rely on a teacher writing individual comments on each student's piece of work but should allow students to have more interaction with the feedback process; for example, use of peer assessment, provision of exemplars of work and encouragement of discussion about how work is graded.

How Assessment Feedback was Practised in the Years 1960-2000

The assessment era promoted integration of assessment and instruction, seeing the student as an active person who shares responsibility, reflects, collaborates and conducts a continuous dialogue with the teacher. This seems to be the transition from assessment as done by the teacher to assessment feedback; involving the active participation of the learner (Dochy et al. 1999). From here onwards, assessment procedures were not seen as serving as tools of crediting students with recognised certificates but also as valuable for the monitoring of the students' progress and to direct them, if need be. Additionally, there was a strong support (Arter, 1997; Dochy & McDowell, 1997) for representing assessment feedback as a tool for learning.

During this period, assessment feedback was typically provided through these traditional methods:

a. Written comments: teachers would often provide written comments on students' work, such as essays or assignments. These comments

would provide feedback on the students' strengths and weaknesses, and suggest areas of improvement

b. Verbal feedback: teachers would also provide verbal feedback to the students, either in person or over the phone (telephone). This feedback would typically be provided after an assessment and would focus on the students' performance and areas of improvement
c. One-on-one meetings: teachers would often schedule meetings with students to provide feedback and discuss their progress. These meetings would be an opportunity for students to ask questions and receive personalised feedback
d. Grade reports: schools would often provide grade reports to parents and students at regular intervals such as at the end of each term or semester. These reports would provide an overview of the student's performance including grades and feedback from teachers
e. Peer feedback: peer feedback was also practised during this time, although it was less common than feedback from teachers. Students would often provide feedback to each other on group projects or assignments, which could help them to develop critical thinking and communication skills.

While these methods are effective (and still in use today), they often required a significant amount of time and effort on the part of teachers and students.

How Assessment Feedback was Practised in the Years 2001-2023

It is important to note that feedback practices in education vary depending on educational institutions, the type of assessment, and the subject matter being assessed. Generally, in the years 2001-2023, assessment feedback has been increasingly recognised as an essential component of the learning process. In the early 2000s, feedback was often provided through the traditional methods; for assignments, tests or examinations. Teachers would often provide assessment feedback to their students using these methods by highlighting areas where they needed improvement and for remedial (Eleja et al. 2020).

From 2001-2023, assessment feedback practices have evolved significantly due to technological advancements, changes in educational paradigms and increased emphasis on student-centred learning. As technology advanced, assessment feedback started to incorporate digital tools. For example, in the late 2000s, Learning Management Systems (LMS) became increasingly popular and teachers began to use them to provide online feedback to students. LMS are powerful tools for online education and can be used to enhance assessment and feedback practices in any learning environment. It can be used

to design, deliver, and evaluate assignments, as well as provide timely and constructive feedback to students (Gronlund, Samuelsson, and Samuelsson, 2021). This platform therefore allows teachers to provide immediate feedback to the students, enabling them to correct their mistakes quickly and improve their learning outcomes. Speaking on emerging technology, Pardo (2017) posited that increasing presence of technology mediating learning activities together with the capacity of communication and information technology to record detailed tracks of the events occurring in web pages, servers and applications produce the collection of an unprecedented amount of data. Learning experiences can now be instantiated and orchestrated in what could be called data-rich environments. These data ubiquity have widespread ramifications that affect various areas and stakeholders, such as instructional design, assessment, teachers, learners, and management roles in educational institutions. Assessment feedback practices have continued to evolve with rise of personalised learning and data-driven instruction. Today, AI (artificial Intelligence) provided tools are being used to provide feedback in REAL TIME, allowing for even more targeted feedback that is specific to each student's needs and learning styles.

Impact of Information and Communication Technology (ICT) on Assessment Feedback

ICT has had a significant impact on assessment feedback in education in the following ways:

- Increased efficiency and speed: ICT has made it easier and faster to provide feedback to the students. With online Learning Management Systems, teachers can provide feedback in real time, reducing the time lag between assessment and feedback.
- Improved accessibility: with the use of digital tools, feedback can be accessed from anywhere, at any time. This can make it easier for students to review feedback and incorporate it into their learning.
- Enhancing feedback quality: Information technology has enabled the use of multimedia feedback, such as audio and visual recordings, which can provide more detailed and personalised feedback than written feedback alone. This can help to make feedback more engaging and effective.
- Data-driven feedback: Information and communication technology has enabled the collection and analysis of large amount of data on students' performance which can be used to provide more targeted and personalised feedback. By analysing patterns in students' responses, teachers can identify areas where students need more support and provide feedback that is tailored to their individual needs.

- Feedback and peer collaboration: information technology has made it easier to facilitate peer feedback and collaboration. With online tools, students can provide feedback to each other, share ideas, and collaborate on projects, providing valuable learning experiences and feedback.

Overall, ICT has significantly enhanced the effectiveness and efficiency of assessment feedback in education, providing new opportunities for personalised and data-driven feedback, as well as improving accessibility and quality.

Forms of ICT Assessment Feedback

The main forms of feedback offered by the feedback framework as given by Perikos, Grivokostopuolous and Hatzilygeroudis (2017) are:-

- ***Minimal Feedback.*** The system informs the student whether the answer is correct or not. Giving just a correct or incorrect notice can dramatically improve the efficiency of learning.
- ***Flag Feedback.*** Initially after a student has submitted an answer to a step, the system informs him whether the answer is correct (coloured green) or incorrect (coloured red). Flag feedback (Henderson et al. 2019) provides a binary "flag" rather than further information and is considered to be a special kind of minimal feedback.
- ***Positive Feedback.*** The system can inform the student about the correct parts of the answer and provide corresponding justifications on them. Providing positive feedback can help the student know that they are on the right track and also help them reinforce the knowledge they have.
- ***Knowledge about Concepts.*** The system provides hints and explanations in terms and processes and also hints and explanations of the appropriate conceptual context.
- ***Procedural Feedback.*** The system tries to help the students on how to proceed towards the solution by providing hints on what has to be done for the sentence formalisation and also what to do next, suggesting the concepts to be used or rules to be applied.
- ***Error-Specific Feedback.*** When a student's answer is incorrect, the mechanism recognises the errors made and provides the proper feedback based on the error.
- ***Bottom-Out Hints.*** The system can decide to give to the student the correct answer or part of it. This can be done after a student's request or after constant failures and during special learning circumstances.
- ***Knowledge On Metacognition.*** The system analyses the student's behaviour during the learning sessions and provides metacognition guiding hints.

Adopting Various E-Feedback Techniques

Today, a number of e-feedback techniques have been developed to improve the students learning process. These e-feedback techniques can be adopted by the teachers to improve the feedback for the students as given by Al-Bashir, Kabir & Raman (2016):

- **Email Feedback:** Email is a simple but effective way of providing feedback to students. There can be different kind of email feedback. Some emails can basically provide generic comments to a whole group of students especially when one lecturer is teaching large group. On the other hand, other form of e-mail feedback is sending electronic versions of the feedback forms of individual feedback to a particular student.
- **Audio & Video Feedback:** MP3 players have been widely-used for few years. Recently, that has been exploited in providing feedback to students. It is widely known as podcast in academic arena. Often this is used in amalgamation with other types of feedback. The lecturers who use podcasts to provide feedback find them an easy technique. It helps to provide a good quality feedback very quickly, rather as they would in a physical meeting with a student.
- **Screencasts:** Screen casting is a new grown technology which leads teachers to exhibit to students how things should be done. A screencast records the activities on a computer screen, so it is predominantly beneficial for demonstrating, for example, how to write or use software, or steps in a calculation, as it demonstrates the process by which something is done. It can also deliver a model answer for a particular kind of problem. Several students can access a screencast at a time as a result it can be used in providing useful feedback on common problems which students encounter in course works.
- **Recycling Written Comments:** Individualised written feedback can be important in helping students to learn. However, it is a time consuming process. If the number of students is very high, it puts more stress on teachers' time in producing these comments. This describes methods of "recycling" comments that teachers find themselves repeatedly making on common matters in students' course works. In some cases comments can be recycled using specialised soft-wares, and in other standard word-processing packages.

Assessment Feedback in African Schools

From literature, there are general trends that can be identified on assessment feedback in African schools. Research suggests that assessment feedback in African schools is often limited in scope and quality, and is primarily focused on grading and ranking students rather than providing meaningful feedback that supports students' learning and development (Taole, 2021; Mutisya and Makokha, 2016). In many cases, feedback is not

personalised or tailored to individual students' needs, and may be delivered infrequently or not at all (Beyene, 2016). However, there is evidence of efforts to improve assessment feedback in African schools, particularly through the use of technology. For example, some schools are using mobile phones or online platforms to provide more immediate and personalised feedback to students after tests or assignments and during project supervision (Ezeugo et al. 2022; Fouche and Andrews, 2022; Hadollo, Oboko, and Omwenga, 2018). Additionally, there is a growing recognition of the importance of formative assessment and feedback in supporting students' learning and achievement (Pillay, and Balele, 2022). Efforts to integrate these practices into teaching and learning in African schools are ongoing.

The Future of Assessment Feedback in Education

The future of assessment feedback in education is likely to involve the more use of technology to provide more personalised and timely feedback to students. With the increasing use of digital tools in education, there are opportunities to collect data on students' performance and use information to provide targeted feedback that is specific to each student's needs.

One potential future direction for assessment feedback is the use of adaptive learning technologies. These technologies use algorithms to personalise learning experiences for individual students, based on their performance and feedback (Bimba et al. 2017; Muñoz et al. 2022). By analysing data on students' performance, these systems can provide feedback that is tailored to each student's strengths and weaknesses, allowing them to focus on areas where they need the most help.

Another potential future for assessment feedback is the use of artificial intelligence (AI) and machine learning. AI-powered systems can analyse vast amounts of data on students' performance and provide feedback that is more accurate and targeted than human feedback alone (Katragada et al. 2020; Stiennon et al. 2020). For example, AI algorithms can analyse patterns in students' responses and identify misconceptions or gaps in understanding, allowing teachers to provide more targeted feedback to help students to improve.

