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Effect of Graphic Organizers on Literal Reading Comprehension of Junior Secondary School Students in Kaduna State, Nigeria

[1]Abroks Dauda Ubale, [1]Sadiq Mohammed and [2]Hamisu Lawal
[1]Department of Arts and Social Science Education,
Faculty of Education, Ahmadu Bello University, Zaria
2 Institute of Education, Ahmadu Bello University, Zaria

Abstract

This study employed quasi experimental design. The study investigated the effect of graphic organizers (GOs) on students' literal reading comprehension. The population for the study covered one hundred and sixteen thousand, four hundred and twenty-eight (116,428) junior secondary students in Kaduna Twelve Educational Zones. The sample size was four (4) junior secondary schools from two Educational Zones and ninety-nine (99) students. These students were divided into two groups: experimental and control; each group. The control groups were taught reading comprehension using conventional method while the experimental groups were taught using graphic organizers (GOs) strategy. Pre-test and post-test were administered to the two groups. The data was analyzed using SPSS21. The results indicated that the post-test mean score of the experimental group was 84.66 and the post-test mean score of the control group was 56.33. The result showed that there is a significant difference between the performance of experimental and control groups. It is, therefore, recommended that GOs strategy should be used as an alternative instructional strategy for ESL students' effective performance in reading comprehension across all levels of education. Furthermore, ESL teachers are recommended to employ GOs strategy in their classrooms.

Key Words: Graphic organizers, literal, reading, comprehension

Introduction

Reading is very essential for ESL students because it is not only a subject, but also a service skill that is use even after school. It is also the key and main source for a second language input when students have learned reading effectively. They will be able to explore in some other subject areas. The students too will be able to learn the other language skills (listening, speaking and writing) and components of grammar, discourse and vocabulary effectively through reading. Krashen and Brown (2007) opined that reading is the most important skill among the four language skills as it can improve overall language proficiency and performance.

According to Heilman (1988), reading comprehension is classified into four levels of; literal, interpreting, critical and creative. Literal reading refers to direct stated information in a text. At literal level of comprehension, students are required to identify and memorize the subject which was discussed by the writer explicitly in the text. In other words, the literal level of comprehension involved students' ability to obtain information from the text. Thus, in literal reading, one aims only to understand the explicitly stated information and the reader's understanding could be checked by

examining his ability to recognize and recall facts; identify the main idea and supporting details, categorize, outline and summarize the information.

Most ESL students find it difficult to master reading at literal level, which is an essential part of language learning. Deporter and Hernacki (1999) echoed that students find reading very difficult, so that they are anxious to read. Despite their realization of the high importance of reading. According to Olaofe (2016), some Nigerian students are not interested to read texts due to their inadequate prior knowledge, inability to comprehend the reading texts and complex structure of the textbooks. For many students at the secondary school level, reading classes are considered boring and stressful because of over long reading of texts, unfamiliar vocabulary, lack of pre-reading activities, activating the students' prior knowledge and repetitive teaching (Firmanto, 2005). Since reading comprehension is very crucial, it is very important to find strategies to help their reading comprehension to be beneficial. This study is an attempt to meet that challenge that has lingered for a long time, by investigating whether or not GOs use has a positive effect on students' literal reading comprehension. GOs was selected to investigate because some previous studies (Fisher, 2002; Parker, 2007; Mcknight, 2010; Roa, 2011; Jiang, 2012; Biria and Sharifi 2013; Abroks, 2022) have claimed its effectiveness to help students understand reading comprehension at various levels of education.

Review of Related Literature

Reading Comprehension

Reading comprehension is the process of understanding and interpreting texts/passages to get some specific information. According to Klingner & Geisler (2018), that reading comprehension is a process of constructing meaning from a passage which involves the complex coordination of several processes, such as decoding, word reading, fluency, background knowledge and prior knowledge of the learner. This is confirmed by Grabe & Stoller (2002) who see reading as the ability to draw meaning from the written text and interpret it appropriately. They argued that the process of reading involves a number of skills, such as; word recognition and syntactic processing, and how these skills enable the reader to anticipate text/passage information, select key information, mentally organize it, summarize it, monitor comprehension, repair comprehension breakdown and match comprehension output to readers' goals. For that, reading is an active, not a passive process. This study is in tune with the above claims because reading is an active process that must involve the students at all levels.

These definitions show that while reading, a reader should not only receive the message or meaning embedded by the author, but should also construct meaning from the information provided in the text. Smith, as cited in Pardede (2016) posited that reading is not just extracting meaning from a text, but rather, it is a process of connecting information in the text with the knowledge the reader brings to the act of reading. This is supported by Olaofe & Masembe (2006) who suggested that reading is a holistic process of constructing meaning from written text. This is done through interaction of the knowledge the reader brings to the text and the reader's interpretation of the language that the writer used in the text. Thus, to make sure that students can read effectively, Brown (2004) recommended the teacher to include their understanding of the basic ideas, expressions, idioms, phrases in context, grammar, supporting ideas and vocabulary in the evaluation of reading skills.

According to Heilman et al (1988), reading comprehension is classified into four levels of; literal, interpreting, critical and creative. Literal reading refers to direct stated information in a text. Thus, in literal reading, one aims only to understand the explicitly stated information and the reader's understanding could be checked by examining his ability to recognize and recall facts; identify the

main idea and supporting details, categorize, outline and summarize the information. Interpretative reading deals with what the author means by what is said. It, therefore, necessitates the ability to read between the lines and draw inferences about things implicitly stated. Interpretative reading could also include the skills to interpret figurative language, draw conclusions, predict outcomes, determine the mood and judge the writer's point of view. Critical reading is an active and purposeful process of comprehending, questioning and evaluating printed text, in order to react intelligently to the author's ideas (Pardede, 2007), deal with why the writer says what he says. In critical reading, the reader needs to use some external standard from his own experience; so as to evaluate and judge the quality of the information, the values of the writer's use of language and his reasoning. In other words, the reader should react emotionally and intellectually to the texts. While creative comprehension involves the information and rethinking of ideas. It means, the reader should be involved with what he reads and rethink ideas of his own to implied and inferred meanings and to evaluate and appreciate reactions.

Furthermore, Rumiris (2012) showed that there are seven strategies for improving comprehension reading as thus; monitoring comprehension; metacognition; graphic and semantic organizers; answering questions; generating questions; recognizing story structure and summarizing. Monitoring comprehension could be done by students when instructions are given clearly. Clear instructions guide the learners to be aware and understand the problem when reading the text. Metacognition could be defined as thinking about thinking. An efficient reader uses metacognition strategies to think and has control over their reading. In line with this, Block et al (2002) opined that metacognition is an awareness of knowledge for planning, monitoring and controlling one's learning. Graphic and semantic organizers mean a relationship between concepts in a text via diagrams. GOs can help a reader to focus on a particulars concept and how they are related to other concepts in a text.

The fourth strategy, answering questions is effective because it gives students a purpose for reading. Focusing on what the students are learning, it helps them to think actively as they read, encourages them to monitor their comprehension and help them review the contents as well as relate what they have learned to what they already know. The fifth strategy, generating questions, makes students to ask themselves questions to combine information from different angles of the text. Recognizing story structure enables students identify the contents, which includes characters, setting, events, problem and resolution which is the sixth strategy. While the seventh, summarizing, requires the students to determine what is important in the text and to generate some words by themselves.

Literal Level of Comprehension

According to Heilman et al (1988), reading comprehension is classified into four levels of; literal, interpreting, critical and creative. Literal comprehension is a type of reading that gives information clearly, stated in a passage or text. It is also called factual reading; that gives information from the passage (Oyentunde, 1997). It is the first level of comprehension in reading. It is arguably the simplest level of comprehension. It refers to an understanding of the straight forward meaning of the text, such as facts, vocabulary, dates times, and locations. In literal reading, the reader needs to understand ideas and information explicitly stated in the reading text. The reader is also locating information, using context clues to supply meaning, following specific directions, following a sequence, identifying the stated conclusion, and identifying explicitly stated relationship and organizational patterns. These organizational patterns are cause and effect as well as comparison and contrast. In an examination, questions related to literal comprehension can be answered directly and explicitly from the text.

In literal reading, the students provide situation report of a particular passage or text they have read. They also recall sequence or series of events and provide contextual meaning of the text or passage read. Students can employ literal comprehension skills (key words, skim reading and scanning) to better locate information efficiently. Key words are the content words that carry the most meaning in a text. The students can underline or highlight the key words. Students can skim read by looking at headings and sub-headings, pictures, diagrams, captions, any italicized or bold words and the first and last paragraphs of the text. Students scan read to locate particular elements or specific details in a text, such as key concept, names, dates or certain information in answer to a question.

The present study is designed to investigate the effect GOs on literal comprehension because it is the first level of reading comprehension, and it is a level upon which other levels are built upon.

Graphic Organizers

GOs are visual devices that show information in variety of ways. They employ lines, boxes and circles to form images which depict four ways of information which are: cause / effect, hierarchy, compare/contrast, cycle or linear sequences. These images serve as visual guide to facilitate understanding of the reading text by showing how essential information in a text are organized (Ellis & Howard, 2015). This is in conformity with Parker (2007) and Mcknight (2010) that GOs are visual representatives that sort information in a text.

In the context of learning, GOs are visual frame used to represent knowledge and understanding of a subject matter by organizing vital aspects of a concept into a logical pattern through labels. They have various patterns which are maps, graphs, charts, diagrams or clusters. Mcknight (2010) claimed there are about 100 reproducible GOs that could be used in reading, writing and content area. But this study is only concern with the aspect of reading comprehension not writing. In reading comprehension context, GOs can be effectively used in all lessons for students of all educational levels to motivate and improve their thinking skills. According to Krasnic (2011), students will be able to organize and link key concepts based on what they are reading to have clear thoughts and refine thinking among themselves.

Research Question

What is the effect of graphic organizers on literal reading comprehension of JSS II students in Kaduna state?

Hypothesis

There is no significant difference between the performance of students on literal reading comprehension taught using graphic organizers and those that were taught using conventional approach.

Methodology

Research Design

The study employed quasi – experimental design, using pre-test and post-test with a control group and experimental group. Amin (2005) claimed that quasi-experimental design is the most appropriate for study that involves treatment. The design was appropriate because the study involved subjects in a natural setting and a homogenous population. Below is the design for the study:

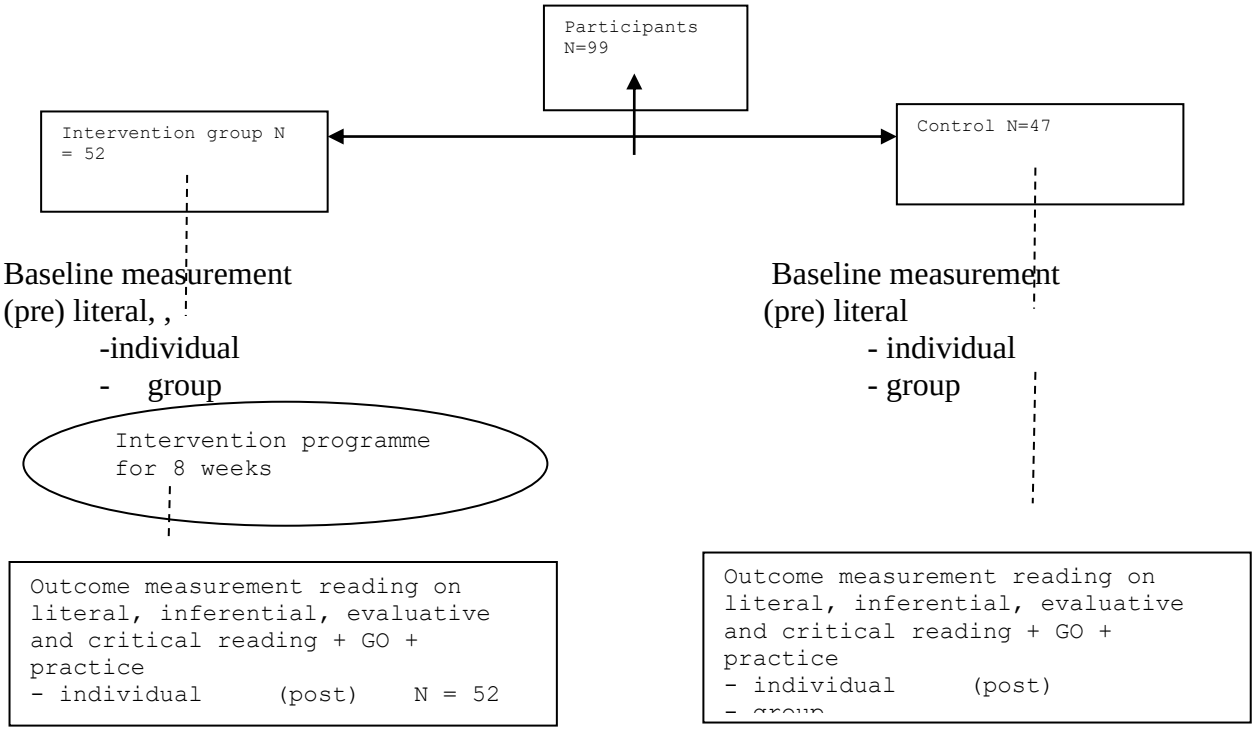

***Figure 1**: Design of the Study*

Population of the Study

The population of this study comprised all the registered JS II students of Kaduna State for the year 2017/2018. There were four hundred and eleven (411) JSS in the state, with a total of one hundred and sixteen thousand, four hundred and twenty-eight (116,428) students from the twelve Education Zones. Table 1 shows the population of the study.

Table 1:
Population 0f the Study

	Zones	Number of JS II Students
1	Anchau	14, 845
2	Birnin Gwari	2, 843
3	Giwa	8, 924
4	Godogodo	5,535
5	Kachia	6,001
6	Kaduna	16, 509
7	Kafanchan	5, 938
8	Lere	10, 390
9	Rigachikun	9, 746
10	Sabon Tasha	14, 893
11	Zaria	16, 799
12	Zonkwa	4, 389
	Total	**116, 428**

Sample and Sampling Procedure

The sample size for this study was four (4) JSS II schools and ninety-nine (99) JSS II students from two zones of Kachia and Zonkwa respectively. The sampling of the four schools was based on intact reflection of the groups with similar characteristics. To ensure that each school was equally represented. Random sampling was employed so that every school has equal chance of being selected. The total number of JSS II students from the two zones of Kachia and Zonkwa was Ten thousand and six (10,006) students. Thus Kachia Zone = 6,001 and Zonkwa Zone = 4005 students. However, ten percent of the total number that is 99 students were used as subjects of the study. This is in line with Zagi and Iliya (2015) who state that 10% is an adequate sample for a population up to 5,000. More so, Glenn (2014) asserts that the sample depends on the purpose of the study, the population size and level of precision. Table 2 shows the number of sampled students.

Table 2:
Number of Sample JS II Students

Schools	Number Sampled
GSS (Jnr) Zonkwa	28
GSS (Jnr) Mazuga	30
GSS (Jnr) Wadon	22
GSS (Jnr) Kachia	19
Total	**99**

Research Instruments

The study employed six comprehension passages for data collection. The passages are based on the objectives and research questions formulated by the researcher. Pre-test weekly progress and post-test were administered to experimental and control groups. The reading texts were adapted from Nelson Functional English JSS II, 2013, New Concept English JSS II, 2012 and JSCE, 2008 (See Appendixes IA, IIA, IIIA . . . VIA). The comprehension passages were modified to be of interest to the students and were not too difficult for them to attempt. The passages were presented to the research supervisors and experts in the field for scrutiny and suitability (see appendix I for titles of the comprehension used in the study).

Results

Control Group Post-test Scores Analysis

The Control Group Post-test Scores were analysed using frequency and percent and the result of the analysis is presented in Table 3.

Table 3:
Control Group Post-test Scores Analysis

Level	Score	Lit.	%
Low	0-8	0	0
Medium	9-14	19	40.43
High	15-20	27	57.45
	Total	**46**	**97.87**

Table 3 presents the Control group Post-test scores in frequencies and percent. It also reveals that at posttest level no student scored low marks (0-8) in literal reading, 19 scored medium marks (15-20)

Experimental Group Post-test Scores Analysis

The Experimental Group Post-test Scores were analysed using frequency and percent and the result of the analysis is presented in Table 4.

Table 4:
Experimental Group Post-test Scores Analysis

Level	Score	Lit.	%
Low	0-8	0	0
Medium	9-14	7	13.46
High	15-20	45	86.54
	Total	**52**	**100**

Table 4 presents the experimental group Post-test scores in frequencies and percent, which indicates that at posttest level none of the students scored low marks in literal reading (0-8), 7 students scored medium marks (9-14) and 45 scored high marks (15-20).

Hypothesis

There is no significant difference in the effects of graphic organizers and conventional method on literal reading in English reading comprehension among JSS II students. This null hypothesis was analysed using inferential statistics of independent samples t-test. The result of the analysis is presented in Table 5.

Table 5:
Summary of Independent samples t-test on the effects of graphic organizers and conventional method on literal reading in English reading comprehension

Group	N	Mean	SD	Std. Error Mean	t	df	p
Control	47	15.16	2.427	.354	4.153	97	.000
Experimental	52	16.99	1.941	.269			
Total	**99**						

Table 5 is the Summary of means and standard deviations on the effects of graphic organizers and conventional method on literal reading in English reading comprehension. The mean literal reading score of the students taught reading comprehension using graphic organizers was (M=16.99, SD=1.941) and that of conventional method was (M=15.16, SD=2.427) with a mean difference of -1.827. The 95% confidence interval of the difference was between -2.699 and -0.954. This is supported by (97) =4.153, p=0.001, the null hypothesis which stated no significant difference was rejected. Therefore, there is a significant difference in the effects of graphic organizers and conventional method on literal reading in English reading comprehension among JSS II students.

Discussion of Findings

This study examined the effects of GOs on literal reading comprehension performance of JSS II students as ESL learners. The data analysis indicated that GOs strategy had significant effects on literal reading comprehension performance of students more than the conventional method.

The findings revealed that this study is in support of the use of GOs in facilitating literal reading comprehension of the ESL students. This finding is also in agreement with Slavin (2011) and Rawson's (2015) who claimed that graphic organizers either conceptual or cyclical as visual tools make reading comprehension effective, easy and fun for the students at any educational level than any other reading strategies especially in second language learning settings.

Conclusion and Suggestion

Based on the findings, it can be concluded that GOs strategy can be used as an alternative instructional strategy for ESL students' effective performance in literal reading comprehension across all levels of education. Furthermore, ESL teachers are recommended to employ GOs strategy in their classrooms, despite that, this study has some time and administrative restrictions which are its limitations. First, the subjects of this study were limited to a certain level of a particular school. To get more valid results, further studies are needed to investigate the effects of using GOs to develop reading comprehension at different levels of language proficiency and comparing students with different learning styles. In addition, investigating the students' and teachers' opinions of using GOs is recommended for better performance in reading comprehension.

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Assessment of Students' Participation on Security Matters in the Management of Universities in North-Central, Nigeria

Ledawo S.A.
Department of Educational Foundation
Federal College of Education, Zaria

Abstract

This study investigated the Assessment of Students Participation on security matters in the Management of Universities in North - Central Nigeria. The study adopted descriptive survey design. The target population of the study was 357, 891, while the sample size used in the study was 2, 275. Questionnaire was used as an instrument for data collection. Experts validated the instrument; The instrument was pilot tested and subjected to reliability analysis using spilt half method of estimating consistency and the result obtained was 0.86. Mean and standard deviation was used to answered the research questions, T-test was used to test the null hypotheses. The findings revealed that; Students participate fully on the security matters in the universities' management in North-Central, Nigeria. The study recommended among others the need for universities' management to continuously make wide consultations and allowed students to participate on security matters in the management of university in North-Central, Nigeria.

Keywords: Assessment, Students' Participation, Security Matters, Management, Universities.

Introduction

The university is a learning organization and as such attracts students, staff and other stakeholders who have one thing or the other to carry out in the university environment. Hence, the issue of security comes to play. The university exists as a complex organization with heterogeneous identity comprising people from different backgrounds with distinct views and divergent goals that make it susceptible to varied security threats. Oladipo, Awoyinfa and Adefarakan (2018) define security as the degree of protection against danger, damage, loss, and criminal activity. In the same vein, Oni (2016) considers security in the university as the protection of tangible and intangible assets of the institution from all forms of danger. The tangible assets include; the physical structures, books in the libraries, electronic gadgets, all stakeholders, the players involving the regular and occasional visitors to universities. On the other hand, intangible assets include intellectual property, research data, classified information, integrity, peace of mind, the image of the university and so on. The main aim of security according to Tari (2004) is to ensure safety and security of staff, students and visitors, protecting the property and assets of the university, investigating and detecting crime, reducing incidence of reported crimes and the apprehension and prosecution of offenders.

Globally, there is a rising wave of insecurity and the universities are not spared from this problem. The rising wave of insecurity in universities has been a source of great concern recently. In the 60s, 70s and up to 80s, educational environments were relatively peaceful for teaching-learning process to go on without hindrance. However, the situation has changed since in the 90s. Recent happenings have shown that university environments are not so safe for the students and for the school personnel any more due to some threatening security challenges. In line with this Mensah, Baafi,

Arthur, Somuah and Mprah (2019) observed that university campuses are no longer safe havens. Similarly, Enang (2019) noted that university communities in recent times have been infested with all manner of criminalities which, quite sadly, paint an opaque and rather disheartening picture. Abdullahi and Orukpe (2016) and Enang (2019) observed that theft, cultism, kidnapping, rape, room break-in, office break-in, cell-phone snatching, stealing, violent demonstration by students, vandalism and other forms of assaults are major security challenges on campuses. Caleb (2013) also noted that cultism has proved to be a major concern for even existing security agencies on campuses. In the same vein, Oladipo, Awoyinfa and Adefarakan (2018) observed that the existence of cultist groups on campus have made life unsafe and scary to both staff and students. It is asserted that the cultist possesses, in many cases, more deadly and functioning weapons than campus security agencies and often uses supernatural and mystical powers in their activities. Besides, many cult members are users of hard drugs, and can act in unthinkable ways when they are under its influence. Cultists are implicated in robbery, killing of innocent students, as well as academic and non-academic staff, arson, rape, extortion, kidnapping, blackmail and all kinds of inhumane practices. Oladipo et al. (2018) further enumerated the activities of cultists to include, harassing any non-member who snatches a member's girlfriend or sugar daddy (as in the case of a female cultist), harassing female students who refused their advances, as well as, harassing any lecturer who insists on merit for passing examination. They also engage in factional struggles for supremacy that often results in bloody clashes among cult groups, during which period lives are sometimes lost. This has made Ibrahim (2013) to posit that, higher institutions of learning which ought to be ideal places for training of the minds have become war zones where cult groups unleash their terror in the community.

As a way of finding solution to increasing security challenges in universities, the Federal Government of Nigeria in a one-day workshop organized for Deans and Deputy Deans of Students Affairs of Federal Institutions in Nigeria in 2016, on the theme "Towards the effective security/safety on campuses", tasked the participants to take the issue of security seriously by fashioning out solutions to the seeming intractable security challenges facing the nation/university. The workshop was part of the series of security/safety seminars to sensitize management officers in tertiary institutions about security management with a view to reducing insecurity to the barest minimum in the campuses (Idoko, 2017).

Every university has a responsibility to protect itself, the students, staff and other customers who visit the universities for one form of transaction or the other, from all forms of danger. The National School Board Association (2013) identified the responsibility of all schools to include, giving adequate safety and security against disasters, accidents, injuries, as well as, prepare proactive plans that investigate perceived threats and disasters. It is in this regard that every university has a well-established security unit, whereby security personnel are employed to handle the school security and ensure that lives and properties are protected and secured. The duties of these security officers include protection of lives/property, surveillance, gathering and dissemination of security intelligence, among others. University campuses as observed by Schneider (as cited in Abdullahi and Orukpe, 2016) are dynamic environments with constant activity, which require an effective security unit that would address the protection and safe guarding of students, staff, visitors, faculty, property and facilities on campus. Good security services not only help to prevent crimes, but also contribute to a positive image of the institution by creating a safe and welcoming environment for students, staff, and visitors.

The term "security" is simply conceptualized as the condition of feeling safe from harm, danger or peril, the defence, protection and preservation of core values and the absence of threat to acquire values (Francis, 2006). It is quite apparent in this definition that security is about survival and the conditions of human existence. Francis (2006) further affirmed that security embraces non-military

dimension such as environment, migration, ethno-religious and nationalist identities, poverty and human insecurity and disease. While peace refers to the absence of war, fear, conflict, anxiety, suffering and violence, and peaceful coexistence. Essentially, peace focuses on creating and maintaining a just order in society and the resolution of conflict by non-violent means. From these definitions, it is obvious that security and peace are mutually re-enforcing, as the absence of peace entails the absence of security. Also, the existence of peace connotes the existence of security. Based on this premise, security in the tertiary academic institution is simply the protection and preservation of stakeholders in the institution of learning from fear, peril, anxiety and danger that threaten people's survival within the institution and to have a safe working and learning environment.

Maintaining security in any organization is a complex issue and the quality of security services depend on a number of factors, one of which is the caliber of staff. A casual observation indicates that some personnel employed in the security units hardly had any formal training on security matters. As a result, it not only exposes their client to serious security risk but also the security personnel themselves as well, when there are security threats. As a matter of policy, the chief security officer in a university must have basic training in any military or paramilitary organization, however, many other security personnel have no professional training whatsoever on crime prevention, e-security, security intelligence, aborting crime or reading crime motive of prospective intruders. Another major impeding factor in the maintenance of security on campus is that most security personnel on campus do not wield gun and, as a result, university campuses are left vulnerable to the menace of criminal-minded individuals who carry guns and conduct their operations without any hindrance. Besides, most security units lack necessary facilities and modern technologies needed to fight crimes on campus. Security personnel cannot discharge their duties effectively without adequate facilities. It is also observed that most institutions of learning are porous and do not have perimeter fencing, which is critical in preventing access by intruders, securing assets, and protecting personnel or buildings.

Safe-guarding the academic environment for educational activities is very important. It is for this reason that Okebukola (as cited in Youdeowei and Iruoma, 2015) posits that "no safe school, no future for the world". The author gave three reasons to justify this assertion as follows; (i) The dream of harnessing the power of education for achieving goals in health, food, employment, enrolment, energy, security will come to naught. (ii) Without safe schools, education for all will remain a pipe dream (iii) Quality education yearned by all countries of the world will be hindered. Xaba (2014) describes safe school environment as one that is not dangerous and possess no threats to physical, emotional, psychosocial and psychological well-being of the occupants. In other words, it is an environment that is secured and free from threat and danger.

The need to re-position the security personnel in the universities to effectively discharge their duties in relation to the emerging security issues and challenges cannot be overemphasized.

Statement of the Problem

Generally, majority of students in Tertiary Institutions are young men and women, best described as youths, and they constitute the most vibrant and resourceful group in society (Zuokemefa, 2015). They are valuable assets indispensable and invaluable to the growth and development of the society. Youths are fragile, vernal, vulnerable and sensitive to stimulus and can be easily influenced positively or negatively. Students need to form associations and come together as a Union to discover their personal competences, attributes, worth, resilience, assert their opinions on issues, take independent positions, ask questions about issues and express their passion in a well-organized environment. This view is supported by Alada (2011), who stated that it is the Students' Unions that

assist Students to develop their organizational abilities and strength of character that prepare them for higher responsibility in the near future. A good Student Union leadership provides the leverage for the student community to strive into the socio-economic and political spheres of the institution and the larger society.

In Nigeria, university management has been faced with various challenges since early 1980s, including high rates of youth restiveness, poor academic performance, examination malpractices, increasing conflict on campus, and indiscipline among students in universities across the country (Adesoji & Adetoro 2015). Moreover, part of this scenario is that Nigerian students have resorted to cultism, riots, robbery, cybercrime, theft, prostitution, hooliganism, and substance abuse, and have shown a general lack of interest in academic matters during the course of their university education (Alani, Isichei, Oni, and Adetoro, 2010).

Objective of the Study:

The study set out to determine Students' participation on security matters in the management of universities in North-Central Geographical zone, Nigeria;

Research Question

This research question guided the study:

What is the level of students' participation in the management of security matters in universities in North-Central Nigeria?

Research Hypothesis

There is no significant difference in the opinions of respondents on the level of students' participation on the management of security matters in the universities in North-Central, Nigeria.

This hypothesis formulated for the study will be tested at 0.05 levels of significance

Methodology

Descriptive survey research design was used for this study. The population for this study consisted of all the 12 public universities in North Central geographical zone, Nigeria. The population of the study was 357,891. This comprises of the 357,831 students, 60 management staff in all the public universities in north central geographical zone, Nigeria.

Sample and Sampling Technique

Three states were selected for the study using stratified random techniques. Using proportional allocation method in stratified random sampling technique, the actual number of the public universities selected in each state was taken. The sample for this study was 2,275 respondents. Comprising of 2,245 students' respondents and 30 management staff of the sampled public universities in north central geographical zone, Nigeria.

Instrumentation

The structured and close ended questionnaires was the main tool of collecting data from the students and the management. The questionnaire enabled the researcher to collect a lot of information from the selected population within a short period of time. Each item in the questionnaire addressed a specific objective and the research question. The close-ended questionnaire comprised of a list of all possible alternatives, from which the respondents select the answers that best suited them. The questionnaire

for the students was titled: Questionnaire on Students' Participation in the Management of Universities (SPMU). The questionnaire targeted at the students with five organized sections. Section (A) of the questionnaire was to seek general information about the students, for instance gender, age, type of school and many others. The respondents were required to indicate their choice of answers by ticking (√) against the choice provided on each sub section.

Method of Data Analysis

The data from the results were interpreted, organized and reported in a narrative form and with the use of tables. The results obtained from the data collected were analyzed using mean, standard deviation and t-test. The significant level of acceptance or rejection for the hypotheses was 0.05.

