Adequacy of Instructional Resources and the Teaching of Sociology in University of Uyo, Uyo, Akwa Ibom State

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ABSTRACT

This study examines the relationship between adequacy of instructional resources and teaching of sociology in University of Uyo, Akwa Ibom State. Two research questions as well as two research hypotheses were formulated to guide the study. The study adopted a survey research design using the population of 100, comprising 20 lecturers and 80 Year 2 students. The sample sizes of 80 respondents were selected through simple random sampling technique. A 30 item questionnaire was used for data collection from the respondents. The instrument was validated by three experts one from Sociology Department while two from Faculty of Education, University of Uyo. The study yielded a reliability co-efficient of 0.82. Pearson Product Moment Correlation Coefficient was used to answer the research questions and also to test the null hypotheses. The result of the finding indicated that there is a significant relationship between adequate used of prints resources and audio-visual and the teaching of sociology in University of Uyo. It was recommended among others that educational institutions should make available to the students a qualitative instructional resources; such as textbooks, audio-visual resources, chat, television and projectors for a continuous enhancement of students' academic performance.

KEYWORDS: Instructional resources, learning, sociology and teaching.

Introduction

Teaching sociology is about educating learners and for the learners to be educated societally: they must acquire knowledge, skills and understanding of being together in harmony, as a person, members in a family, in groups, religious environment, cultural and work as a team. The process of teaching and learning therefore necessarily involves a two-way communication between the teacher and the learner. The communication may be face-to-face or from a distance.

Whatever forms the two-way communication takes, appropriate media of communication have to be used for effective teaching and learning of sociology (Onyejemezi, 2011).

Such media are usually referred to as teaching and learning resources. These resources whether they are real or representations, their main purpose is to improve the quality of teaching and learning. They make the learning content meaningful, preserve and extend knowledge to unlimited number of learners. These resources can be adequately produced, both in terms of quantity and quality; they may or may not be effectively and efficiently distributed to schools and learners. For useful learning to occur, all learners in the various level of the nation's educational system should be provided with appropriate learning materials.

A systematic integration of a variety of sociology resources in teaching-learning process or environment produces appropriate learning experiences, which in turn results in effective or meaningful learning. Experiencing is therefore, the process of acquisition of knowledge, skills, attitude and understanding through active participation on the part of the learners. There exist in virtually every facet of Nigeria's educational system an acute, even embarrassing shortage of sociology instructional resources and facilities, and when available they are exceptionally of low quality. One word sums up the situation - decay.

This decay is characterized by;

i. Lack of concrete and authoritative support for replacement of obsolete resource and facilities.

ii. Inability to match the educational institutions with their peculiar circumstance.

iii. Persistent lack of appropriate and necessary infrastructural facilities necessary for the use of the resources and,

iv. General absence of support service unit personnel and services needed by resource agencies, teachers and learners for optimum production and utilization of resources.

This study aims to bring to the attention of all the stakeholders concerned with the need to address the inadequacy of instructional resources at the University of Uyo. The absence of relevant resources in the classrooms, lecture halls, laboratories, demonstration rooms and workshops left the teachers with the dominant method of teaching which has continued to be frontal teaching that is oral exposition "teacher talk which averages 90% of all lessons" (Onyejemezi, 2011).

The learners, on their own part, are faced with no option but memorization without understanding and the required competencies. Sociology education, properly conceived and applied, requires competencies. Sociology education, properly conceived and applied, requires all kinds of resources: human, financial and physical indeed, it has said that as far as sociology education is concerned, the whole world is a resource. When these are available, desirable quantity, they usually have the following effect: encouraging the teacher and the learner to have easy and repeated reproduction of an event or procedure; provide visual access to a process or technique, provide common frame work or experience to a large number of learners; promote an illusion of reality; gain or hold the attention of the learner; focus attention on highlights of key points and create impact (Suleiman, 2011).

Scarcity of these resources is partly responsible for the situation that prevails today where learners are programmed right from the start without the capacity to visualize in concrete terms the concepts learnt, as such are unable to do things practically, describing relationship between various objects accurately or apply themselves to challenging situations at the required time. But in spite of the overriding value of instructional media in increasing the effectiveness of sociology educational process, and the tragedy of the Nigeria situation is that they are invariably scare or not available at all. Teachers are left with no choice but learn to do with less, improvise, innovate and invent. This work aims at looking into the adequacies of instructional resource/facilities of sociology in university and suggests various ways on how teaching and learning of sociology can improve through the supply and use of appropriate instructional resources for harmony and peaceful co-existence.