Summarily, the future of assessment feedback in education is likely to involve a greater emphasis on personalised, data-driven feedback that is tailored to the needs of individual students. This will require the development of new technologies and approaches that can effectively collect, analyse, and use data to provide more effective feedback to students.

Conclusion

From the review of literature, the researchers observed that the traditional methods of
assessment feedback is still in use today. To improve on the quality of feedback given to students, the future of assessment feedback need to involve more use of technology for personalised feedback, and the use of Artificial Intelligence (AI) and machine learning to analyse patterns in students' responses so that feedback will be targeted to improve students' learning. This will go a long way in achieving the primary goal of assessment feedback which is to help the students improve their performance by providing information that is relevant, timely and useful.

Recommendations

It was recommended that:-

1. online feedback mode be used by teachers, (especially in Africa) so as to have dialogical interface with students for more productive learning
2. students should take active role in seeking, understanding and negotiating their feedback preferences and make use of assessment feedback in their learning since advancement in technology has provided avenue for dialogic assessment

References

Ajjawi, R., & Boud, D. (2017). Researching feedback dialogue: An interactional analysis approach. *Assessment & Evaluation in Higher Education, 42*(2), 252–265. http://.doi/10.1080/02602938.2015.1102863.

Ajjawi, R., Molloy, E., Bearman, M., & Rees, C. E. (2017). Contextual influences on feedback practices: An ecological perspective. In D. Carless, S. Bridges, C. Chan, & R. Glofcheski (Eds.). *Scaling Up Assessment for Learning in Higher Education* (Chapter 9, pp. 129–143). Singapore: Springer. http://doi.org/10.1007/978-981-10-3045-1_9.

Al-Bashir, M., Kabir, R., & Raman, I. (2016). The value and effectiveness of feedback in improving students' learning and professonalising teaching in higher institutions, *Journal of Education and Practice, 7*(16), 38-41.

Arter, J. (1997). Using assessment as a tool for learning. In R. Blum, & J. Arter, (Eds.). *Student Performance Assessment in an Era of Restructuring*, Alexandria, VA: ASCD, 1-6.

Bimba, A. T., Idris, N., Al-Hunaiyyan, A., Mahmud, R. B., & Shuib, N. L. B. M. (2017). Adaptive feedback in computer-based learning environments: A review. *Adaptive Behavior, 25*(5), 217-234.

Bloom, B. S., Hastings, T. J., & Madaus. G. F. (1971). *Handbook on formative and summative evaluation*. McGraw-Hill.

Boud, D., & Molloy, E. (2013). Rethinking models of feedback for learning: The challenge of design.. *Assessment & Evaluation in Higher Education,* 38 (6),698–712. http://.doi.org/10.1080/02602938.2012.691462.

Carless, D. (2015). *Excellence in university assessment: Learning from award-winning practice*. Routledge.

Carless, D., Salter, D., Yang, M., & Lam, J. (2011). Developing sustainable feedback practices. *Studies in Higher Education 36*(4), 395–407. http://.doi.org/10.1080/03075071003642449.

Chalmers, C., Mowat, E., & Chapman, M. (2018). Marking and providing feedback face-to-face: staff and student perspectives. *Active Learning in Higher Education, 19*(1), 35–45.

Clarke, J. L., & Boud, D. (2018). Refocusing portfolio assessment: Curating for feedback and portrayal. *Innovations in Education and Teaching International, 55*(4), 479–86.

Dochy, F J.R.C., & McDowell, L. (1999). Assessment as a tool for learning. *Studies in Educational Evaluation, 23*(4), 279-298.

Dochy, F, & Moerkerke, G. (1997). The present, the past and the future of achievement testing and performance assessment. *International Journal of Educational Research, 27*(5), 415-432.

Eleje, L. I., Esomonu, N.P.M., Okoye, R.O., Agu, N. N., Ugorji, C. O., Okoi, O.A., & Abanobi, C.C. (2020). Students' academic achievement in secondary-school quantitative economics: Effect of feedback with remediation. *Education Quarterly Reviews, 3*(4), 479-488. http://.doi.org/10.31014/aior.1993.03.04.155

Esterhazy, R., & Damşa, C. (2017). Unpacking the feedback process: An analysis of undergraduate students' interactional meaning-making of feedback comments. *Studies in Higher Education*, 1–15. http://.doi.org/10.1080/03075079.2017.1359249.

Ezeugo, N. C., Metu, I. C., Eleje, L. I., Mbelede, N.G., Ezinwa, A.U., Ezenwosu, N. E., Akinfe, G., Achebe, O., & Anachunam, C. (2022). Lecturers' acceptance and use of ICT for the sustenance of research supervision amidst Covid-19 pandemic. *London Journal of Research in Humanities and Social Sciences, 22*(4), 61-70.

Fouche, I., & Andrews, G. (2022). "Working from home is one major disaster": An analysis of student feedback at a South African university during the Covid-19 lockdown. *Education and Information Technologies*, *27*(1), 133-155.

Gronlound, A., Samuelsson, J., & Samuelsson, J. (2021). When documentation becomes feedback: Tensions in feedback activity in LMS. *Education Inquiry.* http://.doi.org/10.1080/20004508.2021.1980976.

Hadullo, K., Oboko, R., & Omwenga, E. (2018). Status of e-learning quality in Kenya: Case of Jomo Kenyatta University of agriculture and technology postgraduate students. *International Review of Research in Open and Distributed Learning*, *19*(1).

Henderson, M., Ajjawi, R., Boud, D., & Molloy, E (Eds.). (2019). Impact of feedback in higher education. https://doi.org/10.1007/978-3-030-25112-3. e-book.

Henderson, M., Ryan, T., & Phillips, M. (2019). The challenges of feedback in higher education. *Assessment & Evaluation in Higher Education.* http://doi/10.1080/02602938.2019.1599815

Ibarra-Sáiz, M. S., Rodríguez-Gómez, G., & Boud, D. (2020). Developing student competence through peer assessment: the role of feedback, self-regulation and evaluative judgement. *Higher Education*, *80*(1), 137-156.

Katragadda, S., Ravi, V., Kumar, P., & Lakshmi, G. J. (2020). Performance analysis on student feedback using machine learning algorithms. In *2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS)* (pp. 1161-1163). IEEE.

Molloy, E., Boud, D., & Henderson, M. (2020). Developing a learning-centred framework for feedback literacy. *Assessment and Evaluation in Higher Education, 45*(4), 527–540.

Muñoz, J. L. R., Ojeda, F. M., Jurado, D. L. A., Peña, P. F. P., Carranza, C. P. M., Berríos, H. Q., ... & Vasquez-Pauca, M. J. (2022). Systematic review of adaptive learning technology for learning in higher education. *Eurasian Journal of Educational Research*, *98*(98), 221-233.

Mutisya, D. N., & Makokha, G. L. (2016). Challenges affecting adoption of e-learning in public universities in Kenya. *E-Learning and Digital Media*, *13*(3-4), 140-157.

Naomi E. W., & Boud, D. (2020). The need to disentangle assessment and feedback in higher education. *Studies in Higher Education.* http://doi.org/10.1080/03075079.2020.1779687

Nash, R. A., & Winstone, N. E. (2017). Responsibility sharing in the giving and receiving of assessment feedback. *Frontiers in Psychology*, 8, 1519. http://doi.org/10.3389/fpsyg.2017.01519

Nicol, D. (2021). The power of internal feedback: Exploiting natural comparison processes. *Assessment and Evaluation in Higher Education, 31*(2), 199–218. https://doi.org/10.1080/02602938.2020.1823314

Nicol, D. (2010). From monologue to dialogue: Improving written feedback processes in mass higher education. *Assessment & Evaluation in Higher Education, 35*(5), 501–517. https://doi.org/10.1080/02602931003786559.

Oxford Dictionaries. (2015). *Feedback*. Retrieved July 26, 2018, from https://

Pardo, A., Jovanovic, J., Dawson, S., Gasevic, D., & Mirriahi. N. (2017). Using learning analytics to scale the provision of personalised feedback. *British Journal of Educational Technology*, 50 (1), 128-138. doi:10.1111/ bjet.12592

Perikos, I., Grivokostopoulou, F., & Hatzilygeroudis, I. (2017). Assistance and feedback mechanism in an intelligent tutoring system for teaching conversion of natural language into logic. *Int J Artif Intell Educ*, 27, 475–514. https://doi.org/10.1007/s40593-017-0139-y

Pillay, P., & Balele, R. (2022). Exploring learners' experiences of receiving formative written assessment feedback in business studies as a subject in South

Africa. *International Journal of Learning, Teaching and Educational Research*, *21*(10), 228-248.

Price, M., Handley, K., & Millar, J. (2011). Feedback: focusing attention on engagement. *Studies in Higher Education*, 36 (8), 879–896.

Stiennon, N., Ouyang, L., Wu, J., Ziegler, D., Lowe, R., Voss, C., & Christiano, P. F. (2020). Learning to summarize with human feedback. *Advances in Neural Information Processing Systems*, *33*, 3008-3021.

Taole, M.J. (2021). Assessment and feedback practices in a multigrade context in South African classrooms. In: Cornish, L., Taole, M.J. (Eds). *Perspectives on Multigrade Teaching*. Springer, Cham. https://doi.org/10.1007/978-3-030-84803-3_8

Wang, S. L., & Wu, P. Y. (2008). The role of feedback and self-efficacy on web-based learning: the social cognitive perspective. *Computers & Education*, *51*(4), 1589–1598.

Wiener, N. (1967). *The human use of human beings: Cybernetics and society (first Avon)*. Avon Books.

Williams, J., & Kane, D. (2009). Assessment and feedback: Institutional experiences of student feedback, 1996 to 2007. *Higher Education Quarterly*, 63, 264–286. http://.doi/10.1111/j.1468-2273.2009. 00430.

Winstone, N. E. (2019). Facilitating students' use of feedback: capturing and tracking impact using digital tools. In M. Henderson, R. Ajjawi, D. Boud, & E. Molloy (Eds.). *The Impact of Feedback in Higher Education: Improving Assessment Outcomes for Learners*, 225–42. Palgrave.