Table 1
Opinions of Respondent on students' Participation on the Management of Universities in Security Matters in North –Central Geographical Zone, Nigeria

S/N	Items	Category of Respondents	SA	A	D	SD	MEAN	SD
1	Students and management work together to secure the institution	Management Students	08 349	10 778	07 559	01 204	3.27 3.25	1.143 1.194
2	The management is insensitive to security issues	Management Students	01 320	17 815	06 568	01 139	3.03 3.02	1.474 1.334
3	There is security lapses in the institution	Management Students	06 267	07 761	07 576	04 200	3.13 3.26	1.332 1.264
4	Stealing takes place constantly in the school environment	Management Students	06 371	06 752	09 415	01 218	3.57 3.21	1.478 1.216
5	Students' lives are not secure in our institution	Management Students	07 283	15 855	00 527	03 179	3.10 3.27	1.348 1.278
6	Management is aware of the insecurity of the institution	Management Students	04 352	07 847	00 385	03 233	2.57 3.16	1.633 1.291
7	Students are suspected to be among the perpetrators of insecurity in the institution	Management Students	05 295	05 818	04 410	09 281	2.40 3.14	1.632 1.269
8	Many students have died as a result of insecurity in the institution	Management Students	05 304	03 742	06 425	10 272	3.47 3.22	1.370 1.242
9	Insecurity persisted because students are not involved in decision making	Management Students	11 352	06 747	06 579	01 132	2.83 3.08	1.802 1.305
10	Lecturers are also the victims of the insecurity in the institution	Management Students	09 302	03 735	02 510	09 269	3.80 3.53	1.297 1.222

Table 1 Shows the response of management and students' Item 1, attempts to find out whether Students and management work together to secure the institution. Finding reveals that 10 respondents representing 33.3% of management staff agreed, while 778 respondents representing students 34.7% agreed, with the statement, Item 2, the analysis attempt to investigate whether the management is insensitive to security issues. The analysis showed that 17 respondents representing 56.7% of management staff agreed, while 815 respondents representing 36.3% of students agreed with the statement. Item 3, sought to find out whether there are security lapses in the institution. The responses showed that 07 management staff representing 23.3% disagreed, 761 respondents representing 33.9% of students agreed with the statement. Likewise, item 4, sought to investigate whether Stealing takes place constantly in the school environment the result showed that 09 respondents representing 30.0% of management staff disagreed, while 752 respondents representing 33.5 % of students agreed with the statement. Item 5 also investigated whether students' lives are not secure in the institution surveyed. The results showed that 15 respondents representing 50.0% of management staff agreed, while 855 representing 38.1% of students agreed with the statement, However, Item 6, tries to find out whether Management is aware of the insecurity of the institution. The views of the respondents showed that 14 respondents representing 46.7% of management staff undecided, while 847 respondents representing 37.7% of students agreed with the statement. Item 7 tries to find out whether Students are suspected to be among the perpetrators of insecurity in the institution The respondents showed that 09 respondents representing 30.0% of management staff strongly disagreed, while 818 respondents representing 36.4 % of students agreed with the statement. Item 8 tries to investigate whether many students have died as a result of insecurity in the institution. The result revealed that 10 respondents representing 33.3% of management staff strongly disagreed, while 742 respondents representing 33.3% of students agreed with the statement. Item 9 tries to investigate whether Insecurity persisted because students are not involved in decision making. The result showed that 11 respondents representing 36.7% of management statement. staff strongly agreed, while 747 respondents representing 33.3% of students agreed with the Item 10 tries to find out Lecturers are also the victims of the insecurity in the institution. The result revealed that 09 respondents representing 30.0% of management staff strongly agreed, while 773 respondents representing 32.7% of students agreed with the statement,

Hypotheses Testing

This section presents the summary of hypotheses testing in accordance with the raised objective of the study. T-test was used to test the hypotheses of significant different among the management staff and students at 0.05 level of significant. The summary of this analysis is presented as follows

Table 2

Summary T-test Showing no Significant Difference in the Opinion of Respondents on the Level of Students' Participation in Management of Security Matters in the Universities in North –Central Geographical Zone, Nigeria

Variables	N	Mean	SD	T-cal	Df	Prob	T-critical
Management	30	30.9000	8.35154	0.722	2273	0.470	1.96
Students	2245	31.8192	6.90316				
Total	**2275**						

From table 2, statistical result of hypotheses testing was presented. The result of the t-test shows that the t-calculated value (.722) is less than the t-critical value (1.96) at 2273 degree of freedom and at 0.05 level of significance. The observed level of significance (P.470) is less than 0.05. This means that there is significant difference in the opinion of respondents on the level of students' participation in management of security matters in the universities in North –Central geographical zone, Nigeria. Therefore, the null hypothesis is rejected.

Table 3 Presents the Summary of the Hypothesis Tested in the Course of this Study.

Table 3
Summary of Hypotheses Testing.

S/no	Hypotheses statements	Statistical test	Results	Level of significance	Decision
	There is no significant difference in the opinions of respondents on the level of students' participation on the management of security matters in the universities in North-Central geographical Zone.	T-test	The observed level of significant P.000 is less than 0.05	0.05	Rejected

Discussion of Findings

The study assessed student's participation on the management of universities in North Central Geographical Zone Nigeria. The issues discussed in the study centered on the Assessment of students' participation on security matters that concerns them in the management of universities, the respondents believed that through security matters students and management work together to secure the institution. This helps the management to control the security challenges in the institution. They also accepted that the management is sensitive to security issues, taking security matters very seriously, and this improves the students' academic performance in the institution. This view was supported by Kohn (1998), who maintains that students' cooperation can be enjoyed when they are involved in decision making on classroom matters, for instance, class rules. Discipline can be effective when teachers encourage students' input and sense of having some control. Besides, Page and Page (2000) hold that the essence of disciplining students is to inculcate self-control in them so as to develop positive self-esteem.

Finding also revealed that there is security lapses in the institution, stealing takes place constantly in the school environment, students' lives are not secured in our institution, and this is a big challenge on the campuses whereby students cause a lots of insecurity in the school environment. The finding is in agreement with Nakpodia (2010) who said students' indiscipline seems to be ubiquitous in the 21stcentury in Nigerian tertiary institutions. The author saw child's discipline as a part of socialization. With increase in students' population in our campuses, however, students' discipline problems accentuated and caused more burdens on staff and management. Her conclusion, and in agreement with Anho (2011), was that students' indiscipline has developed into an epidemic in Nigeria and it has plagued schools to series of unrest.

Conclusion

This study sought the opinion of management staff and students on student's participation on the management of universities in Nigeria, specifically on security matters
Based on the findings of the study, it is **concluded** that Students and management should work together to secure the institution on the security matters that concerned them in the university management in North-Central Geographical zone, Nigeria;

Recommendations

Based on the findings of the study, the following recommendation was made:

1. Federal Ministries of Education, University Management and Stakeholders in education sector should provide tight security to ensure safe environment for the staff and students.
2. Students should be involved in the security matters of the universities in North-Central, Nigeria.

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Poor Curriculum Planning as a Debacle to Secondary Education in Gombe State: Quest for Innovative Solution

Samuel AlfayoBoh (Ph.D)
Department of Educational Foundations,
Federal University Kashere, Gombe State

Abstract

This study sought to investigate poor curriculum planning as a debacle to secondary education in Gombe state: quest for innovative solution. This study adopted a descriptive survey design. Three research questions and three hypotheses guided the study. The sample for this study consisted of 244 respondents made up of 200 teachers and 44 principals selected from public secondary schools in Gombe State, Nigeria. The instrument for data collection was researcher's developed questionnaire which was structured on a 4-point rating scale of strongly agree (4), agree (3), disagree (2) and strongly disagree (1). The research questions were answered using mean scores and standard deviation, while the null hypotheses were tested at 0.05 level of significance using t-test. The findings of this study showed that the causes of poor curriculum planning in secondary education in Gombe state have the following consequences: It derails the intellectual abilities of students, contributes to students' poor academic performance, erodes the cultural and moral values of students among others. The findings of the study also shows that the innovative solutions to the poor curriculum planning in Gombe State are: Redesigning the secondary school curriculum, school organization and teacher preparation programs, forming professional learning communities among others. The study recommended that the government should make an adequate financial support for curriculum planning; there should be a mutual team work; high quality of human and material resources for curriculum planning.

Keywords: Assessment, Students' Participation, Security Matters, Management, Universities.

Introduction

Education is a process by which individuals are assisted formally through proper direction and guidance to develop their capacities for their own benefit and that of the society. It is focused towards developing the individuals for them to live effectively and efficiently in the society and to contribute to its advancement and upliftment. Hence, through education the behaviour patterns of the citizens could be changed in the desired direction. Okeke (2013) stated that with sound education, people will start to understand and appreciate one another better and try to restore the dignity of man. Hence, we have to recognize the role education plays in equipping individuals with requisite knowledge and skills for survival and societal progress. The importance of secondary education in educational system cannot be overemphasized. Apart from serving as the link between primary and tertiary education, it provides opportunity for a child to acquire additional knowledge, skills, and traits beyond the primary level. Ige (2011) asserted that a major factor that necessitates the acquisition of secondary education in Nigeria is that the education being provided at the primary level is proving to be insufficient for a child to acquire permanent literacy, communicative, and numeracy skills expected from him/her at the end of the training. Such education is provided in secondary school, which can be owned by government (state or federal), individuals or community and it is divided into junior secondary phase and senior secondary phase. Each of these phases is driven by a curriculum.

The term **curriculum** refers to the lessons and academic content taught in a school or in a specific course or program. Yusuf (2012) defined a curriculum as the totality of student experiences that occur in the educational process. The term often refers specifically to a planned sequence of instruction, or to a view of the student's experiences in terms of the educator's or schools instructional goals. Luciano (2017) argues that curriculum is the total learning experiences of individuals not only in school but society as well. It is seen as all the learning experiences which are planned and guided by the school whether carried out in groups or individually. It can be said to be the sum total of activities which is planned and directed by the school for the attainment of educational goals. Olaitan and Alli (2007) stated that curriculum involves all the activities that a student has under the auspices or direction of the school. It comprises the sum total of the school's effort to influence learning, whether in the classroom, on the playground or out of school. Curriculum of a school is the formal and informal content and process by which learners gain understanding, develop skills, and alter attitudes, appreciations, and values under the auspices of that school. However, a curriculum can only be effective if it is well planned.

Curriculum planning refers to the creation of a curriculum. Amon (2018) defined curriculum planning as the process of structuring academic experiences, using expertise knowledge of the teacher. It is the activity which teachers get involved in before the actual implementation. Meduna (2016) defined curriculum planning as a complex activity involving the interplay of ideas from the curriculum field and other related disciplines. However, the ultimate purpose of curriculum planning is to describe the learning opportunities available to students. Thus, curriculum planning is ultimately concerned with the experiences of learners. Faria (2021) stated that **t**he phrase curriculum planning" can mean one of two related things: either the process of an individual teacher to build a class curriculum, or the means through which school boards coordinate the various curricula being used by teachers in order to achieve uniform goals. On its own, a *curriculum* is basically a lesson plan that functions as a map for learning. Careful planning is required to ensure first that the lessons actually touch on all required topics, and also that they meet school or governmental standards of basic education.

Curriculum planning is concerned with making decisions about what to learn, why, and how to organize the teaching and learning process taking into account existing curriculum requirements and the resources available. At the general level, it often results in the definition of a broad curriculum framework, as well as a syllabus for each subject to be used as reference by individual schools. At the school level, it involves developing course and assessment plans for different subjects. At the classroom level, it involves developing more detailed plans for learning units, individual lessons and lesson sequences. In any teaching/learning situation, however, the concern is not only with what students ought to learn, but also with how they are going to learn it. Curriculum plans that define concepts or ideas without considering action, are incomplete since learning must eventually involve the application of what has been learned. In the same way, plans that merely describe action without considering purposes are also incomplete since otherwise, learning activity runs the risk of being aimless. This relationship of content and process accentuates the need to consider curriculum and instruction not as distinct entities, but rather as interdependent concepts in the planning process. Therefore, curriculum planning involves decisions about both content and process.

The idea of having a curriculum for education in Nigeria's educational system dates back to the year 1969 when a National Curriculum Conference was inaugurated, sequel to public criticisms of the educational system inherited from the colonial governments (Ogunnu, 2000). Since that time, the curriculum of education has been undergoing review and improvements. Even though secondary education curriculum had undergone a lot of review and improvements over the years, the curriculum is still laden with shortcomings and has been a subject of criticisms because of poor planning (Ukpai & Okoro, 2011). Arguments against secondary education curriculum planning in Nigeria and Gombe

state in particular have been that the curriculum is overloaded, content driven, not relevant, fails to give regards to vocational training as a major component of a child's development, irrelevant to the needs of the society, too wide in scope, does not take care of teachers' qualification and training, as well as laying too much emphasis on intellectual development of a child.

Secondary education in Gombe state has been riddled with crises of poor curriculum planning and this has posed as an obstacle to secondary education in this state. Aminu (2018) lamented that the following challenges have impeded curriculum planning in Gombe state: inadequate supervision, time mismatch with school calendar, lack of financial and material support, and negative attitudes of teachers towards the new curriculum. Noah (2015) disclosed that poor curriculum planning has dampen the enthusiasm of students to learn, derailed their intellectual abilities and contributed to students' poor academic performance in Gombe state secondary schools, this ugly trend has made the achievement of educational goals a mirage. However, Ismail (2019) is of the view that some innovative measure can be adopted to curb these challenges. They include: tightening the teacher accountability system, forming professional learning communities, redesigning the secondary school curriculum, school organization and teacher preparation programs.

Statement of the Problem

Secondary education curriculum in Gombe state is still laden with shortcomings and has been a subject of criticisms due to poor curriculum planning. Arguments against secondary education curriculum planning in Gombe state have been that the curriculum is overloaded, content driven, not relevant, fails to give regards to vocational training as a major component of a child's development, irrelevant to the needs of the society, too wide in scope, does not take care of teachers' qualification and training, as well as laying too much emphasis on intellectual development of a child. Secondary education in Gombe state has been riddled with crises of poor curriculum planning and this has posed as a obstacle to secondary education in this state. Curriculum planning in Gombe state has been impeded by inadequate supervision, time mismatch with school calendar, lack of financial and material support, and negative attitudes of teachers towards the new curriculum. In addition, the procedures for curriculum planning in Gombe state were complex and tedious. This ugly trend may have been responsible for the derails on the intellectual abilities of students, students' poor academic performance and dwindling cultural and moral values of students in Gombe state. It is against this backdrop that the researcher deemed it fit to investigate poor curriculum planning as a obstacle to secondary education in Gombe state: Quest for innovative solution.

Objective of the Study

The main purpose of this study is to investigate poor curriculum planning as a obstacle to secondary education in Gombe state: quest for innovative solution. Specifically, the study sought to:

1. Ascertain the causes of poor curriculum planning in secondary education in Gombe state.
2. Determine the effects of poor curriculum planning in secondary education in Gombe state
3. Find out the innovative solution to the poor curriculum planning in Gombe State

Research Questions

The following research questions guided the study.

1. What are the causes of poor curriculum planning in secondary education in Gombe state?
2. What are the effects of poor curriculum planning in secondary education in Gombe state?
3. What are the innovative solutions to the poor curriculum planning in Gombe State?

Hypotheses

The following null hypotheses formulated guided the study, and were tested at 0.05 level of significance.

Ho_1: There is no significant difference between the mean ratings of principals and teachers on the causes of poor curriculum planning in secondary education in Gombe state.

Ho_2: There is no significant difference between the mean ratings of principals and teachers on the effects of poor curriculum planning in secondary education in Gombe state.

Ho_3: There is no significant difference between the mean ratings of principals and teachers on the innovative solution to the poor curriculum planning in Gombe State.

Research Methodology

The study adopted a descriptive survey design. The target population for this study was four thousand three hundred and sixty-one (4361) respondents made up of 66 principals and 4295 teachers from the 66 public secondary schools in Gombe State (Source: Post Primary Schools Management Board *(PPSMB*) Gombe, 2019). The reason for choosing principals and teachers was because they were the categories of people that can give correct information with respect to the subject matter in this study. The sample of this study was drawn from principals and teachers in the public secondary schools through a stratified random sampling technique. The state was stratified along the 11 local government areas and four public secondary schools were randomly selected from each local government area, thus, making a total of 44 secondary schools. From the 44 secondary schools, 44 principals and 200 teachers were randomly selected for the study. The instrument for data collection was a questionnaire structured on a 4 – point rating of Strongly Agree (SA) 4 points, Agree (A) 3 points, Disagree (DA) 2 points and Strongly Disagree (SD) 1 point. The instrument was face validated by two experts from the Department of Educational Foundations, one expert from Measurement and Evaluation, Federal University Kashere, Gombe State. The reliability of the instrument was established using the Cronbach Alpha formula. The reliability coefficient value yielded 0.86 on average which was considered adequate for the study. The instrument was administered to the respondents by the researcher and three research assistants. A total of 244 copies of the questionnaires were administered and collected on the spot from the respondents. Data obtained were analyzed using mean score and standard deviation. In addition, the null hypotheses were tested using t-test statistics at 0.05 level of significance. Any mean score lower than 2.50 implied disagree while equal to or higher than 2.50 implied agree to the items. Similarly, for the testing of null hypotheses if the t-calculated values are less than critical t-value, null hypotheses were accepted, but if the t-calculated values are more than critical t-value, null hypotheses were rejected.

Results

The results of the data analyses were presented based on research questions and hypotheses in tables.

Research Question One

What are the causes of poor curriculum planning in secondary education in Gombe state?

Table 1
Mean ratings on the causes of poor curriculum planning in secondary education in Gombe state

S/N	ITEMS	Distribution of Response	Principal $\overline{X}$	Principal SD	Principal REM	Teacher $\overline{X}$	Teacher SD	Teacher REM
1	Negative attitudes of teachers towards the new curriculum	SA – 4points	3.11	0.80	A	3.07	0.77	A
2	Time mismatch with school calendar	A - 3points	3.22	0.85	A	3.01	0.89	A
3	Lack of financial support	DA - 2points	2.73	1.09	A	2.99	1.07	A
4	Low quality of human and material resources	SD – 1point	2.84	0.93	A	2.92	0.82	A
5	Lack of mutual team work		2.88	0.94	A	2.86	0.50	A

$\overline{X}$ = Mean, SD = Standard Deviation, rem = Remark

The result in Table 1 shows that the mean ratings of the principals for item numbers 1-5 are 3.11, 3.22, 2.73, 2.84, and 2.88 with the corresponding standard deviation of 0.80, 0.85, 1.09, 0.93, and 0.94 respectively. On the other hand, the mean ratings of the teachers on the above items are 3.07, 3.01, 2.99, 2.92 and 2.86 with the corresponding standard deviation of 0.77, 0.89, 1.07, 0.82 and 0.50 respectively. This shows that the respondents agree that items in the Table 1 above are the causes of poor curriculum planning in secondary education in Gombe state.

Ho_1: There is no significant difference between the mean ratings of principals and teachers on the causes of poor curriculum planning in secondary education in Gombe state.

Table 2
t-test of the two groups on the causes of poor curriculum planning in secondary education in Gombe state

S/N	Group	No.	Mean	SD	DF	t.cal	t-value	Decision
1	PRINCIPAL	44	2.96	0.92	242	1.54	1.96	Not significant
2	TEACHER	200	2.97	0.81				

In the table above, the t-calculated value of each item was obtained; the degree of freedom of all items was 242, while the critical t-table of 1.96 was obtained at 0.05 level of significance. From the table, it can be seen that the t-calculated values for all items were less than critical t-value. Therefore, the null hypothesis of no significant difference between the mean ratings of principals and teachers on the causes of poor curriculum planning in secondary education in Gombe state was accepted. This position indicates that there is no significant difference between principals and teachers on the causes of poor curriculum planning in secondary education in Gombe state.

Research Question Two

What are the effects of poor curriculum planning in secondary education in Gombe state?

Table 3
Mean Ratings on the Effects of poor Curriculum Planning in Secondary Education in Gombe State

S/N	ITEMS	Distribution of Response	Principal			Teacher		
			$\overline{X}$	SD	REM	$\overline{X}$	SD	REM
6	It derails the intellectual abilities of students	SA – 4points	3.23	0.62	A	3.18	0.18	A
7	It contributes to students' poor academic performance	A - 3points	3.04	0.68	A	3.21	0.15	A
8	It erodes the cultural and moral values of students	DA - 2points	3.15	0.14	A	2.91	0.16	A
9	It makes the achievement of educational goals a mirage	SD – 1point	3.39	0.17	A	3.17	0.13	A
10	It dampens the enthusiasm of students to learn		2.24	0.23	DA	2.14	0.47	DA

$\overline{X}$ = Mean, SD = Standard Deviation, rem = Remark

The result in table 3 shows that the mean ratings of the principals for item numbers 6-10 are 3.23, 3.04, 3.15, 3.39 and 2.24 with the corresponding standard deviation of 0.62, 0.68, 0.14, 0.17 and 0.23 respectively. On the other hand, the mean ratings of the teachers on the above items are 3.18, 3.21, 2.91, 3.17 and 2.14 with the corresponding standard deviation of 0.18, 0.15, 0.16, 0.13 and 0.47 respectively. This shows that the respondents agree that items in the Table 3 above are the effects of poor curriculum planning in secondary education in Gombe state.

H_{O2}: There is no significant difference between the mean ratings of principals and teachers on the debacles of poor curriculum planning in secondary education in Gombe state.

Table 4
t-test of the two groups on the Effects of Poor Curriculum Planning in Secondary Education in Gombe State

S/N	Group	No.	Mean	SD	DF	t.cal	t-value	Decision
1	PRINCIPAL	44	3.01	0.37	242	1.68	1.96	Not significant
2	TEACHER	200	2.92	0.22				

In the table above, the t-calculated value of each item was obtained; the degree of freedom of all items was 242, while the critical t-table of 1.96 was obtained at 0.05 level of significance. From the table, it can be seen that the t-calculated values for all items were less than critical t-value. Therefore, the null hypothesis of no significant difference between the mean ratings of principals and teachers on the effects of poor curriculum planning in secondary education in Gombe state was accepted. This position indicates that there is no significant difference between principals and teachers on the debacles of poor curriculum planning in secondary education in Gombe state.

Research Question Three

What are the innovative solutions to the poor curriculum planning in Gombe State

Table 5
Mean ratings on the innovative solution to the poor curriculum planning in Gombe State

S/N	ITEMS	Distribution of Response	Principal			Teacher		
			$\overline{X}$	SD	REM	$\overline{X}$	SD	REM
11	Redesigning the secondary school curriculum and school organization	SA – 4points	3.54	0.50	SA	3.64	0.42	SA
12	Redesigning secondary school teacher preparation programs	A - 3points	2.98	0.61	A	2.86	0.59	A
13	Forming professional learning communities	DA - 2points	3.14	0.18	A	3.31	0.16	A
14	Tightening the teacher accountability system	SD – 1point	2.61	1.51	A	2.68	0.47	A
15	Identifying factors of teacher motivation		3.21	0.17	A	3.24	0.19	A

$\overline{X}$ = Mean, SD = Standard Deviation, rem = Remark

The result in Table 5 shows that the mean ratings of the principals for item numbers 11-15 are 3.54, 2.98, 3.14, 2.61 and 3.21 with the corresponding standard deviation of 0.50, 0.61, 0.18, 1.51 and 0.17 respectively. On the other hand, the mean ratings of the teachers on the above items are 3.61, 2.86, 3.31, 2.68 and 3.24 with the corresponding standard deviation of 0.42, 0.59, 0.16, 0.47 and 0.19 respectively. This shows that the respondents agree that items in the Table 5 above are the innovative solutions to the poor curriculum planning in Gombe State.

Ho_3: There is no significant difference between the mean ratings of principals and teachers on the innovative solutions to the poor curriculum planning in Gombe State.

Table 6:
t-test of the two groups on the innovative solutions to the poor curriculum planning in Gombe State

S/N	Group	No.	Mean	SD	DF	t.cal	t-value	Decision
1	PRINCIPAL	44	3.10	0.59	242	1.54	1.96	Not significant
2	TEACHER	200	3.15	0.37				

In the table above, the t-calculated value of each item was obtained; the degree of freedom of all items was 242, while the critical t-table of 1.96 was obtained at 0.05 level of significance. From the table, it can be seen that the t-calculated values for all items were less than critical t-value. Therefore, the null hypothesis of no significant difference between the mean ratings of principals and teachers on the innovative solutions to the poor curriculum planning in Gombe State was accepted. This position indicates that there is no significant difference between the mean ratings of principals and teachers on the innovative solutions to the poor curriculum planning in Gombe State.

Discussion of Findings

The findings with respect to research question one and hypothesis one show that principals and teachers have similar view on the causes of poor curriculum planning in secondary education in Gombe state. They agreed that the causes of poor curriculum planning in secondary education in Gombe state include: Negative attitudes of teachers towards the new curriculum, Time mismatch with school calendar, Lack of financial and material support and Lack of mutual team work. This finding is in consonance with the lamentation of Aminu (2018) that the following challenges have impeded curriculum planning in Gombe state: inadequate supervision, time mismatch with school calendar, lack of financial and material support, and negative attitudes of teachers towards the new curriculum.

The result with respect to research question two and hypothesis two shows that both principals and teachers share or have a similar view on the debacles of poor curriculum planning in secondary education in Gombe state. They agreed that the effects of poor curriculum planning in secondary education in Gombe state are: It derails the intellectual abilities of students, it contributes to students' poor academic performance, it erodes the cultural and moral values of students and it makes the achievement of educational goals a mirage. This finding is in consonance with the disclosure made by Noah (2015) that poor curriculum planning has dampen the enthusiasm of students to learn, derailed their intellectual abilities and contributed to students' poor academic performance in Gombe state secondary schools, this ugly trend has made the achievement of educational goals a mirage.

The findings with respect to research question three and hypothesis three shows that the principals and teachers have similar view on the innovative solutions to the poor curriculum planning in Gombe State. They agreed that the innovative solutions to the poor curriculum planning in Gombe State are: Redesigning the secondary school curriculum and school organization, redesigning secondary school teacher preparation programs, forming professional learning communities, tightening the teacher accountability system and identifying factors of teacher motivation. This finding is in concord with the view of Ismail (2019) that some innovative measure can be adopted to curb these challenges; they include: tightening the teacher accountability system, forming professional learning communities, redesigning the secondary school curriculum, school organization and teacher preparation programs.

Conclusion

Curriculum planning is a continuous process which involves activities characterized by interrelationships among individuals and groups as they work together in studying, planning, developing and improving the curriculum which is total environment planned by the school. Effective curriculum planning and decision-making process is key to the success of educational programs. It develops well-coordinated, quality teaching, learning and assessment programmes which build students' knowledge, skills and behaviours in the disciplines, as well as their interdisciplinary and or physical, personal and social capacities. However, some cogent factors have led to poor curriculum planning. This has resulted in a grave obstacle to secondary education. However, some innovative measures can be put in place to check this ugly trend before it gets out of hand.

Recommendations

The following recommendations were made based on the findings of this study:

1. Enlightenment programmes on curriculum should be organized for teachers to enable them develop a positive attitude towards new curriculum.
2. There should be a proper consultation with school authorities during curriculum planning to avoid time mismatch with school calendar.

3. The government should make an adequate financial support for curriculum planning.
4. There should be high quality of human and material resources for curriculum planning
5. There should be a mutual team work in curriculum planning.

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Quality Education and Skill Acquisition: A Veritable Tool for Youth Empowerment and Sustainable Development

[1]Ihenacho, U.O, [2]Ubochi, L.F., [3]Ohizu E.C. and [4]Akalador, M.C.

[1]Department of Business Education, Alvan Ikoku Federal College of Education, Owerri
[2]Department of Curriculum and Instructions, Alvan Ikoku Federal College of Education, Owerri
[3] Department of Educational Psychology/G&C, Alvan Ikoku Federal College of Education, Owerri
[4]Department of Economics, Federal College of Education (Technical), Umunze

Abstract

The need to improve on the instrumentality of quality education and skill acquisition in relation to youth empowerment for sustainable development necessitated this study. It emphatically stresses that through quality education, members of the society, especially the youths will acquire functional entrepreneurial and vocational skills requisite for independent living and sustainable socio-economic development. The study adopted a descriptive survey design. Two research questions guided the study. The sample size of the study comprised 50 students from the Department of Business Education, Alvan Ikoku Federal College of Education, Owerri, Imo State, Nigeria, through purposive sampling technique. The instrument for data collection was a structured-validated questionnaire with a reliability coefficient of 0.76 using Cronbach Alpha. Data collected were analyzed using arithmetic mean. Findings revealed that institutional oriented strategies are necessary for enhancing skill acquisition and youth empowerment and sustainable development for the youth to become productive to the society. It was recommended among others that youths/students should be encourage to be creative and innovative because wealth is said to flow directly from innovation.

Keywords: Quality Education; Skill acquisition; Youth Empowerment; Sustainable Development.

Introduction

Education is the most powerful instrument, which can be used to change the world. This is why its quality is very important. Quality education requires skilled professionals such as teachers. It is believed that through relevant education, the recipients become capable of living a better life. This is made possible through functional (relevant) education as it equips the beneficiaries with knowledge, basic literacy and numeracy skills. However, education has been considered paramount in the development of the cognitive, manipulative, perceptual, spatial and motor/psychomotor skills in the individuals, especially the youths. Other skills include the following: collaborative, creative and communication skills, etc. If the students are assisted to develop these skills during the course of their studies, they will be able to delve into diverse fields of human endeavours, such as agriculture, fashion and designing, carpentry and laundry services, etc. indeed, the era of looking forward to securing a white-collar job upon leaving school is gone, and in the present era, getting a job is no longer totally guaranteed. The youths in particular and the members of the society in general can become empowered by learning and developing saleable skills. Again, young school leavers, regardless of their different fields of specializations, could also be made to understand that they can excel outside their disciplines.

Furthermore, quality relevant education aims at developing a balanced set of capabilities of children which they require to become economically productive, develop sustainable livelihoods, contribute to peaceful and democratic societies and enhance individual well-being (Amaele, 2007). Akin to the above, Aigbomain (2012) suggest that quality education should be fully accessible to all students, and should embrace diversity and engage the cultural assets of all children and their families. It should be community-centered and should provide services and activities that benefit students and

their families. This type of education should be supported by full, robust and equitable funding from the appropriate government sources.

Similarly, skill acquisition services is a solid rock upon which the individual members of the society, especially the able-bodied men and women (youths) could become empowered. For instance, the youths are exposed and trained on different entrepreneurial and vocational skills, such as carpentry, poultry management, catering, computer maintenance and operation as well as small scale businesses, etc. Gobet and Chassy (2008) suggest that out trainings are designed to provide a platform to train and educate individuals on skills that can help create wealth, taking into consideration the broad framework of the (UNDP's Millennium Development Goals (MDG's) e.g. eradication of poverty. Besides, it helps the participants to be trained as to foster better-informed skill acquisition and produce more creative and well-thought-out services that result in better offerings to the consumers. Appreciating the benefits of skill acquisition especially to the youths, the researchers emphasized that with skills acquisition combined with the education attained by the recipients, effective function is offered to the institution he works or is going to work in.

Youths are the cornerstone of any meaningful and sustainable development. Agagu (2005) aptly captures the youths as the young people between the ages of 13 and 35 years. The youths are vibrant, energetic, inquisitive, adventurous, gregarious, risk takers and identity seekers. They often clash with the adults, having arrived at the apex of intelligence. Acknowledging the suave attribute of the youths, youth empowerment may be explained as the process of directing and supporting the young persons to discover and claim personal power through skill acquisition for sustainable development. To buttress this further, Creswell (2003) asserts that youth empowerment is a process where children and young people are encouraged to take charge of their lives. He adds that they do this by addressing their situation and then take action in order to improve their access to resources and transform their consciousness through their beliefs, values and attitudes.

Sustainable Development is a multi-faceted concept embracing educational, human, political and socio-economic development, etc. approaching it from this perspective, Ofoeze (2015) maintains that economic development is concerned with efforts directed towards the improvement of socio-economic and materials well-being of man in the society in terms of his standard of living. Besides, the researchers perceive sustainable development to be a process for meeting human development goals while strengthening the ability of natural system to continue to provide the natural resources and ecosystem services upon which the economy and society depend.

It should be noted that motor-skill acquisition follows a pattern in which learning accompanied by practice. All these skills are transmitted to the recipients of education. Hence, through them, the recipients become empowered for active participation in the society. Duke (2007) observes that empowerment is focused on creating greater community change relying on the development of individual capacity. In the same vein, youth empowerment occurs in homes, at schools, through youth organizations, government policy making and community organizing campaigns. Youth empowerment through quality education and skill acquisition can be realized through teaching, research, job creation, information dissemination and services to the community (Okereke & Emenalo, 2008). The researchers contend that youth empowerment comprises of entrepreneurship training, skill acquisition, access to credit facilities and qualitative education with unlimited life-enhancing opportunities.