Abdullahi (2005) states that instructional resources refer to anything a teacher uses in teaching and learning situations from small stones, pieces of papers, small sticks, samples of leaf, chalk board, maps, charts, radio, television and computer. They are the vehicles that carry messages/information from a transmitting source, which may be human being, or inanimate object to the receiver of the message which in the teaching and learning environment are the students. Teachers need to realize that for them to inspire the education of their students, they must endeavour to employ teaching resources in the course of their lesson presentation. Teachers are free to use any relevant resources while teaching, such resources range from simple one such as pictures, charts, diagrams and models, television, video, projectors and computers. These instructional resources are vehicle that carry messages/information from a transmitting source to the receiver of the message, which are the students in the teaching/learning environment. Such vehicles provide students with opportunities to use their sense, so that at the end of instruction students can perform teacher's stated objectives (Arolasafe, 2005).

Sociology teaching at any level of education therefore, should never be deemed a "talk and chalk" affair. Today, effective and meaningful teaching should be seen as a process in which the teacher and the learner are actively engaged. Both sides must be constantly contributing to the process of learning. If this process is to be fully realized each significant step should be baked up with learning resources/facilities, which are designed to make teaching easier and learning more meaningful. Instructional resources enable the teacher and the learner to have easy and repeated reproduction of an event or procedure, it promotes an illusion of reality, provides visual access to a process or technique, creates impact, focuses attention on highlight of key points, saves time by limiting the use of wordy explanations, gain and hold the attention of the learner, and facilitate the understanding of abstract concept (Ayodele, 2006).

At all levels of the nation's teaching and learning resources are indispensable factor in the attainment of goals. The utilization of instructional resources call into play the sense of sight and touch additionally. The more the number of senses involved in the instructional practice: I hear, I forget, I see, I remember; I do, I understand. The use of teaching-learning resources guarantee more effective learning as the learner hears, sees, and does. It is therefore necessary to have resources and use them effectively in the classroom when teaching sociology. According to Galadanci, B. S. (2005): The main concern of a good teacher is to achieve his/her instructional objectives through effective teaching. When a teacher communicates effectively with the learners; they will understand and assimilate what they were taught. Effective teaching can only be achieved when appropriate instructional methods are combined with appropriate instructional

resources by a professional teacher. Instructional resources are various forms of educational resources that teachers and learners can use to enhance understanding of concepts, skills and competences in the teaching- learning process.

Instructional resources are the perfect communicators that implicitly clarifies concepts knowledge and facilitates understanding for learners. Teaching-learning process without the use of relevant instructional resources can be regarded as tea without sugar or food without salt. Etuk, Udosen, Emah, Edem & Afangideh (2015), expressed need of instructional resources in teaching and learning when stated that instructional resources are article that carry messages/information from a transmitting source to the achieving end.

Classification of instructional resources could be obtained as follows;

1. Printed and non-printed resources.
    a. Printed resources e.g. text books, journals, posters.

        Textbooks: The importance of good text books cannot be overemphasized. Both the teacher and the learner make use of text books because they contain accumulated wealth of knowledge which he/she communicates to the student on the other hand, student themselves make use of the text book, continue on their own in private studies both in school and at home. With textbooks, they gather more information that made by the teacher. With textbook, student can conveniently do their homework and assignment. With textbooks, student can validate certain points by the teachers.

    b. Non-printed resources e.g. chalk board, flannel board, models, 16mm film projector.
2. Audio resources, visual resources, audio-visual resources e.g.
    a. Audio resources e.g. radio, audio tape, record players.
    b. Visual resources e.g. pictures, charts, maps, real things, model, mock-ups, etc.
    c. Audio-visual resource e.g. instructional or educational television, 16mm and 8mm sound films.
3. Projected and non-projected resources
    a. Projected still pictures, films, slides inside and films strips, motion pictures films, overhead projector, opaque projector.
    b. Non-projected resources e.g. various forms of chalk board, flannel board, text books

Importance of instructional resources, Etuk, *et al.* (2015), cannot be overemphasized with the following advantageous values for both the teacher and the students;

1. They arouse the interest and curiosity of the learners.
2. They make what is being taught to be real thereby bridging the gap between theory and practice.

3. They supply a concrete basis for conceptual thinking and reduce abstraction of novel contents, learning experiences and concepts.

4. Instructional resources if properly used, stimulate the learners into engaging in other related useful activities such as further observations, modeling, reading, drawing, etc.