Winstone, N. E., Nash, R.A., Rowntree, J., & Parker, M. (2017). It'd be useful, but i wouldn't use it : Barriers to university students' feedback seeking and recipience. *Studies in Higher Education*, *42*(11), 2026–2041. http://.doi.org/ 10.1080/03075079.2015.1130032.

Wolf, D. P. (1993). Assessment as an episode of learning. In R.E. Bennett, & W.C. Ward. (Eds.). *Construction Versus Choice In Cognitive Measurement: Issues in Constructed Response, Performance Testing, and Portfolio Assessment.* Erlbaum Associates, 213 – 240.

Zhu, Q., & Carless, D. (2018). Dialogue within peer feedback processes: Clarification and negotiation of meaning. *Higher Education Research & Development*, 1–15. http://.doi.org/10.1080/07294360. 2018.1446417

Applying Generalizability Theory Using EduG Software: An Overview

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Introduction

Measurement theory is the thought-out method and interconnected body of knowledge that serves as the foundation for correct measurements. Translation of measurement theory to behaviors helps to assure the validity and relevance of tests and the data generated by them (Britannica, 2023;Linn, 2010). Valid measurements are required for assessments to be meaningful and truthful, whether performed in the clinic or in the research laboratory. In research, useful and true data rely on scalable and detectable events being transformed into relevant, valid, and reliable measurements. The rules by which numbers are assigned to events form the basis of measurements theory (Kreb, 1987; Teker, et al 2016). These rules link researcher's ideas to concrete arithmetic notes that are typically reported as "data" and amongst these measurement theories is the generalizability theory which use in pursuit of evaluation of the reliability of measures is becoming more prevalent in modern research.

What is Generalizability Theory (G-Theory)?

Generalizability theory, popularly known as G-theory was originally created by Lee J. Cronbach and associates (Cronbach, Gleser& Rajaratnam, 1963) as an alternative to the classical test theory (CTT) for assessing the dependability of behavioral measurements (Truong et al 2020). This model provides a more comprehensive understanding of the origins of variance than the more common test-retest method. G-theory disentangles sources of measurement errors and estimates them individually (Cronbach et al 1963 as cited in Medvedeva, et al 2022). In G Theory, a behavioral observation (e.g. test score) can be viewed as a sampling from a universe of admissible measurements, which is all the possible observations that are considered acceptable by decision-makers to replace the actual observation (Kline et al, 2020). When performance-based assessments are done, G theory emphasizes the need to take into account potential influences such as rater bias, test form, relative difficulty of items, the examinee's attention and mood, the ability of student and the general environment. Though these characteristics may not matter to a decision maker,all are potential sources of error.G-theory allows us to quantify the variance that these factors contribute which G–theory calls *facets* and each form of a given facet is called a *condition*.The universe for admissible observations is defined therefore by all combinations of levels of conditions (called facets).

To evaluate the reliability of behavioral measures, a generalizability study is designed in order to isolate and estimate all facets of measurement errors that can be reasonably and economically estimated (Hove, 2021; Monteiro et al, 2019;Vispoel et

al, 2022). However, primary interest in G-analysis is the components that are affected by various sources of error. Monteiro, et al (2019) stated thus;

> If you conduct a literature review regarding methods to reduce measurement error, you will find a heady multitude of study designs and analysis approaches.Of these approaches, readers are likely familiar with Cronbach's alpha to examine measurement reliability. A calculation of Cronbach's alpha can inform test score reliability, but not whether systematic rater bias has an influence on scores. Thatis, if trainee gender influenced a rater's assessment of performance, we could not discover this from Cronbach's alpha alone. A highly useful theory that informs reliability, validity, elements of study design, and data analysis is *Generalizability theory* (G-theory). G-theory is a statistical framework for examining, determining, and designing the reliability of various observations or ratings (Pg 366).

Statistical Assumptions of G-Theory

The necessary conditions that underlie G-Theory are basically the same as Classical Test Theory. They include that

Data should be either ordinal or interval in nature when performing generalizabilty analysis.

G-Theory assumes that a student's observed scores are composed of their universe score and/or additional sources of error.

The errors are assumed to be uncorrelated and unrelated to the universe score. That is to say, the measurement model's effects are all independent.

G-Theory assumes that the random samples used for estimation of error variances, selected items or occasions, are drawn randomly from their respective populations. These facts are not necessarily fixed. This concept of "randomness," in particular, refers to the fact that although a facet's conditions have not been randomly sampled, it can still be considered random if other conditions than those observed can be used. If the researcher is willing exchange 30 items for another sample of 30, the facet may be considered to be reasonable as random.

The standard errors for all scores are the same. The standard error of measurement can be applied to all objects of measurement, regardless of the underlying score (Alkharusi, 2012; Strube, 2012).

Estimated Parameter of G-theory

In generalizability theory, two distinct reliability coefficients are estimated: the generalizability coefficient (G-coefficient) for relative evaluation, and the index of dependability (Phi coefficient) for absolute decisions. Like in all methods of reliability estimation, G and Phi coefficients are estimated based on a data set obtained from a sample as a result of administering the instrument. Therefore, it has been a critical issue to determine what sample size is necessary in order to reliably estimate the population's characteristics.

Consider a two-facet crossed person x-item-occasion-G design, in which items and occasions were randomly selected. It is important to note that the subject of measurement in this case, persons, does not represent a source for error. Therefore, it is

not included as a facet. In this design, with generalization to all admissible items and occasions from an infinitely-large universe, a person's observed score on a given item and event is decomposed as an effect for grand mean plus effects of the person, the object, the occasion and each two-way interactions and a residue (three-way interplay plus unsystematic mistake).Except for grand mean, the distributions of each component (effect) have mean zero and variance σ^2 (variance component). The variance component for the person effect is called the *universe-score variance and* error variations for the other effects. Each variance component can also be estimated by using other methods, such as maximum likelihood. The relative magnitudes for the estimated variance components can provide useful information about error sources that may influence a behavior measurement. Statistical tests are not used in G theory; but standard errors for variance component estimations provide information about the sampling variability of estimated components.

Generalizability Theory: Concepts and Principles

Generalizability study (G-study). Generalizability studies provide a better understanding of the composition of assessment scores. This can be created from G-theory to better understand what contributes to final examination scores (i.e. how assessment scores are composed) (Li, et al 2018). G studies are used to estimate G-coefficients and describe the influence of various facets within the universe of scores (Dragojlovic et al, 2021; Meyer et al, 2022).G-studies are special type of assessment of the actual information aimed at evaluating the fluctuation parts for both the populace as well as the range of permitted perceptions. This is often done by using mean squares (Brennan, 2003). The G study is the first stage in applying generalizability theories. This phase uses an Analysis of Variance (ANOVA) system to partition the change of the data index into its parts. A factorial ANOVA should also be used when more than one facet of the review plan is being engaged. This allows the user the ability to analyse the effects of multiple independent variables.

The study design will affect the ANOVA model that is used in the initial step. A fixed-impacts plan (fixed-facet) should be used if the informational qualities are the only ones of interest. The plan, however, would restrict generalizations of data to the real conditions of research. This is especially true when the study's objective is to plan an assessment protocol. In most cases, data should also address random sampling of conditions. The data collected should be compatible with the estimates made from the target population. A random-effects model (random-facets), of ANOVA is recommended in this case.When performance-based assessments are done, G-theory allows us to quantify the variance of potential influences such as rater bias and relative difficulty of items or stations, the examinee's attention and mood, the ability of student sand the general environment. In G-Theory we can reinterpret several standard questions.

Standard question(CTT)	Reinterpreted in G-Theory
What is the inter-rater reliability of this examination?	To what extent can we *generalize* these scores across raters?
What is the test-retest reliability?	To what extent can we *generalize* these scores across occasions?
What is the test-retest/inter-rater reliability?	To what extent can we *generalize* these scores across both occasions and raters?

Decision study (D-study). The *decision* (D) *study* deals with the practical application of a measurement procedure that helps to predict how reliable the data will be under different conditions. A D-study uses variance component information from a G-study to design a measurement procedure that minimizes error for a particular purpose. In planning a D-study, the decision maker defines the universe that he or she wishes to generalize to, called the *universe of generalization*, which may contain some or all of the facets and their levels in the universe of admissible observations. In the D-study, decisions usually will be based on the mean over multiple observations (e.g.test items) rather than on a single observation (a single item). A D-study uses the information provided by the G-study to design the best possible application of the measurement for a particular purpose (Brown, 2005; Webb et al, 2006) and answers the question "What if…?" by designing variations in measurement through optimization (Brennan, 2010). The decision maker uses the information from the G-study to evaluate the effectiveness of alternative designs for minimum error and maximum reliability (Webb et al, 2006).

Quick notes here. G-theory recognizes that the decision maker might want to make two types of decisions based on a behavioral measurement: relative (norm-referenced) and absolute (criterion- or domain-referenced). A *relative decision* focuses on the rank order of persons; an *absolute decision* focuses on the level of performance, regardless of rank. Error variance is defined differently for each kind of decision. To reduce error variance, the number of conditions of the facets may be increased in a manner analogous to the Spearman– Brown prophecy formula in classical test theory and the standard error of the mean in sampling theory. G-theory distinguishes between two reliability-like summary coefficients: a Generalizability Coefficient (Gr) for relative decisions and an Index of Dependability (Phi) for absolute decisions (Ga). While the relative G coefficient (Gr) only analyzes variation that is directly related to the object of measurement, the absolute G coefficient (Ga) accounts for additional sources of volatility, such as trial, that may affect absolute measurement indirectly, making it a more conservative measure of reliability (Medvedeva, et al 2022). It allows the decision maker to use different designs in G- and D-studies. Although G-studies

should use crossed designs whenever possible to estimate all possible variance components in the universe of admissible observations, D-studies may use nested designs for convenience or to increase estimated generalizability.