Statement of the Problem

It is no exaggeration to assert that certain teething factors militate against the realization of the objectives of youth empowerment and sustainable development. They include lack of conducive teaching and learning environment, shortage of qualified teachers and resource persons, inadequate funding, paucity of skill acquisition centers, inadequate infrastructure facilities, poor remuneration of staff, quest for materialism, get-rich-quick syndrome and amazing interest in search of white-collar jobs on the part of the youths among other obvious factors. In line with this, Akinkuotu and Olufowobi (2010) state that many countries, particularly the developing countries are facing acute shortage of qualified teachers, while serving teachers are paid poorly (and sometime irregularly) because of the scant qualification needed to get entrance into the system, it suffers from low social and professional status. Regrettably, most youths especially the graduates have become perpetual job seekers; worst still is that some of them are unemployable sequel to the fact that they have nothing to offer with regard to knowledge and saleable skills. Rucci (2009) observes that one of the problems of education system of Africa is that it lacks imparting skills on the students. The researchers opine that youthful age is a period when youths exhibit their innate qualities and show-case their God-given talent, but it is regrettable that most times, youths live, study and work under precarious conditions, sometimes they are dehumanized and underrated and their freedom abused leading to insecurity, marginalization and neglect.

Purpose of the Study

The main purpose of this study was to ascertain if quality education and skill acquisition as veritable tool for youth empowerment and sustainable development. Specifically, the study sought to:

i. determine the government-oriented strategies for enhancing skill acquisition for youth empowerment and sustainable development.
ii. ascertain institutional oriented strategies for enhancing skill acquisition for youth empowerment and sustainable development.

Research Questions

The following research questions guided the study:

1. What are the government-oriented strategies for enhancing skill acquisition for youth empowerment and sustainable development?
2. What are the institutional-oriented strategies for enhancing skill acquisition for youth empowerment and sustainable development?

Method

The study adopted a descriptive survey design. The sample of the study comprised 50 students from Business Education Department, Alvan Ikoku Federal College of Education, Owerri, Imo State, Nigeria, through purposive sampling. The instrument for data collection was a structured questionnaire titled Quality Education and Skill Acquisition Questionnaire (QESAQ)developed by the researchers. The questionnaire was subjected to expert validation. The reliability of QESAQ yielded 0.76 based on Cronbach Alpha Coefficient. Data collected were analyzed using arithmetic mean.

Results

Table 1
Mean responses on the government-oriented strategies for enhancing skill acquisition for youth empowerment and sustainable development

S/N	Items	Mean	Remarks
1.	Plan occasional excursions for students	2.51	Agreed
2.	Provision of more entrepreneurial centres and facilities	3.50	Agreed
3.	Proper placement of students in different companies for their industrial training programmes	3.92	Agreed
4.	Draw up and follow through a standard entrepreneurial curriculum content for the students	3.63	Agreed
5.	Recruiting qualified teachers and educator of entrepreneurial studies	3.71	Agreed

The result in Table 1 showed that the respondents agreed with all the items as the government-oriented strategies for enhancing skill acquisition for youth empowerment and sustainable development. This is because the mean responses fall within the range of 2.51-3.92, which is above the criterion mean of 2.50.

Table 2
Mean responses on the institutional-oriented strategies for enhancing skill acquisition for youth empowerment and sustainable development

S/N	Items	Mean	Remarks
6.	Launching more youth entrepreneurial programs like YouWin and Sure-P	3.40	Agreed
7.	Financing and nurturing students with good entrepreneurial spirits and skills	3.71	Agreed
8.	Building of more governmental facilities and entrepreneurial development centres for students	3.32	Agreed
9.	Reinforcing students that have good entrepreneurial idea by providing scholarship to them	3.81	Agreed
10.	Partnering and supporting profit and non-profit vocational centres	3.20	Agreed

The result in Table 2 showed that the respondents agreed with all the items as the institutional-oriented strategies for enhancing skill acquisition for youth empowerment and sustainable development. This is because the mean responses fall within the range of 3.20-3.81, which is above the criterion mean of 2.50.

Discussion of Findings

The findings of this study revealed the government-oriented strategies for enhancing skill acquisition and youth empowerment and sustainable development. That the relevance of quality education in this regard is obvious for instance it serves as a prerequisite to the acquisition of skills and armed with these skills, the youth would become empowered both for independent living and for sustainable socio-economic development. The finding is supported by Anderson's (2000) submission that quality education leads to empowerment as it is a process of strengthening individuals, organizations and communities to get more control over their own situations and environments. Quality education is a crucial factor in combating poverty and inequality in the society. Also emanating from the findings revealed institutional-oriented strategies for enhancing skill acquisition

and youth empowerment and sustainable development. For the youths to become productive to the society, the need to acquire requisite functional skills. The finding is supported by Duke (2007) who observed that empowerment is focused on creating greater community change, relying on the development of individual capacity. Also, youth empowerment occurs at homes, in the schools, through youth organization, government policy making and community organizing campaign. Youth empowerment through quality education and skills acquisition can be realized through teaching, research, job creation, information dissemination and services to the community.

Conclusion

Based on the findings of the study, it can be concluded that governmental-oriented and institutional-oriented strategies were considered effective and appropriate strategies needed for enhancing skill acquisition and youth empowerment.

Recommendations

Based on the finding of the study, the following recommendations were made:

1. Curriculum developed for, and at every level of education should be geared towards self-employment through entrepreneurship.
2. Entrepreneurial culture should be inculcated into students by encouraging SIWES programme to a high extent and thoroughly monitor the programme during the training so as to ensure that all students participated in the training.
3. Youth/Students should be encouraged to be creative and innovative because wealth is said to flow directly from innovation.
4. Encourage the establishment of functional skill acquisition centres and making same assessable to all and sundry.

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Determination of Objectives and Content of Quality Management Skills for theBuilding Technology Curriculum of Colleges of Education (Technical) in Nigeria: A Case of Abia State College of Education (Tech), Arochukwu

Bldr. Dr. Kingsley O. Igboko
School of Technical Education,
Abia State College of Education (Tech),
Arochukwu, Abia State.

Abstract

The purpose of the study was to determine the quality management skills for inclusion in the building technology curriculum of Colleges of Education (Tech), in Nigeria. Specifically, it sought to determine the specific objectives and content of quality management skills appropriate for inclusion in the building technology curriculum. Tworesearch questions and two null hypotheses tested at .05 level of significance guided the study. A descriptive survey research design was adopted for the study. The population forthe study was 170 respondents (80 professional builders, 45 basic technology teachers, 21 building technology graduates, and 24 industrial technical education lecturers). There was no sampling as the population was manageable. A structured questionnaire developed by Igboko (2016) was adopted for data collection. The research questions wereanalyzed using frequencies, mean and standard deviation while the hypotheses were analyzed using ANOVA. The findings include: 21 specific objectives and 65 content areas. Based on the findings, it was recommended that the National Commission for Colleges of Education (NCCE), while reviewing the building technology curriculum of colleges of education (Tech.) in Nigeria, should integrate the determined quality management skills into it. It was also recommended that further research should be conducted for the determination of other curriculum elements such as instructional activities and resources as well as evaluation techniques, for integration into the quality management componentof the curriculum.

Introduction

Building serves many useful purposes for the people. It provides shelter in the areas of factories, residences, classrooms, hostels, laboratories, libraries, conference halls, offices, conveniences and lots more. No aspect of life in any society can go without need for one form of building or the other; hence building is considered one of the basic necessities of life as it is very indispensable in the overall wellbeing of man.

However, buildings do not just spring up, they are achieved through a defined process, and this process involves the mechanics of building production. Therefore, the mechanics of building production is known as building Technology. When the mechanics are right, quality buildings will result; but when the production process is faulty, it will definitely lead to the production of buildings that cannot guarantee the safety, health and welfare of users of such buildings. This is according to the Federal Republic of Nigeria (FRN, 2006). Hence, Atkinson (1995) opined that quality should be given first place in the building production process. According to the author, it is better, cheaper and safer to get it right at first attempt than to put it right later. Obiegbu (2008) also adds that quality buildings ensure smooth running of businesses and reduction in disaster aids. Therefore, quality is very essential in the building production process.

The quality of a product has been variously discussed. According to the Nigerian Institute of Building (NIOB, 2013), the quality of a product is its conformity with existing standards or specifications, i.e. fit for the purpose as required by the client. Again, Bamisile (2004) defines quality as the totality of features and characteristics of a product or service that bear on its ability to satisfy stated needs. However, quality does not come about on its own. It is achieved through a process called

quality management. According to Nwachukwu (2009), management is the co-ordination of all the resources of an organization through the processes of planning, organizing, directing and controlling, in order to attain organizational objectives. Further, Alugbuo (2000) and Weihrich and Koohtz (2006) identify coordinating, motivating and communication as the other elements of management. Therefore, Ezeji and Onoh (2008) define management in building construction as the application of knowledge and skills in the successful quality control and execution of building construction actvities. According to chase (1998), Torbica and Stroh (1999), Liu (2003) and Bamisile (2004), customer satisfaction, reduced rework, job satisfaction and prevention of time and cost overrun are some of the many benefits of implementing quality management in the building production process.

Given the many benefits of quality management in the building industry, the practice looks very appropriate in the Nigerian situation as the industry in the country is widely plagued with serious challenges. These challenges include: building collapse (Onuoha & Olunkwa, 2013 and Uzor, 2014), defective structures (Bamisile, 2004), use of quacks and untested materials/products (FRN, 2006), project failure or abandonment (Jimoh, 2012), public apathy to the building industry (Jambol, 2012) and time/cost overrun (Bamisile, 2004). These challenges cannot be ignored if Nigerians are to derive maximum benefit from the industry.

Perhaps, one way of addressing these challenges might be to infuse quality management skills into the curriculum of institutions charged with the responsibility of training building technology teachers such as Colleges of Education (Tech). These institutions use the National Commission for Colleges of Education (NCCE) minimum standards as its curriculum. From the content of NCCE (2012), it is implied that the Building Technology Programme is meant to produce, among others, building technology teachers and practitioners capable of teaching the subject in Junior Secondary schools; building technology teachers who will be able to inculcate building scientific and technological attitude and values into the society and; building technology teachers who are motivated to start the so much desired revolution of technological development right from the Nigerian schools. Therefore, the curriculum is designed to produce teachers with the intellectual and Professional background adequate for teaching future or budding building construction workers. Unfortunately, a deeper look at the curriculum shows clear absence of quality management skills. However, Nwachukwu (2001) opines that the curriculum of technical and vocational education, of which building technology is a part, must speak of today, of real-life problems facing the environment and life in all its aspects and ramifications. According to the author, the curriculum must be responsive to present life situations, and its content should derive from the needs of the immediate community. On this score therefore, the building technology curriculum of Colleges of Education (Tech) must be made to address the current challenges facing the building industry, the situation of which is impacting negatively on the well-being of the society. If this is not done the curriculum will continue to produce graduates who lack the quality management consciousness required to train younger and future building industry operatives who are poised to contribute meaningfully towards sanitizing the building industry. Such graduates will therefore be uncompetitive in the industry. Therefore, any future attempt at reviewing the curriculum of colleges of education (Tech) in Nigeria should involve the inclusion of the quality management skills being espoused in this work.

Every skill training is normally organized in a curriculum. According to Anwuka (2000), Curriculum is defined as a planned and organized set of formal education or training intended towards the acquisition of defined or specified competences. Wheeler (1978) identified five curriculum elements to include: objectives, learning experience, content, organization and integration of content and learning experience, and evaluation. However, the present study will be limited to the specific

objectives and content of quality management skills for the Building Technology programme of Colleges of Education (Tech) in Nigeria.

The first task in any educational programme is the selection of instructional objectives. Onyemerekeya (2004) sees instructional objectives as statements of quantifiable operational nature indicating actions from which mastery of desired activities can be correctly inferred. According to Okorafor (2009), the achievement of instructional objectives is expected to bring about solution to some indentified societal problems. Onyemerekeya (2004) and Okorafor (2004) maintain that one key factor that determines instructional objectives is the contemporary society or the culture. That is, instructional objectives should be formulated to address current societal challenges. On this score therefore, quality management action statements should be infused into the specific objectives of building technology curriculum of Colleges of Education (Tech), in Nigeria. This will ensure the raising of quality management- conscious building technology teachers who will in turn infest their students and future building construction workers with the same consciousness. But content is needed to in order to realize the stated objectives.

So, objectives cannot be achieved without a content. According to Onwuka (1996) and Okorafor (2009), content includes all the knowledge, skills, concepts, principles, attitudes and values to be emphasized during the teaching and learning process. Okorafor (2004) had earlier observed that content include those things that are systematically and logically arranged to enable individuals acquire the knowledge that will enable them develop themselves and the society. Nwachukwu (2001) opines that curriculum content must address real-life situations if they are to be valid. Therefore, quality management skills are needed in the content of the building technology curriculum of Colleges of Education (Tech) in Nigeria. Such elements are essential as they will predispose the graduates to quality management consciousness and practices. This will ultimately lead to the production of better building construction operatives for the society.

Several studies have been conducted in the areas of integration of elements into a curriculum and quality management in construction. Lemchi (2005), conducted a study on integrating entrepreneurship education into the NCE Home Economics Programme. The study identified the objectives, learning experiences, instructional methods and evaluation techniques suitable for inclusion in the NCE Home Economics Curriculum. The researcher recommended that curriculum planners should utilize the objectives, learning experiences, instructional methods, evaluation technique and guidelines identified in the study for reviewing and re-planning the entrepreneurship education for Home Economics Education. Lemchi's work is related to the present one in that they are both addressing the integration of ideas into the curriculum. However, while Lemchi's work focused on the integration of specific objectives, content/learning experiences, instructional methods and evaluation techniques of entrepreneurship education into the NCE Home Economics Curriculum, the present work is on the integration of specific objectives and content of quality management skills into the Building Technology curriculum of Colleges of Education (Tech) in Nigeria. Lombard (2006) conducted a study on managing the quality of engineering on large construction projects in the South African context. The study came up with a number of findings and recommendation which include that: internationally accepted quality systems, processes, procedures and practices are also appropriate and applicable to South Africa; engineering designs should conform to owner's requirements, and to codes and standards, while at the same time making efforts to determine the reasonableness of clients' requirements through the processes of focusing, revealing and calibrating; teamwork is a factor that impacts engineering quality and should therefore be promoted; continuous improvement should be promoted; there should be explicit allocation of responsibilities. Lombard's work is related to the present one in that both of them are addressing the elements of quality management in construction.

However, while Lombard's work focused on the management of the quality of engineering on large construction projects in South Africa, the present work is on the integration of specific objectives and content of quality management skills into the building technology curriculum of Colleges of Education (Tech) in Nigeria. Hoonakker, Carayon and Loushine (2010) also conducted a study to determine the barriers and benefits of quality management in the construction industry. The results of the interviews showed that: quality is most often measured through customer satisfaction; the best way to improve quality is through education and training; and the biggest barrier to quality is personnel, among others. Hoonnakka's, Carayon's and Loushine's work is related to the present work in that they are both addressing quality issues in construction. However, while their own work was on the determination of the barriers and benefits of quality management in construction, the present work is on the integration of quality management skills into the building technology curriculum of Colleges of Education (Tech)in Nigeria with special emphasis on the specific objectives and content. Still on quality, Atkinson (1995) identifies the following as very essential: a workforce with sound skills, materials of specified quality, satisfaction of designers' intentions and expectations, recording of changes in design, application of quality standards, and improved information flow. Again, Moore (nd) identifies the logical sequence of quality management elements to include: quality plan, quality requirements, applying quality methods, phase quality review, project quality review and quality audit. Based on the foregoing, this work is underpinned by the Total Quality Management Theory. The theory of Total Quality Management (TQM) was propounded by Edward Deming, an American engineer, in 1986. The theory emphasizes the use of teams that include employees who deal directly with customers to achieve continuous quality improvements. It is based on close attention to details, self-monitoring by workers at each step and a passionate commitment to quality as part of an organization's identity, and which is internalized by everyone in the organization. The theory of TQM suggests that customer focus and customer satisfaction should be a company's primary goals. TQM believes that the quest for quality is a never-ending process in which people are continuously working to improve the service. Continuous improvement means that small but incremental improvements that occur on a regular basis will eventually add up to vast improvements in quality. When TQM is implemented effectively, the following results, according to Weihrich and Koontz (2006), will be achieved: greater customer satisfaction, fewer defects and less waste, increased total productivity, reduced costs and improved profitability, and an environment in which quality has high priority. The theory of Total Quality Management is relevant to the present study as it will guide the crafting of suitable quality management skills to be integrated into the building technology curriculum of Colleges of Education (Tech) in Nigeria. This will position the graduates well to train competent future building production workers.

Several related studies have been reviewed for this work. However, none of these studies addressed the issue of integrating quality management skills into the specific objectives and content of the building technology curriculum of Colleges of Education (Tech) in Nigeria. This is the gap that this study seeks to fill considering that the college of Education (Tech) is the institution where teachers that train young and future building construction operatives are trained. The infusion of quality management skills into their curriculum will enable them come out as quality-conscious professionals who are capable of imparting the same consciousness into their students for the overall good of the society.

Purpose of the study:

The purpose of the present study was to integrate quality management skills into the building technology curriculum of Colleges of Education (Tech) in Nigeria. Specifically, the study was to

determine:

1. The specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) in Nigeria.
2. The content necessary for achieving the specific objectives of quality management skills in the building technology programme.

Research questions

The following research questions guided the study:

1. what should be the specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) in Nigeria?
2. what should constitute the content necessary for achieving the specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) inNigeria?

Hypotheses

The following hypotheses were tested at.05 level of significance:
H0$_1$: There is no significant difference in the mean responses of professional builders, that is, CORBON-registered builders; building technology teachers in junior secondary schools; building technology graduates of Colleges of Education (Technical); and building technology lecturers of industrial technical education background on what should constitute specific objectives of quality management skills for the building technology curriculum of Colleges of Education (Tech) in Nigeria.

H0$_2$: There is no significant difference in the mean responses of professional builders, building technology teachers in junior secondary schools, building technology graduates of Colleges of Education (Technical), and building technology lecturers of industrial technical education background on what should constitute the content of quality management skills for the building technology curriculum of Colleges of Education (Tech) in Nigeria.

Method

The study adopted descriptive survey research design. This design was considered appropriate as the study sought to sample the opinion of experts on the suitable quality management skills to be included in the building Technology curriculum of Colleges of Education (Tech), in Nigeria. The study was conducted in Abia State College of Education (Tech), Arochukwu situated in the South East geo-political zone of Nigeria. The College has a well-equipped building technology department with highly qualified and dedicated lecturers and support staff. Further, the host community, Arochukwu, has a good number of registered builders, qualified basic education building technology teachers as well as graduates of building technology from colleges of Education (Tech).
The population for the study was 170, comprising 80 Registered builders, 45 basic technology teachers (building technology option), 21 building technology graduates of colleges of Education (Tech), and 24 building technology lectures in colleges of Education (Tech). There was no sampling as the population of 170 was manageable enough. This agrees with Uzuagulu (2011) who opines that studying the entire population is usually better for a study as it eliminates sampling error.

The study adopted the Technical College Building Construction Quality Management Skills Questionnaire (TCBCQMSQ) developed by Igboko (2016) as the instrument for data collection. The

Questionnaire is divided into three (3) sections. Section A sought information on the personal data of the respondents while section B was further divided into two clusters (A & B). Cluster A was about the specific objectives of quality management skills suitable for inclusion in the curriculum while cluster B sought information on the content of quality management skills necessary for achieving the stated specific objectives. The instrument was based on the real limit of numbers, that is, scores ranging from 0.5 to 1.49 were considered not appropriate; those from 1.50 to 2.49, moderately appropriate; those from 2.50 to 3.49, appropriate; and those from 3.50 to 4.00, very appropriate. Cluster A of the instrument has 21 items while cluster B has 65 items. With the help of four research assistants, the questionnaires were distributed through personal contact. This enabled the researcher and his assistants to clarify issues with the respondents. The questionnaires were retrieved from the respondents after two weeks. The number of questionnaires that were correctly filled and returned was 161. This showed a return rate of 94.71%.

The research questions were analyzed using frequencies, mean and standard deviation. And with the aid of the Statistical Package for Social Science (SPSS) Version 10.0, the two null hypotheses were analyzed using ANOVA at .05 level of significant.

Research Question 1

What are the specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) in Nigeria?

Data for this research question are analyzed and presented in Table 1

Table 1

Mean Responses of the Respondents on the specific Objectives of Quality Management skills for the Building Technology Curriculum. **Cluster Mean = 3.44**

S/N	The specific objectives of quality Management in Building Construction should include ability to:	N1= 75 X_1	N2= 43 X_2	N3 = 20 X_3	N4= 23 X_4	XG	SD	RMK
1.	Assess the workmanship skills of site workers before the commencement of any job	3.72	3.58	3.91	3.75	3.71	0.55	VA
2.	Analyze building drawings before the commencement of setting out operations.	3.71	3.77	3.74	3.75	3.73	0.52	VA
3.	Inspect setting out operations to assure conformance to design.	3.76	3.72	3.78	3.55	3.73	0.72	VA
4.	Ensure that acceptable standards of workmanship are applied in the construction of foundations and floors.	3.57	3.58	3.65	3.55	3.58	0.61	VA
5.	Obtain materials from reputable sources	3.22	3.43	3.43	3.20	3.31	0.75	A
6.	Adhere strictly to manufacturers' recommendations on the use of different materials.	3.23	3.44	3.51	3.25	3.33	0.82	A
7.	Test materials e.g. blocks, water and fine/coarse aggregates for crushing strength, injurious matters, and mud/silt respectively before use.	3.55	3.53	3.26	3.30	3.47	0.73	A
8.	Ensure that materials that do not meet specified quality standards are removed from site to avoid contaminating the good ones.	3.47	3.37	3.39	3.50	3.43	0.69	A
9.	Ensure that concrete aggregates are properly graded.	3.52	3.47	3.52	3.40	3.49	0.62	A
10	Ensure that concrete aggregates are batched according to specifications.	3.42	3.65	3.74	3.45	3.53	0.61	VA

11.	Obtain concrete that meets specified quality standards	3.72	3.47	3.59	3.25	3.57	0.65	VA
12.	Obtain blocks that meet specified quality standards.	3.51	3.63	3.65	3.55	3.57	0.64	VA
13	Inspect to assure that blocks are laid in accordance with design and specifications.	3.52	3.58	3.70	3.65	3.58	0.56	VA
14.	Ensure that site operations are executed within specified time and budget.	3.15	3.24	3.30	3.05	3.18	0.79	A
15.	Instill quality culture into every participant.	3.03	3.10	3.35	3.10	3.10	0.84	A
16.	Review every completed stage of work to assure adherence to designs and specifications.	3.33	3.63	3.74	3.30	3.47	0.73	A
17.	Insist on correcting every sub-standard work in each stage before proceeding to the next stage.	3.62	3.80	3.52	3.40	3.62	0.63	VA
18.	Ensure that solutions to problems are collectively articulated.	3.72	3.37	3.30	3.50	3.33	0.73	A
19.	Document every corrective action using technical information.	3.11	3.33	3.30	3.20	3.21	0.78	A
20.	Document changes in design as construction proceeds	3.14	3.19	3.00	3.25	3.15	0.97	A
21.	Motivate every participant adequately.	3.23	3.26	3.17	3.15	3.22	0.85	A

Key: N_1 CORBON – Registered Builders, N_2 = Building Technology Teachers, N_3 = Building technology graduates, and N_4 = IndustrialTechnical Education lecturers. VA= Very Appropriate, A = Appropriate, MA = Moderately Appropriate and NA = Not Appropriate. X_1 = Mean Response of CORBON – Registered Builders, X_2 = Mean response of Building Technology Teachers, X_3 = Mean Response of Building Construction graduates, and X_4 = Mean Response of Industrial Technical Education lecturers. Total Respondents = 161, Grand Mean = XG and SD = Standard Deviation

In Table 1, the mean responses of the respondents on the specific objectives of quality management skills for the building technology curriculum of colleges of education (technical) are presented. The data revealed that items 1, 2, 3, 4, 10. 11. 12, 13 and 17 were very appropriate while the rest of the items were appropriate. Further, a cluster mean of 3.44 was obtained for research question 1, showing that all the items were rated as being appropriate specific objectives of quality management in building technology.

Again, the standard deviation of each possible specific objective was found to be less than 1.00. This shows that the responses of individual respondents were clustered around the mean, giving the mean values added validity.

Hypothesis 1 ($H0_1$)

There is no significant difference in the mean responses of professional builders, building technology teachers in junior secondary schools, building technology graduates of colleges of education (Technical), and building technology lecturers on the specific objectives of quality management skills for the building technology curriculum of Colleges of Education (Tech) in Nigeria.

Analysis of variance (ANOVA) result for hypothesis 1 is presented in Table 2.

Table 2

Analysis of Variance of the Responses of the Respondents on the Specific Objectives of Quality Management in Building technology

S/N	The Objectives of quality Management in Building Construction	N1= 75	N2 = 43	N3 = 20	N4 = 23	X G	SD	F-	Sig. of F	RMK
1.	Assess the workmanship skills of site workers before the commencement of any job	3.72	3.58	3.91	3.75	3.71	0.55	1.87	0.14	NS
2.	Analyze building drawings before the commencement of setting out operations.	3.71	3.77	3.74	3.75	7.73	0.52	0.13	0.94	NS
3.	Inspect setting out operations to assure conformance to design	3.76	3.72	3.78	3.55	3.73	0.54	0.90	0.44	NS
4.	Ensure that acceptable standards of workmanship are applied in the construction of foundations and floors.	3.57	3.58	3.65	3.55	3.58	0.61	0.13	0.94	NS
5.	Obtain materials from reputable sources.	3.22	3.43	3.43	3.20	3.31	0.75	1.02	0.39	NS
6.	Adhere strictly to manufacturers' recommendations on the use of different materials.	3.23	3.44	3.52	3.25	3.33	0.82	1.02	0.35	NS
7.	Test materials e.g. blocks, water and fine/coarse aggregates for crushing strength, injurious matters, and mud/silt respectively before use	3.55	3.53	3.26	3.30	3.47	0.73	1.41	0.24	NS
8.	Ensure that materials that do not meet specified quality standards are removed from site to avoid contaminating the goods ones	3.47	3.37	3.39	3.50	3.43	0.69	0.26	0.85	NS
9.	Ensure that concrete aggregates are properly graded.	3.52	3.47	3.52	3.40	3.49	0.62	0.24	0.87	NS
10.	Ensure that concrete aggregates are batched according to Specifications	3.42	3.65	3.74	3.45	3.53	0.61	2.33	0.08	NS
11.	Obtain concrete that meets specified quality standards	3.72	3.47	3.59	3.25	3.57	0.65	3.38	0.09	NS
12.	Obtain blocks that meet specified quality standards	3.51	3.63	3.65	3.55	3.57	0.64	0.44	0.93	NS
13.	Inspect to assure that blocks are laid in accordance with design and specifications.	3.52	3.58	3.70	3.65	3.58	0.56	0.71	0.55	NS
14.	Ensure that site operations are executed within specified time and budget.	3.15	3.24	3.30	3.05	3.18	0.79	0.48	0.69	NS
15.	Instill quality culture into every participant	3.03	3.10	3.35	3.10	3.10	0.84	0.84	0.47	NS
16	Review every completed stage of work to assure adherence to designs and specifications	3.33	3.63	3.74	3.30	3.47	0.73	3.13	0.08	NS
17.	Insist on correcting every sub-standard work in each stage before proceeding to the next stage.	3.62	3.79	3.52	3.40	3.62	0.63	2.07	0.11	NS
18.	Ensure that solutions to problems are collectively articulated	3.27	3.37	3.30	3.50	3.33	0.73	0.57	0.63	NS
19.	Document every corrective action using technical information	3.11	3.33	3.30	3.20	3.21	0.78	0.85	0.47	NS
20	Document changes in design as construction proceeds.	3.14	3.19	3.00	3.25	3.15	0.97	0.27	0.84	NS

21	Motivate every participant adequately.	3.23	3.26	3.17	3.15	3.22	0.85	0.09	0.97	NS

Key: N_1 = CORBON – registered builders, N_2 = Building technology teachers, N_3 = Graduate of building technology N_4 = Industrial technical education lecturers. $\overline{X}_1$ = Mean response of CORBON – registered builders, $\overline{X}_2$ = Mean response of building technology teachers, $\overline{X}_3$ = Mean response of graduates of building technology, $\overline{X}_4$ = Mean response of Industrial technical education lecturers. XG = Grand mean, SD = Standard deviation. F is significant at $p \leq 0.05$.

The analysis reveals that there is no significant difference in the mean responses of CORBON – registered builders, building technology teachers, building construction graduates and industrial technical education lecturers on all 21 items.

Research Question 2

What should constitute the content necessary for achieving the specific objectives of quality management skills for the building technology programme of Colleges of Education (Tech) in Nigeria?

The data for answering this research question are presented in Table 3.

Table 3
Mean Responses of the Respondents on the Content of Quality Management skills in the Building Technology Curriculum.