5. Instructional resources enhance retention and remembering on the part of the learner.

6. They offer learners opportunity for independent and individualized learning.

7. They hold learner opportunity thereby helping them to remain focused in teaching-learning process.

8. The use of instructional resources conveniently accommodates the different learning styles of the learners or their differences or background.

9. The use of instructional resources especially those available in the immediate environment of the learners makes him appreciate the extent of nature's support for his effective learning.

10. The instructional resources help the teacher to do the work better and efficiently, their importance is based on the learners because they are effective means of learning with understanding in less time as well as means of communication.

11. Instructional resources foster growth of meaning and vocabulary.

12. They help learners to get firsthand experience by looking at concrete things, living experiences and actual demonstration handling the apparatus and performing the practical themselves. The usefulness of instructional resources in the teaching learning cannot be overemphasized.

13. Studies have shown students retain the knowledge gained through a much longer time as compared with subject matter learnt in the absence of such instructional resources.

Sociology is the most interesting subjects as far as students are concerned, although it is difficult. Sociology is the easiest subject to score hundred marks, because steps and formula are considered most, and not the answer, since sociology is involved in all major subjects like physics, chemistry and statistics, students should take utmost care to learn math (Curzon, 2004).

1. Adaptive reasoning is the most essential aspect in math and that is why children should be taught sociology with very strong base in the introduction stage. Different nations follow different ways of math teaching and in poor countries, kids are not provided with math learning equipment, which is a disadvantage for the school students. In present days, schools have become commercial and program the syllabus, which is heavy for the kids.

2. Even mentally challenges kid and autism-affected children show special interest in learning math. In fact, they understand math better than other subject. Speech therapy specialists use math as base tool to teach kids, who are with disabilities. In practical like, math is not just a subject to learn, but it also supports kids to deal with various situations.

In recent times, sociologists have mad sociology very interesting and kids are fond of learning math, with deep involvement.

3. Sociology scholars provide various creative ideas, for the benefit of the students and very unfortunately, only a few global education institutions are implementing those innovation ideas. Modern math is not easy for kids to learn, without visual lessons. In fact, many international electronic whiteboard manufacturers have upgraded the way of learning sociology.

4. The developed sociology is based on the philosophies, which were formalized by ancient sociology. This rich history of sociology makes the subjects unique, which has stood of the test of times, over past years. Unless kids are provided with the opportunity to have complete exposure to social studies, they may not be able to reach their goals, or perhaps even decide their goals.

5. Mastering of social studies at young age paves way for critical reasoning and thinking to cope up with the present global economic condition. For economists, who are in public making opinions, social studies helps to have holistic approach, while making important decisions, which determines the entire global smooth functioning. Further learning of social studies inculcates creative as well as lateral thinking, which is highly essential, not only in schools, but also in difficult situations, in fact, all employers believe that lateral thinking ability of candidates is far better than their technical skills and academic knowledge.

The word sociology came from a Greek word which means science or study. Sociology is "branch of human enquiry involving the study of behaviour, quantities, data, shape and space and their relationships, especially their generalizations and abstractions and their application to situations in the real world." Sociology generalizes new formulas or methods based on similar patterns for different branches of study for human up bring and togetherness. Before teaching sociology, every teacher should be informed well about the educational valves of this subject. Proper teaching method should be adopted according to the situation, learning environment and educational background of the students. It is very important to keep the motivational level of students high otherwise they lose interest in sociology (Curzon, 2004).

Statement of the Problem

Sociology is one of the most important subject in schools at whatever level. However, in the process of teaching sociology, it appears that adequate instructional resources are not available for learning of the subject. It may be out of place to suggest that, this has resulted in students' poor performance in examinations. Students are not able to concretize abstract concept learnt, they cannot establish relationships between concepts in sociology and this often lead to perceived difficulty of sociology as a result of inadequacy and unavailability of instructional resources for teaching sociology. The study therefore aims at investigating the adequacy of instructional resources for teaching sociology in University of Uyo.

Purpose of the Study

Generally, the purpose of the study is to examine the adequacy of instructional resources for teaching sociology in the University. Specifically, the study aims at;

1. Examining the adequacy of print resources for teaching sociology in University of Uyo.
2. Assess adequacy of Audio-visual resources for teaching sociology in University of Uyo.

Research Questions

1. What is the relationship between print resources and the teaching of sociology in University of Uyo?
2. What is the relationship between audio-visual resources and the teaching of sociology in University of Uyo?