Facets. The Facets of Generalization are sources of variation which affects the measures taken of the objects under study. These are more importantly aspects of the study which create random errors of measurement, but also that are, in a sense, "systematic errors" of measurement. Facets can be considered *fixed* or *random*. Fixed facets are stable, for example, the same raters in every exam and random facets are interchangeable. Ideally, facets are identified a priori. Knowledge of an assessment design informs the researcher whether facets should be considered fixed or random for the purpose of D-studies. Generalizability theory recognizes that any observation is subject to the influence certain sources of variation that cannot be controlled. One can only establish a confidence interval to delimit the probable influence of all these factors combined. Common of facets of generalization would include moments (times) of test administration, raters, testees, topics etc. The Cartesian product of all the facets of generalization constitutes set of all the possible conditions of observation considered in the study.

G-coefficient. This estimates the generalizability of a given aspect of the measurement (eg, interrater reliability). For example interrater G-coefficient, helps evaluate how well we might generalize a score from one rater (in one context) to another. G-coefficient could be Relative or Absolute.

Relative G-coefficient. Estimates the generalizability of a given aspect of the measurement but only to the same context. Variance is defined only relative to the data collected in that context. When in doubt, use absolute error as it is a more conservative estimate.

Absolute G-coefficient. Estimates the generalizability of a given aspect of the measurement that generalizes to other potential contexts. Variance is defined by considering the possible universe of scores yet to be collected.

Validity. In G-studies, validity estimates whether an assessment tool gives meaningful, truthful results. Validity is not a fixed property of the assessment tool, but varies with subjects, setting, purpose, and other factors. Together, validity and reliability provide the primary basis for judging the technical quality and the appropriateness of the uses and interpretations of educational tests results. There is widespread agreement among measurement experts that while reliability is important, validity is the most important consideration in evaluating the uses of and inferences that are made from test results. Other considerations, such as fairness and the comparability of test results for different test takers or from one occasion to another, are also important, but such considerations can be readily subsumed under the more fundamental topics of validity and reliability.

Application of G-Theory in Measurement and Evaluation

In G theory, there are 2 different studies: G-study and D-study. G-study quantifies the amount of variance that is associated with the different facets (factors) while D-study provides information on which strategy are most suitable for specific measurements by generating generalizability coefficients. Repeated measures analysis

of variance is used to determine the amount of variance that each facet and any interactions have. These sources of variation are used to identify the interactions and aspects most responsible for measurement errors. This allows for the control and manipulation of the sources of variance which are key in measurement and evaluation. The D study's results can be used to decide on the most stable and effective measurement protocols. Intraclass models permit any number of repeated scores, while traditional test/retest reliability coefficients can only accommodate two scores. G theory can include any number offactors that could affect reliability. These factors affect true score variation and measurement error. In a model that uses G theory to assess reliability, all of these factors can be included.

Using EduG: The Generizability Theory Software

The methods for calculating G coefficients are still debatable today, due to this fact, Cronbach and, later, Brennan decided to use ρ^2 formula for it is consistent with the history of psychometric theory and is equivalent to the traditional ANOVA model. They made the assumption that the research subjects (often the testees) are chosen at random from an unlimited population, (random effect model). In such situations, drawing conclusions about the population from the sample is simple and data would be reliable for any random selection.The theory can be applied to any object of study and not just Students. It is also applicable to other purposes of measurement, such as comparing the performance of different teaching methods, schools, regions and student subgroups. When the factors being differentiated have fixed levels, such as socio-economic status or gender, the significance of the effect is quantified by an Ω^2 using a different formular instead of aρ^2 factor. In EduG, each dependability coefficient compares an estimated variance of the effects studied with an estimated variance of the entire study. It is important to compute the estimates while taking into account the type and size of the sample be it purely random, fixed or random finite.

EduG calculates a G- Coef as ρ^2 and Ω^2 or an intermediate value but always expressing the proportion of "true" score variance in the total expected score variance. This is done by applying the "Whimbey correction" on the variance component estimates. Whimbey correction which must be included in EduG report is expressed as $\frac{(Nf)-1}{Nf}$, being the size of the facet F universe in the relevant design (Cardinet et al 2010). Each ANOVA derived-variance component must be weighted by this coefficient (or these coefficients, in the case of interactions), and it is these weighted components that appear in the column - Corrected components in the first report table produced by EduG. The corrected component values are carried through all further computations.

Levels of EduG Menu

When EduG is opened for the first time, it presents four basic menu choices:File, Edit, Preferences and Help.

***File*.** The File menu contains three options: New, Open and Quit. New is used

to create a new "basis". A basis in EduG is a file, with. gen extension, that contains all data and design specifications needed for a particular G study. Open accesses an existing basis. These are by default placed in the folder Data in the EduG, except if you direct it to an alternative location. Quit is used to exit from the program.

Edit. This is to access a text processor for change in the text of a files. The default text processor for files in Text format is WordPad, while that for files in RTF format is MS Word. You can change these default editors by using the Preferences menu option.

Preferences. Preferences menu allows you to define the parameters that will control certain program functions, by accepting default choices or indicating alternatives (see Fig 1). In particular, you can use this menu to change the directory in which EduG bases and reports are automatically saved. In addition, you can indicate the number of decimal places you would like to see in EduG reports. You can also use this option to confirm automatic text editor calls to WordPad, MS Word or any other text processor. EduG has been programmed to open WordPad using the write.exe program.

Fig. 1. Preference interface

MS Word is the default software for RTF files. However, certain versions of Windows may not allow an automatic call. If this is the case, uncheck the box in Preferences and specify the application to be used when opening a saved RTF file. Windows XP normally does not need synchronization delays (0). Some configurations, however, may require a small delay to allow MS Word's automatic startup.

Help. Help is used to navigate to the help pages produced to guide you while you use EduG. To access specific help, click the question mark which appears in most interactive program windows or consult the Index. The help pages aim to cater to the needs of users with a solid understanding of G Theory and EduG who want to get accustomed to EduG. They also try to accommodate those with a limited knowledge of G Theory and EduG. Determining your level of expertise will determine whether some help texts seem elementary or very technical.

Launching a G-Study

Opening the Work screen. To set up a G study, create a new study basis to hold all the design and data details. You can do this by clicking on New under the main File menu. After you name the new file, you will be shown a Work screen (See Fig 2).
The Work screen provides you with a variety of command options to help you specify the study design, and enter your data. You should first give your study an appropriate title. The title of your study will appear on the top page of any EduG report related to the study, and helps you to find it when classifying and retrieving reports.

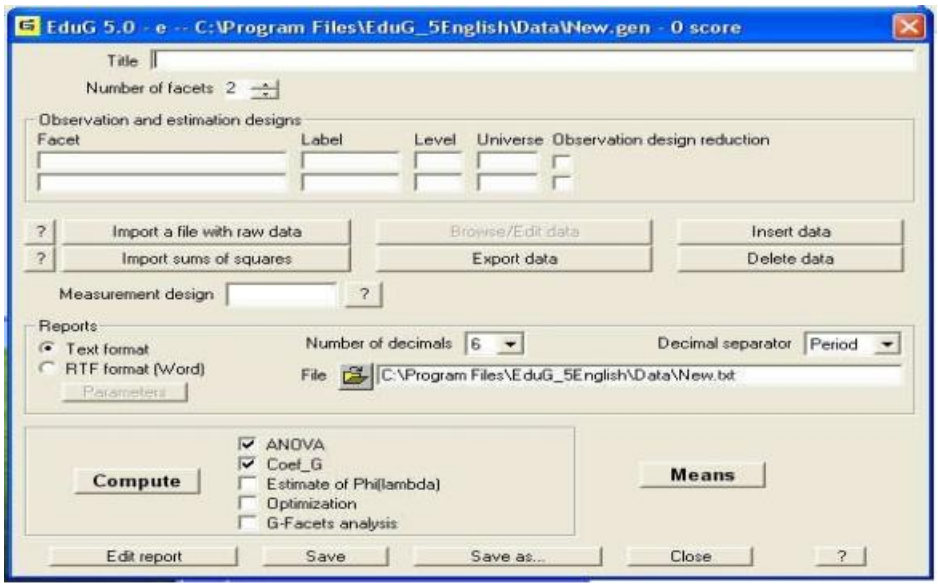

Fig 2. Opening a work screen

Declaring observation design. After you have given your study a title, then declare how many facets you want to include in the data set. This is the basis for your observation plan. EduG presents you with "facet rows" to describe your facets. The number of rows will equal the number of facets that you have declared. EduG handles up to 8 facets for an observation design.

The observation design you choose is defined by the following two sets of data: a facet identifier, which includes information about interrelationships and levels observed. EduG will assume, unless you indicate otherwise that all of your facets are cross-referenced (See fig 3). Nesting facets are required if your observation design contains them. The nesting faces must be described prior to the nested ones, and in a descending order.

Each facet must contain the information below:

- The full name of each facet (Raters for example). Additional information can be included if desired.
- A single letter is used to label the facet (e.g. S stands for Students. A nested facet's identifier must include its nesting facet separated by a colon. There should be no space around the colon. You must use S:C instead of just S if students are nestled within Classes. Classes must also be declared. S:C:T is used if Classes in turn are nested in Towns, The facet Towns must already be declared. Note that X:YZ is interpreted by the program as X nested in the interaction of Y and Z.
- The number of levels for each facet. This information is needed for EduG's correct identification and processing of the data points. If the facets are nested, the number to declare is the number levels in each level.
- The number of levels that make up the universe for a facet. [This actually defines your estimation design, and not your observations design]

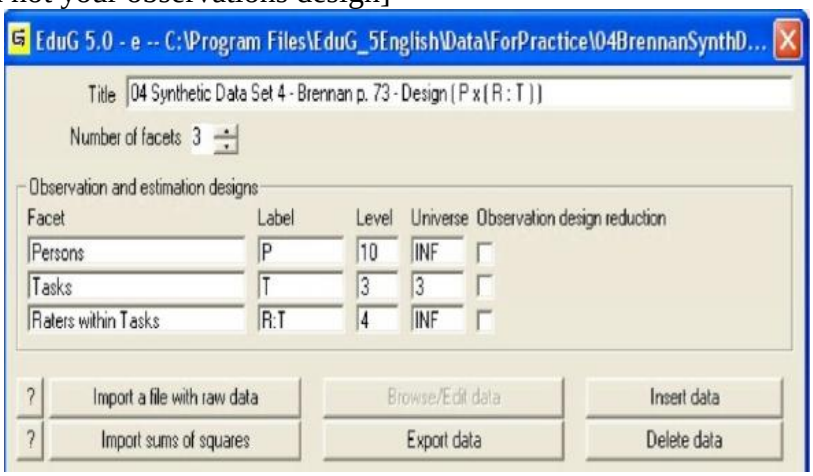

Fig 3. Declaring Design

Reducing observation design. It may be necessary to analyze certain subsets of your data. For example, you may wish to separate results by gender or age group, or compare the results between students.The Work screen allows you to do this by checking the box next to each facet that is titled Observation and Design Reduction.