S/N	Content of Quality Management In Building Construction	$N_1 = 75$ X_1	$N2 = 43$ X_2	$N3 = 20$ X_3	$N4 = 23$ X_4	X G	SD	RMK
	Planning skills for quality materials and personnel							
22.	Recruitment of building personnel with the appropriate competencies	3.58	3.79	3.70	3.35	3.62	0.61	VA
23.	Procurement of materials and products from reputable manufacturers or suppliers.	3.35	3.65	3.48	3.25	3.44	0.71	A
24.	Carrying out appropriate tests on materials	3.63	3.49	3.48	3.60	3.57	0.64	VA
25.	Ensuring proper storage of materials	3.53	3.44	3.74	3.60	3.54	3.63	VA
26.	Ensuring proper handling of materials	3.42	3.47	3.61	3.55	3.48	0.65	A
	Planning skills for setting out of buildings							
27.	Analysis of building drawings to determine if they are constructable or not	3.65	3.30	3.26	3.45	3.48	0.78	A
28.	Analysis of building drawings to determine their conformance to codes and standards	3.49	3.56	3.57	3.50	3.52	6.67	VA
29.	Determination of the accuracy of dimensions in building drawings.	3.51	3.58	3.43	3.60	3.53	0.62	VA
30.	Determination of the reliability of setting out equipment	3.35	3.35	3.52	3,40	3.38	0.70	A
31.	Inspection of setting out operations before the commencement of trench excavation	3.52	3.53	3.70	3.60	3.56	0.59	VA
	Planning skills for foundation construction							
32.	Ensuring that the depth and width of foundation trenches are in accordance with design	3.62	3.56	3.52	3.55	3.58	0.64	VA
33.	Ensuring that the floor of the trench is leveled, rammed and blinded before placing the foundation concrete.	3.65	3.35	3.61	3.75	3.58	0.66	VA
34.	Ensuring that the DPC level is well above the natural ground level	3.61	3.51	3.52	3.70	3.58	0.65	VA
35.	Ensuring that the earth or laterite fill is placed in layers and well compacted before placing the hardcore materials	3.41	3.20	3.22	3.30	3.31	0.80	A
36.	Ensuring that materials and standards of workmanship applied are in accordance with specifications.	3.50	3.56	3.43	3.60	3.52	0.62	VA

	Planning skills for concrete production							
37.	Ensuring that specified concrete mixes are strictly adhered to	3.48	3.72	3.52	3.60	3.57	0.63	VA
38.	Ensuring that only a gauge box, not head pan or wheel barrow, is used for measuring concrete materials where weight batching is not practicable	2.99	3.07	2.87	2.70	2.96	1.02	A
39.	Ensuring that the aggregates are properly graded	3.28	3.24	3.26	3.35	3.27	0.76	A
40.	Ensuring that the water content in aggregates is established before determining the water cement ratio of concrete	3.27	2.93	2.74	3.20	3.09	0.94	A
41.	Ensuring that concrete and mortar constituents are mixed on a hard and clean surface if a mixing machine is not affordable	3.34	3.47	3.48	3.30	3.39	0.80	A
42.	Ensuring thorough mixing of concrete to achieve a uniform paste	3.52	3.67	3.57	3.40	3.55	0.69	VA
43.	Ensuring that fresh concrete is transported undisturbed	3.22	3.37	3.43	3.15	3.28	0.85	A
44.	Ensuring that formworks are rigid, strong, water tight, but easy to strike	3.40	3.56	3.22	3.45	3.42	0.75	A
45.	Ensuring that concrete is poured or placed from a height not more than one meter away	3.14	3.35	3.22	2.95	3.18	0.85	A
46	Ensuring that newly placed concrete is compacted until maximum density is achieved	3.34	3.40	3.35	3.37	3.36	0.72	A
47.	Ensuring that concrete is placed and compacted within 30 minutes of mix	3.26	3.35	3.57	3.50	3.36	0.76	A
48.	Ensuring the constant curing of concrete as hardening proceeds	3.37	3.49	3.43	3.35	3.41	0.71	A
49.	Ensuring the use of reinforcement bars that are clean and free from mud, paint, loose rust, grease or retarders	3.50	3.49	3.61	3.50	3.51	0.71	VA
S/N	**Content of Quality Management in Building Construction**	**$\underline{N_1}$ = 75 $\overline{X_1}$**	**$\underline{N2}$ = 43 $\overline{X_2}$**	**$\underline{N3}$ = 20 $\overline{X_3}$**	**$\underline{N4}$ = 23 $\overline{X_4}$**	**$\overline{X\,G}$**	**SD**	**RMK**
50.	Ensuring that the bending schedule prepared by a competent structural engineer is strictly adhered to.	3.58	3.63	3.70	3.70	3.62	0.56	VA
51.	Ensuring adequate concrete cover to reinforcement bars using concrete spacers	3.49	3.58	3.62	3.50	3.54	0.59	VA
52.	Ensuring that concrete attains maximum strength before striking the formwork	3.53	3.56	3.65	3.65	3.57	0.62	VA
	Planning skills for the production and laying of blocks							
53.	Ensuring that only clean and sharp sand is used for moulding blocks	3.29	3.53	3.65	3.40	3.42	0.70	A
54.	Ensuring that the specified proportion of materials is strictly adhered to.	3.53	3.65	3.43	3.47	3.54	0.57	VA
55.	Ensuring that block constituents are mixed on a hard and clean surface	3.34	3.51	3.48	3.50	3.43	0.74	A
56.	Ensuring thorough mixing of block constituents	3.26	3.51	3.39	3.45	3.37	0.73	A
57.	Ensuring that blocks are well compacted and cured	3.47	3.65	3.70	3.45	3.55	0.62	VA
58.	Ensuring that jointing mortar satisfies specified mix proportions	3.33	3.42	3.57	3.20	3.37	0.66	A
59.	Ensuring that interface joints do not exceed or fall below specified thickness	3.27	3.33	3.30	3.15	3.28	0.73	A
60.	Ensuring that every block course is measured, checked, and approved before commencing another course	3.20	3.30	3.09	3.25	3.22	0.88	A
	Planning skills for site supervision							
61.	Ensuring that work instruction forms are used in the execution of every item of work	3.36	3.00	3.09	3.25	3.21	0.81	A
62.	Monitoring the execution of work items to ensure the satisfaction of designers' intentions	3.51	3.53	3.39	3.60	3.51	0.64	VA
63.	Ensuring that where there are conflicts between	3.44	3.16	3.35	3.35	3.34	0.79	A

	designers' intentions and standards/codes, the later prevail							
64.	Ensuring that every completed stage of work is inspected and approved by competent persons	3.46	3.53	3.39	3.55	3.48	0.64	A
65.	Ensuring that no activity takes more time than was allotted to it in the construction programme	3.31	3.19	3.22	3.25	3.25	0.78	A
66.	Keeping accurate financial records to ensure that no activity consumes more money than was budgeted for it	3.50	3.65	3.65	3.20	3.53	0.69	VA
67.	Ensuring that sub-contractors and suppliers are selected on the basis of pre-qualification rather than through competitive bidding.	3.35	3.44	3.39	3.15	3.36	0.73	A
68.	Consulting regularly with top management	3.26	3.33	3.17	3.00	3.23	0.80	A
	Controlling skills for site operations							
69.	Initiation of peer review of every completed item of work	3.41	3.35	3.35	3.25	3.36	0.72	A
70.	Preparation of checklists for phase and whole project quality reviews	3.19	3.30	3.22	3.25	3.23	0.69	A
71.	Reviewing to assure that everything has been done in the correct way in each phase of a project	3.46	3.60	3.57	3.45	3.51	0.59	VA
72.	Reviewing to assure that the correct materials have been used in each phase of a project	3.61	3.58	3.31	3.70	3.58	0.62	VA
73.	Carrying out similar reviews after the completion of the whole project	3.20	3.37	3.26	3.00	3.23	0.78	A
74.	Invitation of independent assessors for the quality audit of the final product	3.05	3.16	3.00	3.05	3.08	0.82	A
75.	Ensuring that every non-conforming item of work is reworked to acceptable standards	3.34	3.44	3.43	3.15	3.35	0.74	A
76.	Ensuring group solutions to identified problems and Challenges	3.28	3.56	3.39	3.35	3.38	0.76	A
	Communication skills for construction activities							
77.	Documentation of every corrective action using technical information	3.33	3.44	3.26	3.20	3.33	0.69	A
78.	Recording, using technical information, changes in drawings and specifications as construction proceeds	3.37	3.42	3.26	3.00	3.32	0.79	A
79	Recording, using technical information, all key work processes undertaken in the course of a project	3.38	2.93	3.13	2.85	3.16	0.76	A
80.	Writing a report of the performance of the final product after a given period of time	3.15	3.26	3.26	3.30	3.21	0.83	A
81.	Documentation of the findings of every field study	3.18	3.37	3.30	3.30	3.26	0.80	A
S/N	**Content of Quality Management In Building Construction**	**$\underline{N_1}$ = 75 X_1**	**$\underline{N2}$ = 43 X_2**	**$\underline{N3}$ = 20 X_3**	**$\underline{N4}$ = 23 X_4**	**$\overline{X}$ G**	**SD**	**RMK**
	Motivational skills							
82.	Taking participants on a study of the activities of the best-performing building construction firms	3.27	3.19	3.17	3.25	3.23	0.81	A
83.	Education and training of all personnel on quality issues on a regular basis	3.32	3.49	3.57	3.25	3.39	0.71	A
84.	Education and training of subcontractors and suppliers on quality requirements	3.25	3.42	3.17	3.25	3.28	0.75	A
85.	Setting quality goals and having every participant key into them	3.32	3.44	3.35	3.35	3.36	0.72	A
86.	Conducting site meetings regularly	3.23	3.19	3.26	3.35	3.24	0.81	A

Cluster mean = 3.39

Key: N_1 = CORBON – registered Builders, N_2 = Building Technology Teachers, N_3 = Building technology Graduates, N_4 = Industrial Technical Education Lecturers. $\overline{X}_1$ = mean response of CORBON – registered Builders, $\overline{X}_2$ = mean response of Building Technology Teachers, $\overline{X}_3$ = mean response of Building technology Graduates, $\overline{X}_4$ = Mean response of Industrial Technical Education Lecturers. $\overline{X}$G = grand mean, SD = standard deviation.

Table 3 shows the mean responses of CORBON – registered builders, building technology teachers, building technology graduates and industrial technical education lecturers on what should constitute the content of quality management skills in building technology. The respondents rated 22 items as being very appropriate and 43 as appropriate. A cluster mean of 3.39 further shows that all the items are appropriate for inclusion into the content of the building technology curriculum.

Again, the standard deviation of each of the items except one was found to be less than 1.00. This means that the responses of each respondent were clustered around the mean. This gives the mean values more validity.

Hypothesis 2 (HO_2)

There is no significant difference in the mean responses of professional builders, building technology teachers in junior secondary schools, building technology graduates of colleges of education (Technical) and building technology lecturers of industrial technical education background on what should constitute the content of quality management skills in the building technology curriculum of Colleges of Education (Tech) in Nigeria.

Analysis of variance (ANOVA) result on hypothesis 2 is presented in Table 4

Table 4
Analysis of Variance of the Responses of the Respondents on the Content of Quality Management Skills in the Building Technology Curriculum of Colleges of Education (Tech) in Nigeria.

S/N	Content of Quality Management Skills in Building Technology:	N1 =75 $\overline{X_1}$	N2 =43 $\overline{X_2}$	N3 = 20 $\overline{X_3}$	N4 = 23 $\overline{X_4}$	$\overline{X}$ G	SD	F-Value	Sig. of F	RMK
	Planning Skills for quality materials and personnel									
22	Recruitment of building personnel with the appropriate competencies	3.58	3.79	3.70	3.35	3.62	0.61	2.74	0.09	NS
23.	Procurement of materials and products from reputable manufacturers or suppliers	3.35	3.65	3.48	3.25	3.44	0.71	2.24	0.86	NS
24.	Carrying out appropriate tests on materials	3.63	3.49	3.48	3.60	3.57	0.64	0.61	0.61	NS
25.	Ensuring proper storage of materials	3.53	3.44	3.74	3.60	3.54	0.63	1.18	0.32	NS
26.	Ensuring proper handling of materials	3.42	3.47	3.61	3.55	3.48	0.65	0.59	0.62	NS
	Planning skills for setting out operations									
27.	Analysis of building drawings to determine if they are constructable or not	3.65	3.30	3.26	3.45	3.48	0.78	2.55	0.06	NS
28.	Analysis of building drawings to determine their conformance to codes and standards	3.49	3.56	3.57	3.50	3.52	0.67	0.15	0.93	NS
29.	Determination of the accuracy of dimensions in building drawings	3.51	3.58	3.43	3.60	3.53	0.62	0.37	0.77	NS
30.	Determination of the reliability of setting out equipment	3.35	3.35	3.52	3.40	3.38	0.70	0.40	0.76	NS
31.	Inspection of setting operations before commencement of trench excavation	3.52	3.53	3.70	3.60	3.56	0.59	0.56	0.64	NS

	Planning skills for foundation construction									
32.	Ensuring that the depth and width of foundation trenches are in accordance with design	3.62	3.56	3.52	3.55	3.58	0.63	0.20	0.90	NS
33.	Ensuring that the floor of the trench is leveled rammed and blinded before placing the foundation concrete	3.65	3.35	3.61	3.75	3.58	0.66	2.56	0.06	NS
34.	Ensuring that the DPC level is well above the natural ground level	3.61	3.51	3.52	3.70	3.58	0.65	0.49	0.69	NS
35.	Ensuring that the earth or laterite fill is placed in layers and well compacted before placing the hardcore materials	3.41	3.21	3.22	3.30	3.31	0.79	0.69	0.56	NS
36.	Ensuring that materials used and standards of workmanship applied are in accordance with specifications	3.50	3.56	3.43	3.60	3.52	0.62	0.33	0.81	NS
	Planning skills for concrete Production									
37.	Ensuring that specified concrete mixes are strictly adhered to	3.48	3.72	3.52	3.60	3.57	0.63	1.39	0.25	NS
38.	Ensuring that only a gauge box, not head pan or wheelbarrow is used for measuring concrete materials where weight batching is not practicable	2.99	3.07	2.87	2.70	2.95	1.02	0.67	0.57	NS
39.	Ensuring that aggregates are properly graded	3.28	3.24	3.26	3.35	3.27	0.76	0.10	0.96	NS
40.	Ensuring that the water content in aggregates is established before determining the water-cement ratio in concrete	3.27	2.93	2.74	3.20	3.09	0.94	2.53	0.06	NS
41.	Ensuring that concrete and mortar constituents are mixed on a hard and clean surface if a mixing machine is not affordable	3.34	3.47	3.48	3.30	3.39	0.80	0.40	0.75	NS
S/N	**Content of Quality Management Skills in Building Construction:**	**N1 =75 $\overline{X_1}$**	**N2 =43 $\overline{X_2}$**	**N3 = 20 $\overline{X_3}$**	**N4 = 23 $\overline{X_4}$**	**$\overline{X}$ G**	**SD**	**F-Value**	**Sig. of F**	**RMK**
42.	Ensuring thorough mixing of concrete to achieve a uniform paste	3.52	3.67	3.57	3.40	3.55	0.69	0.82	0.48	NS
43.	Ensuring that fresh concrete is transported undisturbed	3.22	3.37	3.43	3.15	3.28	0.85	0.70	0.56	NS
44.	Ensuring that formworks are rigid, strong, watertight, but easy to strike	3.40	3.56	3.22	3.45	3.42	0.75	1.08	0.36	NS
45.	Ensuring that concrete is poured or placed from a height not more than one meter away	3.14	3.35	3.22	2.95	3.18	0.85	1.15	0.33	NS
46.	Ensuring that newly placed concrete is compacted until maximum density is achieved	3.34	3.40	3.35	3.37	3.36	0.72	0.05	0.98	NS
47.	Ensuring that concrete is placed and compacted within 30 minutes of its mix	3.26	3.35	3.57	3.50	3.36	0.76	1.26	0.29	NS
48.	Ensuring the constant curing of concrete as hardening proceeds	3.37	3.49	3.43	3.35	3.40	0.71	0.30	0.82	NS
49.	Ensuring the use of reinforcement bars that are clean and free from mud, paint, loose rust, grease or retarders	3.50	3.49	3.61	3.50	3.51	0.71	0.17	0.92	NS
50.	Ensuring that the bending schedule prepared by a competent structural engineer is strictly adhered to	3.58	3.63	3.70	3.70	3.62	0.56	0.43	0.73	NS

51.	Ensuring adequate concrete cover to reinforcement bars using concrete spacers	3.49	3.58	3.65	3.50	3.54	0.59	0.57	0.64	NS
52.	Ensuring that concrete attains maximum strength before striking the formwork	3.53	3.56	3.65	3.65	3.57	0.62	0.33	0.81	NS
	Planning skills for the production and laying of blocks									
53.	Ensuring that only clean and sharp sand is used for molding blocks	3.29	3.53	3.65	3.40	3.42	0.70	2.17	0.10	NS
54.	Ensuring that the specified proportion of materials is strictly adhered to	3.53	3.65	3.43	3.47	3.54	0.57	0.89	0.45	NS
55.	Ensuring that block constituents are mixed on a hard and clean surface	3.34	3.51	3.48	3.50	3.43	0.74	0.60	0.62	NS
56.	Ensuring thorough mixing of block constituents	3.26	3.51	3.39	3.45	3.37	0.73	1.17	0.32	NS
57.	Ensuring that blocks are well compacted and cured	3.47	3.65	3.70	3.45	3.55	0.62	1.42	0.24	NS
58.	Ensuring that every jointing mortar satisfies specified mix proportions	3.33	3.42	3.57	3.20	3.37	0.66	1.29	0.28	NS
59.	Ensuring that interface joints do not exceed or fall below specified thickness	3.27	3.32	3.30	3.15	3.28	0.73	0.27	0.84	NS
60.	Ensuring that every block course is measured, checked, and approved before commencing another course	3.21	3.30	3.09	3.25	3.22	0.88	0.31	0.82	NS
	Planning skills for site supervision									
61.	Ensuring that work instruction forms are used in the execution of every item of work	3.36	3.00	3.09	3.25	3.21	0.81	1.98	0.12	NS
62.	Monitoring the execution of work items to ensure the satisfaction of designers' intention	3.51	3.53	3.39	3.60	3.51	0.65	0.41	0.75	NS
63.	Ensuring that where there are conflicts between designers' intentions and standards/codes, the later prevail	3.44	3.16	3.35	3.35	3.34	0.79	1.09	0.36	NS
64.	Ensuring that every completed stage of work is inspected and approved by competent persons	3.46	3.53	3.39	3.55	3.48	0.64	0.35	0.79	NS
65.	Ensuring that no activity takes more time than was allotted to it in the construction programme	3.31	3.19	3.22	3.25	3.25	3.79	0.22	0.88	NS
66.	Keeping accurate financial records to ensure that no activity consumes more money than was budgeted for it	3.50	3.65	3.65	3.20	3.53	0.69	2.30	0.18	NS
67.	Ensuring that sub-contractors and suppliers are selected on the basis of pre-qualification rather than through competitive bidding.	3.35	3.44	3.39	3.15	3.36	0.73	0.75	0.53	NS
68.	Consulting regularly with top management	3.26	3.33	3.17	3.00	3.23	0.80	0.83	0.48	NS
	Controlling skills for site operations									
69.	Initiation of peer review of every completed item of work	3.41	3.35	3.35	2.25	3.36	0.72	0.25	0.86	NS
70.	Preparation of checklists for phase and whole project quality reviews	3.19	3.30	3.22	3.25	3.23	0.69	0.25	0.86	NS
71.	Reviewing to assure that everything has been done in the correct way in each phase of a project	3.46	3.60	3.57	3.45	3.51	0.59	0.67	0.57	NS

72.	Reviewing to assure that the correct materials have been used in each phase of a project	3.61	3.58	3.39	3.70	3.58	0.62	1.01	0.39	NS
73.	Carrying out similar reviews after the completion of the whole project	3.20	3.37	3.26	3.00	3.23	0.78	1.10	0.35	NS
74.	Invitation of independent assessors for the quality audit of the final product	3.05	3.16	3.00	3.05	3.08	0.82	0.25	0.86	NS
75.	Ensuring that every non-conforming item of work is reworked to acceptable standards	3.34	3.44	3.43	3.15	3.35	0.74	0.81	0.49	NS
76.	Ensuring group solutions to identified problems and challenges	3.28	3.56	3.39	3.35	3.38	0.76	1.23	0.30	NS
	Communication skills for construction activities									
77.	Documentation of every corrective action using technical information	3.33	3.44	3.26	3.20	3.37	0.69	0.68	0.56	NS
78.	Recording, using technical information, changes in drawings and specifications as construction proceeds	3.37	3.42	3.26	3.00	3.32	0.79	1.47	0.23	NS
79.	Recording, using technical information, all key work processes undertaken in the course of a project	3.38	2.93	3.13	2.85	3.16	0.76	4.88	0.15	NS
80.	Writing a report of the performance of the final product after a given period of time	3.15	3.26	3.26	3.30	3.21	0.83	0.27	0.85	NS
81.	Documentation of the findings of every field study	3.18	3.37	3.30	3.30	3.26	0.80	0.49	0.69	NS
	Motivational skills									
82.	Taking participants on a study of the activities of the best-performing building construction firms	3.27	3.19	3.17	3.25	3.23	0.81	0.15	0.93	NS
83.	Education and training of all personnel on quality issues, on a regular basis	3.32	3.49	3.57	3.25	3.39	0.71	1.28	0.29	NS
84.	Education and training of sub-contractors and suppliers on quality requirements	3.25	3.42	3.17	3.25	3.28	0.75	0.70	0.55	NS
85.	Setting quality goals and having every participant key into them	3.32	3.44	3.35	3.35	3.36	0.72	0.28	0.84	NS
86.	Conducting site meetings regularly	3.23	3.19	3.26	3.35	3.24	0.81	0.19	0.90	NS

Key: N_1 = CORBON – registered Builders, N_2 = Building Technology Teachers, N_3 = Graduates of Building Technology, N_4 = Industrial Technical Education Lecturers. $\overline{X}_1$ = mean response of CORBON registered Builders, $\overline{X}_2$ = mean response of Building Technology Teachers, $\overline{X}_3$ = mean response of Building technology Graduates, deviation. F is significant at $p < 0.05$. **Note:** Letters of the alphabet (a, b and c) indicate mean difference as determined using the scheffe test. Means with the same letters of the alphabet are not significantly different while those with different letters are significantly different. The Analysis in Table 4 shows that there is no significant difference in the mean responses of the respondents on all 65 items. $\overline{X}_4$ = mean response of Industrial Technical Education Lecturers. $\overline{X}G$ = Grand mean, SD = Standard.

Discussion of Findings

The findings of the study showed that all 21 items identified for specific objectives of quality management skills in building technology were rated as appropriate by the respondents. This is not unconnected with the fact that all the respondents are professionals in their various areas, and living witnesses to the crises rocking the building industry in Nigeria. As such, they saw all the items as being essential for repositioning the industry for better service delivery. This indicates that the integration of the specific objectives into the building technology curriculum of Colleges of Education (Tech) in Nigeria will help in the production of quality-conscious graduates who have the capacity to ensure quality performance in construction activities. This, if achieved, will go a long way in addressing the many challenges facing the building construction industry in Nigeria. This finding is in line with the opinions of Onyemerekeya (2004) and Okorafor (2004) who opine that instructional

objectives should be selected on the basis of their ability to address current societal challenges. The Nigerian building industry today is beset with challenges of building collapse, defective structures, time and cost overrun, project failure or abandonment and so many other issues. Therefore, if the building technology curriculum of Colleges of Education (Tech) in Nigeria is reinforced with the identified quality management specific objectives, the institutions will be able to instill quality management consciousness into the students so that on graduation, they will be able to impart same to future construction workers. This finding is also in line with the opinions of Mkpa (1987) and Offorma (1994) who opine that the learner as the ultimate recipient of instruction should be able to use what he learns to better himself and the society. This implies that the seemingly different professional backgrounds of the respondents did not have significant effect on their mean responses. It can therefore be confidently said that there was no significant difference in their mean responses as shown in the overall ANOVA result. This shows that the specific objectives of quality management skills in building technology determined in this work are considered appropriate.

The findings of the study showed that all sixty-five (65) items identified for inclusion in the content of the quality management skills component of the building technology curriculum of Colleges of Education (Tech) in Nigeria were considered appropriate by the respondents. Again, this is likely because the respondents, as professionals who have seen it all in the Nigerian building industry, saw the continuous absence of quality management skills content from the building technology curriculum of Colleges of Education (Tech) in Nigeria as not only dangerous but retrogressive in these modern times. Hence the rating of all the items as appropriate. These items were grouped under nine sub-headings as follows: Planning skills for quality materials and personnel, planning skills for setting out of buildings, planning skills for foundation construction, planning skills for concrete production, planning skills for the production and laying of blocks, planning skills for site supervision, controlling skills for site operations, communication skills for construction activities, and motivational skills.

The indication of the respondents is that if the above skills are integrated into the content of the building technology curriculum, it will help in producing quality – conscious graduates who will have a competitive advantage in the building industry. This finding is in line with the opinion of Nwachukwu (2001) who opined that whatever should find its way into a vocational and technical education curriculum, such a thing must be capable of addressing real-life situations. Therefore, the finding of the study with respect to the content of quality management skills for the building construction curriculum is in line with Moore (nd) who proposed that the logical elements of quality management should include: planning, applying quality methods, phase quality review, project quality review, and quality audit. The finding is also supported by Atkinson (1995) who compiled a list of issues to be covered in any quality performance approach in building construction. The list includes: a workforce with sound skills, materials of specified quality, satisfaction of designers' intentions and expectations (unless such intentions and expectations are, themselves, contrary to codes and standards), recording of changes in design, observance of quality standards, and an improved information flow.

The finding is also in line with Hoonakker, Carayon and Looushine (2010) who found in a study that the best way to improve quality is through education and training, and that lack of skilled workers and the low bid mindset in awarding contracts are among the greatest barriers to quality improvement in construction. Also supporting the present finding are the findings made by Lombard (2006) which include, that: 1) designs should conform to owner's requirements, and to codes and standards 2) teamwork impacts positively on construction quality 3) quality-based selection of contractors shouldbe preferred to cost-based selection 4) quality audit is a condition for construction

quality 5) quality is improved when reputable suppliers are engaged, 6) design changes should be carefully managed,
7) design should be audited for constructability. It is also in agreement with the recommendation made by Lombard (2006) that research be carried out to develop a comprehensive guide for quality improvement practices across the entire construction value chain.

Recommendations

1) Further research should be conducted to identify the instructional methods/activities, instructional resources and evaluation techniques for integration into the building technology curriculum of Colleges of Education (Tech) in Nigeria.
2) The National Commission for Colleges for Education (NCCE) should review the minimum standards to include the identified quality management skills in the Building Technology Programme of the Curriculum.
3) Experts should be encouraged to produce textual materials for the quality management skills component of the building technology curriculum.

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Concepts, Causes and Consequences of Trafficking in Persons: Implication for Guidance and Counseling

Udechukwu, J.A. and Okeke K.C.
Department of Early Childhood & Primary Education,
Federal College of Education (Tech) Umunze, Anambra State

Abstract

Trafficking in persons has been identified as a modern-day form of slavery. This is because according to the United Nations Office on Drugs and Crime (UNODC), some 2.5 million people are subjected to human trafficking at any given time. The interest of this paper is to do an overview of the numerous nomenclatures given to this illicit trade from the period of trans-Atlantic slave trade to the present time. The paper also examined the causes of trafficking in persons both for the traffickers and for the victims of human trafficking. Attempt was also made to take a cursory look at the consequences of trafficking in persons on individuals and the society at large so as to help put a stop to the problem. Attempts were also made to suggest how guidance and counselling groups and individual can create awareness as to the menace of the trade. The author finally recommended among others the use of individual counselling to bring about family reorientation of core values as instrument per excellence in curbing the trade. Secondly, the paper also recommended the use of public enlightenment through creating awareness campaigns via jingles, films and guidance to reduce the vulnerability of potential victims.

Keywords: Slave Trade, Trafficking in Persons, Guidance and Counseling.

Introduction

Trafficking in person has been with mankind from the primordial time, and over the years. The label or nomenclature has changed tremendously starting with slave trade, to Trans-Atlantic slave trade, to child trafficking, and now human trafficking and / or trafficking in persons. Whatever appellation or name given to the illicit trade, the common denominator is that "over many centuries, the notion of human trafficking has been accepted to mean illegal, criminal and inhumane deprivation of liberty and violation of the dignity of human beings for some sort of profit" (NAPTIP 2014; 24) Trafficking in persons or human trafficking is the local or international buying and selling of human beings for the purposes of enslavement, cheap labour, organ harvesting and/ or for adoption, all for the ultimate objective of making profit for the sellers. In support of this working definition the United Nations Protocol (2000), defined trafficking in persons as "the recruitment, transportation, transfer, harbouring or receipt of persons, by means of the threat or use of force or other forms of coercion, abduction, fraud, deception, the abuse of power or a position of vulnerability or the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation. Exploitation shall include, at a minimum the exploitation of the prostitution of others or other forms of sexual exploitation, forced labour or services, slavery, servitude or the removal of organs". This definition appears to cover all the dimensions of human trafficking. The reader will do well to remember that child trafficking and other such nomenclature have been used to literature to explain this illicit trade over the years Ngwakwe (2010:2016) observed that "trafficking is used to imply any form of movement and change of control, supervision and guardianship of the child which is not in the interest of the child, is inconsistent with the laws (domestic and international regulating dealings in the affairs of the child), lacks parental/guardians consent or such consent is obtained by coercion, duress or fraud.

Human trafficking has also been defined as "the unlawful act of transporting or coercing people in order to benefit from the work or service, typically in the form of forced labour or sexual exploitation. It has also been defined as "modern-day slavery and involves the use of force, fraud, or coercion to obtain some type of labour or commercial sex act (https://www.adhs.gov,blue-compaign). Finally human trafficking or trafficking in persons is a hidden crime, meaning a crime that happened in the black market or "behind closed doors" because it is an illicit trade. A careful reader will see that over the years human trafficking has been in existence under numerous names such as slave trade, child trafficking, women and young girls trafficking and of course the latest umbrella label of trafficking in persons.

Conceptual Clarifications:

Considerable effort will now be made to clarify briefly some of the related concepts used in literature by earlier writers to explain slave trade, child trafficking, women & young girls trafficking and of recent, human trafficking and trafficking in persons. Slave Trade as the name implies is defined as trade on human beings for the purpose of forced labour both in the domestic front as well as factory and agricultural farm land. Isichei (1976) put it more succinctly by saying that the trans- Atlantic Slave trade in 1518 saw the first load of African Prisoners (slaves) taken directly from West Africa to the West Indies, ushering in over three centuries of the infamous triangular slave trade. In the eighteenth century, slave trade rose to its climax in Igboland - a trade dominated by the British (Isichei, 1976). A number of independent observers claimed that a certain captain Adams, who made ten voyages to the area between 1956 and 1800 said that over 20,000 slaves were sold annually at Bonny, 16,000 of them Igbo (Isichei, 1976).. Over a period of twenty years, 320,000 Igbos were sold into slavery at Bonny, and 50,000 at Calabar and Elim Kalabari (Isichei, 1976). The distinction is that in slave trade, emphasis was on able-bodied young men who were needed for labour and productivity in the plantations and factories in Europe and America. Children were not the main target unless where their mothers become pregnant in transit.

In Child trafficking, a child without prejudice to statutory provisions regulating age for specific purposes, a child is used here in line with the Nigeria constitution to mean a person below the age of eighteen years (source). Trafficking is also used to imply any form of movement and change of control, supervision and guardianship of the child which:

- Is not in the interest of the child.
- Is inconsistent with the laws (domestic and international regulating dealings in the affairs of the child).
- Lacks parental / guardian's consent or such consent is obtained by coercion, duress or fraud (Ngwakwe, 2010, 206).

Women and Young Girls Trafficking is the focus on women and young girls as objects and victims by traffickers. Statistics show that over 80% (eighty percent) of victims of trafficking are women (young girls, including pre-teen and teenagers) (Source). However, there seems to be a split of gender between pre-colonial slave trade and post-colonial modern-day slavery. During the former, able bodied young men with enough strengths to work on western farm in Europe and the Americas were of high demand in the slave market. In today's slavery called trafficking in persons, the preferred demand has changed between the sexes - traffickers now want young women, not to plough farmlands, but to satisfy the expansion of the sex industry in developed countries. The victims pass through

harrowing experiences of rights abuses and deprivations. The girls often end up in prostitution where they are employed in various commercial sexual services like fondling the genitals, intercourse, incest, rape, sodomy, bestiality, the production of pornographic materials, and sometimes sleeping with animals, or even made to use artificial things for sexual pleasure…." (National Agency for the Prohibition of Trafficking in Persons, 2014; Ngwakwe, 2010).

Human Trafficking/Trafficking in Persons appears to be a general label and the terms mostly used by writers to describe all forms of that criminal and illicit trade. According to the protocol of the United Nations adopted in the city of Palermo Italy, in the year 2000, human trafficking or trafficking in persons is defined as the recruitment, transportation, transfer, harbouring or receipt of persons by means of threat or the use of force or other forms of coercion, such as abduction by fraud, deception, or the abuse of power or of a position of vulnerability or by receiving payments or benefits to achieve the consent of a person, for the purpose of exploitation".