Null Hypotheses

1. There is no significant relationship between print resources and the teaching of sociology in University of Uyo.
2. There is no significant relationship between Audio-visual resources and the teaching of sociology in University of Uyo.

Methodology

This study adopted survey design. The survey design was found suitable for this study because questionnaire was used to collect data from respondents. The population was 100, comprising twenty (20) lecturers and eighty (80) 200 level students in University of Uyo. The sample size of 80 students was adopted using simple random sampling technique. A – 30 item questionnaire titled "Adequacy of Instructional Resources for Teaching of Sociology (AIRTSQ)" was formulated. The questionnaire was validated by three experts in the University of Uyo, and a reliability coefficient of 0.82 was established using Cronbach Alpha reliability technique. In answering the research questions and testing the null hypotheses, Pearson Product Moment Correlation Coefficient (PPMC) was used.

Results

Null Hypothesis 1: There is no significant relationship between print resources and teaching of sociology in University of Uyo.

Table 1: Correlation analysis of print resources in teachings of sociology

Variables	$\sum X$ / $\sum Y$	$\sum X2$ / $\sum Y2$	$\sum XY$	**R-Cal**
Print resources X	260	13750		
			7150	0.96*
Teaching sociology Y	140	4050		

***Significant at 0.5, df=78, critical r = 220, calculated r = 0.96.**

The result of the analysis show that the calculated r-value of 0.96 was found to be greater than the critical r-value of 0.220 when tested at 0.05 level of significance with 78 degree of freedom. This means that the result is significant. The result of the analysis thereby indicated that

there is a significant relationship between print resources and teaching of sociology, hence, the null hypothesis is rejected in favour of the alternative hypothesis.

Null Hypothesis 2: There is no significant relationship between audio-visual resources and the teaching of sociology in University of Uyo.

Table 2: Correlation analysis of print resources teachings of sociology

Variables	$\sum X$ $\sum Y$	$\sum X2$ $\sum Y2$	$\sum XY$	**R-Cal**
Print resources X	300	18250	5750	0.86*
Teaching sociology Y	100	2250		

***Significant at 0.5, df=78, critical r = 220, calculated r = 0.96.**

The result of the findings revealed that there is a significant relationship between adequate used of prints resources and audio-visual and teaching of sociology in in University of Uyo.

Discussion of Findings

The findings revealed that all the null hypotheses were rejected which implied that there is a significant relationship between adequate used of instructional resources and teaching-learning of sociology. This collaborate with Suleiman (2011) who maintained that when resources are available in desirable quantity and quality, they usually have the following effects: encourage the teachers and learners to have easy and repeated reproduction of an event or procedure; provide visual access to a process or technique; provide common framework or experience to a large number of learners; promote an illusion of reality gain or hold the attention of the learner; focus attention on highlights of key points and create impact.

Conclusion

Based on the result of the findings, the study concluded that instructional resources could encourage teaching of sociology not only in University of Uyo, but across the entire educational system.

Recommendations

Hence, the following recommendations;

1. That educational institutions should make available to the lecturers and students a quantitative and qualitative instructional resources; such as print resources, audio-visual resources to reduce abstraction to concrete learning.

2. Teachers as well as students should make use of approved sociology instructional resources especially the textbooks.

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An Assessment of Expertise Recommender System for Scientific Community

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ABSTRACT

Finding experts in academics as well as in enterprises is an important practical problem. Both manual and automated approaches are employed and have their own pros and cons. On one hand, the manual approaches need extensive human efforts but the quality of data is good, on the other hand, the automated approaches normally do not need human efforts but the quality of service is not as good as in the manual approaches. Furthermore, the automated approaches normally use only one metric to measure the expertise of an individual. For example, for finding experts in academia, the number of publications of an individual is used to discover and rank experts. This paper illustrates both manual and automated approaches for finding experts and subsequently proposes and implements an automated approach for measuring expertise profile in academia. The proposed approach incorporates multiple metrics for measuring an overall expertise level. To visualize a rank list of experts, an extended hyperbolic visualization technique is proposed and implemented. Furthermore, the discovered experts are pushed to users based on their local context.

KEYWORDS: Expertise Finding, Hyperbolic Visualization, Digital Journals, Multi-faceted expert Profile, Spiral Visualization.