EduG lists the observed levels in the corresponding facet. Select the levels that you do not want by clicking Ctrl + Click. The same procedure can be followed to reverse your selection.If you do not clear the box(es), the observations you made in relation to the facet levels will be excluded from the analysis.

Declaring estimation design. Declaring your estimation design simply means declaring your facet universe sizes,i.e. This is a number that indicates how many levels are present in the population of each facet. Since there was no level sampling, all the levels in a facet will be included in the data. If the universe level number is greater than the observed level number, then the data set will have more levels. Indicate an infinite facets population by using 'INF,' or more simply "i".

You should remember that your results will be more generalizable if you use the right definition of your facet universes. You have to decide what you want to do if, for example, you're analyzing student scores on a number of questions in order establish the reliability and consistency of their average test scores. You could view the facet Questions like a fixed facet. In this case, you would be unable to generalize any findings beyond a specific set of questions. If you prefer, you can think of the facet Questions in terms of a random universe with a finite size or infinitely large. Then you will be able generalize any results you have to a larger set of questions.

Declaring measurement design. To define measurement design, by default, identify the facets that are instrumentation and differentiation facets. Separate the two sets using a forward-slash and Measurement designs must contain all facets of the observation design. Even if a facet has been reduced to a single level, eliminating it as a possible source of variance, it still needs to be included in the design. If you want to differentiate between facets, then use the facet's unique identification letter. There is no need for colons, as nesting relationships are already indicated in your observation design. In the design Students x Questions if the facet is Students then the measurement design would be S/Q. If the Students are nested within Classes, then your measurement design will be SC/Q but If you want to distinguish between Questions and not Students or Classes then Q/SC is the measurement design for you.It does not matter whether you place the SC/QP or SC/PQ to the right or left of the slash.In the Measurement Design Box in the middle of the Work Screen, you should enter the design notation.

Saving the new basis. There are two ways to save the basis. Save saves your basis to the folder EduG in the subfolder Data. You can save it with the name you gave to it previously. Save As allows you to save a basis in a folder with a name that is different. If you don't change the file name, The folder in which the file was created cannot be deleted. Even if you haven't filled it in completely or only partially, save the basis.

Managing Your Data

Data characteristics. EduG allows you to enter raw score data as well as data that is already preprocessed and in the form of sums of squares, degrees of freedom either directly into the basis via the keyboard or alternatively by importing a data file. to analyze raw score, the data must be complete (no missing data) and balanced. EduG

does not handle unbalanced designs. If you find that your data is unbalanced (for example, if your students are in different classes), you'll need to add balance to the data before adding it to the basis. To do this, you can delete records as necessary.If you prefer, ANOVA software can calculate the approximate sums of all squares in these situations. This will allow you to submit degrees of freedom and sums of all squares to EduG so that they can perform a G-study analysis.You can perform a G analysis based on a published ANOVA result table, even if you don't know the original data.

Entering/keying your data. You can add data via the keyboard. When you click on Insert data, the

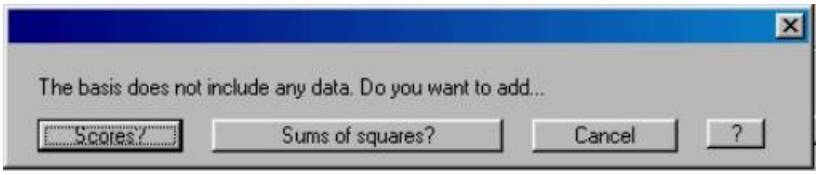

Fig 4. Keying data

Work screen will display the options box, you then select the type data you wish to key

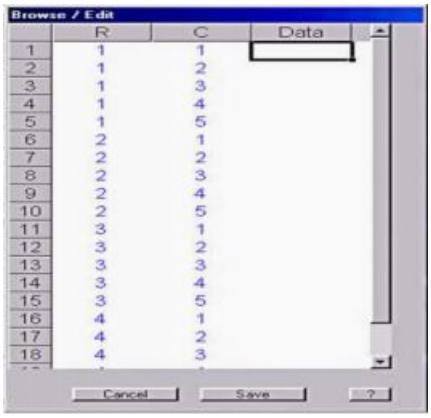

Fig. 5. Option Box

EduG would not be able to recognize the data points that you want to enter if you have not defined your observation design in the Work screen. Imagine you've declared a design observation with two crossed facets R (Rows) & C (Columns) at four or five levels, respectively. You will see a table that is partially filled out (in a Browse/Edit Window) with all the level combinations possible for the two facets you have crossed, and spaces to add your observations as in Fig. 5.

The coordinates for the expected entry can be found by using the R and C column identifiers. When you press 'Enter' the score that is entered in the box below the column to the right will be recorded. Save is located at the bottom of Browse/Edit. When you click on Save before you've finished entering data, zeros will appear in any empty cells. If you click Browse/Edit data again when starting your work, the window Browse/Edit scores will appear. Place the cursor in the first position that is empty and then continue entering data. To finish, click on Save. Selecting Sums of Squares instead

of Scores will open a new window. This window (Fig. 6) will appear if you choose Sums of Squares.

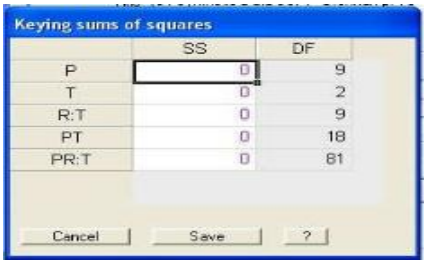

Fig. 6. Keying figures

The first column lists all the components of variance relevant for the declared observation design, and the third list the associated degrees-of-freedom. The sums-of-squares values are simply introduced in the middle of the column. The sums of squares, and degrees of freedom are as follows:

R 10 3
C 16 4
RC 30 12

If, in the estimation design, you declare that rows and columns are infinite sets i.e. Random facets. If you provide the measurement R/C design, you'll get two values for G Coefficient.

Importing a Data File. You can import data from an existing file or create one outside of EduG. You can import raw scores, or sums. Just choose the appropriate command from the Work screen: Import raw data or Import Sums. You will then be prompted to enter the name and the location of the data you wish to import.The file that you are importing must comply with two requirements:

1) The number in the file should match the expected results of the observation design. If the file contains raw scores, then their number must match that of the observed levels as declared in your observation design.

2) As a delimiter, a semicolon or tab should have been used.

If the condition 1 is not met, you will receive an error message that suggests that you correct and check the file. If condition 2 is being violated, EduG invites you to confirm whether the file format is fixed or delimited (as in Fig. 7)

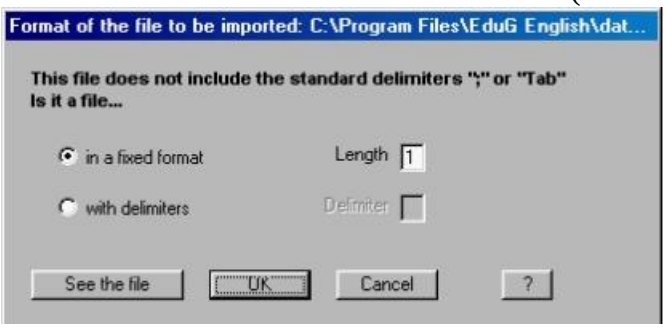

Fig. 7: Format of Imported file

If the file has a fixed format, it is important to note the maximum size of the data points. If the file has been saved in a free format, you'll need to indicate the delimiter. To view the structure of a file, click on the See the file button. If you want to create a file of data that you can import later, it's best to make the file an Excel or Word Table. The rows and columns should be identified (facet names, level identifiers), to make it easier to introduce and validate the data. The rows and columns that were used to introduce the first two faces will be subdivided into the third facet, the fourth, and so on.

	Col 1	**Col 2**	**Col 3**	**Col 4**	**Col 5**
Row 1:	5	2	2	5	1
Row 2:	2	6	3	5	4
Row 3:	2	7	5	5	6
Row 4:	3	5	2	5	5

As shown below, once the table is complete and verified, it's time to remove the row and columns headings. You should only keep the raw data.

5 2 2 5 1
2 6 3 5 4
2 7 5 5 6
3 5 2 5 5

Save the file using ASCII text only (tabs are used to separate lines) and the suggested file extension,.txt. Verify that the file has the correct number of lines. Sometimes, the last line with a paragraph symbol will have to be deleted. After saving, the table will appearas a vector. This is the same column of values which you could have typed into the Browse/Edit Window in Fig. 5.

If you are going to import an Excel file that contains sums of squares as well as degrees of freedom then it should have one record per source of variance. For each variance source, there should be one row. The row should identify the variance source as well as record the sums of squares or degrees of freedom. Data points can be delimited by tabs, semi-colons or other standard symbols. The file for this exercise would look like:

R;10;3
C;16;4
RC;30;12

EduG will not be affected by the order of rows - this will not affect the computations. But it must be able identify each source for variation. The file must have been saved as Text only, with the extension.dat.

Editing data. Browse/Edit data on the Work screen allows you to look at the data that has been saved in your basis. To navigate the file, use the vertical scrollbar. Simply position the cursor where the old value is and type the new one. Once all the changes are complete, save the file again.