Causes of Trafficking in Persons

One will be wondering why human beings will treat their fellow human beings in this uncivilized manner. Human trafficking which is used interchangeably with trafficking in persons is caused by two major factors namely push factors and pull factors (National Agency for the Prohibition of Trafficking in Persons, 2014). By way of explanation. Push factors refer to the reasons why victims are forced or pushed to leave their own environment to venture into the unknown. They include the following:

a. **Poverty: -** poverty is the inability of an adult person to work and make income with which to provide the basic necessities of life. It is a kind of generalized deprivation of basic needs of the individual for survival. Udechukwu (2005) made it clear that the pains of poverty can be more devastating than the pains of sickness. Hence, it is a truism that acute poverty can push a young person into making him/herself available for human trafficking.
b. **Low wages/under-employment: -** Trafficking in person can become an Eldorado for a graduate who receives about ₦20,000. Therein lies his rentage, feeding, transportation etc. After genuinely struggling for some time, can accept an offer from a friend to go explore other areas including travelling outside the country without current and correct papers. Hence, Ngwakwe (2010) posits that "today, not only children and women are trafficked; young boys seeking greener pastures abroad also fall prey to this evil"
c. **Land dispossession: -** In Igbo land Nigeria, there is a tradition of land tenure system whereby land is transferred and inherited from fathers to their children. Whereas such land is dispossessed from the owners for whatever reasons they can lose both hope and interest in such society and community and migrant to whatsoever that resembles opportunities including trafficking in persons especially where large sum of money is promised with little effort.
d. **Social Marginalization: -** All over the world especially in black Africa people are marginalized based on their ethnic group and of course based on religiosity. Even among people of the same faith, there is still marginalization based on denominational differences. So, if people fail to gain admission into universities because of their ethnic group, fail to get employment because of their faith, such marginalized persons fall prey to promise of lucrative jobs in Europe.
e. **Climate change: -** An environment of frequent change in climate such as landslide, tremour, earthquake, frequent storm, desertification and fire can become very dynamic, unpredictable, expanding, fluctuating environment is a turbulent environment. Hence, young people can decide to seek for greener pastures elsewhere. Trafficking in persons thus become a very attractive alternative

f. **Lack of Opportunities in home communities: -** In Nigeria, because of so much emphasis on statism and state of origin, opportunities abound more in the northern parts for employment, admission, and owning properties. In the same vein, opportunities to do certain jobs and earn money in dollars and pound sterling abound outside the country. Hence, there are some people who are behind trafficking and tricking young people into travelling outside the country with a promise of well - paid jobs waiting for them.

g. **Economic Hardship: -** It is not a matter of rhetoric or polemics that acute hardship in Nigeria have become the catalyst that drives the Nigeria youth to go into human trafficking as their last resort to either make it in life or go down as non-achievers. There is no gain-saying that the most spectacular failure of successive government in Nigeria from 1979 till date, which boarders on criminality has been their failure to create wealth and their readiness to plunge the nation into greater economic hardship. On the other hand, the full factors are the reasons that make young people to embark on certain destinations. The full factors include the following:

   i. *Perceived better opportunities elsewhere:* - Many a time, there are unverified news of better opportunities elsewhere. The tendencies are that since there are evidence to prove that there is acute lack of opportunities in home communities. People especially the youths will definitely look outside their communities, their state and of course their countries for perceived better opportunities. It is in this type of exploration of other countries that most of them become victims of trafficking in persons.

   ii. *Lack of Workers:* - It is also true that some countries do not have enough and adequate workers for their factories and industries especially in the developed countries of Europe and North America. Whereas such workers are in surplus in most West African countries including Nigeria. Naturally, people gravitate to those countries where they will have work to do and where they will be paid as at when due. Such promises of better work and payment which is done in US dollars can become strong pull factor that draws people into trafficking in persons.

   iii. *Good Social Security Measures:* - Good Social Security measures mean availability of state of the arts health facilities, good road networks, water supply, basic education, steady supply of electricity, housing scheme development as well as adequate security of lives and properties and of course recreational facilities. All these are lacking in our society while they exist outside the country, their existence in other countries becomes a pull factor that attract people into human trafficking knowingly and unknowingly.

   iv. *Positive Economic Situation:* - In the words of Ojo (2011: 188) he posits that: "Unfortunately however, as vital as infrastructures to the socio-economic well-being of a nation, successive civil and military Administration in Nigeria has paid little or no attention to their development. The result has been a comatose economy, crippled education system and fractured health care delivery. In other climes, the development of infrastructure is the rule but it is the exception in Nigeria". A close look at the above assertion shows that the economic situation in Nigeria is far from positive, thus other places where the economic situation is vibrant and healthy thus can be described as positive, and thus becomes a pull factor that attract people to trafficking in persons.

   v. *Political and Social Stability:* - Political and Social Stability are products of good governance. It is a truism that in Europe and North America where there is good governance, it shows in infrastructural development of good roads, water supply, qualitative education, health care facilities, steady electricity, housing scheme development, workable transportation and recreational facilities per excellence. However,

in Nigeria, the reverse is the case hence Ezeogidi (2014) avers that "good governance remains a theory that has not found relevance in the concept of empiricism and destability in Nigeria; it remains a Utopian theory, a million miles journey that is waiting for a take-off grant". All giving rise to political and social instability which acts as pull factor to trafficking in person as a safe haven to personal well-being. It is important to state here that these push and pull factors can be presented in a tabular form which was the way NAPTIP (2014) presented it before this writer simplified the points raised.

In the same vein, Ngwakwe (2010) identifies some causes of trafficking in persons to include monetary dividends or attraction, violence and other forms of child abuse, corruption and bad government? In continuation, among others greedy parents as a major cause. The author said, that some parents who are very greedy and want a better life for their ward, pressurize their daughters into illicit trade in order to bring money to the family.

Another reason that pulls people to human trafficking is the get-rich-quick syndrome. Some people want to be rich very quickly and at all cost. Due to the fact that they want to get rich quickly, they may fall victim to traffickers who deceive them easily because of their desire to get "quick cash". It is also true that greed and increasing glamourization of the West (America); and collapse of family values as well as family dysfunction are pull factors to human trafficking. In the primordial time, children fear to bring home sudden and unexplainable wealth and properties for fear of what their parents will say. However, nowadays, parents urge, cajole, talk and even pray their children into going out to make money at all costs, because the children have seen that that has been the sole desire of their parents from them all along.

Consequences of Trafficking in Persons

Again, the consequences of trafficking in persons are very negative and has two sides namely; consequences on individuals known and referred to here as personal consequences while the other side is societal consequences.

1. Personal consequences of trafficking in persons:
   Trafficking in persons has been identified as a modern-day slavery. It therefore breached the human right of freedom of movement, and human dignity as provided by section 34 of the 1999 constitution of the Federal Republic of Nigeria as amended thus:
   Every person is entitled to respect for the dignity of his person, and accordingly
   (a) no person shall be subjected to torture or to in human or degrading treatment;
   (b) No person shall be held in slavery or servitude
   (c) No person shall be required to perform forced or compulsory labour

   Trafficking in persons on the other hand can be degrading and dehumanizing. For instance, the life to personal liberty is breached by the aspect of human trafficking that restrict the victim to certain location of amorous activities only for the benefit of their captors. Victims of human trafficking irrespective of their faith are subjected to taking oath before a shrine to be obedient and loyal to their captors. Moreover, personal consequences result in loss of, or deprivation of property rights. Hence, Ngwakwe (2010) reported, that "in many cases, traffickers seize their victims' travelling document and sell the woman to brothel owners…" Also, the victims of human trafficking pass through harrowing experiences of rights abuses and deprivations.

The girls often end up in prostitution where they are employed in the various commercial sexual services like fondling the genitals, intercourse, incest, rape, sodomy, bestiality, the production of pornographic materials, and sometimes sleeping with animals, or even made to use artificial things for sexual pleasure (Ngwakwe, 2010). The above scenario will definitely lead to health risks and health challenges to the victims. Trafficking in persons could result in death of victims because all the consequences of deaths can result from the unusual travel methods of trafficking, infection with deadly diseases other poor living conditions etc. Can ultimately lead to death of victims.

2. Societal Consequences of Trafficking in Persons:

Trafficking in persons can trigger public sector corruption. Writing on the effects of corruption on economic development of a country, Ihiokwu and Okpamen (2007, 334) noted that:

> *Corruption reduces economic development by creating economic inefficiencies, increasing the cost of doing business, reducing competition, scaring potential investors, diverting public funds from services that benefit citizens and reducing compliance with regulation.*

Moreover, trafficking in persons can also fuel irregular migration. For instance, it amounts to irregular migration when children below the age of eighteen are compelled to move out from the custody of their loved ones and biological parents to destination where there is change of control, supervision and guardianship of the child which

(a) Is not in the interest of the child.

(b) Is inconsistent with the laws (domestic and international regulations dealings in the affairs of the child)

(c) Lacks parental/guardians' consent or such consent is obtained by coercion, duress or fraud.

Trafficking in persons is ranked as the world's third target and lucrative organized crime, second only to trafficking in drugs and the arms trade (National Agency for the Prohibition of Trafficking in Persons, 2014). In fact, both trades are interwoven with one another making it a very organized crime. According to the United Nations office on Drugs and Crime (UNODC, 2017) some 2.5 million people are subjected to human trafficking at any given time. It is therefore a serious global and national social and economic crisis. It can lead to other consequences such as the use of child-soldier, HIV/AIDS pandemic malnutrition and diseases, Covid-19 variants etc.

It is also easy to see the nexus between trafficking in persons and the spread of HIV/AIDs and other diseases which could lead to massive loss of precious lives. This also leads to the under development of human capital who are wasted through harsh condition of migration, diseases and infection and it is a truism to say that no effort is made anywhere in the world to develop the victims of human trafficking.

As a final comment to be made in this regard, trafficking in person can yield or lead to insecurity through migrations, social breakdown and exclusion such as the use of child-soldiers and / or deploying victims to espionage assignments. Finally, "it promotes money laundering and other financial crimes which can distort the economy: it can bring about a negative image for the country wherein anybody from that country will be perceived as a person of no moral standard since he/she comes from a country known for trafficking in persons. This is a national embarrassment and will need thousand and millions of monies invested in image laundering to clear the mess brought about by the activities of those involved in human trafficking. It is

to solve this numerous problem that group guidance and individual counseling must be called to bare to change the get- rich-syndrome.

Implication for guidance and Counselling

Guidance by way of definition is a cluster of educational activities geared towards the creation of awareness which will in turn prevent problems and challenges for a social group. While counselling on the other hand is that process which takes place in a one-to-one relationship between an individual troubled by problems with which he cannot cope alone, and a professional worker whose training and experience have qualified him to help others reach solutions to various types of personal difficulties (Udechukwu, 2014). This definition clearly shows that guidance is preventive while counselling is curative. Secondly the definitions shows that guidance is group oriented while counselling is individual oriented. Both sister concepts therefore go hand in hand and are not by any means limited to what happens within the inner perimeters of the school settings. Hence, Guidance and Counselling, especially group guidance, can be organized for Nigerian Parents and their wards as a preventive measure for persons attracted to human trafficking. While counselling on individual basis will serve as curative measures for victims of human trafficking.

It is therefore, within the scope of Guidance and Counselling to make services available for the Nigerian Parents and potential youthful travelers in a warm and threat-free environment. The Guidance Counsellor can organize awareness, seminars, workshops and/or conferences where they would interact with the parents and youths to discuss their challenges, educate the people on the dangers of travelling outside the country with legitimate valid papers. Also, the Guidance Counsellors must educate the people on the risks and negative consequences of choosing trafficking in persons as a lee-way to financial Eldorado.

These types of interactive sessions will be free from the usual support given by kindred meetings that are usually backed with rules and regulations with corresponding sanctions. The guidance and counselling interaction must be cordial, free, warm, friendly, threat-free and devoid of any kind of payment and/or sanctions.

This interaction sessions can be organized in synergy with the religious leaders and the church. This is because parents, youths and most Nigerians find it easier to assemble in church environments or setting such as town halls, civic centers and villages squares. It is upon this background that this researcher suggests that the training of Guidance Counsellors in Nigeria must be upgraded to include proficiency and needed competencies in the crucial areas of trafficking in persons, effects of poverty, child abuse, wife abuse, husband abuse, value orientation etc. This training will act as pre-requisite for their relevance in Guiding and Counselling victims of human trafficking.

These interactive sessions will help all stakeholders to air their views on any matter that worries them, share their views on issues corruption, unemployment get-rich-quick syndrome, lack of core values of hard-work, perseverance, coping strategies for the teaming adolescents and young persons. Coping with irresponsible parents that cajole their children to make money at all cost. This intermittent interactive session gives the operators and victims of trafficking in person a sense of we are in the public eyes", Such seminars, workshop and conferences are in themselves refreshing, preventive and curative.

Conclusion

Trafficking in persons is prevalent in Nigeria especially among young women. It appears that the impact of poverty, unemployment, quick money mentality, over-expectations, immature and frantic approach to financial stress, over-demanding from parents, curiosity have all combined with causes such as hereditary, environmental discomfort and poverty etc. Have rendered the youth especially young women vulnerable to human trafficking. The conclusion is that creation of awareness through seminars, workshop and conferences will reduce these incidents of human trafficking, especially when such enlightenment and awareness creation are done in synergy with the church leaders. Guidance and Counselling techniques and services rendered in a threat-free, cordial, warm and encouraging environment will not only prevent further cases, and or reduce same to the barest minimum.

Suggestions:

Sequel the enormity of the risks and negative consequences of trafficking in person the following suggestions are hereby made:

1. Guidance and Counselling techniques and Services should be used to create awareness concerning the risks and dangers of human trafficking.
2. Seminars, workshop and conferences should be used to discourage trafficking in persons especially when done in synergy with the church leadership.
3. Counsellors' training should also be reviewed by curriculum planners to include strategies for curbing trafficking in persons, inculcation of family core values such as hard work, honesty, perseverance, and of course, setting the right goals.
4. Government at all levels should strive to create more jobs and build more skill acquisition centers as well as give the young graduates incentive such as grants, soft loans enabling environment to come out of poverty.
5. The judiciary should be fearless in issuing sanctions and severely punish traffickers as well as rehabilitate victims of trafficking in person while making effort to maintain confidentiality when counselling victims.

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Causes of Students' Poor Attendance to Early Morning Lectures in Abia State College of Education (Technical) Arochukwu

Onyeachu, J.A.E.
Department of Curriculum & Instruction
Abia State College of Education (Technical), Arochukwu

Abstract

This study investigated the causes of students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu. Descriptive survey design was adopted. Twenty item questionnaire was developed and validated by the five experts and its reliability calculated using Cronbach Alpha and it gave a reliability index of 0.820. The population for the study comprised of all the 120 students made up of 75) NCE III students and 45 NCE II students. Using mean statistic, it was found out from the study among others that lack of interest on the part of students, lack of seriousness to study, inability of students to manage their time well are the major causes of students' poor attendance to early morning lectures. Home factors were identified such as lack of money and distance from school. It was therefore recommended among others there should be constant checking of students' attendance to lectures using attendance register.

Introduction

Regular attendance to lectures is very important especially in teacher training institutions because it is in teacher training institutions that teachers are trained for effective performance of their duties. Hence, Federal Republic of Nigeria (FRN 2013:43) through the National Policy on Education charged teacher training institutions to produce highly motivated, conscientious and efficient classroom teachers for all levels of educational system. This objective of producing efficient classroom teachers cannot be achieved if curriculum content is not effectively covered while teaching in the classroom (Onyeachu, 2011). Teacher training institutions are meant to produce specialist teachers for pre-primary education, primary education, junior secondary education, adult education and non-formal education as well as special needs education. To this effect, the National Commission for Colleges of Education produced a new minimum standard document containing the content to be covered within the period of three years for one to get Nigeria Certificate in Education (NCE) (Federal Republic of Nigeria, 2012). The content as contained in the minimum standard cannot be covered if there is irregularity in attendance to lectures. Regular attendance to lectures is very important, because according to Onyeachu (2011) irregularity to lectures militates against effective curriculum implementation. This is because the curriculum of any subject is systematically planned as such; any topic not learnt will affect the full learning and the understanding of the other topics. Onyeachu (2011) therefore, lamented that situation where majority of the students will be missing the first two lessons every day, one wonders how such students can perform well in examination. It is equally very difficult for the lecturer to cover the content of the curriculum and teach for mastery. This ugly situation is a cog in the wheel of curriculum implementation and production of quality teachers. Therefore, this study set out to find the causes of students' poor attendance to early morning lectures and to recommend ways of improving students' attendance to early morning lectures.

The problem of this study is therefore aimed at finding the causes of students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu where poor attendance to early morning lectures is mostly noticed.

Statement of the Problem

The Poor attendance to lectures noticed among students in institutions of learning has generated worries and great concern among school administrators, lecturers (teachers), educators and researchers. The most disturbing aspect of this bad behaviour is noticed in tertiary institutions (Ayodele, 2017). Poor attendance to lectures is equally noticed in Teacher Training institutions. This is a disturbing situation because, Federal Republic of Nigeria (FRN, 2013) through her National Policy on Education expected teacher training institutions to produce highly motivated, conscientious and efficient classroom teachers for all levels of education system. There is, therefore, the urgent need to curtail the excesses of truancy so that the objective of producing conscientious and efficient classroom teachers will be achieved for all levels of education. Up to these recent times, the cry over students' poor attendance to lectures is still worrisome. The most disturbing aspect of truancy among students is that in most cases, those truants do not attend morning lectures. This study therefore deemed it very necessary to investigate the causes of students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu where poor attendance to early morning lectures (8.am to 9.am lectures) is overtly noticed.

The objective of the study was to investigate the causes of students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu. The specific objectives of the study are to identify the:

1. school factors that cause students' poor attendance to early morning lectures.
2. home factors that cause students' poor attendance to early morning lectures.
3. societal factors that cause students' poor attendance to early morning lectures.

In line with the purpose of the study, the following research questions were posed:

1. What are the school factors that cause students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu?
2. What are the home factors that cause students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu?
3. What are the societal factors that cause students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu?

Research Method

Descriptive survey research design was adopted for the study. Descriptive research design is suitable for the study as it will enable the researcher to find the opinion of both students and lecturers on the causes of students' poor attendance to early lectures. The study was conducted in Abia State College of Education (Technical) Arochukwu. The choice of Abia State College of Education (Technical) was as a result of frequent reports of students' poor attendance to early lectures by lecturers. The instrument used in this study was twenty (20) item questionnaire titled "questionnaire on causes of poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu". The items in the questionnaire were structured using 4-point Likert scale. The instrument contained two parts. Section A, provided background information, while section B provided information on the causes of students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu. To ensure the validity of the instrument, five experts were given the instrument for validation. They are two (2) experts from measurement and evaluation, two (2) from curriculum studies, and one (1) from English Language. The suggestions and corrections they made were incorporated in the final version of the instrument. The items were trial-tested by administering it to twenty (20) students

that are not part of the sample but are equivalent to the sample. The instrument has reliability of 0.820. The instrument was administered by the researcher, the return made was 100%.

The instrument was administered by the researcher. The data collected were analyzed using mean score, mean of 2.50 was chosen as a criterion for acceptance as causes of Abia State College of Education (Technical) Arochukwu students' poor attendance to early morning lectures. Mean below 2.50 was rejected because they are not causes of students' poor attendance to early morning lectures.

The study adopted survey research design. This design was used to investigate the causes of students' poor attendance to early morning lectures. The study was conducted in Abia State College of Education (Technical) Arochukwu, Arochukwu Local Government Area of Abia State of Nigeria. Arochukwu is located at the Southern end of Abia State being bounded in the North and North-East by Abriba and Ohafia towns respectively: in the South-East by Cross River State and West by Akwa Ibom State.

The population of the study is made up of all the seventy-five (75) NCE III students and forty-five (45) NCE II students in Abia State College of Education (Technical) Arochukwu. There was no sample for the study since the population is manageable. One hundred and twenty (120) students from both NCE III and NCE II students in Abia State College of Education (Technical) Arochukwu were used for the study. These NCE III and NCE II students were chosen for the study because they are in their final and semi-final years. They have stayed three years and two years respectively in the College. Hence, they are in position to give correct responses to the questions and items of the study.

Results

Research Question 1: What are the school factors that cause students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu?

Table 1

Mean and standard deviation ratings of NCE III students on whether school factors cause students' poor attendance to early morning lectures in ASCETA

n = 75

S/N	Item Description	Total	Mean ($\bar{x}$)	Decision
	The following school factors constitute the causes of students' poor attendance to early morning lectures in ASCETA			
1.	Laziness on the part of the students.	245	5.44	Agree
2.	Non-strict compliance to rules of 75% attendance to lectures legible for writing examination.	208	4.62	Agree
3.	Some students are not serious with their studies	260	5.77	Agree
4.	Influence of bad friends	249	5.53	Agree
5.	Lack of interest to learn	275	6.11	Agree
6.	Relying on sorting	187	4.15	Agree
7.	Lecture halls are not opened on time	190	4.22	Agree

Result obtained in table 1 revealed that all the seven (7) items scored above 2.50. item 1 scored mean of 5.44, item 2 scored mean of 4.62, item 3 scored mean of 5.77, item 4 scored mean of 5.53, item 5 scored mean of 6.11, item 6 scored mean of 4.15, item 7 scored 4.22, item 5 which has the highest score of 6.11 is a clear indicator that lack of interest to learn is the major cause of ASCETA students' poor attendance to early morning lectures.

Table 2:

Responses from NCE II students on whether school factor constitutes causes of students' poor attendance to early morning lectures in ASCETA

n = 45

S/N	Item Description	Total	Mean ($\bar{x}$)	Decision
	The following school factors constitute the causes of students' poor attendance to early morning lectures in ASCETA			
1.	Laziness on the part of students	148	3.28	Agree
2.	Non-strict compliance to rules of 75% attendance to lectures	146	3.24	Agree
3.	Some students are not serious with their studies	157	3.50	Agree
4.	Influence of bad friends	157	3.40	Agree
5.	Lack of interest to learn	147	3.26	Agree
6.	Relying on sorting	130	2.88	Agree
7.	Lecture halls are not opened on time	112	2.48	Disagree

Result obtained from table 2 showed that all the seven (7) items scored means above 2.50 except item 7 which had a low mean of 2.48. A low mean of 2.48 is an indicator that lecture halls are not opened on time is not a cause of poor attendance to early morning lecture in ASCETA. Item 1 had a mean of 3.28, Item 2 had a mean of 3.24, item 3 had a mean of 3.50, item 4 had a mean of 3.40, item 5 had a mean of 3.26, item 6 had a mean of 2.88, item 3 had the highest mean of 3.50 which showed that one of the major causes poor attendances to early morning lecture is that some students are not serious with their studies.

Research question 2: What are the home factors that cause students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu?

Table 3

Responses from NCE III students on whether home factor constitute causes of students' poor attendance to early morning lectures in ASCETA

n = 75

S/N	Item Description	Total	Mean ($\bar{x}$)	Decision
	The following home factors constitute the causes of students' poor attendance to early morning lectures in ASCETA			
1.	Improper time management.	242	3.37	Agree
2.	Distance from home to school	218	4.84	Agree
3.	Running small scale business	221	4.97	Agree
4.	Lack of money for transportation	236	5.24	Agree
5.	Majority of the students trekked to school	225	5.00	Agree
6.	Frequent attendance to night parties	241	5.35	Agree
7.	Majority of the students are living off campus	222	4.93	Agree
8.	Lack of money for transportation	217	4.82	Agree
9.	Frequent travelling by students	241	5.35	Agree
10.	Students who stay with their parents find it difficult to cope with early morning classes due to chores at home	186	4.13	Agree
11.	Pride on the part of the students	164	3.64	Agree

Results obtained from table 3 revealed that all the 11 items scored a mean above 2.50. Item 1 scored a mean of 5.37, item 2 scored a mean of 4.84, item 3 scored a mean of 4.91, item 4 scored a mean

of 5.24, item 5 scored a mean of 5.00, item 6 scored a mean of 5.35, item 7 scored a mean of 4.93, item 8 scored a mean of 4.82, item 9 scored a mean of 5.35, item 10 scored a mean of 4.13, item 11 scored a mean of 3.64. Item which scored the highest mean of 5.37 is a clear indicator that home factor which causes students' poor attendance to early morning lecture is improper time management.

Table 4

Responses from NCE II Students on whether home factors contribute to poor attendance to early morning lectures in ASCETA

n = 45

S/N	Item Description	Total	Mean ($\bar{x}$)	Decision
	The following home factors constitute the causes of students' poor attendance to early morning lectures in ASCETA			
1.	Improper time management	136	3.02	Agree
2.	Distance from home to school	125	2.77	Agree
3.	Running small scale business by students	125	2.77	Agree
4.	Lack of money for transportation	134	2.97	Agree
5.	Majority of the students trek to school	110	2.44	Disagree
6.	Frequent attendance to night parties	101	2.24	Disagree
7.	Majority of the students are living off campus	104	2.31	Disagree
8.	Frequent traveling by students	128	2.84	Disagree
9.	Students who stay with their parents find it difficult to cope with early morning classes due to chores at home	132	2.93	Agree
10.	Pride on the part of students	124	2.75	Agree

Result obtained from table 4 revealed that seven (7) items out of ten (10) items scored a mean above 2.50. While three (3) items scored mean below 2.50. Item 1 scored a mean of 3.02, item 2 scored a mean of 2.77, item 3 scored a mean of 2.77, item 4 scored a mean of 2.97, item 5 scored a mean of 2.44, item 6 scored a mean of 2.24, item 7 scored a mean of 2.31, item 8 scored a mean of 2.84, item 9 scored a mean of 2.93, item 10 scored a mean of 2.75. While item 5 scored a mean of 2.44, item 6 scored a mean of 2.44, item 7 scored a mean of 2.31. the highest mean of 3.02 scored by item 1 is a clear indication that causes of ASCETA students' poor attendance to early morning lecture is mostly improper time management. Other home factors which the findings from the study revealed was bad road, which resulted to the problem of transportation system contributed to students' poor attendance to early morning lecture in Abia State College of Education (Technical) Arochukwu.

Research Question 3: What are the societal factors that cause students' poor attendance to early morning lectures in Abia State College of Education (Technical) Arochukwu?

Table 5

Responses from NCE III students on whether societal factor constitutes causes of students' poor attendance to early morning lectures in ASCETA.

n = 75

S/N	Item Description	Total	Mean ($\bar{x}$)	Decision
	The following societal factors constitute the causes of students' poor attendance to early morning lectures in ASCETA			
1.	Bad road	197	4.37	Agree
2.	Frequent internal crisis in the community	160	3.55	Agree

Results obtained in the table 5 showed that the two (2) items scored a mean above 2.50. Item 1 scored a mean of 4.37, item 2 scored a mean of 3.55. A higher mean of 3.55 indicate that frequent internal crisis in the community contributes to students' poor attendance to early morning lectures.

Table 6:

Responses from NCE II Students on whether society contributes to poor attendance to early morning lectures in ASCETA

n = 45

S/N	Item Description	Total	Mean ($\bar{x}$)	Decision
	The following societal factor constitute the causes of students' poor attendance to early morning lectures in ASCETA			
1.	Poor transportation	143	3.17	Agree
2.	Bad road	129	2.86	Agree
3.	Frequent internal crisis in the community	96	2.13	Disagree

Results obtained in table 6 showed that two (2) out of three (3) items had mean above 2.50 whereas only one (1) item scored a mean below 2.50. Item 1 scored a mean of 3.17, item 2 scored a mean of 2.86, while item 3 scored a mean of 2.13. The highest mean of 3.17 scored by item 1 is a clear indicator that transportation contributes to ASCETA students' poor attendance to early morning lectures. The low mean of 2.13 scored by item 3 showed that frequent internal crisis in the community of Arochukwu does not cause ASCETA Students poor attendance to early morning lectures.

Summary of Findings

The findings of the study revealed that major cause of students' poor attendance to early morning lectures in ASCETA is that majority of the students lack interest in learning. They are not serious with their studies. Most of the students are being influenced by their bad friends, ASCETA students travel too much, hence, they return late to school. Lack of money for transportation constitutes a problem.

Discussion of Findings

The findings of the study showed that many factors contributed to ASCETA students' poor attendance to early morning lectures. Such factors emanate from school, home and society. One of the findings of this study in the area of school factors is in line with the one the findings of Alua (2013) who conducted a study on how attendance affects general success of students. The findings of the present study in addition supports the finding of the research carried out by Komakech and Osuu (2014) who found students household work as one of the causes of students' poor attendance to lectures/lessons. The findings of this present study corroborate the finding of the study carried out by Khana (2019) who fund influence of friends and classmate as some of the factors responsible for students' poor attendance to lectures.

Conclusion

Attendance to early morning lecture is very important. This is because curriculum implementation is very effective when all the content (teaching topics) of the entire subject (course) is fully taught in the classroom. As such all stakeholders to curriculum implementation in teacher education institutions (such as the Provost, School Management, Lecturers, students and Parents should

put their human (heads) and material resources together so as to produce highly motivated and conscientious classroom teachers for all levels of education in Nigeria.

Recommendations

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

1. The school administration and members of the College management should provide series of rewards to hard working students such as automatic employment to first class students during graduation ceremony.
2. There should be yearly reinforcement for students at the end of every academic session, the list containing the names of students with highest cumulative average should be provided by Deans of every school. These students are to be called by the Provost (school administrator) where gifts of different types including notebooks and other writing materials will be provided to them during official gathering in the College.
3. There should be constant check on students' attendance to lectures. This could be done using lecture attendance form, whereby students write their names at the beginning of every lecture.
4. For accurate selection of students that attend early morning lectures, lecturers should use sociometric technique, a technique whereby students are instructed by their lecturers to write in a sheet of paper the students in their class that attend early morning lectures. The names should be recorded and forward to the Dean of schools.
5. Students should prepare all their major domestic activities in the evening so that early morning will be for their lectures as students.
6. Students should have a well detailed systematically planed personal time table, setting apart 7am to 4pm each day for their lectures.
7. Students should use their vacation period for their small-scale business or for their personal activities that are domestic oriented.
8. School administrators (Provost, School Management, Deans, Directors, and Heads of Departments should organize orientation and re-orientation programmes to acquaint learners (students) with the dangers of poor attendance to lectures especially morning lectures.
9. School administrators (Provost, Rectors) of tertiary institutions should create awareness to the parents on students' poor attendance to lectures. This could be done during matriculation and convocation ceremonies.
10. Parents should assist the children/wards by providing all the necessary school materials by so doing, the dangers of students going to search for money during school period will be reduced.
11. Since poor transportation is a cog on the wheel of students' attendance to early morning lectures, students should endevour to live very close to the school. Students should equally start going to school very early every school day.
12. Living in the hostel should be mandatory for all NCE I (first year students and NCE III (final year students.

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Development of Computerized Students' Project Management System (CSPMS) for Enhancing Students' Research in Public Universities in Akwa Ibom State

Nwangwu, E.C. and Asuquo, G.E.
Department of Computer and Robotics Education,
University of Nigeria, Nsukka.

Abstract

The study focused on the development of computerized project management system for enhancing students' research in public universities in Akwa Ibom State. The researchers embarked on this study in order to transform the current approach and methods used in managing the diversity of projects of final year students, ranging from the start of a project to completion and final hosting of the project online. The study adopted research and development design by Gall, Gall and Borg (2007), with four phases – Needs Assessment, Development of CSPMS, Validation of the CSPMS, and Trial-testing the CSPMS. The CSPMS was developed based on the Agile software development Model. The study's participants comprised 26 lecturers, 16 ICT staff and 65 students, and all from the Faculty of Education. The participants were selected based on their willingness to participate in the study. The instrument for data collection was a structured questionnaire that was face-validated by 3 experts in order to check for its suitability for the study. Cronbach Alpha reliability method was used to determine the reliability index (0.76) of the instrument. The data collected for the study were analyzed using mean scores and standard deviations. The findings of the study revealed that the CSPMS was very effective based on its functionality and participants' level of satisfaction with the system compared to the traditional form of project/thesis management in the universities. It was therefore recommended among others that the school administrators should adopt CSPMS to automate project/thesis management electronically, which is easier to use, manage, and faster in operations. Also, students and lecturers should be encouraged to use the new system for online project/thesis management since CSPMS is secured and can be accessed irrespective of geographical location.

Keyword: Software Development, Project, Project Management System, Students' Research, Computerization

Introduction

A project is an endeavor or task undertaken to create a unique product, service or result/outcome. According to Hampshire College (2020), a project is a process of systematic inquiry that entails the collection of data, documentation of critical information and analysis of data/information in accordance with suitable methodologies set by specific professional fields and academic disciplines. Projects require students to do an in-depth study of the topic they are to write and to go into the discipline to research about the concept that requires to be investigated. They are developed from researches conducted by researchers in order to answer research questions posed in the study. Projects are one of the final year requirements and criteria for graduation, which indicates that every student, having offered a number of courses and stayed the number of years required for successful graduation, must have encountered some issues in his disciplines that needs to be solved through investigation, analysis and reporting of findings.