Introduction

The discovery of expertise is crucial in supporting a number of tasks. Finding appropriate experts is a key to unprecedented success in enterprises as well as in academia. Finding an appropriate expert is very helpful when one needs guidance on a subject matter, or needs to fill a vacancy based on relevant expertise, or needs to boost the overall productivity especially in enterprises, or needs to find research collaborators working in similar areas, or needs to find editors/reviewers in peer-review setting etc. Therefore, the expertise finding systems can increase overall productivity and can decrease critical delays due to ineffective work. There are different application areas like Software Engineering [Mockus and Herbsleb, 2002], Enterprise [Balog et al., 2006], Medicine [Sun and Giles, 2007] and Research [Liu and Dew, 2004] which employ various techniques to find appropriate experts using both manual and automated approaches.

A variety of tools have been implemented within organizations to find experts and expertise for different scenarios. Most related works make use of explicitly specified expert profiles constructed manually. The problem with such manually constructed profiles is that they tend to be developed for particular projects and constantly need to be updated e.g. [Pipek et al., 2002]. Using an entirely automated mechanism for determining user expertise may also not be adequate in itself. As an illustration, Google Scholar employed an automated approach and wrongly identified names of places such as Ann Arbour, or Milton Keynes as cited authors [Postellon, 2008]. This also highlights the non-trivial nature of expertise mining and the difficulty faced in the disambiguation of individuals. Automated approaches normally use one facet to judge the overall expertise level of an expert. For example, in a discussion forum analyzing only the number of interactions of an individual is used to judge expertise level [Krulwich, 1995].

In the peer-review setting, appropriate and capable reviewers/committee-members/editors are discovered by computing their profiles, usually based on the overall collection of their publications [Cameron, 2007]. However, the publication quantity alone is insufficient to get an overall assessment of expertise. To incorporate the publication quality in the expertise profile, Cameron used the impact factor of publications' venues (journals, conferences etc.) [Cameron, 2007]. However, the impact factor in itself is arguable [Seglen, 1997] [Hecht et al., 1998]. All publications in a high impact venue do not necessarily get high number of citations. The impact factor of a journal is calculated by considering the number of citations received by all publications published in the journal for a typical period of time [Garfield, 1972]. However, Hirsch, a physicist, proposed another metric, the "H-Index", to rank individuals [Hirsch, 2005]. The H-Index of an author is calculated by considering the number of citations received by his/her most cited publications. To be precise, a scholar with an index h means that the author has published at least h papers each of which has been cited by others at least h times. However, this index works fine only for comparing scientists working in the same field because citation conventions differ widely among different fields [Hirsch, 2005]. Therefore, to measure the quality of one's work in the same field, it is better to calculate the number of citations a person receives rather than just considering the impact factors of journals/conferences where the publications were published. In our approach, additionally we incorporate the number of citations received by an author in a particular topic to make an overall assessment of expertise.

We propose an automated technique which incorporates multiple facets in providing a more representative assessment of expertise as explained in [Afzal et al., 2008]. To overcome automation errors during citation mining process as mentioned above. We introduced an innovative citation mining technique [Afzal et al., 2010]. We see these facets as providing multiple sources of evidence for a more reflective perspective of experts. We present the combination of both tangible and intangible metrics to shed deeper insights into the intensity of expertise. The system mines multiple facets for an electronic journal and then calculates expertise' weights. The overall weight is further used to rank experts in the respective topic. The measures provided are, however, not absolute indicators of expertise as the discoveries are limited by the coverage of the database of publications and expert profiles used.

The system discoveries can be enhanced by visualizing the mined data [Shneiderman, 2002]. In order to enhance the knowledge discoveries, we have visualized experts by using hyperbolic tree visualization technique. The proposed technique is based on focus plus context

with extended focus to represent the statistical data. The aforementioned technique is useful especially for journal administration to find high profile authors (experts) who can be assigned as editors/reviewers for the respective topics. To facilitate users of J. UCS, the mined experts are further pushed to users by observing users' local context and task at hand. For example, when a user is viewing a paper, he/she will instantly know about assigned editors and highly active experts associated with topics of the paper. This helps users to establish collaborations in their respective area.

Visualizing a rank list of experts is not enough, users would have an option to explore more aspects of experts, for example short biographies, recent publications, contact information, and affiliations of experts. To support this task, editors are linked with their profiles represented in J. UCS. However, the actively emerging experts (potential reviewers) are further linked with Faceted DBLP. The Faceted DBLP provides a search interface of the huge repository of DBLP. The search interface provides different facets like publication years, co-authors, venues (journal/conference/book series etc) for the selected author. By this means, the users not only know about experts in the respective area, but they can also explore other recent publications of experts and their co-authors, indexed in DBLP.