Exporting data. With the option Export data on the Work screen, you can save the data that is currently in your basis as an ASCII (Text) file with the file name of choice. The data will be stored in whatever form they were initially imported, i.e. The

data will be saved as raw scores, or as the sums of all squares.If you want to select a name that is unique and suitable, it may be helpful to look at the names of other data files. This can be done by clicking the icon next to File in the Reports area. You will then see a window that opens allowing you to examine the contents of each directory.

Deleting data. You can delete data from the basis once you have exported it out. Click on Delete Data and confirm your intention by responding to prompts. Save the modified basis. After the data has been removed from the basis, you can change the observation design. Then import a new set of data.

Requesting Analysis and Interpreting Reports

Options for analysis and reports. EduG is able to perform all calculations required for a G Study once the observational, estimational and measurement designs and the data have been defined. TheCompute area on the Work screen displays the set of commands.

- Means, ANOVA, CoefG, Estimate for Phi(lambda)., Optimizing, G-Facets analysis

These computations can all be done independently, and each will produce a different report. By clicking the Compute button, you can select multiple boxes and request all analyses.EduG offers you the option to create your reports as RTF or Text. You can select the format that you want by clicking the appropriate button on the Reports screen in the middle (see fig. 8). Moreover, you can specify how many decimals to display in the reports and the decimal separator. Prior preferences will then be replaced.

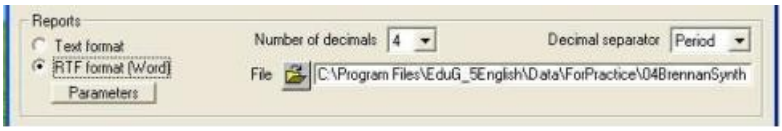

Fig. 8. Report screen

If you choose Text, if you are using WordPad, you will be able edit your report directly. If you choose RTF, you shouldn't try to edit the report on screen within EduG because RTF contains specific limitations that can freeze the program. If you need to edit the report, perhaps for presentation, you can save it as a Word document (with an '.doc" extension) and work on this file. If you prefer, you can decide the specifics of your table in advance. Click on RTF Format (Word), then Parameters, located below. The screen will look similar to this one, where you can change a variety of presentation parameters such as the page format, columns, shading, and character types. EduG uses by default the report name and the directory location you have specified in Preferences. The report name or the file destination can be changed at any point. Print your report by selecting the Word processor that you have selected in Preferences. You'll need to enter the printing commands specific to your chosen software. Close all the windows relating to the current report prior to executing any new analysis.

Importance of G-theory

They are routinely applied in high stakes testing, such as basis for securing the defensibility of measurements in large-scale educational assessments, such as the Programme for International Student Assessment or the National Assessment of Educational Progress (von Davier et al. 2006; Rutkowski et al. 2013; Schauber et al 2017). Decisions based on the results of these assessments can have far-reaching consequences, sometimes affecting a whole social system. For instance, vast educational reforms have been enacted as a consequence of students' inferior performances on the Programme for International Student Assessment (Grek 2009).Generalizability theory has the ability to examine multiple sources of error variance at the same time, and to provide important information about the use of measurement tools to make decisions, whether relative or absolute, and to determine the consistency and generalizability of scores (McCaffrey, et al 2018). On the other hand, generalizability analysis software enjoys its simplicity and ease. use, attractive surface and symmetry, and detailed reporting of results. To achieve the goal, a gradual presentation was presented starting from the definition of the software, and the steps to install it on the "Windows" operating system.

The generalizability principle is used to measure test reliability in cases where multiple sources can cause measurement error. If quantitative assessment is to take place, measurement reliability is crucial. To standardize methods for using quantitative assessment, it is important to determine the most efficient and accurate method for measuring the variables and which aspects are responsible for them.

- G-theory is a flexible model of measurement error that models different measurement conditions. It also provides the ability to make decisions based upon test results. It's a statistical framework to conceptualize, investigate, and design reliable observations. It can be used to measure the reliability (i.e. reproducibility or dependability of measurements under particular conditions). It is especially useful when assessing reliability of performance assessments.
- G-theory adds to the true score model, acknowledging multiple factors that affect measurement variance. G-theory refers to the sources of variation as facets. Facets are similar in nature to the "factors", which are used in the analysis of variance. They can include people, raters and items or forms, as well as time and settings. These facets could be sources of error/variance.
- Generalizability theory attempts to quantify the error due to each facet and their interaction. The design of a G research study has a major impact on its usefulness. Researcher must consider how they intend to generalize particular results; does it make sense to generalize one setting to more; from one to more than one rater; from one set of items, to a larger number? These questions will differ from one researcher and the other, which will impact the design of a G-study in different ways.

References

Alkharusi, H. (2012). Generalizability theory: An analysis of variance approach tomeasurement problems in educational assessment. *Journal of Studies in Education 2(1),*184-196 http://dx.doi.org/10.5296/jse.v2i1.1227

Brennan, R.L. (2003). Coefficients and indices in generalizability theory. A perspective on the history of generalizability theory. *Educational Measurement: Issues and Practice, 16(4),* 14–20. https://education.uiowa.edu/sites/education.uiowa.edu/files/2021-11/casmaresearch-report-1.

Brennan, R. L. (2010). Generalizability theory and classical test theory. *Applied measurement in education, 24(1),* 1-21. https://doi.org/10.1080/08957347.2011.532417

Britannica, T. (2023, April 24). Measurement. *Encyclopedia Britannica*. https://www.britannica.com/technology/measurement

Brown, J. D. (2005). Generalizability and decision studies. *SHIKEN: JALT Testing & Evaluation. SIG Newsletter. 9(1).* 12 – 16.https://hosted.jalt.org/test/PDF/Brown21.

Cardinet, J., Johnson, S., & Pini, G. (2010). *Applying generalizability theory using EduG. quantitative methods series*. Routledge. https://doi.org/10.4324/9780203866948

Cronbach, L. J., Rajaratnam, N., & Gleser, G. C. (1963). Theory of generalizability: A liberalization of reliability theory. *British Journal of Statistical Psychology, 16,* 137–163. https://doi.org/10.1111/j.2044-8317.1963.tb00206.x

Dragojlovic, N., Kopac, N., Borle, K., Tandun, R., Salmasi, S., Ellis, U. & Lynd, L. D. (2021). Utilization and uptake of clinical genetics services in high-income countries: A scoping review. *Health Policy, 125*(7), 877-887.

Hove, T. D., Jorgensen, T. D., & van der Ark, L. A. (2021). Interrater reliability for multilevel data: A generalizability theory approach. *Psychological Methods, 27*(4), 650–666. https://doi.org/10.1037/met0000391

Krebs D. E. (1987). Measurement theory. *Physical therapy*, *67*(12), 1834–1839. https://doi.org/10.1093/ptj/67.12.1834

Li, G., Guiyun, H. Xingjun, W., Dong, Y., Hu, J. & Weijun, W. (2018). A multivariate generalizability theory approach to college students' evaluation of teaching. *Journal of Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2018.01065

Linn, R. L.(2010). Educational measurement: Overview. *International Encyclopedia of Education (3rd ed.).* https://www.sciencedirect.com/topics/social-sciences/measurement-theory

McCaffrey, D.F., Oliveri, M. E. & Holtzman, S. (2018). A generalizability theory study to examine sources of score variance in third-party evaluations used in decision-making for graduate school admissions. *ETS Research Report Series.* https://doi.org/10.1002/ets2.12225

Medvedeva, A., Galli, G., Petrovskaya, A. & Medvedev, O. N. (2022). A novel application of generalizability theory to evaluate the reliability of the

recognition memory test. *Current Psychology*. https://link.springer.com/article/10.1007/s12144-022-02886

Medvedev, O.N., Siegert, R.J. (2022). Generalizability theory. In: Medvedev, O.N., Krägeloh, C.U., Siegert, R.J., Singh, N.N. (Eds.). *Handbook of Assessment in Mindfulness Research*. Springer, Cham. https://doi.org/10.1007/978-3-030 77644-2_5-1

Medvedeva, A. G., Petrovskaya, A.Petrovskaya, A. & Medvedeva, O. N. (2022). A novel application of generalizability theory to evaluate the reliability of therecognition memory test. *Current Psychology*. https://doi.org/10.1007/s12144-02202886-6

Meyer, E. G., Boulet, J. R., Monahan, P. B., Durning, S. J.& Uijtdehaage, S. (2022). *Academic Medicine, 97(4),* 562-568. https://doi.org/10.1097/ACM.0000000000004590

Monteiro, S., Sullivan, G. M., & Chan, T. M. (2019). Generalizability theory made simple(r): An introductory primer to g-studies. *Journal of Graduate Medical Education*, *11*(4), 365–370. https://doi.org/10.4300/JGME-D-19-00464.1

Strube, M. (2012). *Reliability and generalizability theory*. https://www.researchgate.net/publication/232595745_Relibility_and_generalizabilitytheory

Teker, G. T., Sahin, M. G. & Baytemir, K. (2016). Using generalizability theory to investigate the reliability of peer assessment. *Journal of Human Sciences 13(3),* 5574. htts://doi.org/ 10.14687/jhs.v13i3.4155

Truong, Q.C., Krägeloh, C.U., Siegert, R.J., Landon, J. & Medvedev, O. N. (2020). Applying generalizability theory to differentiate between trait and state in the five facet mindfulness questionnaire (FFMQ). *Mindfulness 11*, 953–963. https://doi.org/10.1007/s12671-020-01324-7

Vispoel, W. P., Morris, C. A., & Kilinc, M. (2018). Applications of generalizability theory and their relations to classical test theory and structural equation modeling. *Psychological Methods, 23(1),* 1–26. https://doi.org/10.1037/met0000107

Vispoel, W. P., Xu, G., & Schneider, W. S. (2022). Using parallel splits with self-report and other measures to enhance precision in generalizability theory analyses. *Journal of Personality Assessment, 104(3),* 303–319. https://doi.org/10.1080/00223891.2021.1938589

Political Activities and Educational Development in Nigeria: The Missing Link

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Abstract
This paper discussed the political activities and educational development in Nigeria: the missing link. Certain key concepts such as education and politics were discussed in the paper. Further discussed in the paper is the educational development in Nigeria and the missing link. These missing links are poor administration, inadequate funding of educational facilities and equipment, corruption in the educational sector, low quality of entrants and high rate of unqualified teachers, policy formulation, uncompleted project and insurgency in Nigeria. Furthermore, the paper also buttressed ways in which these challenges can be solved effectively by the government ensuring proper monitory on educational projects so as to guide against mis-management of funds, the government should also ensure to provide adequate fund for proper implementations of programme, the government should also ensure that infrastructures are provided in schools and also provide adequate facilities and structures for learning, the government should ensure that qualified teachers are employed in the teaching profession, the government should also ensure that funds and facilities released to ensure quality education are not diverted, Non - governmental agencies and individuals should assist the government in providing facilities and structures to schools and Government, non-governmental agencies and individual should ensure that there is adequate security in schools.