Research project is one form of assessment the final year students carry out to test their ability to conceptualize and organize materials in a project form with a view to solving a problem. It is thus expected that a graduating student should master the skills and internalize the procedure for solving

societal problems through research approach. On the other hand, research can be described as a process through which new knowledge is discovered (U.S. Department of Health and Human Services, 2005; Kempen, 2012). It can also be defined as the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings (O'Donnell, 2012). According to Kowalczyk and Scalia (2003), research is a careful and detailed study into a specific problem, concern, or issue using the scientific method.

Based on the definitions of research given above, a final year student in a Nigerian university is expected to write a research project to demonstrate mastery of skills and procedures for result-oriented research. This is done under the supervision and guidance of a lecturer called the project supervisor. When students are assigned supervisors, they must work with their supervisors to obtain project titles for approval. The title so approved is often generated from an identified problem. With the guidance of the supervisor, the student is expected to read wide on the area of concern in order to establish a wide range of literature. Research questions and hypotheses are also generated to guide the research after which data are collected from an identified and relevant population for the study. The data so collected are subsequently analyzed and interpreted with a view to drawing conclusion. Many social sciences and humanities programmes in public universities in Nigeria generally adopt the above approaches for students to successfully write a final year research project before graduation.

More often than not, some students find it difficult to successfully write their research projects due to the fact that either they are not well-guided to follow this procedure or that they fail to grasp the skills for doing so. It is against this backdrop that this study is undertaken to develop a software to enhance research project writing by students in public Universities thereby enabling a proper management of research project. Management is a process of planning, decision making, organizing, leading, motivation and controlling the human resources, financial, physical, and information resources of an organization to reach its goals efficiently and effectively (iEdunote, 2017). In the context of this study, management involves the process of planning, investigating, analyzing & reporting the outcome of a research in a project document. The skills taken in managing a project system include the appointment of project supervisors, selection and approval of a project topic, registering of the project topic, writing of project, data collecting process, review and correction of project and reporting research output. Most times, the manual project management system has caused severe trauma and stress to both the students and supervisors. Such issues include corrections made are sometimes not reflected; there is often lack of adequate and regular feedback from supervisors, inadequate or poor communication between the supervisor and supervisee, non-identification of plagiarism; it is hard to find out if the selected topic has been conducted before; huge money spent by distant students in mailing their projects through post offices which could be delayed and sometimes could be misplaced, among others. These problems have caused the delay of their graduation. This could lead to psychological trauma, helplessness, depression, and frustration leading some of them into crimes and desperate behaviours. Furthermore, some supervisors are hardly available in their offices and sometimes do not pick calls as well which drastically affects timely completion of research projects. In order to curb all of these issues, the researchers developed a computerize the project management system (CSPMS) for an enhanced quality research product.

A Computerized Students' Project Management System (CSPMS) is a web application designed to assist students and academic supervisors in the selection, planning, organizing, investigating, and reporting of research projects and the resources applied to the projects. The CSPMS web-based application can be used to assign supervisees to supervisors, title selection and approval, materials' gathering and content development, content review, correction and approval for presentation/defence, and then the final production and submission for signing and distribution to the university, faculty and departmental libraries.

CSPMS is a web application that runs in the online web browser and stores its critical documents in the cloud. A web application is a computer program that utilizes web browsers and web technologies to perform tasks over the internet (StackPath, 2016; Ern, 2019; indeed, 2022). The web applications are usually coded in browser-supported languages such as HTML5, Cascading Style Sheet (CSS), PHP, MySQL and JavaScript as these languages rely on the browser to render the program executable. The application can however be accessed by the end-user through a web browser such as Google Chrome, Safari, Mozilla Firefox, Edge or any other web browser. In the development of CSPMS website, there are several modules that are considered and incorporated into it. These modules include Registration Module (for registering new users under the following sections: students, lecturers, and the Head of Department); Upload and Download Modules (for uploading of documents like abstracts, main project, corrected versions, or synopsis by the students, and as well for downloading the necessary documents by the lecturer/supervisor); Previous Year Project Module (for maintaining the previous years' project details so that users/supervisees can download previous projects in the archive for use as a guide to writing their own projects); Notification Module (for sending the necessary instructions or notifications regarding the project process which can be viewed by students); Admin Module (for processing various functions such as assigning supervisees to supervisors, uploading of project guides, announcements, announcements/notifications regarding seminar defence or meetings, etc.); Student Module (for abstract submission as well as thesis or any other project related documents' submissions); Project Allocation Module (to help students identify researchable cases before submitting to the project supervisor for approval); Communication Module (for general communication between students, lecturers and the Head of Department); Project management Module (it provides a new and convenient channel for meeting and discussion between students and supervisors, and it includes chat and messaging functionalities which are provided for students to discuss with their supervisors one-on-one); File Sharing and Repository Modules (for sharing of source codes, documents and other important resources related to the project with lecturers/supervisees and others); Submission and Grading Module (it enables students to submit/upload their final projects to the system for final assessment and grading/reporting by the supervisors).

In developing a standard software such as a web application, programmers often choose a software development model that meets with the requirements of such software. This is also known as Software Development Life Cycle and it has phases. Software models include the Waterfall, Spiral, V-Shape, Rapid Application Development (RAD), prototype, agile, Incremental and Iterative models. The present study adopted the Agile software development model. The Agile software development methodology centers around time-boxed project cycles known as sprints (QualityLogic, 2022). It is the advanced model of Waterfall. The choice of Agile model is based on the fact that final year students are often given a shorter period of time to complete their final year projects in order to enable them graduate on time. Secondly, the new system to be developed would not be too large to necessitate the use of the Waterfall model, which may affect timely release of the new system. Agile model is a model that guides the development of a time-bound web-based systems that require regular evaluation by in-house users, and it is flexible enough to adjust to future situations (SimpliLearn, 2022). The phases of Agile software development model are Planning, System Analysis and Requirement, System Design, Development, Integration and Testing, Implementation, Operations & Maintenance.

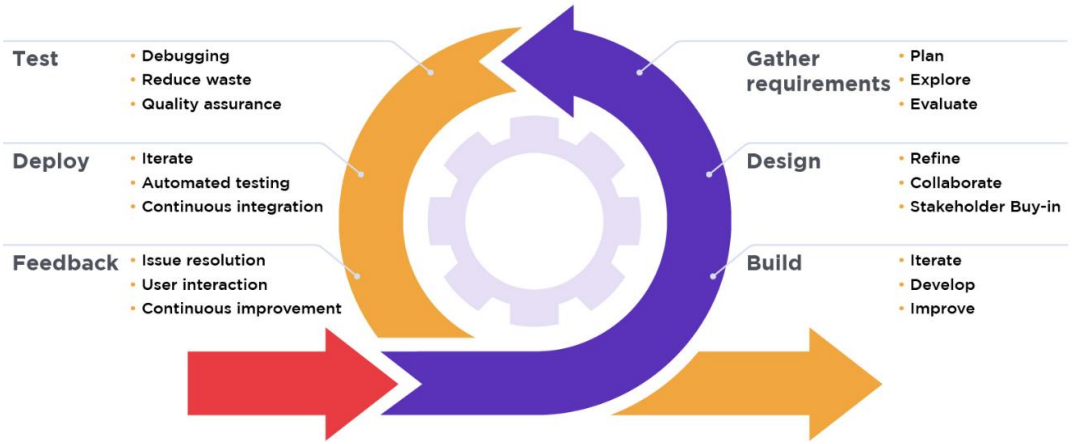

Figure 1: Stages of Agile Modelling
Source: SimpliLearn (2022)

Statement of the Problem

The traditional (manual) method of project management which has been very inconvenient for both students and lecturers needs to be reconsidered based on certain shortcomings observed in its implementation over the years in Nigerian universities. The delay in the submission of projects by students leads to delay in students' graduation. Lack of proper communication can be another bottleneck hindering completion of a project. The traditional system does not enable easy communication as it requires physical presence between the supervisor and supervisee. The manual process is considerably difficult in a situation where there is a need to locate student's files to retrieve previously stored record because it takes a long time due to the volume of submissions and sometimes, the record or data sought may not necessarily exist or have been misplaced. Moreover, in the event of any losses or damages to students' project files and no backup files are available, the students may risk restarting the work afresh, which is often disheartening considering the efforts put in by the student in writing the project. Furthermore, the continuous printing of project for the purpose of correction at the different levels of the project research processes is very expensive and, in most cases, students' do not have enough resources to cope with such requirements. Final year project is a major criterion in tertiary education for successful graduation of students after staying the required number of years stipulated by institutions. It is based on the aforementioned that the researchers developed a web-based student project management system for easy and quick handling of students' project matters.

Purpose of the study

The main purpose of this study was to develop a Computerized Students' Project Management System (CSPMS) for enhancing students' research in public Universities in Akwa Ibom State. Specifically, this study sought to:

1. determine the objectives of CSPMS
2. determine the software requirements for developing the CSPMS
3. development of the CSPMS
4. validate the CSPMS
5. trial test the developed CSPMS

Methodology

The study was conducted in two public universities (University of Uyo and Akwa Ibom State University) in Akwa Ibom State. The study adopted research and development design by Gall, Gall and Borg (2007), with four phases – Needs Assessment, Development of CSPMS, Validation of the CSPMS, and Trial-testing the CSPMS. The CSPMS was developed based on the Agile software development Model with the following phases: Planning, System Analysis and Requirement, System Design, Development, Integration and Testing, Implementation, Operations & Maintenance. The study's participants comprised 26 lecturers, 16 ICT staff and 65 students, and all were selected from the Faculty of Education in the respective universities covered in this study. The participants were selected based on their willingness to participate in the study.

A questionnaire titled "Computerized Students' Project Management System Questionnaire" (CSPMSQ) was developed by the researchers as the instrument for data collection. The questionnaire is made up of two parts: The Part A comprising of demographics and Part B for eliciting information from respondents based on the specific purposes posed in the study. The specific purposes 1 and 2 have four-point rating scale coded as follows: 4 = Highly Important (HI), 3= Important (I), 2 = Slightly Important (SI) and 1 = Not Important (NI); while specific purposes 3 and 4 have four-point rating scale with the following coding sequence: 4 = Strongly Agree (SA), 3 = Agree (A), 2 = Disagree (D) and 1 = Strongly Disagree (SD). The instrument was face-validated by 3 experts in order to check for its suitability for the study. Cronbach Alpha reliability method was used to determine the reliability index (0.76) of the instrument.

The instrument (CSPMSQ) was administered to the respondents with the assistance of three research assistants. The research assistants were briefed on the modalities for distributing and collecting the questionnaire from the respondents on the spot. This was to ensure that the respondents appropriately completed the questionnaire with high-return rate. The data collected for this study were analyzed using mean scores and standard deviations. The analysis was done in SPSS version 22. For the interpretation of the results, items greater than or equal to 3.50 are Highly Important (HI)/Strongly Agree (SA); items greater than or equal to 2.50 and less than 3.50 are Important (I)/Agree (A); items greater than or equal to 1.50 and less than 2.50 are Slightly Important (SI)/Disagree (D); and items less than 1.50 are Not Important (NI)/Strongly Disagree (SD).

Presentation and Analysis of Data

This section presents in tables the results of the analysis of the data collected for the study, according to the specific purposes.

Objective 1: the objectives of CSPMS

Table 1

Mean Scores and Standard Deviations of Responses of Respondents on the Objectives of the Computerized Students' Project Management System (CSPMS) for Universities in Akwa Ibom

S/N	ITEMS	Mean	SD	DECISION
1	Registration of students' topics	3.59	0.505	HI
2	Documentation of projects	3.46	0.511	I
3	Approval of project topic	3.58	0.585	HI
4	Update students' and lecturer records regularly	3.45	0.542	I
5	Scheduling of project defense	3.64	0.482	HI
6	Project submission and defense	3.45	0.521	I
7	Communication between lecturer and student	3.38	0.600	I
8	Backup records of students and lecturer regularly	3.40	0.502	I

9	Track project progress	3.50	0.608	HI
10	Set deadline of task	3.43	0.508	I
11	Set notification of activities	3.44	0.627	I

The data presented in Table 1 showed that items 1, 3, 5, and 9 have mean values ranged from 3.50 to 3.64 indicating that the items were rated Highly Important (HI) while the rest of the items have mean values ranged from 3.38 to 3.46 indicating that the items were rated Important (I) by the respondents. This implies that the respondents agreed that the items constitute the objectives of Computerized Students' Project Management System (CSPMS). The standard deviations of the items ranged from 0.482 to 0.627 which revealed that the respondents were close to one another in their opinions.

Objective 2: the software requirements for developing the CSPMS

Table 2

Mean Scores and Standard Deviations on the Software Requirements of the New System

S/N	ITEMS	Mean	SD	DECISION
12	Programming/Scripting language - JavaScript	3.39	0.667	I
13	Local Server – XAMP, WAMP, etc.	3.26	0.585	I
14	HTML	3.55	0.632	HI
15	CSS	3.54	0.531	HI
16	Web Browser	3.54	0.570	HI
17	Oracle	3.27	0.503	I
18	My SQL	3.37	0.546	I
19	PHP	3.44	0.498	I
20	Apache	3.47	0.541	I

The data presented in Table 2 showed that items 14 - 16 have mean values above the real limit of 3.50 indicating that the items were rated Highly Important (HI) while the rest of the items were rated Important (I) since their mean values ranged from 3.26 to 3.47. This implies that the respondents agreed that all the items in the Table are the items constitute the software requirements for developing CSPMS. The standard deviations of the items ranged from 0.503 to 0.667 which indicate that the respondents were close to one another in their opinions.

Objective 4: validation of the CSPMS

Table 3

Mean and Standard Deviation on the Level of Acceptance of CSPMS by ICT Experts

S/N	ITEMS	Mean	SD	DECISION
21	CSPMS has a standard user interface	3.62	0.489	SA
22	CSPMS is compatible with mobile platforms	3.61	0.491	SA
23	Students' record/profile were registered successfully	3.64	0.546	SA
24	The Login task is functional	3.50	0.563	SA
25	Downloading of projects is easy and fast	3.52	0.600	SA
26	Uploading of projects is fast and easy	3.50	0.502	SA
27	Change of user's record was simple and flexible	3.57	0.582	SA
28	The approval of project was done without any errors	3.52	0.497	SA

The data presented in Table 3 showed that all the items have their mean values ranged from 3.50 to 3.64 which indicate that ICT Experts Strongly Agreed (SA) with all the items that evaluated the functionality of CSPMS. On the other hand, the standard deviation of the items ranged from 0.491 - 0.648 indicating that the respondents were close to one another in their opinions.

Objectives 5: trial test the developed CSPMS

Table 4

Mean and Standard Deviation on the Extent to which Users are Satisfied with the CSPMS

S/N	ITEMS	X	SD	DECISION
29	CSPMS has the potential to improve productivity	3.51	0.544	SA
30	The user interface is appealing	3.48	0.502	A
31	The system is easy to use	3.52	0.544	SA
32	CSPMS is very effective in performing tasks	3.49	0.564	A
33	CSPMS is great in storing project documents and other vital information	3.54	0.616	SA
34	CSPMS is user-friendly	3.43	0.539	A
35	The system allows me to conveniently track the progress of my project and set deadlines.	3.61	0.513	SA
36	CSPMS provides quick response to action	3.52	0.523	SA
37	I will be glad to have the CSPMS to make my project management process easier	3.57	0.539	SA
38	I am willing to recommend this software (CSPMS) to my institution	3.46	0.533	A
39	With CSPMS, I can easily dialogue with my supervisor on difficult or confusing aspects of my projects	3.57	0.540	SA
40	I like the way the CSPMS registered and stored user records	3.46	0.514	A

The data presented in Table 4 above showed that items 29, 31, 33, 35, 36, 37 and 39 have their mean values ranged from 3.51 to 3.61 indicating that the respondents (users of CSPMS) Strongly Agreed (SA) with the items. However, the remaining items (30, 32, 34, 38 and 40) have their mean values ranging from 3.43 to 3.49 which indicate that the respondents Agreed (A) with the items. This implies that the respondents found the CSPMS very satisfactory in managing students' projects online from conception to final assessment and grading. The standard deviations of the items ranged from 0.502 to 0.616, indicating that the respondents were close to one another in their opinions.

Discussion of Findings

The findings of the study based on specific objectives one revealed that the respondents agreed with all the objectives of the Computerized Students' project Management System. The items that constituted the objectives of CSPMS were all rated as important. This is in line with Nwangwu, Omeh and Okorie (2020), Ogba and Nwangwu (2021) and Nwangwu, Obichukwu, Uzuagu and Omeh (2021) who found out that every electronic training system should meet certain objectives that will guide its development and deployment. This is also consistent with what Okorie (2014) pointed out that there are needs that are specific to each software project, which require an understanding of the objectives of the task that the user needs to accomplish with the desired application.

The findings on specific purpose two revealed that the software requirements for developing CSPMS are Programming/Scripting language – JavaScript, Local Server – XAMP, WAMP, etc.,

HTML, CSS, Web Browser, Oracle, My SQL, PHP, and Apache. Among all the software requirements, HTML, CSS and Web Browser were rated highly important by the respondents, in developing the CSPMS. This agrees with Timotic (2018), who listed most popular Client-Side Scripting technologies to include: HTML (HyperText Markup Language), CSS (Cascading Style Sheets), JavaScript Ajax (Asynchronous JavaScript and XML), etc. while the most popular Server-Side Scripting technologies include: PHP (usually combines with MySQL database), ASP.NET (Microsoft's Web Application Framework – successor of ASP), etc.

The data presented in Table 3, addressed specific purpose four which focused on the validation of the CSPMS by ICT Experts. The findings revealed that ICT experts rated CSPMS as an effective functional system that can handle students' project management electronically with ease. The CSPMS's interface is found to be standard, it is compatible with mobile platforms, students' record/profile were registered successfully in the CSPMS, if has functional download and upload functions, projects were assessed and approved successfully, among others. This is in line with Nwangwu, Omeh and Okolie (2021) and Nwangwu (2018) whose developed software/web app were rated very functional by ICT Experts who evaluated their functionalities.

The data presented in Table 4, addressed specific purpose five which presented results on the trial-testing of CSPMS by users (students and lecturers). The findings revealed that students and lecturers are satisfied with the new system (CSPMS) based on certain tested criteria which include improved productivity, ease of use, user-friendliness, user registration and storage of records, quick response to user actions, among others. The findings also revealed that the respondents are willing to have the CSPMS for project management in their respective schools; and are willing to recommend CSPMS to their respective institutions. This is in line with Nwangwu (2018) whose study revealed that users were satisfied with the developed an Interactive PowerPoint Presentation Design Training Package (IPPDTP) for Lecturers of Tertiary Institutions in the South-East Nigeria.

Conclusion

The traditional method of managing students' projects has been the order of the day in universities especially in public universities in Akwa Ibom State. However, this method has had a lot of shortcomings ranging from cost of printing project documents, the delay in the submission of projects by students leading to delay in students' graduation, lack of proper communication between supervisors and supervisees based on distance or location to possible misplacement of project documents with no backup hosted online. In order to address these challenges, the researchers developed a Computerized Students' Project Management System that will ensure a convenient and effect students' project management process being that the final year project is a very integral part of assessment required for graduation. The findings of the study revealed that the objectives and software requirements for developing CSPMS were very important; the ICT Experts who evaluated the new system approved its functional elements indicating that CSPMS had a high level of acceptance; and the users (students and lecturers) who trial-tested the CSPMS were very satisfied with the operations and capability of the new system.

Recommendations

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

1. school administrators should adopt CSPMS to automate project/thesis management electronically, which is easier to use, manage, and faster in operations.
2. students and lecturers should be encouraged to use the new system for online project/thesis management since CSPMS access to the new system is assured irrespective of geographical location
3. Trainings should be carried out for both lecturers and students to educate them on how to use the computer and the CSPMS for project management.

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Strategies Adopted by Small and Medium Scale Enterprises (SMES) in Implementing Corporate Social Responsibility and Environmental Sustainability in Enugu State

Odokoro, G.C. [1], Uzuagu, A.U.[2], Abanyam, F.E.[3]

[1,2]Department of Business Education, University of Nigeria, Nsukka
[3]Department of Business Education, Ambrose Ali University, Ekpoma

Abstract

The study determined cooperate social responsibility and environmental sustainability strategies among SMEs in Enugu State. The study adopted descriptive research design. The population of the study was seventy-eight (78). Validated questionnaire was used for data collection. Mean and standard deviation were utilized for analyzing research question while ANOVA was used to test the hypothesis at 0.05 level of significance. Findings revealed that the strategies used by SMEs in implementing CSR in Enugu State included ensuring safety of employees, adequate waste disposal management and prevention of waste pollutants to host communities. Findings also indicated that the strategies used by SMEs in implementing ES included ensuring that the business activities do not affect the natural environment, reducing pollutants in the environment, implementing green manufacturing practices such as waste reduction, reuse and recycling, among others. ANOVA showed that there was no significant difference in the mean responses of SMEs on the strategies used in implementing environmental sustainability. Among recommendations made was that SMEs should engage in recycling of wastes from their activities

Keywords: Small and Medium Scale Enterprises (SMEs), Cooperate Social Responsibility (CSR), Environment, Sustainability, Strategies

Introduction

Small and medium enterprises (SMEs) are an integral part of the economy. Central Bank of Nigeria (CBN) (2014) cited in Ayozie (2019) classified SME as a firm with a workforce between 30 and not more than 300 workers and a capital involvement which ranges from N50m to N500m. Ayozie, Iliya and Adebayo (2021) noted that SMEs covers all economic activities including manufacturing, wholesale, retail trade, construction, processing and servicing which can be regarded as small in the given economy. SMEs are business enterprises owned by an individual to create values, which include economic, social, and environmental values (James, Ayodotun, Atolagbe, Maxwell, Augusta, Borishade & Fred,2018). These values enhance the economic growth of the nation, decrease poverty, and reduce unemployment (Fatoki, 2018). In most economies, SMEs spring up, and with their business activities, they improve the lives of the people and society (Jacinto & Du Preez, 2018).

SMEs are important for economic growth. SMEs are imperative to the growth of any nation (Masama & Bruwer, 2018). Bello, Jubril and Ahmed (2018) mentioned that SMEs are the ingredient for industrial development in a developing economy. Setting up small and medium manufacturing businesses could be through art, for instance, such as painting, bag making, shoemaking, and clothing with the use of locally sourced materials (Bello, *et al.*, 2018). Also, SME could involve food manufacturing from local producers that could reduce dependence on imported foods and increase the consumption of locally made products to boost the national economy. The National Bureau of Statistics

(2019) reported that in the past five years, SMEs in Nigeria have contributed about 48.5% of the national GDP. As observed by Obimgbo, Abanyam and Owenvbiugie (2022), small enterprises account for about 50% of the industrial jobs and nearly 90% of the manufacturing sector. Despite these numbers, most SMEs in Nigerua are not sustainable (Abanyam & Uwaimeye, 2019). Hence the need to to encourage the application of innovative strategies for the sustenance of their businesses (Feniser, Burz, Mocan, Ivascu, Gherhes & Otel, 2017).

The role of a sustainable business strategy is to have a positive impact on environment and the society. "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987) cited in (Scheyvens, Banks&Hughes, 2016). When companies fail to focus on sustainability, some form of harm will result such as environmental degradation, social injustice, and inequality (Feniser *et al.,* 2017). Engert, Rauter and Baumgartner (2016) addressed the integration of corporate sustainability into the strategic management of various firms in the industry, the need for the firms to ensure that there is a strategic approach as part of the business strategy and process. Baumgartner and Rauter (2017) defined sustainable development as an economic, environmental, and social development to meet present needs but not pose a threat to future generations. Therefore, sustainability takes care of both the present and the future to safeguard resources, meeting both present and future needs.

SMEs are responsible for ensuring sustainability of their business through innoative ideas. Organization can create new business models that ensure sustainability in the workplace (Roome & Louche, 2016). For these models to be successful, the businesses should be sustainable to the extent that they are beneficial to both business owners and society in general. Scheyvens, Banks and Hughes (2016) suggested that to ensure the sustainability of a business, the business needs to consider SDGs to improve the lives of the people in society. Small and medium enterprise owners should, therefore, come up with effective business models that will ensure success in whatever they do as a way of focusing on sustainability since it is clear such models put in place by business leaders can be sustainable in the long run. Sustainability exists both for the needs of the present generation and the needs of the generations to come by ensuring that the environment is well protected for the benefit of society in general.

The concept of sustainability is generally regarded as having emerged from the environmental perspective. Sustainability in the environmental perspective is about how to manage physical resources so that they are conserved for the future. The best way to ensure sustainability in SMEs is to make them focus on individual lifestyles and wellbeing as opposed to focusing on profits and the amount of revenue (Font, Garay & Jones (2016). The firms that focus on high profits tend to do everything to get them, and some of the measures they put in place may be detrimental to the lives of the people in society as well as the environment (Font *et al.,* 2016). According to Imran, Salisu, Aslam, Iqbal and Hameed (2019), in the era of industrial revelation 4.0 (IR 4.0), sustainability is a serious challenge of contemporary SMEs. Through their survey, they found that environmental and social responsibilities are equally important factors affecting sustainability. Hosseininia and Ramezani (2016) claimed that the environmental factors that include recycling and the future of the earth affect the sustainability of SMEs. However, securing shareholder value remains the overarching tenet in profit organizations. SMEs in the Pakistani leather industry perceive environmental sustainability as social and moral responsibilities towards their stakeholders and the natural environment (Wahga, Blundel, & Schaefer, 2018). Environmental sustainability can be achieved by SMEs through business objectives in form of corporate social responsibility (CSR).

Corporate Social Responsibility (CSR) can be described as a set of standards to which a company subscribes in order to make its impact on society positive. CSR has the potential to make positive contributions to the development of businesses and the society. More and more organizations are

beginning to see the benefits from setting up strategic CSR agendas. One of the most used and quoted model of CSR is Carroll´s (1991) Pyramid of Corporate Social Responsibility (Wahga, Blundel& Schaefer,2018). It indicates that CSR constitutes of four kinds of social responsibilities; economic, legal, ethical and philanthropic. These four responsibilities can be illustrated as a pyramid. The economic component is about the responsibility to profit and this responsibility serves as the base for the other components of the pyramid. With regard to the legal aspect, society expects organizations to comply with the laws and regulations (Rekik & Bergeron, 2017). Ethical responsibilities are about how society expects organizations to embrace values and norms even if the values and norms might constitute a higher standard of performance than required by law (Rajhans,2018). Philanthropic responsibilities are those actions that society expect for a company to be a good corporate citizen.

Corporate social responsibility is a marketing communication tool that SMEs could utilize for marketing, campaigns and branding to communicate to prospective clients about their products and services, safety, social issues, and environment security (Youssef, Leicht, Pellicelli, & Kitchen, 2018). Corporate social responsibility practices were also confirmed to have a positive influence on SME competitiveness (Camacho & Fernandez, 2018). Beyond the social responsibilities and philosophical duties of companies and SMEs, correctly tailoring CSR strategies in SMEs is efficient for SME owners in meeting strategic business objectives, whether they be economic, environmental, or social (Zbuchea & Pinzaru, 2017).

The implementation of Corporate Social Responsibility (CSR) initiatives by SMEs is vital for the survival of any business within the communities that host the organizations. Business enterprises benefit commonly from the communities in terms of patronage, usage of enabling facilities, security and profit making (Abdullahi, Abubakar, Aliyu & Umar, 2015). Therefore, they must contribute to the society by being ethical and behaving in responsible manner. According to Ayozie, Iliya and Adebayo (2021), SMEs in Nigeria are largely managed by indigenous entrepreneurs, who overtime grow this business into large conglomerates, like the Dangote, Innoson and Coschans group.

A firm cannot, therefore, operate in an environment, reap every fruit from that environment but put back nothing. The impact of organizations in their environments today are sometimes quite glaring and sometimes not quite open but nonetheless quite destructive. Ayozie (2019) offers a detailed listing of the areas a company's social responsibility programmes are expected to have an impact, especially the SMEs in their respective communities. These areas especially in Nigeria cities includes: safety and health of employees, mental health, employment policies, retirement benefits, education and training, leisure, civil rights, ethnic rationalism, treatment of women, employee welfare, employee attitude, pollution, public safety, waste disposal/management, management of the physical environment, use of land, participation in community affairs, government relations, consumerism, profits, business image of the company. Studies on CSR do exist, but it seems like most of these studies have focused mainly on multinational companies and less neither on indigenous companies nor on the regional contexts in which the companies operate (Amaeshi, Adi, Ogbechie & Amao, 2006).

In Enugu State, the area of study, the researcher observed that there are several SMEs operating in different sectors of the economy such as manufacturing and fabrication firms, food and drinks as well as services industries such as telecommunication and banks. The problem of environmental sustainability by SMEs is not peculiar to Enugu State. Chinweuba and Okpala (2015) noted that noted that environmental sustainability is a global problem facing SMEs. However, Olusanya, Awotungase and Oyebo (2012) noted that most organizational policies on SMEs, focus on growth at the expense of environmental quality, these policies were premised on the expectation that gains in material well-being would far exceed losses incurred in environmental degradation. In the emperical studies reviewd, Ajibola (2020) investigated Nigeria Small and Medium Enterprise sustainability strategies. Nwoba and

Udoika (2016) studied community development and corporate social responsibility in Ebonyi State. Obi (2016) determined corporate social responsibility practice among small and medium scale enterprise of three manufacturing companies. Ogechukwu, Obere, Umukoro and Uche (2013) investigated small and medium scale enterprises (SMES) in Nigeria and the Marketing Interface. Kayode and Akinlo (2012) studied the determinants of Small and Medium Scale Enterprises (SMEs) Performance and Poverty Alleviation in Developing Counties: Evidence from South-West, Nigeria. None of the empirical studies reviewed investigated the strategies adopted by small and medium scale enterprises (SMEs) in implementing corporate social responsibility and environmental sustainability in Enugu State. This is the gap in literature filled by the study. Based on the problem of the study the study investigated the strategies adopted by small and medium scale enterprises (SMEs) in implementing corporate social responsibility and environmental sustainability in Enugu State. Specifically; the study determined:

1. Strategies used by SMEs in Implementing Cooperate Social Responsibility in Enugu State.
2. Strategies used by SMEs in Implementing Environmental Sustainability in Enugu State

In line with the purpose of the study, the following research questions guided the study:

1. What are the strategies used by SMEs in Implementing Cooperate Social Responsibility in Enugu State?
2. What are the strategies used by SMEs in Implementing Environmental Sustainability in Enugu State

Based on the research questions, the following hypotheses were formulated and tested at 0.05 level of significance:

1. There is no significant difference among the mean responses of SMEs [Manufacturing and Fabrication firms, Food and Drinks (whole sale and retailers) and the SMEs in Services industries (Telecom and Banks)}] on the Strategies used by SMEs in Implementing Cooperate Social Responsibility in Enugu State.
2. There is no significant difference among the mean responses of SMEs [Manufacturing and Fabrication firms, Food and Drinks (whole sale and retailers) and the SMEs in Services industries (Telecom and Banks)] on the strategies adopted by SMEs in implementing Environmental Sustainability in Enugu State.

Method

The study adopted descriptive research design. This is because the study obtained data from the SMEs through the use of structured questionnaire and interpreted the results based on the responses. The population of the study was seventy-eight (78). This consisted of 38 SMEs in Manufacturing, Production and Fabrication firms, 22 SMEs in Food and Drinks Establishments (whole sale and retailers) and 18 SMEs in Services industries (Telecom, Banks). No sampling was done since the population is a manageable size. Questionnaire was used for data collection. The questionnaire was divided into two sections which are Section A on nature of SME and Section B was based on purposes of the study. Section B was obtained from extensive literature review. It was separated into two clusters. Cluster A on “Strategies used by SMEs in Implementing Cooperate Social Responsibility in Enugu State” and Cluster B on Strategies used by SMEs in Implementing Cooperate Social Responsibility in Enugu State. Section B was rated on a four-point scale of Strongly Agreed (SA) - 4 points, Agreed (A) - 3 points, Disagreed (D) - 2 points and Strongly Disagreed (SD) - 1 point.