Related Work

Expertise finder systems in the past, have been innovatively applied in helping PhD applicants in finding relevant supervisors [Liu and Dew, 2004] and also in identifying peer-reviewers for a conference [Rodriguez and Bollen, 2008]. The former made use of a manually constructed expertise profile database while the latter employed reference mining for all papers submitted to a conference. In the latter, a co-authorship network was constructed for each submitted paper making use of a measure of conflict-of-interest to ensure that papers were not reviewed by associates.

Cameron [Cameron et al., 2007a] employed a manually crafted taxonomy of 100 topics in DBLP [DBLP, 2009] covering the research areas of a small sample of User researchers appearing in DBLP. They proposed the need for automatic taxonomy creation as a key issue in finding experts. Mockus et al., [Mockus and Herbsleb, 2002] employed data from a software project's change management records to locate people with desired expertise in a large organization. Their work indicated a need to explicitly represent experiential characterization of individuals as a means of providing insights into the knowledge and skills of individuals. Yimam [Yimam, 1999] have further shown that a decentralized approach can be applied for information gathering in the construction of expertise profiles. Tho et al., [Tho et al., 2007] employed a citation mining retrieval technique where a cross mapping between author clusters and topic clusters was applied to assign areas of expertise to serve as an additional layer of search results organization.

There are also expertise detection systems that were based entirely on an analysis of user activity and behavior while being engaged in an electronic environment. Krulwich et al., [Krulwich and Burkey, 1995] have analyzed the number of interactions of an individual within a discussion forum as a means of constructing an expert's profile. Although such an approach is useful in monitoring user participation, measures such as number of interactions on a particular topic is in itself not reflective of knowledge levels of individuals. Information visualization techniques have been used to visualize large datasets to support exploration and in finding

hidden patterns [Card et al., 1999]. To visualize large hierarchal structures, the hyperbolic tree was developed by Xerox [Lamping and Rao, 1996]. The principle of Focus plus Context is supported by a detailed view for the focused part of the data in the center of the display, while the overall hierarchal structure of data remains visible around the edges. In computer science, ACM categories are widely used to organize scientific work. ACM categories can be seen as a hierarchal taxonomy and can be visualized using a hyperbolic tree. To visualize experts in a proper ranking for a specific ACM category, spiral visualization is appropriate. The RankSpiral was used by [Spoerri, 2004] to maximize information density and minimize occlusions for large documents. We have applied a similar approach for the visualization of experts around a particular node in the ACM category tree.

A Multi-Faceted Expert Profile

In exploring a comprehensive characterization of expertise, we proposed a multifaceted approach for mining the expertise for a digital journal [Afzal et al., 2008]. The multiple facets are represented by the following measurements: number of publications, number of citations received, extent and proportion of citations within a particular area, expert profile records, and experience. We have thus incorporated the use of user-defined profiles, "experience atom" (as proposed by [Mockus and Herbsleb, 2002] to indicate fundamental experiential units), reference mining results and a characterization of expert participation as facets of an expert profile. In a comprehensive characterization of expertise, the following measurements have been proposed:

Number of publications: This describes the overall expertise areas of a person. The intensity of expertise, however, can be represented by the extent of publications. The number of publications can also be used to indicate the topic specific expertise intensity of researchers.

Number of citations received: Citations are indicative of the impact of publications and as a result can be applied to reflect the impact of expert.

Extent and proportion of citations within a particular area: This further indicates the actual interest of citing authors and the overall contribution in a specific area.

Expert Profile Records: J.UCS has expert profiles for its 300 members in its editorial board representing the specified area of expertise based on ACM categories.

This input can be useful as a source in identifying a person as an expert in the area. There are however a number of issues to be considered: areas of interest may change and the research area in itself may evolve.

Experience: Other experiential measures of a person can also be applied in representing one's expertise. Measures that can be acquired with regards to the assessment of experiences include: period of publishing in a particular area, list of projects participated in, assessments of mentoring activities, etc. In the current work, we have taken into consideration the publication age factor only.

Combining all these factors provides a better indication of expertise with regards to a particular topic.