Keywords: Education, Politics, Educational Development, Educational Projects

Introduction

Education is the impartation of knowledge. According to Aliyu (2001) education is the method by which a society transmits from one generation to the next its knowledge, culture and value. Fafunwa (2004) defined education as the aggregate of all the processes by which a child or young adult develops the abilities, attitude and other forms of behavior which are of positive value to the society in which he lives. As opined by Abdu (2003), democratic ideas became interwoven with the belief that education was the only path to a useful and productive life. As it could have been seen in the lives of leaders, no matter their background once one is able to acquire education there are possibilities for one to rule and issue directives that will benefit the society. The federal government of Nigeria also sees education as the greatest force that can be used to bring about change; and the greatest investment that a nation can make for quick development of its economic, political, sociological and human resources which brought the need for a national policy on education in Nigeria. It was in this realization, that the national policy on education seeks the inculcating of the right type of values and attitudes for the survival of the individual and the Nigerian society; inculcation of national consciousness and national unity; the training of the mind in understanding of the world around; and the acquisition of appropriate skills, abilities and competence both mental and physical as equipment for the individual to live in and contribute to the development of his society. This need became even more pressing following the National Curriculum Conference in 1969, where experts in the field of education expressed dissatisfaction with the then existing education systems, which had become irrelevant to national needs, aspirations and goals. After the conference, a follow up seminar of experts in this regard was convened in 1973. The outcome was a draft document, the final of which became the national policy on education first published in 1977, in 1981 as well as 1998 the policy was revised. These commissions and policies were and are formulated for Nigeria via education to achieve her national goals and objectives viz a viz global objectives.

Politics plays a prominent position in our environment as it is backed up with power and how one uses the power in the society. According to Okeke (2007) He sees politics as a civilizing agent and a way of ruling in divided society without violence. Political influence on education in the context of this study refers to the success of good educational policies issued by the government on the citizen, as formulation of policies are sometimes influenced by the political parties in power which are sometimes being criticized by the opposition party. Since the inception of colonial administration in Nigeria till the contemporary political dispensation, educational sector in Nigeria is administered through the national policy on education which has gone through many modifications; as knowledge increases through technological advancement educational policies too are not left behind. During the colonial era, education policies initiated was in line with European education system: primary, secondary, sixth form and higher education. Their education system is to train people so as to achieve the colonial mission, these could be seen in the introduction of Christianity into villages and communities in Nigeria. After the attainment of independence, it was discovered that the colonial system of education did not meet the need of Nigerian; hence the 6:3:3:4

education policy was introduced. The civilian and military regime in Nigeria formulated different policies that may sometimes have political undertone to achieve their political agenda.

Education and politics are related because education is an agent which transmits political culture. Education plays prominent role as an agent of transmitting political education such as political socialization which mold people into the political class in a community. The educational system is in a way an extension of the political system, because education system is funded by the government of the day thereby propagating government policies. Therefore, both the educational sector and the political institution work hand in hand in the formulation of policies for the smooth running of the educational sector, that is, politics has influence on education right from the policy formulation stage to the implementation stage. As education improves every day, the political scene also does, as education helps in keeping the political institution stable, it organizes training in order to improve the political institution. Obanya (2002) perceived politics and education as interaction in the fullest and best sense for stimulation of the desire for better things and the urge to attain such better things. Education and politics cannot be separated because education is the primary agents for selection and training of political elites. According to Almond and Coleman in Okwori and Ede (2012), the family, the church, community, school, work group, voluntary organization, media of communication, political parties and government institution are among the agents of socialization within the primary and secondary structures, through later or manifest procedures that give the individual the pre-political citizenship education or experience. From independence till date, there have been several administrations in Nigeria. The successive political leaders either military or civilian often suspend the existing educational policies and replace them with the newly fashioned ones which typify their own political agenda. By this, the educational policy planners are compelled to jettison a plan still on the drawing board and take up new policies which must be geared towards meeting the current political demands. This has become a serious bottleneck to education in terms of achieving national development. There explains lack of continuity in educational policy formulation. Still in the same vein, education in Nigeria is politicized (Afolabi, F.G. and Loto, A.B. 2012). Educational policy decisions in Nigeria are highly political orders, directives, and assertions bereft of synergy. This happens when the envisaged educational plans and objectives are being politically manipulated to suit the whims and caprices of policy formulators. Adesina (2005) states that Nigerian politicians would rather advocate unrealistic populist educational programmes than risk their constituency through technically derived and obviously realistic and productive educational programmes. It is sad to note that political appointments in most universities evade due process to the detriment of stakeholders. Nevertheless, incessant change of educational policies also impacts negatively on national development. A policy requires sufficient time to mature from planning phase to implementation phase and finally to review phase. For instance, a policy that affects the secondary level of Nigerian educational system would definitely require twelve years to have just two complete cycles that is Junior Secondary School (JSS) and Senior Secondary School (SSS). This is the reverse in the Nigerian context as the usual practice is to jettison such policy,

drastically modify or completely abandon it for reasons obvious to the policy makers who are political leaders in power (Afolabi and Loto 2012). Particular examples here include the phasing out of Teachers Grade II programme in the late 1980s and the establishment of National Teachers' Institute (NTI), replacement of Modern Mathematics in schools with General Mathematics and incessant changes in school calendar.

Concept of Education

Education can be described as preparation for life and life itself. Education aims at giving information and developing complete personality of an individual. It is seen as a process of facilitating learning for acquisition of knowledge, skills, values, beliefs and habits. Education tends to develop individual into both intellectual and good social being (Nweke, 2019). Education is the bedrock of any meaningful nation that disruption to the system affects both human and national development. Education is a social service, provided world-wide with multiple objectives in mind. The objectives vary from the acquisition of basic skills required for a more rapid growth of the economy and the basic knowledge for the individual to function effectively in the society. Etymologically, education derived its meaning from two Latin words 'educare' and 'educere' respectively. The word 'educare' is interpreted to mean; *to train* or *to form* or *to mold*. Education here seems to be sociologically biased. In other words, *Educare* implies that the society trains, forms or mold's the individual to achieve the societal needs and aspirations. This perspective of education has little to consider on the natural potentialities of the individual child. On the contrary, the word 'educere' is interpreted to mean: *to build, to lead* or *to develop*. This perspective of the concept is mostly favoured by the humanists, who insist that the function of educationist is to develop the natural potentialities in the child to enable him function in the society according to his abilities, interest and needs. This perspective of the concept education is child-centred, whereas the former is society-centred or subject matter-centred. From the ongoing discussion, therefore, education could be understood to mean the total development of the individual child, through acceptable methods and techniques, according to his abilities and interests, as well as the needs of the society, to take his rightful place and contribute adequately to the advancement of his society, (Amaele, 2003). Education is also the instrument used for the development of human beings in the cognitive, affective, psychomotor and psycho productive domains. This is achieved through the process of teaching and learning.

Concept of Politics

The term "politics" is taken from the Greek word "politika"**.** This term originated from the book of Aristotle on governing and governments as modeled his view "affairs of the city." These are the evolving terms of Politics: (1) "Polettiques" was the Latinized term provided by the English in the mid-15 centuries; and (2**)** "Politique" came from the Middle French with the Latin term "Puliticus" to the Greek term "Politikos." The meaning of the root term relates to the citizens, civic , civil and belonging to the state. Generally, the common definition of politics *is the ability to persuade and influence in*

the sovereign electorate and to provide political power and authority in the governmental affairs of the state. Politics is the governing and administering of people, according to American political scientist, Harold Lasswell, politics is define as who get what, when and how.

Educational Development in Nigeria

Education played a very important role in creating political awareness in the citizens of Nigeria as other places in the world. As early as 1921 Herbert Macaulay formed a party in Lagos named National Democratic Party, another opposing party emerged in 1934, it was called Lagos (later Nigerian) Youth Movement. These two dominated the political scene for some time until parties dominated the political scene for some time until in 1944 when the Nigeria students founded the National Council of Nigeria and the Cameroun (N.C.N.C). The other two parties were pressurised to team up with N.C.N.C. Their leaders were Herbert Macaulay and Nnamdi Azikwe. In 1951 another party was formed which was called the Action Group and their leader was Obafemi Awolowo. In 1952, the Northerners formed another party called Northern People's Congress (N.P.C) and their leader was Ahmadu Bello.

In 1946, based on Richard's constitution of 1945, the country was divided into three regions namely East, West and North. These corresponded with the three largest ethnic groups in the country. The East corresponded with the Ibos, the west corresponded with the Yoruba's while the North was with the Hausa – Fulani's. The three political parties equally leaned towards ethnic line, the N.C.N.C. became party for Easterners, the Action Group for the Westerners while the Northern people congress was for the Northern education of their citizens.

In 1951, education became regionalised, the three parties contributed a lot to the education of their citizens. In the west, Chief Obafemi Awolowo resolves to make education and health his top priority. A proposal was therefore presented by the then minister of Education for the west, Chief S.O. Awokoya for a free, universal and compulsory education to be introduced. The scheme was called Universal Primary Education (U.P.E). The scheme was launched in on the 17th January, 1955. After the introduction of the scheme, about 811,000 came up for enrolment, in 1957 it was 982,755 and by 1959, a total of 1,080,303 pupils enrolled. The above figure was astronomical compared to the projected figures during the planning stage of the scheme. It created an initial problem because the number of schools and teachers were not adequate compared to the number of pupils ready to get enrolled into schools.