The questionnaire was validated by three lecturers from the department of Business Education, Faculty of Vocational Technical Education, University of Nigeria, Nsukka. The validators comments were used to make necessary corrections before making final draft of the questionnaire. The reliability of the study was determined using Cronbach Alpha reliability index among ten SMEs in Anambra State. These SMEs were chosen because they share similar characteristics with SMEs in Enugu State.
Copies of the questionnaire were distributed to the 78 respondents and efforts were made to retrieved same immediately. Out of the 78 copies of the questionnaire distributed, 70 were returned showing 90% return rate.

Mean and standard deviation were utilized for analyzing research questions while ANOVA was used to test the hypotheses at 0.05 level of significance. For the decision rule, mean ratings from 2.50 and above were regarded as agree while mean ratings from 2.49 and below were disagree. With reference to the hypotheses, the null hypothesis was accepted and upheld when the p-value was equal to or greater than 0.05 level of significance(P>0.05) or not upheld if otherwise.

Results

Table 1

Mean and Standard Deviation Responses on Strategies used by SMEs in Implementing Cooperate Social Responsibility in Enugu State.

S/N	CSR Strategies used by SMEs in Implementing CSR	Mean	SD	Remark
1.	Ensuring safety of employees	3.48	1.01	Accepted
2.	Providing safe working environment	3.65	0.92	Accepted
3.	Adequate training and retraining of staff	3.05	1.04	Accepted
4.	Adequate waste disposal management	3.18	1.11	Accepted
5.	Prevention of waste pollutants to host communities	3.55	0.34	Accepted
6.	Providing retirement benefits for employees	2.13	0.51	Rejected
7.	Ensuring that products are safe for consumption	3.79	0.93	Accepted
8.	Using locally available materials in product development	2.32	0.66	Rejected
9.	Employing qualified personnel from host communities	3.51	0.93	Accepted
10.	Introducing behavioural change programme to reduce energy waste	2.06	1.13	Rejected

Key: SD = Standard Deviation

Table 1 indicated that the strategies used by SMEs in implementing CSR in Enugu State included ensuring safety of employees, providing safe working environment, adequate training and retraining of staff, adequate waste disposal management, prevention of waste pollutants to host communities, ensuring that products are safe for consumption and employing qualified personnel from host communities. The strategies rejected by SMEs in implementing CSR included proving retirement benefits for employees, using locally available materials in product development and introducing behavioural change programme to reduce energy waste. The standard deviation ranged from 0.34 to

1.13 implying nearness of mean responses.

Table 2

Mean and Standard Deviation Responses on Strategies used by SMEs in Implementing Environmental Sustainability (ES) in Enugu State

S/N	CSR Strategies used by SMEs In Implementing ES	Mean	SD	Remark
1)	Ensuring that the business activities do not affect the natural environment	3.82	1.22	Accepted
2)	Recycling of Wastes from SMEs activities	2.16	0.93	Rejected
3)	Avoid dumping of wastes close to residential areas	3.57	0.62	Accepted
4)	Focusing on adding value to human life rather than on more profit	2.68	0.89	Accepted
5)	Reducing pollutants in the environment.	3.64	0.91	Accepted
6)	Implementing green manufacturing practices such as waste reduction, reuse and recycling.	3.02	0.82	Accepted
7)	Promoting positive work environment that will not affect the ecosystem.	3.11	0.69	Accepted
8)	Creating a waste treatment plant	1.21	1.01	Rejected
9)	Supervising by environmental protection agency	3.66	0.74	Accepted
10)	Abiding to the rule of eco-friendly environment	3.04	0.97	Accepted
11)	Promoting the use of renewable sources of energy	3.17	1.05	Accepted

Key: SD = Standard Deviation

Table 2 indicated that the strategies used by SMEs in implementing environmental sustainability included ensuring that the business activities do not affect the natural environment, avoid dumping of wastes close to residential areas, focusing on adding value to human life rather than on more profit, reducing pollutants in the environment, implementing green manufacturing practices such as waste reduction, reuse and recycling, promoting positive work environment that will not affect the ecosystem, supervising by environmental protection agency, abiding to the rule of eco-friendly environment and promoting the use of renewable sources of energy. The strategies not used by SMEs in implementing environmental sustainability included recycling of wastes from SMEs activities and creating a waste treatment plant. Standard deviation ranged from 0.62 to 1.22 implying that the mean values were close to each other.

Table 3

Analysis of Variance (ANOVA) on the Strategies used by SMEs (Manufacturing, Food and Drinks and Services Industries) in Implementing Cooperate Social Responsibility in Enugu State.

S/N	Strategies Used by SMEs in Implementing CSR	SSb	SSw	MSb	MSw	F	Sig	Decision
1.	Ensuring safety of employees	0.26	48.72	0.13	0.72	0.18	0.83	NS
2.	Providing safe working environment	0.82	64.1	0.41	0.95	0.43	0.65	NS
3.	Adequate training and retraining of staff	7.05	61.9	3.52	0.92	3.81	0.07	NS
4.	Adequate waste disposal management	5.51	40.25	2.75	0.60	4.58	0.93	NS
5.	Prevention of pollutants to host communities	5.17	60.26	2.58	0.89	2.87	0.06	NS
6.	Providing retirement benefits for employees	11.75	39.68	5.87	0.59	9.92	0.09	NS
7.	Ensuring that products are safe for consumption	0.70	64.7	0.35	0.96	0.36	0.69	NS
8.	Using locally available materials in product development	0.63	76.45	0.31	1.14	0.27	0.76	NS
9.	Employing qualified personnel from host communities	3.47	61.97	1.73	0.92	1.87	0.16	NS
10.	Introducing behavioural change programme to reduce energy waste	0.19	49.29	0.09	0.73	0.13	0.87	NS

Key: NS = Not Significant, S = Significant, df = Degree of Freedom, F = Calculated value of ANOVA using SPSS, SSb = Sum of Squares between groups, SSw = Sum of Squares within groups, MSb = Mean of Squares between groups, MSw = Mean of Squares within groups, N_1 = number of Respondents (70), Level of Significance = 0.05.

Table 3 contains ANOVA of the strategies used by SMEs (Manufacturing, Food and Drinks and Services Industries) in implementing cooperate social responsibility. Result in the table shows that there was no significant difference in the mean responses of SMEs on the strategies used in implementing CSR. The probability values range from 0.06 to 0.93 which are more than 0.05 level of significance (P>0.05). Therefore, the null hypothesis of no significance difference at 0.05 level of significance was upheld.

Table 4

Analysis of Variance (ANOVA) on the Strategies used by SMEs (Manufacturing, Food and Drinks and Services Industries) in Implementing Environmental Sustainability (ES) in Enugu State

S/N	Strategies used by SMEs in Implementing ES	SSb	SSw	MSb	MSw	F	Sig	Decision
1.	Ensuring that the business activities do not affect the natural environment	3.47	50.03	0.74	1.73	2.32	0.11	NS
2.	Recycling of Wastes from SMEs activities	1.16	54.68	0.58	0.81	0.77	0.40	NS
3.	Avoid dumping wastes close to residential areas	0.75	58.22	0.37	0.86	0.43	0.64	NS
4.	Focusing on adding value to human life rather than on more profit	12.29	60.40	6.14	0.90	6.82	0.62	NS
5.	Reducing pollutants in the environment.	13.01	73.26	6.50	1.09	5.95	0.81	NS
6.	Implementing green manufacturing practices such as waste reduction, reuse and recycling	0.49	66.94	0.24	0.99	0.24	0.78	NS
7.	Promoting positive work environment that will not affect the ecosystem.	1.16	45.41	0.58	0.67	0.86	0.42	NS
8.	Creating a waste treatment plant	6.23	51.03	3.11	0.76	4.09	0.72	NS
9.	Supervision by environmental protection agency	5.72	55.54	2.86	0.82	3.45	0.83	NS

10.	Abiding to the rule of eco-friendly environment	5.18	44.25	2.59	0.66	3.92	0.66	NS
11.	Promoting the use of renewable sources of energy	2.91	50.22	1.45	0.75	1.94	0.15	NS

Key: NS = Not Significant, S = Significant, df = Degree of Freedom, F = Calculated value of ANOVA using SPSS, SSb = Sum of Squares between groups, SSw = Sum of Squares within groups, MSb = Mean of Squares between groups, MSw = Mean of Squares within groups, N_1 = number of Respondents (70), Level of Significance = 0.05.

Table 4 contains ANOVA of the strategies used by SMEs (Manufacturing, Food and Drinks and Services Industries) in implementing Environmental Sustainability. Result in the table shows that there was no significant difference in the mean responses of SMEs on the strategies used in implementing environmental sustainability. The probability values range from 0.11 to 0.83 which are more than 0.05 level of significance (P>0.05). Therefore, the null hypothesis of no significance difference at 0.05 level of significance was upheld.

Discussion of Findings

Findings indicated that the strategies used by SMEs in implementing CSR in Enugu State included ensuring safety of employees, providing safe working environment, adequate training and retraining of staff, adequate waste disposal management, prevention of waste pollutants to host communities, ensuring that products are safe for consumption and employing qualified personnel from host communities. This implies that CSR operations and strategies adopted by SMEs in Nigeria vary but each has a benefit for the society and for the SMEs. In line with the findings, Amaeshi, Adi, Ogbechie and Amao (2006) noted that Nigerian companies are engaged in one CSR activity or the other. Ayozie, Iliya and Adebayo (2021) noted that there has not been a clearly designed policy of CSR by SMEs in Nigeria. Also, in support of the findings, Ogundele, Akingbade, Saka, Elegunde and Aliu (2013) stated that a major contribution made by SMEs is in the area of employment as they offer a high amount of employment in casual, part-time, low training and low-skilled jobs to host community dwellers. ANOVA of the strategies used by SMEs (Manufacturing, Food and Drinks and Services Industries) in implementing cooperate social responsibility showed that there was no significant difference in the mean responses of SMEs on the strategies used in implementing CSR. This implies that the SMEs adopt similar approaches in implementing CSR.

Findings indicated that the strategies used by SMEs in implementing environmental sustainability included ensuring that the business activities do not affect the natural environment, avoid dumping of wastes close to residential areas, focusing on adding value to human life rather than on more profit, reducing pollutants in the environment, implementing green manufacturing practices such as waste reduction, reuse and recycling, promoting positive work environment that will not affect the ecosystem, supervising by environmental protection agency, abiding to the rule of eco-friendly environment and promoting the use of renewable sources of energy. These findings indicate that the SMEs adopt different measures in ensuring that their activities are environmentally sustainable. In support of the findings, Ayozie, Iliya and Adebayo (2021) noted that environmental researches must be carried out by SMEs in the host community in order to identify areas of interest that need that can be solved through CSR which might be spanned for a period of time (Long term implementation) for the activities to have a meaningful impact to the community in particular and society as a whole. Also, in agreement with the findings, Amaeshi, Adi, Ogbechie and Amao (2006) noted that CSR practices in the oil and gas multinationals involved activities focused on remedying the effects of their extraction

activities on the local communities. The companies provide pipe-borne waters, hospitals and schools. To further support the finding, Ayozie (2019) stated that the areas a company's social responsibility programmes are expected to have an impact, especially the SMEs in their respective communities included safety and health of employees, pollution, public safety, waste disposal/management, management of the physical environment, use of land among others. ANOVA of the strategies used by SMEs in implementing Environmental Sustainability revealed that there was no significant difference in the mean responses of SMEs on the strategies used in implementing environmental sustainability.

Conclusion

Based on the findings of the study, it was concluded that SMEs in Enugu state adopt different strategies in ensuring CSR and environmental sustainability. Findings indicated that most of the SMEs do not use locally available materials in product development which can be attributed to the nature of the raw materials needed by the SMEs. SMEs constitute key performers in the delivery of corporate social responsibility to their host communities. Since, the SMEs benefit from the host communities; it is expected of them to give back to the society.

Recommendations

Based on the findings of the study, it can be recommended that:
1. SMEs should engage in recycling of wastes from their activities.
2. SMEs should be encouraged to use locally available materials for the production processes.
3. SMEs should adopt renewable sources of energy for the production processes.
4. There is need for SMEs to introduce behavioural change programmes that would help reduce energy waste.

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Development and Validation of Result and Transcript Management System for University of Jos, Plateau State

Iliya, S., Teng, C. and Cinfwat, K.Z.

Abstract

The importance of results computation, and accurate academic records in educational establishments cannot be overemphasized. Hence the need for a robust, efficient, accurate and comprehensive academic result computation system. A user-friendly Result and Transcript Management System (RTMS) was designed for uploading of results, and computation of 'Senate format', for the University of Jos, Nigeria. The software was developed using Python, it was compiled as a standalone executable Graphical User Interface (GUI) toolkit; not requiring any programming language or dependencies. The system was designed to work on Windows operating system. This result computation toolkit was designed to ease result computation as the job of Level Coordinators are made easier, and more efficient. This software is designed to be hosted on one machine for each department; all results for that department will be uploaded on that machine (computer) and processed. The scores are not manually entered into the system, rather each lecturer submits a softcopy of their results to the departmental Exam Officer who collates the results in one Excel workbook, with each sheet named using the Course Code. The software automatically loops through the Excel workbook sheets, uploads each course, and locates each student, in their current level and assigns their scores and grades to them. This mitigates the errors due to manual entering of results. This tool automates the entire process about result computation ranging from creation of workbooks, uploading and validation of registrations, uploading of previous records, uploading of individual course results from Course Lecturers, computation of cumulative performance indices and preparation of summary pages.

Keywords: Graphical User Interface (GUI), Registration, Academic Result, Computation.

Introduction

Result computation and processing is a very sensitive and demanding exercise. Every session, Level Coordinators are tasked with the responsibility of preparing results of the levels they coordinate. This reduces the efficiency and productivity of these members of staff as most of their useful time is spent on result preparation with little or no time for research, and self-development resulting in a poor lecture delivery. Manually prepared results are prone to human errors and bias. More so, as the results is been prepared by many individuals (Level Coordinators), the security and reliability of the results cannot be guaranteed.

Despite the fact that the results are prepared by many individuals, it takes time for each level coordinator to finish preparing his levels result, leading to late or untimely presentation of results to students. Sometimes a student may have been withdrawn, but as results may not have been completed and released before the commencement of the new session, such students often fall

victims of registering for the new session, paying their tuition fees, accommodation, etc. only to be informed in the course of their studies that they have been withdrawn. This is highly frustrating and can lead to academic and psychological depression (Belfield, 2012; Käfer et al., 2019). Several teams and individuals have developed tools for computation of 'Senate Format' result for University of Jos, Nigeria. The senate format is the form the University Senate expects the Departmental results to be presented for consideration and approval. One of such tools was developed by Akinola (2014) to compute Total Credit Registered (TCR), Total Credit Earned (TCE), Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) However, this tool demanded that the spreadsheet containing the students' scores should be manually prepared and the content of the spreadsheet be copied and pasted in any text editor before it can be used by the software. This was found to be cumbersome and prone to middle 'man' errors. Once a syntax error is encountered, execution will stop with no feedback to the user.

Another tool was developed but, in this case, all the courses offered by the students from their entry session (level) to the current level has to be prepared using a spreadsheet, and presented to the software for computation of each current cumulative performance of the students. For both tools, the programming language used in designing the tools had to be installed, along with their dependencies, causing significant challenges in getting the tool to install on some computers. Therefore, this paper presents the design and development of a robust and comprehensive result computation toolkit for the University of Jos. The tool was developed using Python which has a robust library for manipulating spreadsheets (Meier, 2015) and compiled as a standalone windows application (Tutorial Point, 2016), (Burkhard, 2017). Hence no need of installation of Python or any dependencies as in some related applications. No programming skill or knowledge is required before using the developed RTMS. A GUI provides an interface between the user and the software. Many of the possible errors were captured, and for each of those errors, feedback is presented to the user via a message box explaining the problem and possible solutions. The description and functionality of the tool is presented in the next section, followed by conclusion and recommendation.

Software Toolkit Description

A brief description of some of the functionality of the designed result computation and academic records management toolkit are presented in this section. This tool is aimed at automating the processes relating to result computation and managing of academic records (transcripts). The toolkit has 21 main functions depicted by a dropdown box. These functions are arranged from first to last in order of which they should be executed where applicable. Only six of these functions are presented in this paper, among these are: uploading of transcript courses, creation of workbooks, uploading and validation of registrations, uploading of previous records, uploading of individual course results, computation of sessional and cumulative performance indexes and preparation of summary pages.
As the tool is standalone Windows application software, once the software is installed, double clicking on the shortcut executable icon, the main GUI shown in Fig.1 will appear. Each function to be executed will be selected from the dropdown box in the main GUI.

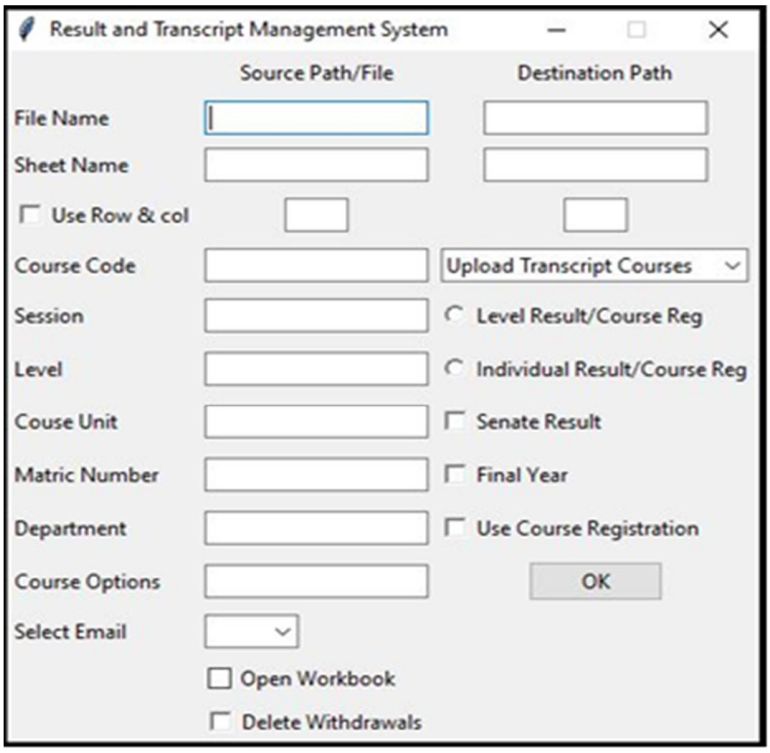

Fig. 1: Main GUI

Upload Transcript Courses

The Upload Transcript Courses' feature is used to upload all the courses that will be used to create workbooks, and for preparation of academic transcripts. All the courses offered in the department including electives are to be uploaded in the format depicted in Fig. 2. The first column should be levels, followed by the course code, course title, semester, credit unit, prerequisites, option (specialization to which the course is meant for), and entry mode. All the options offering each course should be specified. This function is to be executed only once except if there is need to update the courses due to curriculum review or addition of courses or specializations within the department, in this case the updated one has to be uploaded which will automatically replace the previous one.

Create New Workbook

The Create New Workbook Feature is used to prepare a new workbook. The following information should be completed on the main GUI i.e., the session, level and the department. When the level is specified, all the required courses needed to create the new workbook will automatically be sourced from the courses uploaded in transcript courses. On clicking the OK button of the main GUI, a top-level GUI will be opened as shown in Fig. 3. The University, faculty, department and the degree in view are to be completed. The information provided on this top-level GUI will be the headings of the workbook. On clicking the OK button of the top-level GUI, the workbook will be created along with five sheets and a message box will be displayed as shown in Fig 4. The five sheets created are

named: Senate Form, Level Form, Senate Summary, Course Summary and Course Registration. The newly created workbook will be displayed as shown in Fig 5.

Upload Record

The Upload Record feature of RTMS was designed for use in bringing the records of students to the next level. If this is not the first time of using the software, when uploading records, the software will source the records of current level and session from last session, next lower level. All the students that were withdrawn based on academic deficiency, will not be brought to the current level/session, but their records will not be deleted from where they were withdrawn. The records of the students including their cumulative record where applicable will be saved in the new workbook.

LEVEL	COURSE CODE	COURSE TITLE	semester	CREDIT UNITS	PREREQUISITE	OPTION	ENM
100	CHM 106	Practical Inorganic Chemistry I	2	1		ALL	UME
100	MTH 101	Elementary Mathematics I- Algebra	1	3		ALL	UME
100	MTH 102	Elementary Mathematics II-Vectors	2	3		ALL	UME
200	EEE 203	Electronics, Measurements	1	2		ALL	ALL
200	EEE 211	Basic Engineering Laboratory I	1	1		ALL	ALL
200	MTH 201	Mathematical Methods I	2	3	MTH 101	ALL	ALL
200	MTH 202	Elementary Differential Equations I	2	3	MTH 102	ALL	ALL
300	EEE 301	Circuit Theory and Systems I	1	3	EEE 201	ALL	ALL
300	EEE 302	Circuit Theory and Systems II	2	2	EEE 202	ECE,PAM	ALL
300	EEE 303	Electromagnetic Fields and Waves	1	2		ALL	ALL
300	EEE 305	Physical Electronics	1	3		ALL	ALL
300	MTH 341	Numerical Analysis	1	3	MTH201	ALL	ALL
300	MTH 342	Complex Analysis	2	3	MTH202	ECE	ALL
400	EEE 401	Power Engineering II	1	2	EEE301	ALL	ALL
400	EEE 403	Telecommunication Principles	1	2	EEE303	ALL	ALL
400	EEE 411	Laboratory Practical and Mini-Project	1	2		ALL	ALL
500	EEE 501	ADVANCE CIRCUIT THEORY	1	3	EEE401	ALL	ALL
500	EEE 503	ADVANCED ELECTROMAGNETIC FIELDS	1	3	EEE403	ALL	ALL
500	EEE 505	ENERGY SYSTEMS AND MANAGEMENT	1	2		ALL	ALL
500	EEE 507	POWER SYSTEMS PROTECTION	1	2		ALL	ALL
500	EEE 509	ENGINEERING MANAGEMENT	1	2		CE	ALL

Fig. 2: Transcript Courses

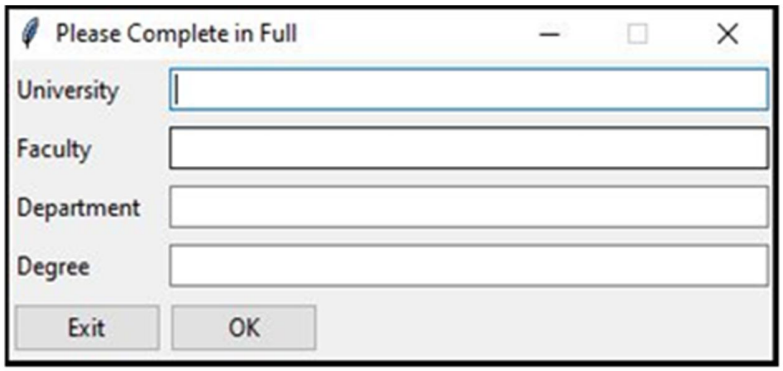

Fig. 3: New Workbook Top Level GUI

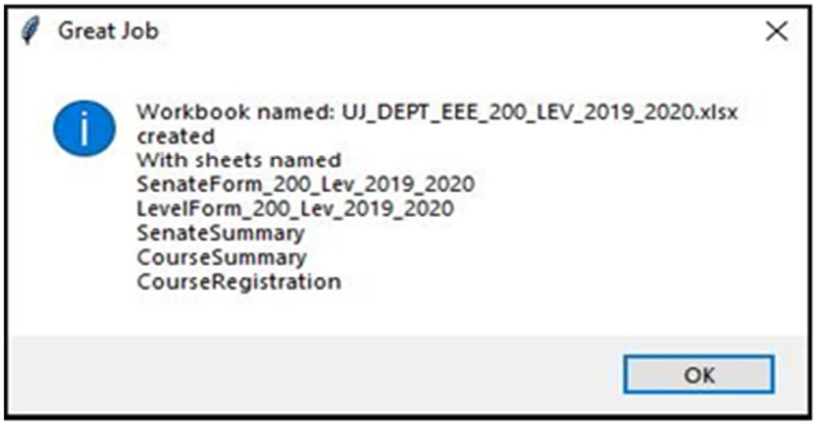

Fig. 4: New Workbook Sheets

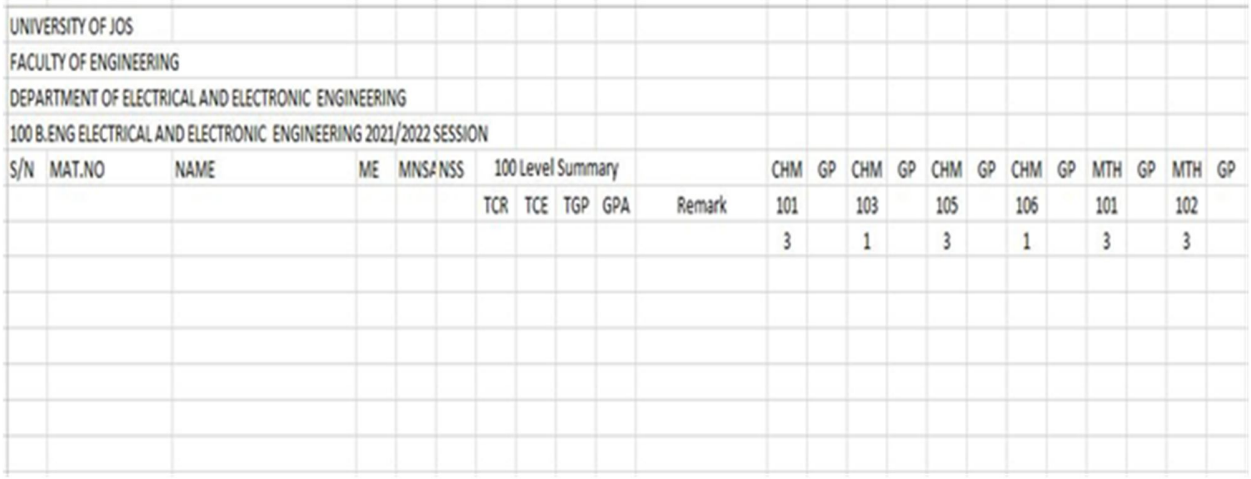

Fig. 5: New Book Sheet

Upload Course Registration

The Upload Course Registration feature is used to upload courses registered by the students in a format shown in Fig. 6. For any course a student registers, 1 is entered or anything including alphabets but not zero. Any cell with zero or empty implies that the student did not register that course. Upload the course registration shown in Fig. 6 to populate the course registration sheet created by the software. The software will check and deregister any student who registers a course for which he/she has not passed the prerequisite, and those that register courses that they have already passed. The software will put 1 for valid registration, and P where the student registered course he/she has already passed, and 0 for courses registered with pending prerequisite. The valid total credit registered will be computed, if it falls below the minimum, it will be coloured blue, and red if is above the maximum required credit load. All pending course(s) to be cleared will be on the summary column of the registration sheet as shown in Fig. 7. Only courses for which the student has a valid registration will be uploaded and assigned to them. This function ensures that if a student sits for an exam in a course not registered, previously passed, or has not passed the prerequisite where applicable, the score will not be assigned to the student.

Upload Course Result

The Upload Course Result section of the RTMS is used to upload individual course results. The source workbook, sheet and row where the scores start has to be specified along with the column containing the total score. The first column is the serial number, next is the matriculation number, followed by the students' names. Any column can be used for the total score but it must be preceded by the columns for continuous assessment (CA) and Exam where applicable. The scores are not manually entered into the system, rather each lecturer submits a softcopy of their results to the departmental exam officer who will collate the results in one Excel workbook in a format depicted in this section, with each sheet named using the course code. The software automatically looped through the workbook sheets, and upload each course result. Only courses where a student has valid registration will be assigned to them. All the scores whose matric numbers were not found, including those that have pending prerequisites or did not register the course or has once passed the course, will be saved in a separate sheet. The tool is highly robust, hence, irrespective of the student level, the software searches and assigns each student mark appropriately. In this way, the work of Level Coordinators is greatly reduced. The results for all the courses in a department will be collated and prepared/computed on one machine. Omitted results that may be brought after can also be uploaded. If there is error in any result uploaded, you can re-upload the corrected one to replace the erroneous one. The course summary sheet will be populated as courses were uploaded as depicted in Fig 8.

Computation of Cumulative

The Compute Cumulative feature is used to compute the sessional or semester performance of the students i.e. the total credit register (TCR), total credit earned (TCE), total grade point (TGP) and grade point average (GPA); and the cumulative performance indexes where applicable i.e.

Cumulative Total Credit Register (CTCR), Cumulative Total Credit Earned (CTCE), Cumulative Total Grade Point (CTGP) and Cumulative Grade Point Average (CGPA). It also provides a remark, such as pass (no pending course), courses to be repeated and those to register. In addition to this, the remark includes voluntary withdrawal for students with no score in all the courses, and withdrawal based on academic deficiencies. Students on probation are also specified in the remark as shown in Fig. 9. The prepared result depicted in Fig. 9 is what is referred to as the Senate format for University of Jos.