In our research, there are two main sources of information used to construct an expert profile: 1) user inputs and 2) system discoveries. User inputs are taken from reviewers of the journal J.UCS. The J.UCS has over 300 reviewers on its editorial board. The expertise of these reviewers are specified and maintained according to the ACM classification scheme [ACM-CCS, 1998]. This information was extracted from J.UCS and used to populate the expert profile database. The second source for constructing expert profiles is computed by the system. The computation considers the number of publications of an individual, the number of citations that a person receives, and the person's duration of publication in the respective area. The extraction of all publications (over 1,400) along with authors and co-authors of the publication is described in [Afzal et al., 2007] with a set of over 15,000 references [Afzal et al., 2008].

Experts Weights

Data Extraction

Within J.UCS, ACM topics, editors, and every individual paper are represented in an XML notation, which needs to be parsed to extract metadata. A typical XML file for J.UCS papers can be seen in Figure 2. The metadata (paper title, authors, ACM topic, etc.) related to a paper is stored inside the XML file.

The extracted data was used to populate a relational database. The database presents a coherent view of all data with relationships (category, paper, authors, and citations). For citation extraction, a technique called Template-based Information Extraction using Rule-based Learning (TIERL) was developed [Afzal et al., 2010]. The TIERL outperformed existing citation extraction approaches (like ISI, Google Scholar, and Cite Seer). The data from this database was then used to calculate and visualize experts within the J.UCS environment.

Weights Assigned to Experts

There are different ways to calculate expertise for different tasks as explained earlier. Our focus is to measure expertise profile in a scientific community, more specifically for finding a program committee or for finding research collaborators. There is no standard and no absolute definition for calculating expertise. The debate for defining suitable scale for overall assessment of expertise is ongoing. Some argue that publication data alone is insufficient to accurately capture expertise [Seglen, 1997] [Hecht et al., 1998]. Others counter that bibliographic data is reasonable as experimental facts support their value [Cameron et al., 2007]. However, the belief that the quantity of publications is proportional to expertise is not universally true. In a very recent and related work, Cameron explained this problem with an example [Cameron, 2007]. He picked two experts in the field of databases in a scenario where one has a long list of publications in the field while the other has only fewer. In this scenario, on one hand, 'E.F. Codd', inventor of the relational database model, and recipient of the ACM Turing Award in 1981 and 1994, has only 49 articles in DBLP, on the other hand, 'Hector Garcia-Molina', an ACM Fellow too, recipient of the ACM SIGMOD Innovations Award in 1999, had 248 publications in DBLP until 2003 (the year of Codd's death). This example highlights a situation in which a researcher having a large list of publications, may by default, be ranked more prolific than his associates having fewer publications, in spite of publication quality. If one considers publication quantity alone as a measure of expertise, the statistics would conclude 'Garcia-Molina', as far more prolific in the field of databases. However, considering magnificent contributions of 'E.F. Codd'

to the field, many may regard it astonishing. To measure a better rank of experts, Cameron employed 'publication impact' as an additional measure to incorporate the quality of the published manuscripts.

However, the impact factor in itself is arguable [Seglen, 1997] [Hecht et al., 1998] [PLoS Medicine Editors, 2006]. The impact factor does not work well since a small number of publications are cited much more than the majority of publication in a particular venue. For example, the well known journal Nature has analyzed the citations of individual papers in Nature and found that 89% of the impact factor was generated by just 25% of the papers [Nature Editorial, 2005]. Alternatively, if a publication is of great quality then it will receive a reasonable number of citations. Therefore, to rank experts in a field, it is better to calculate the number of citations of all publications of an individual [Hirsch, 2005]. This also applies the above defined scenario. As per Google Scholar database, the most cited paper by 'E.F. Codd' has received 5140 citations as of November 2009 while the most cited paper by 'Hector Garcia-Molina' has received 1408. Therefore, using citations of researchers' publications directly rather than using the impact factor as Hirsch did in calculating H-Index [Hirsch, 2005] would be better. In our approach, we have applied the number of publications and citations in an innovative way to calculate overall expertise as explained in the next sections. Apart from publications and citations lists, there might be different measures that can be integrated into the overall weight of the experts. For example, one can use the fact that if a person is serving as a reviewer or on editorial board of some journals and conferences.

In our system, experts are grouped into one of two categories: 1) editors (persons currently manually assigned as reviewers for a particular ACM topic) and 2) high-profile authors (persons flagged automatically as experts in a particular topic). Reviewers are selected by the editor-in-chief based on their expertise in the respective ACM topical area. Reviewers for a particular ACM category are visualized without any further calculation. High-profile authors are calculated based on weights assigned to them. The facets defined in Figure 3 are used to assign the weights. The weights used in our system are publication weight, citation weight, and editor weight.