In the eastern region, the government made a proposal of an eight-year free primary education to be launched in January 1957. Though this programme was launched in 1957 but soon ran into difficulties which were;

- Inadequate planning due to the shortness of time.
- Scarcity of funds
- Most of the teachers were untrained and uncertificated.

- The stiff opposition posed by the catholic mission.
- The building and other facilities were not enough and those available were poorly constructed.

The government therefore reversed its decision and announced a modest scheme of free universal primary education for two years still the scheme ran into difficulties meanwhile the northern government was not in a hurry to launch any form of U.P.E. scheme mainly because of the feeling that it would corrupt their children and turn them away from their Muslim faith and also because of financial reasons. The northern government paid more attention to development of education in the rural areas, adult literacy and crafts.

In 1973, the national seminar on education had as one of its recommendations that a "free universal basic education" in a variety of forms depending on needs and possibilities should be provided for all citizens. Though the government did not take immediate action, later in 1974, the then head of state, General Yakubu Gowon announced that a universal free primary education (U.P.E.) of a six-year duration would be launched in 1976. The time for preparation was too short, therefore some crash programmes for training of teachers were organised, emergency blocks of classrooms were erected. It was estimated that by 1976 a total of 36,000 classrooms and 59,500 teachers would be required for the scheme and the enrolment wasestimated at 2.3 million 6 – years – olds. The head of state however was thrown in a coup by General Murtala Mohammed in September 1975, who was also assassinated on February 13, 1976. Murtala Mohammed was succeeded by General Olusegun Obasanjo who eventually launched the U.P.E. nationally on September 6th, 1976. All the military governors in the 19 states also launched their, (Enueme, 2006).

Just like the U.P.E. scheme of the 1950s, the military government equally under estimated the number of children that would turn out for enrolment. Contrary to the projected 2.3 million, 3 million turned up for enrolment. This immediately created a problem of space; the classrooms, teachers and other equipment were not enough. In 1975, a year before the launch, the total pupil population was 6 million, it jumped to 8.7 million in the 1976/1977 session. It rose to 12.5 million in 1979/1980 session and by 1982, it had increased to 15 million. This programme was not entirely successful because the teachers, classrooms, other facilities and funds were in short supply, lack of reliable statistics and lack of political will among others (Ajayi, 2002).

In 1969, at the national curriculum conference, the 6-3-3-4 system of education was recommended and was adopted by the 1973 national seminar on education. The outcome was published in the government white paper titled the National Policy on Education in March 1977. The 2nd and 3rd editions were published in 1981 and 1998 respectively while the 4th edition was published in 2004. Under this new system, there shall be a six-year primary education, followed by a three – year junior and a three – year senior secondary education, this will lead to a four – year university course. This

system did not take off in all the states by 1982 which was the scheduled date due to political reasons with time, states eventually embraced it and it is still being practiced till date, with a few modification as seen in the revised national policy on education (FRN, 2004).

On 30th September, 1999 in sokoto state, the Universal Basic Education programme (UBE) was launched. The launching of the programme was a strong evidence of Nigeria's commitment to different international conventions to the promotion of basic education. The UBE scheme aims at providing nine years of free and compulsory education for every Nigerian child from primary to junior secondary school. The UBE involves 6 years' primary school and 3 years of junior secondary school culminating to 9 years of uninterrupted schooling, adult literacy and non – formal education, skills and acquisition programme and the education of special groups such as normad and migrant, girl – child and women, almajiri, street children and disabled groups (FME, 2000). Transition from one class to another is automatic, though assessed through continuous assessment. The UBE programme is designed to remove distortion and inconsistencies in Basic education delivery and to reinforce the implementation of the national policy on education. (Uche & Chinyere, 2013).

In 1999, the number of elementary school in Nigeria had increased to 116,925 while the number of secondary schools had also increased to over 27,042. (statista,2019). In 2023 Nigeria has 170 universities these include 79 private universities, 43 federal universities and 48 states universities, (Statista, 2023). Despites the increase in the number of schools and the policies that have been formulated and implemented, the educational system in Nigeria still faces most challenges it had from the very beginning. These problems in the educational sector keep lingering from time to time due to some certain factors which have not been properly addressed.

The Missing Link

1. **Poor Administration.** poor administration is one of the main issues affecting the realization of educational programmes in Nigeria. Plans have been halted due to inadequate control or inadequate personnel to handle sensitive positions. The various successful plans were interrupted due to inadequate control or poor supervision to monitor these programmes.
2. **Inadequate Funding of Educational Facilities/Equipment.** The educational sector needs to be financed properly in order to meet up the requirement that is needed. Most schools and institutions in Nigeria lack the basic facilities and equipment that is needed for learning. The federal government in demonstration of its commitment to ensuring quality control and general coordination of the UBE implementation set aside 2% of its consolidated revenue fund (CRF) to support the implementation of the UBE programme. The UBE declaration of 2000 stipulated that the federal government shall provide the bulk of fund while the state governments assist sufficiently to ensure that parents contribute minimal fund. Despite the above fact, Nigeria is still allocating less than 2% to education.

This means that there is still the phenomenon of poor funding because the federal government is yet to come to terms with its responsibility.

3. **Corruption in the Educational Sector.** When there is corruption in the educational sector even if much has been allocated to the sector there will be no effect. Funds meant for the development of education are mostly diverted.
4. **Low Quality of Entrants and High Rate of Unqualified Teachers.** This is most probably the serious challenge faced in teacher education in Nigeria. The poor quality of the entrants into the profession have affected not only their effectiveness, efficiency and their ability and readiness to imbibe he knowledge, skills and precept taught them but also the prestige of the profession. Teachers with lower qualification lower than the minimum of NCE are still found in some states of the federation.
5. **Policy Formulation.** Formulation of policies in educational institutions in Nigeria sometimes lead to strikes and protest, example could be sited concerning the earn allowance paid into the universities by the federal government to the Academic Staff Union of Nigeria Universities (ASUU) and Non-academic staff in Nigeria universities that led to protest and national strike from December 2017 till March 13th, 2018.
6. **Uncompleted Project.** There are lots of un-completed projects in primary, secondary and higher institution in the country. Abandoned projects can be seen in some of our universities.
7. **Insurgency.** Education in the northern part of Nigeria has been hampered by insurgency, during President Goodluck Jonathan's administration 2011, Chibok girls' secondary school Bornu state was invaded by Boko Haram, an Islamic group that kicked against western education, the abducted girls were rescued through the payment of ransom by the federal government. In February, 2018, 110 girls of technical college Daphi Yobe state were abducted by Boko Haram.
8. **Low Budget on Education in Nigeria.** It is quite unfortunate that Nigeria does not finance the educational sector properly. What the federal government allocates to the educational sector is not even enough to sponsor the tutors and research that is expected to be carried out. The UNESCO has recommended that at least 26 percent of what is allocated in a country's budget should be injected in education but in a develop Nigeria, the private sectors should see ways in which they could assist in funding education. Most private companies spend more on programmes that entertain youths and forget that if they are no youth to fill the space of the aging population in the working population, there will be setbacks.

Conclusion

Education and politics cannot be separated because education is the primary agents for the selection and training of political elites. Politics is concerned with governance, administration and management. The creation and execution of Policies formulated and programmes for education depends on the government therefore it is the duty of the government to always ensure that before policies and programmes are implemented, the necessary requirements and facilities to ensure the smooth running of

these programmes and policies are put in place so that the major aim of these policies and programmes can be achieved at the long run.

Recommendations

- There should be proper monitory on educational projects so as to guide against mis-management of funds
- Government should ensue to provide adequate fund for proper implementations of programme.
- The government should also ensure that infrastructures are constructed in schools and also provide adequate facilities and structures for learning.
- The government should ensure that qualified teachers are employed in the teaching profession.
- The government should also ensure that funds and facilities released to ensure quality education are not diverted.
- Non-governmental agencies and individuals should assist the government in providing facilities and structures to schools.
- Government, Non-agencies and individual should ensure that there is adequate security in schools.

Reference

Abdu, P.S. (2003). The cost and finance of education in Nigeria. *Education Today, 10*(1), 12-16.

Adesina, S. (2005). *Growth without development: Nigeria educational experience between 1914-2004.*

Afolabi, F.O. & Loto, A.B. (2012). Socio–political vicissitudes and bureaucratic constraints on educational formulation and implementation in Nigeria in Edo. In V.O. & Salami, E.F.K (Eds.). *Issues and Trends in Nigeria's Development,* 330-335.

Amaele, (2003). *A study guide on history and policy of education in Nigeria*. Ilorin; INDEMAC (Nigeria publishers) limited.

Aliyu, Y.O. (2001). New methods and techniques in the educational management and decision making. In Nnoli, O. & Duliana, I.O (Eds.). *Reassessing the Future of Education in Nigeria, Abuja, ETF.*

Kingdom, E.O. & Maekae, J. (2013*).* The role of education in national development; Nigeria experience. *European Scientific Journal*, 9(28), 312-318.

Fafunwa, A.B. (2004). *History of education in Nigeria*. Boston: George Alien.

Federal Republic of Nigeria (2013). *National Policy on Special Needs Education in Nigeria.*

Obanya, P.A. (2001). *Revitalizing education in Africa. Ibadan.* Ibaban Press.

Okeke, B.S. (2007). *Politics of Education: The Nigeria experience*. Awka

Okparaugo, O.J. (2021). *The historical background of Nigeria from 1960 till date and compare the development it has created in Nigeria*. Katsina

Okwori, A. & Ede, S. (2012). *Management issues in education*. Markurdi.

Olayisade, R.O. (2018). Impact of political influence on educational sector in Nigeria. *International Journal of Research and Innovation in Social Science, (IJRISS)*,11(5), 58.