UNIVERSITY OF JOS															
FACULTY OF ENGINEERING															
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING															
100 B.ENG ELECTRICAL AND ELECTRONIC ENGINEERING 2019/2020 SESSION															
S/N	MAT.NO	NAME	ME	OPTIO	REMARK	TCR	CHM 101	CHM 103	CHM 105	CHM 106	CS 101	CS 102	MTH 101	MTH 102
							3	1	3	1	2	3	3	3
1	UJ/2015/EN/0120	GH	UME	CE			1	1	1	1	1		1	1
2	UJ/2015/EN/0009	JJ	UME	CE			1	1	1	1	1		1	1
3	UJ/2015/EN/0118	KO	UME	CE			1	1	1	1	1	1	1	1
4	UJ/2015/EN/0023	LP	UME	CE			1	1	1	1	1	1	1	1
5	UJ/2014/EN/0001	MK	UME	CE			1	1	1	1	1	1	1	1
6	UJ/2014/EN/0086	HJ	UME	CE			1		1	1	1	1	1	1
7	UJ/2019/EN/0141	GT	UME	CE			1	1	1	1		1	1	1
8	UJ/2019/EN/0164	JY	UME	CE			1	1	1	1	1	1	1	1
9	UJ/2019/EN/0236	ABU	UME	PAM			1	1	1	1	1	1	1	1
10	UJ/2018/EN/0045	ATBU	UME	PAM			1		1	1	1	1	1	1
11	UJ/2016/EN/0223	UU	UME	PAM			1	1	1	1		1	1	1
12	UJ/2016/EN/0098	HH	UME	PAM			1	1	1	1	1	1	1	1
13	UJ/2016/EN/0018	HJ	UME	PAM			1	1	1	1	1	1	1	1
14	UJ/2018/EN/0071	HY	UME	PAM			1	1	1	1	1		1	1
15	UJ/2018/EN/0073	GH	UME	PAM			1	1	1	1			1	1
16	UJ/2018/EN/0075	EJEBA ang	UME	PAM			1	1	1	1			1	1

Fig 6. Registration to be uploaded

UINIVERSITY OF JOS														
FACULTY OF ENGINEERING														
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING														
500 B.ENG ELECTRICAL AND ELECTRONIC ENGINEERING 2023/2024 SESSION														
S/N	MAT.NO	NAME	ME	OPTION	Remark	TCR	EEE 501	EEE 503	EEE 505	EEE 507	EEE 509	EEE 511	EEE 401	EEE 403
							3	3	2	2	2	2	2	2
1	UJ/2015/EN/0120	DZUNGWE Terence Aondongu	UME	CE	REG: CHM101, EEE302, EEE403, EEE501, EEE503,	12	0	0	1	1	1	1	1	0
2	UJ/2015/EN/0009	IBRAHIM Muhammed Awwal	UME	PAM		14	1	1	1	1	1	1	P	P
3	UJ/2015/EN/0118	BAGU Dorcas Nenadi	UME	CE		14	1	1	1	1	1	1	P	P
4	UJ/2015/EN/0023	JOHN Ayuba Pam	UME	ECE		14	1	1	1	1	1	1	P	
5	UJ/2014/EN/0001	SAMUEL Oluwatimilehin Emmar	UME	CE	REG: CHM106, MTH201, MTH202, MTH341, MTH342	14	1	1	1	1	1	1	P	
6	UJ/2014/EN/0086	SHUAIBU Ibrahim Muhammed	UME	CE		14	1	1	1	1	1	1	P	
7	UJ/2019/EN/0141	OKWUJIA Victor Oyare	UME	CE		14	1	1	1	1	1	1	P	
8	UJ/2019/EN/0164	NWAFOR Rejoice Chinasa	UME	CE	REG: MTH202, MTH342,	14	1	1	1	1	1	1	P	
9	UJ/2019/EN/0236	FOLORUNSHO Enoch Oluwadam	UME	PAM	REG: CHM105, EEE305,	14	1	1	1	1	1	1	P	
10	UJ/2018/EN/0045	FRANCIS Wisdom	UME	PAM		20	1	1	1	1	1	1	P	
11	UJ/2016/EN/0223	EWUGA Bathsheba Ashezi	UME	PAM	REG: EEE211, EEE407,	14	1	1	1	1	1	1	P	
12	UJ/2016/EN/0098	IKWUOCHE Ogbene Blessing	UME	PAM		14	1	1	1	1	1	1	P	
13	UJ/2016/EN/0018	PAM Dorcas Chuhwak	UME	PAM		14	1	1	1	1	1	1	P	P
14	UJ/2018/EN/0071	BULUS Nanpyal Gwakbong	UME	PAM	REG: CHM103, EEE203, MTH201, MTH202, MTH341, I	13	1	0	1	1	1	1	P	1

Fig. 7: Validated Registration

UINIVERSITY OF JOS
FACULTY OF ENGINEERING
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING
500 B.ENG ELECTRICAL AND ELECTRONIC ENGINEERING 2023/2024 SESSION
SUMMARY

S/NO	OURSE COD	COURSE TITLE	CREDIT UNITS	A	B	C	D	F	PASS	FAIL	TOTAL	SHEET
1	EEE501	ADVANCE CIRCUIT THEORY	3	2	9	5	2	2	18	2	20	14
2	EEE503	ADVANCED ELECTROMAGNETIC FIELDS	3	3	4	3	3	7	13	7	20	16
3	EEE505	ENERGY SYSTEMS	2	6	1	5	2	6	14	6	20	18
4	EEE507	POWER SYSTEMS PROTECTION	2	2	4	9	3	2	18	2	20	19
5	EEE509	ENGINEERING MANAGEMENT	2	2	4	9	3	2	18	2	20	20
6	EEE511	RELIABILITY AND MAINTANABILITY	2	3	4	7	2	4	16	4	20	21

Fig. 8: Course Summary

UINIVERSITY OF JOS
FACULTY OF ENGINEERING
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING
100 B.ENG ELECTRICAL AND ELECTRONIC ENGINEERING 2019/2020 SESSION

S/N	MAT.NO	NAME	ME	MNSA	NSS	100 Level Summary					CHM	GP	CHM	GP	CHM	GP	CHM	GP
						TCR	TCE	TGP	GPA	Remark	101		103		105		106	
											3		1		3		1	
1	UJ/2015/EN/019	CF	UME	15	2	14	11	34	2.43	RPT: CHM101,	43	0	60	4	50	3	50	3
2	UJ/2015/EN/0999	GH	UME	15	2	14	14	46	3.29	PASS	68	4	80	5	55	3	45	2
3	UJ/2015/EN/0118	DD	UME	15	2	14	14	49	3.5	PASS	55	3	60	4	70	5	55	3
4	UJ/2015/EN/0023	GH	UME	15	2	14	14	63	4.5	PASS	67	4	45	2	88	5	60	4
5	UJ/2014/EN/0001	JK	UME	15	2	14	13	48	3.43	RPT: CHM106,	58	3	55	3	45	2	33	0
6	UJ/2014/EN/0086	KL	UME	15	2	14	14	52	3.71	PASS	45	2	66	4	77	5	56	3
7	UJ/2019/EN/0141	KL	UME	15	2	14	14	41	2.93	PASS	68	4	45	2	45	2	55	3
8	UJ/2019/EN/0164	KP	UME	15	2	14	14	58	4.14	PASS	66	4	45	2	66	4	46	2
14	UJ/2018/EN/XX71	OK	UME	15	2	14	7	15	1.07	Probation, RPT: CHM103, MTH101	45	2	33	0	45	2	58	3
15	UJ/2018/EN/0073	XX	UME	15	2	8	5	19	2.38	RPT: CHM105,	68	4	45	2	34	0	77	5
16	UJ/2018/EN/0075	PP	UME	15	2	14	14	60	4.29	PASS	50	3	54	3	78	5	50	3
17	UJ/2018/EN/0084	XC	UME	15	2	14	14	62	4.43	PASS	60	4	48	2	89	5	55	3
18	UJ/2018/EN/0087	CV	UME	15	2	14	11	39	2.79	RPT: CHM105,	70	5	45	2	43	0	60	4

Fig. 9: Senate Format Result

Conclusion

This research is focused on the development of Result and Transcript Management System (RTMS) for University of Jos, Nigeria. The tool is developed to ease the work of level coordinators by automating results processing processes. As the results are uploaded and not entered manually by the exam officer, human entering errors are mitigated. The tool was first used by Civil Engineering Department of University of Jos for computation of their senate format results for 2019/2020 academic session. Seeing how accurate, efficient, and reliable the computation outcome of the tool, the entire Faculty of Engineering of the University of Jos has adopted the tool. Currently, the Faculty of Education and Arts which are the Two largest Faculties in University of Jos, have placed a demand for the tool to be deployed to them. The RTMS is robust and user friendly, no programming knowledge is required to use the tool. In addition to this, no installation of any programming language or their dependencies is required as the tool is compiled as a standalone GUI toolkit. With this tool, all results for a given department will be collated on one machine where computation of cumulative performance indices for all the levels will be carried out. Future work will include efficient electronic dissemination of results and registration status to students, moderation of results and preparation of academic transcripts.

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Pattern Recognition and Prediction of Univariate Time Series

[1]Nwajiobi, Emmanuel N. and [2]Nwangwu, Emmanuel C.

[1]Department of Computer Science, Nwafor Orizu College of Education, Nsugbe, Anambra State, Nigeria
[2]Department of Computer and Robotics Education, University of Nigeria, Nsukka, Enugu State, Nigeria

Abstract

These days, there is massively evolving data which are represented as observations made sequentially in time from businesses, economic activities and scientific researches. Data that are calculated, measured or observed sequentially on a regular basis about business or economic activity over a period of time is called time series. There is therefore need, to find and extract recurring patterns within the time series temporal databases and also predict future patterns. In view of the forgoing, this research was carried out to: (1) find an efficient method to represent univariate time series (2) detect and extract recurring patterns and, (3) finally predict future patterns in a univariate time series. To achieve these research interests, many representation algorithms were reviewed and finally a novel datamining-based time series pattern recognition model was developed. The model was tested and validated with historical time series data obtained from the Nigerian Stock Exchange (NSE) and Yahoo finance websites. Our model uniquely represented patterns with three symbols (U, D, F for Up, Down and Flat respectively). Out of the fifteen (15) datasets used in the experiment, the model predicted twelve (12) correctly (which is 80% accuracy). Two methodologies were employed in the design and implementation of the system, namely: prototyping and object-oriented analysis and design methodology (OOADM); while the programming tools used consisted of Wampserver64 (virtual host server), MYSQL (for database implementation), PHP (for backend production), HTML, JavaScript and CSS for front end development.

Keywords: Data Mining, Pattern Recognition, Pattern, Time Series, Pattern Extraction, Time Series Representation

Introduction

At present, majority of activities in businesses, companies and organisations generate large amounts of data which are typically saved in databases. This is made possible by the availability of large storage systems, fast computer systems and efficient information systems. However, the question of what to do with such huge amounts of data is not always easily obvious to the owners of such large databases. This therefore calls for efficient computational algorithms to analyse the data to find patterns and relationships buried in data. Massive data sets are rarely profitable; their real worth lies

in the possibility to extract useful information for making decisions or for understanding the phenomena that generated such data.

Consequent upon the foregoing, information retrieval is no longer enough anymore for decision-making. Therefore, the availability of these huge collections of data have now created new needs that will help us make better and informed decisions, including making predictions about the future. These new needs include but not limited to: automatic summarization of data, extraction of information buried in stored data, discovery of patterns, and prediction of future patterns. Data mining techniques can be used to discover patterns from large datasets, which are mostly in form of time series.

Time series is a collection of observations made sequentially in time (Abdullah, 2016). It is an ordered sequence of values (real numbers) of a variable or variables measured, observed or calculated at regular time intervals over a period of time. According to Pohl and Bouchachia (2012), the following activities can be performed on a time series data: detecting motifs, recognizing and extracting patterns, finding correlation between time series or finding similar time series. Similarly, analysis of a time series can be said to comprise three processing steps, namely: (a) Abstraction (or representation), (b) Mining and Discovery of trends and patterns, and (c) Prediction (Pohl and Bouchachia, 2012).

Figure. 1: Processing stages in time series analysis
Source: Pohl and Bouchachia (2012)

Any information of the sequential nature can be processed by pattern recognition algorithms to make the sequences comprehensible and enable its practical use. The term pattern recognition connotes automatic discovery of regularities in data through the use of computer algorithms and with the use of these regularities actions such as classifying the data into different categories can be taken (Bishop, 2006). These regularities in data are referred to as patterns in this paper.

In view of the above background information, this research work was able to develop a model for representation, detection and prediction of univariate time series. The type of time series data considered in this work were mostly those that can generate forecasts, like stock closing price. Time series datasets collected via yahoo finance website from different sources were used to test and validate the model.

Statement of the Problem

The goals of any time series analysis or data mining tasks on time series are usually to identify the nature of the phenomenon represented by the sequence of observations and possibly predict the future values of the time series variable. Incidentally, both goals require that the pattern of the

observed time series be identified. Some studies on time series domain point to the fact that patterns in time series can repeat themselves. Therefore, detection of patterns similar to those that have occurred in the past can readily provide useful information about the future of time series evolution. It is against this backdrop that this study sought to develop a model that can detect, extract and predict specific patterns of interest from large discrete univariate time series datasets. Specific

Objectives of the Study

1. Provision of a new symbolic representation scheme for time series.
2. Provision an algorithm to "mine" time series to discover patterns
3. Extracting specific patterns of interest and storing same in a database
4. Use extracted patterns in the database to predict future time series patterns

Literature Review

Time series according to Nguyen and Duong (2007) is a sequence of real numbers, each number representing a value at a time point. It is a collection of observations made sequentially in time (Abdullah, 2016). A time series is an ordered sequence of values of a variable (univariate) or many variables (multivariate) measured, observed or calculated at equally spaced time intervals over a period of time. It consists of a sequence of values and their corresponding timestamps (i.e. the time at which the values were observed or measured).

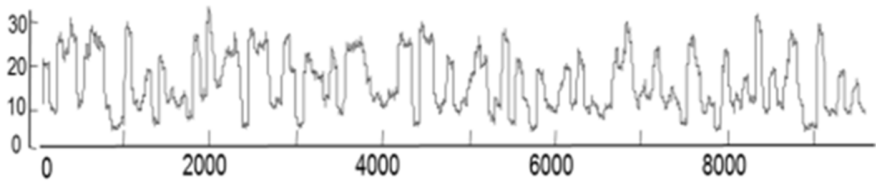

Figure 2: A typical illustration of a time series plot. On the Y-axis are the values, and along the X-axis are time stamps
Source: Lin et al, (2002)

Time series representation is concerned with finding a suitable way to represent it for further computational analysis. The process creates a more compact representation of the data, while at the same time preserving the information content of the original time series. Good representation fosters further time series analysis towards discovering patterns and making informed decisions.

Kimoto, Asakawa, Yoda and Takeoka (1990) used several learning algorithms and prediction methods to predict the Tokyo Stock Exchange Prices Index (TOPIX). The proposed system used neural network that learned the relationships between the various factors. The output of the system was the best time to buy and sell stocks. They executed simulation of buy and sell stocks to evaluate the system. In their study, vector curve, turnover ratio, foreign exchange rate and interest rate were used as input variables. Trading profit using the system proved better than using ordinary buy and hold strategy.

Trippi and Desieno (1992) in their work performed daily prediction of up and down direction of S&P 500 Index Futures using artificial neural network (ANN). Input variables in the study were technical variables for a two-week period to the trading day: open, high, low, close price, and the price fifteen minutes after the market opening of the current trading day. The output variable was a long or short recommendation. They performed composite rule generation procedure to generate rules for combining outputs of networks. They reported prediction accuracy of 45.3% to 52.8%. Singh (2000) addressed the problem of time series representation by creating an algorithm called binary representation, in which "1" was used to represent increase and "0" was used to represent decrease. It partially solved the problem of time series representation by transforming it into strings of ones and zeros for further processing. It did not address the issue of patterns in time series. What about a situation where there exist consecutive increases or decreases? The model was silent on that. Nguyen and Duong, (2007) proposed the use of Piecewise Linear Approximation (PLA) to segment time series, as a preprocessing approach necessary for further analysis. The approach represents a time series with straight lines. PLA refers to the approximation of a time series T, of length n with k straight lines (where k < n) (Nguyen and Duong, 2007). The PLA is composed of a series of segments representing the trend (up and down) of the raw data. Thus, PLA approximates a time series into a representation of linear segments that is efficient to manipulate and faster to process than the raw data.

Robert et al (2009), established a financial time series forecasting model by clustering stocks in Taiwan Stock Exchange Corporation (TSEC). The forecasting model integrated a data clustering technique, a fuzzy decision tree (FDT), and a genetic algorithm (GA) to construct a decision-making system based on historical data and technical indexes. The set of historical data was divided into k sub-clusters by adopting K-means algorithm. GA was then applied to evolve the number of fuzzy terms for each input index in Fuzzy Decision Tree so that the forecasting accuracy of the model can be further improved. Different forecasting models were generated for each sub-cluster. According to their study, the proposed Genetic Algorithm Fuzzy Decision Tree (GAFDT) model had the best performance when compared with other approaches on various stocks in TSEC.

Álvarez (2010) proposed a clustering approach to find patterns in electricity time series. He applied K-means, Expectation Maximization (EM) and Fuzzy C-Means (FCM) clustering techniques to find patterns in stock market data and electricity pricing data. The model proposed can be used to forecast a stock market and electricity pricing time series as recorded in the study. The approach did not delve into the use of large historical data to find patterns necessary for pattern extraction and prediction. No definite means of extracting patterns from a historical database.

Lee, Lin, Kao and Chen (2010) proposed an effective approach to stock market prediction. The method they proposed converted each financial report to feature vector and used hierarchical agglomerative clustering to divide the feature vector into clusters and then applied K-means for each sub-cluster so that most feature vectors in each sub-cluster belonged to the same class. Then, for each sub-cluster, a centroid was chosen as the representative feature vector and finally this feature vector was employed to predict the stock price movements.

Jiangling et al, (2011) developed a novel time series segmentation method that was based on turning points to extract trends from the maximum or minimum points of the time series. It was a very solid and useful idea for detecting patterns in a time series. It segmented time series into up and down structure that minimized destruction of the original underlying trends in the dataset. It did not address the issue of how to symbolically (or otherwise) represent the time series or the discovered trends.

Babu, Geethanjali and Satyanarayana (2012) proposed the use of an effective clustering method, HRK (Hierarchical agglomerative and Recursive K-means clustering) to predict the short-term stock price movements. They used the proposed framework to classify stock time series based on similarity in their price trends. Result of their model HRK outperform support vector machine (SVM) in terms of accuracy and average profit, even as their work used financial report as features. Senthamarai; Sailapathi; Mohamed and Arumugam (2012) proposed techniques which were able to predict whether future closing stock price will increase or decrease. They combined five methods of analyzing stocks to predict if the day's closing price of a stock would increase or decrease. The methods are Typical Price (TP), Bollinger Bands, Relative Strength Index (RSI), CMI and Moving Average (MA). The results of their technique showed that the algorithm was able to predict if the following day's closing price would increase or decrease. The algorithm performed well on half of the stocks and not so well on the other half of the stocks since it was able to generate both increase and decrease predictions. Thus, the algorithm could perhaps be used as a buying or selling signal, or be used to give confidence to a trader's prediction of stock prices.

Prasanna, S. and Ezhilmaran, D. (2013). Performed analysis of past and present financial data to generate patterns and decision-making algorithms using artificial intelligence and data mining techniques. The study was able to establish that data mining can be applied in evaluating past stock prices and acquire valuable information. The weakness of the study was its inability to define the type of patterns that can be generated and how to represent them. Badhiye, et al (2015) addressed time series representation to facilitate data mining of large time series databases. The method used symbolic piecewise trend approximation to represent the original dataset. It achieved dimensional reduction, and was able to symbolically represent time series dataset. The shortcoming of the approach was classification of trend into two: up and down only. It ignored the existence of flat trend, and lacked the ability to predict future trend.

Keogh Eamonn and Jessica Lin in 2002 invented SAX. SAX stands for Symbolic Aggregate Approximation. It was the first, and a novel symbolic representation for a time series. SAX is a symbolization method that involves placing a symbol for each segment obtained by using PAA, since it is based on the Piecewise Aggregate Approximation (PAA) representation. The PAA representation is merely an intermediate step required to obtain SAX. SAX uses alphabet symbols (a – z) to represent segments obtained through PAA. In order to place the symbols, it is essential to specify the number of symbols to be used and the intervals (or breakpoints) of the values for each symbol. To this end, Burcu, et al (2011) stated that the number of symbols to be used is generally determined by an expert having knowledge about the application domain under study. However, to

help solve the problem of specifying the intervals (breakpoints) for each symbol, Burcu, et al (2011) suggested the use of histograms of the data values, see figure 3 below.

Figure 3: Histogram of segment values to help determine breakpoints

Another way to surmount the problem of determining breakpoints is to make use of the predefined statistical table. Table 2.1 below shows a typical predefined lookup statistical table for 3 to 10 alphabets.

β_i \ a	3	4	5	6	7	8	9	10
β_1	-0.43	-0.67	-0.84	-0.97	-1.07	-1.15	-1.22	-1.28
β_2	0.43	0	-0.25	-0.43	-0.57	-0.67	-0.76	-0.84
β_3		0.67	0.25	0	-0.18	-0.32	-0.43	-0.52
β_4			0.84	0.43	0.18	0	-0.14	-0.25
β_5				0.97	0.57	0.32	0.14	0
β_6					1.07	0.67	0.43	0.25
β_7						1.15	0.76	0.52
β_8							1.22	0.84
β_9								1.28

Table 1: Lookup table from a pre-defined statistical table that contains the breakpoints (β1 .. β9) for alphabet size a = 3 to 10 that divides a Gaussian distribution into an arbitrary number.
Source: Lin et al. (2003).

SAX normalizes data in order to transform the series into a Gaussian distribution so that the breakpoints can be determined from the curve in accordance with the required alphabet size. SAX has also the potential for dimensionality reduction. Kuo-Ping, W; Yung-Piao, W and Hahn-Ming, L. (2014) presented a model to predict the stock trend based on a combination of sequential chart pattern, K-means and AprioriAll algorithm. The stock price sequence was cut short into charts by sliding window. The resulting charts were clustered by K-means algorithm to form chart patterns. Thus, the chart sequences were now successfully converted into chart pattern sequences, such that the frequent patterns in the sequences can be extracted by AprioriAll algorithm. The existence of frequent patterns implies that some specific market behaviors often appear, therefore, the corresponding trend can be predicted. Experimental results showed that the proposed system can produce better index return with fewer trades. As a result, the proposed method can make profits on the real market, even in a long-term usage.

Shunrong, Haomiao and Tongda (2015) proposed the use of data collected from different global financial markets as the input features to a machine learning algorithm such as support vector machine (SVM) to predict the stock market index movement. Various machine learning based models were proposed for predicting daily trend of US stocks, and numerical results obtained suggested high accuracy. In addition, a practical trading model was built upon their trained predictor and the model generated higher profit compared to selected benchmarks. Hence, they were convinced that index value of stock markets and commodity prices can provide useful information in the prediction process.

Methodology

This study employed two major types of used in the development of computer programs. They are: (1) Prototyping (2) Object-Oriented Analysis and Design Method (OOADM). They were used in the development of the pattern recognition model for times series representation, extraction and prediction of patterns. Software tools applied in the development of the pattern recognition model included WampServer, MySQL, HTML 5, CSS 3, Notepad plus, Star UML and Microsoft Excel.

For ease of identification of patterns, extraction, representation and prediction, we predefined patterns as either Up (U), Down (D) or Flat (F) and represented them using UDF symbols. Each pattern represents a segment, and can be drawn as shown in figure 4 below. The algorithm begins with a historical time series dataset which it receives as input. Prior to that, the dataset should have been preprocessed by removing blank cells of data and transforming (normalizing) the dataset into the range [0,1], such that the highest value is 1 and the least value in the series is 0. After this normalization process, the pattern recognition algorithm can be applied to the resulting dataset to detect patterns of interest and thus represent them with symbols. All patterns identified are symbolized and stored in a database for future uses and manipulation.

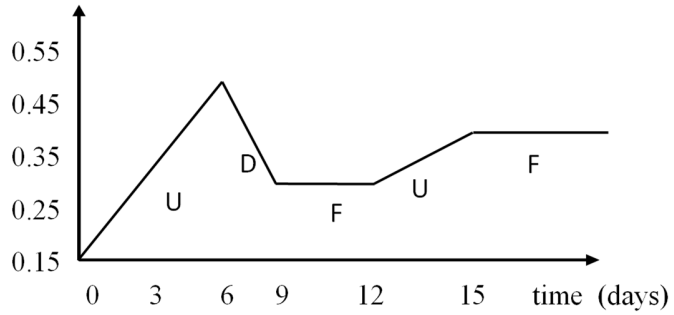

Figure 4: Visualisation of patterns of a time series, showing the up, down and flat patterns. (**Courtesy of** Nwajiobi E.N, 2019.), where value = average value for segments: Up, Down or Flat pattern

From figure 4 above, the symbolic representation of the time series is UDFUF. So, a time series of length 25 (data points) has been reduced to a string of UDFUF (which is five characters).

The algorithm for pattern detection, extraction and symbolic representation:

Input: *S, Segment_size*
Output: *Pattern string symbols (for Up, Down and Flat patterns)*
Repeat
Initialize tup = tdn = 0;
For (i = 0; i ≤ Segment_size - 1, i ++) {
df = (i + 1) – i;
if df is positive, tup++ //augment increasing pattern variable
if df is negative, tdn++ //augment decreasing pattern variable
}
If tup = Segment_size - 1 or tdn = Segment_size - 1 then, pattern is Up or Down respectively
Calculate segment average; //Call SegmentAvg ( ) function
Store segment MinDate, MinValue MaxDate, MaxValue, Segment_Symbol (U,D,F), SegmentAvg
Until end of S is reached.

The Prediction algorithm

1. *Start*
2. *Enter new set of data*
3. *Detect pattern of the new set of data (pat)*
4. *Calculate its average (avg)*
5. *Open the patterns turning point database table*
6. *Find match for average (avg) and pattern (pat) in the database*
7. *If match is found, get the next pattern ('np') in the database*
8. *If match is not found, then increment or decrement average (avg) until a match is found*
9. *Display predicted future pattern*
10. *return*

Results

The model was tested with real-valued discrete univariate time series data, mostly stock market data, obtained online from the Nigerian Stock Exchange (NSE) and Yahoo finance website. The model achieved 100% success in detecting and extracting the three pre-defined patterns and representing the patterns with symbols (UDF). Out of the 15 different datasets used for experimental prediction, the system was able to predict 12 correctly and missed 3. Thus, it achieved 80% success, which is an impressive and acceptable outcome. Thus, the model achieved all the stated objectives, which included time series representation using symbols, detection, extraction and prediction of patterns. The results of this study showed also that patterns not only exist, but can also can repeat over time. Thus, a time series can be represented by a string of UUDFFDUDFF instead of the numerical values. By converting time series into patterns and storing same symbolically using the three alphabets, the

system thus achieved dimensionality reduction of the size of time series dataset. Below are some of the outputs from the system.

Record No	Date	Value	Normalised Value	Year
1	2000-01-03	11357.5097656250	0.8104355931	2000
2	2000-01-04	10997.9296875000	0.6239265800	2000
3	2000-01-05	11122.6503906250	0.6886174083	2000
4	2000-01-06	11253.2597656250	0.7563626170	2000
5	2000-01-07	11522.5595703125	0.8960445523	2000
6	2000-01-10	11572.2001953125	0.9217924476	2000
7	2000-01-11	11511.0800781250	0.8900903463	2000
8	2000-01-12	11551.0996093750	0.9108479023	2000
9	2000-01-13	11582.4296875000	0.9270983338	2000
10	2000-01-14	11722.9804687500	1.0000000000	2000
11	2000-01-18	11560.7197265625	0.9158377051	2000
12	2000-01-19	11489.3603515625	0.8788245916	2000

Table 1: Sample raw and normalized time series data. It has 5158 records (data points).

Figure 5: Showing the symbolic representation of the extracted patterns

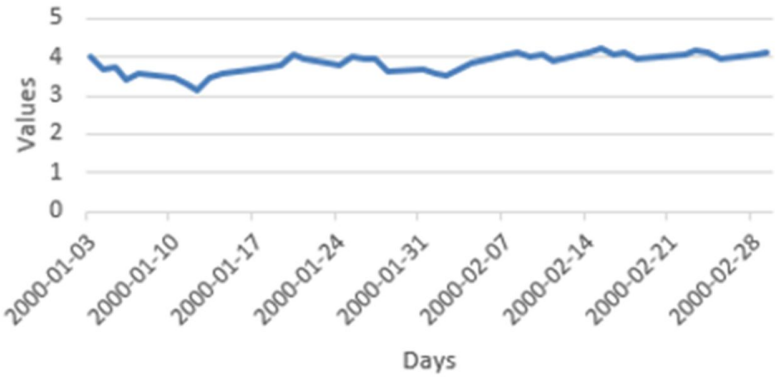

Figure 6: This shows the raw data plot without patterns extracted for two (2) months

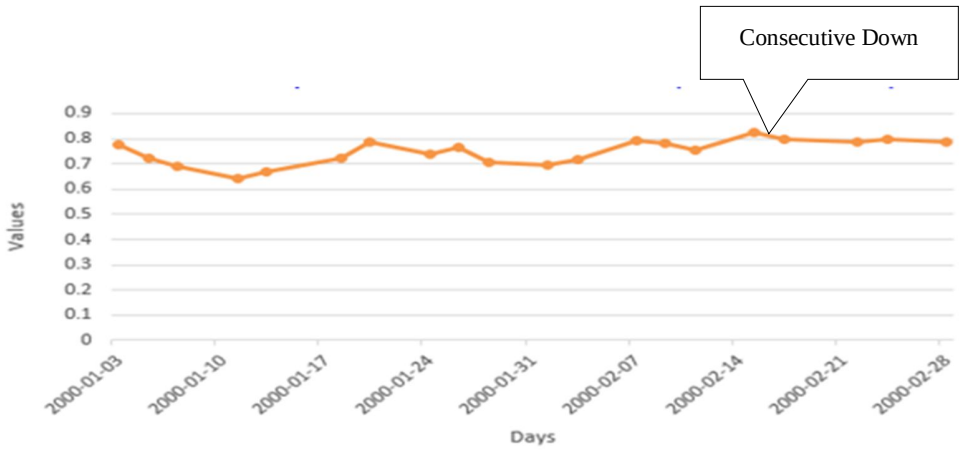

Figure 7: This shows plot of the extracted patterns for the same 2 months.

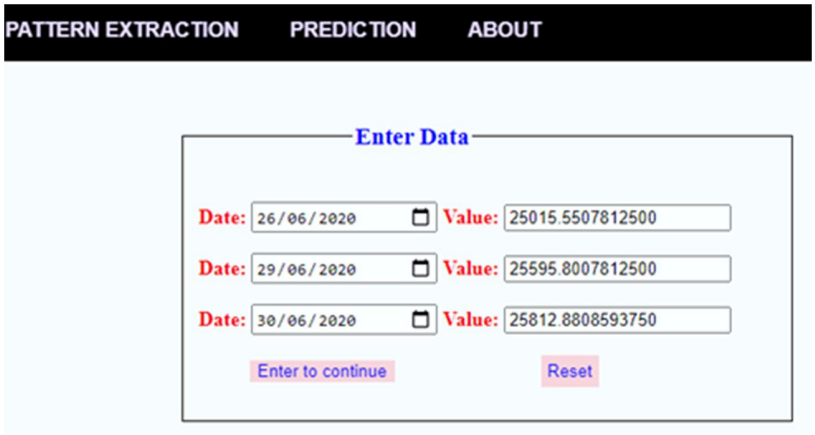

Figure 8: This is the pattern prediction window.

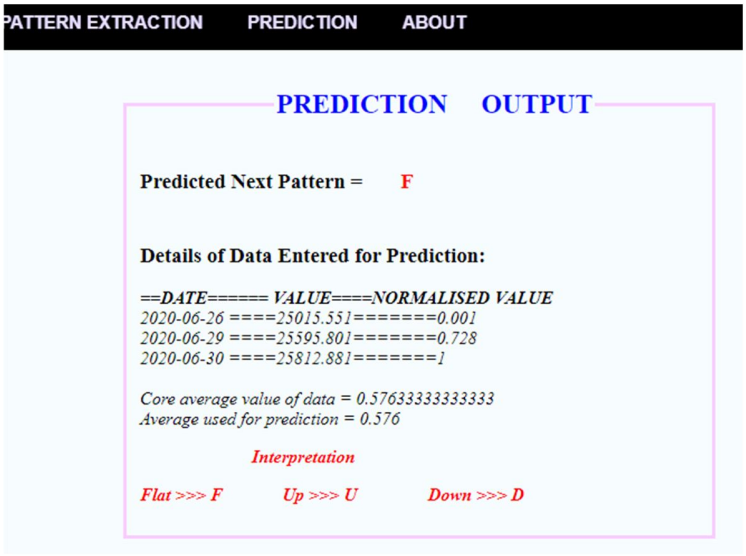

Figure 9: The prediction output from the system.

Conclusion

This research has shown that through the process of data mining, that patterns: (a) can be identified in a univariate discrete time series (b) can be predicted (c) repeats in historical datasets. The aim and all the stated objectives of the research were met. Thus, with the new model developed, time series data miners and the general time series community have gained knowledge that were once not obvious. Researchers in time series analysis from different perspectives like statistics, economics and data mining will benefit immensely from the contributions of this work. Further research can be carried out to explore the applicability of the algorithms to other time series domains aside stock market data. In addition, consideration of multivariate time series datasets can also be explored.

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