Publication Weight

In a particular research area, the publication weight of an author is obtained by dividing the number of the author's publications by the number of publications' years (duration of publications). To find active experts, we consider the publications of an author that have been published in the last five years. The number of years is calculated from the year of a first publication (within last five years) until the current year. For example, if an author has published four contributions in the last four years then the publication weight of the author would be one. Consequently, for a specific research area, authors having a larger publication weight would get an edge over their counterparts having fewer publications.

Publication Weight = No. of publications / duration (No. of years).

Citation Weight

The citation weight reflects the author's impact in the growth of a particular research area. For example if all papers in a research area have received 1000 citations collectively and an author's

papers in that specific area have received 100 citations, then the citation weight of this author would be 0.1.

Citation Weight = No. of citations received by an author / total No. of citations in an ACM topic.

Editor Weight

The editors' weight is calculated by dividing the number of J.UCS reviewers by the total number of J.UCS authors. This weight is assigned to only those authors who are also working as editor/reviewers. In this way, reviewers (already acclaimed experts) get an edge over the other authors.

Editor Weight = No. J.UCS editors / Total no. of J.UCS Authors.

The total weight

It is defined as the sum of the above defined weights:

Editor Weight = No. J.UCS editors / Total no. of J.UCS Authors.

Algorithm to Construct Experts' Profiles

The algorithm for calculating an expert profile is shown in Figure below. The algorithm takes: topic, papers, citations, and reviewers as input and returns an expert profile for all topics.

```
Algorithm calculaeExpertiseProfile(Topics)
1.  create 'empty expertise profile'
2.  for each 'topic' do
3.      get 'papers' written in the last 5 years.
4.      get 'topic_cit_count' (get citation counts for all papers in a topic)
5.      get 'authors'
6.       for each author do
7.          get 'pub_count' (publication count of an author ).
8.          get 'pub_duration' (publication duration is defined as: current
            year - year of the first publication (within last 5 yrs) + 1).
9.          Get 'cit_count' (citation count of an author).
10.         publication_weight = pub_count / pub_duration.
11.         citation_weight    = cit_count / topic_cit_count.
12.         if 'author' is also a 'editor' do
13.             get 'editors_count' (number of editors in a topic).
14.             get 'authors_count' (number of authors in a topic)
15.             editor_weight = editors_count / authors_count
16.         else
17.             weight 3 = 0
18.         end
19.         weight = publication_weight + citation_weight + editor_weight
20.         add <'topic', 'author', 'weight'> to 'expert profile'
21.     end
22. end
    return 'expert profile'
```

Figure 1: Algorithm calculate Expertise Profile (Topics)

Information Visualization

Two different visualizations were developed based on measured expertise, one for the journal administration and the other for users of this journal. The visualization for the journal administration is based on the assumption that all topics should be visible in one place where one can easily navigate to a particular topic and can see editors and potential experts belonging to that topic. To make it user-friendly, we have chosen a hyperbolic browser which is based on "focus+context" technique [Lamping and Rao, 1994] [Lamping et al., 1995] [Lamping and Rao, 1996]. The hyperbolic browser was further extended with a spiral representation of potentially ranked experts. This makes the job of administrator to focus on any particular topic while the overall context remains there. The details of hyperbolic visualization can be found in the next section. The second visualization was developed for users of the journal. This visualization is based on the assumption that the user should have an access to experts whenever he needs them. For the current implementation, when a user is looking on a particular paper and clicks 'Links into the Future', then he/she is shown active experts associated with the topics of the focused paper along with the similar papers written in the same area. The details of 'Links into the Future' can be found in [Afzal et al., 2007]. The remaining parts of this section explain both of the aforementioned visualizations.

Extended Hyperbolic Visualization

Reviewers are essentially attached to a node within the ACM classification hierarchy. For each node within the ACM classification hierarchy, a ranked list of high-profile authors (potential reviewers) was calculated. The hyperbolic browser is an efficient visualization technique for large hierarchies. A hyperbolic browser is used to provide intuitive navigation within the ACM classification hierarchy. For any selected node in the ACM hierarchy, a spiral is used to visualize the ranked list of high-profile authors for that node. The spiral is simply superimposed upon and around the selected node. This builds on past work with Rank Spiral [Spoerri, 2004] which use spiral representations to display ranked search result lists.

Visualization for Users of J. UCS

The measured experts for topics of the paper are pushed to users by looking at user's local context. For example, a user is viewing a paper titled 'The Transformation of the Web: How Emerging Communities Shape the Information We Consume'.

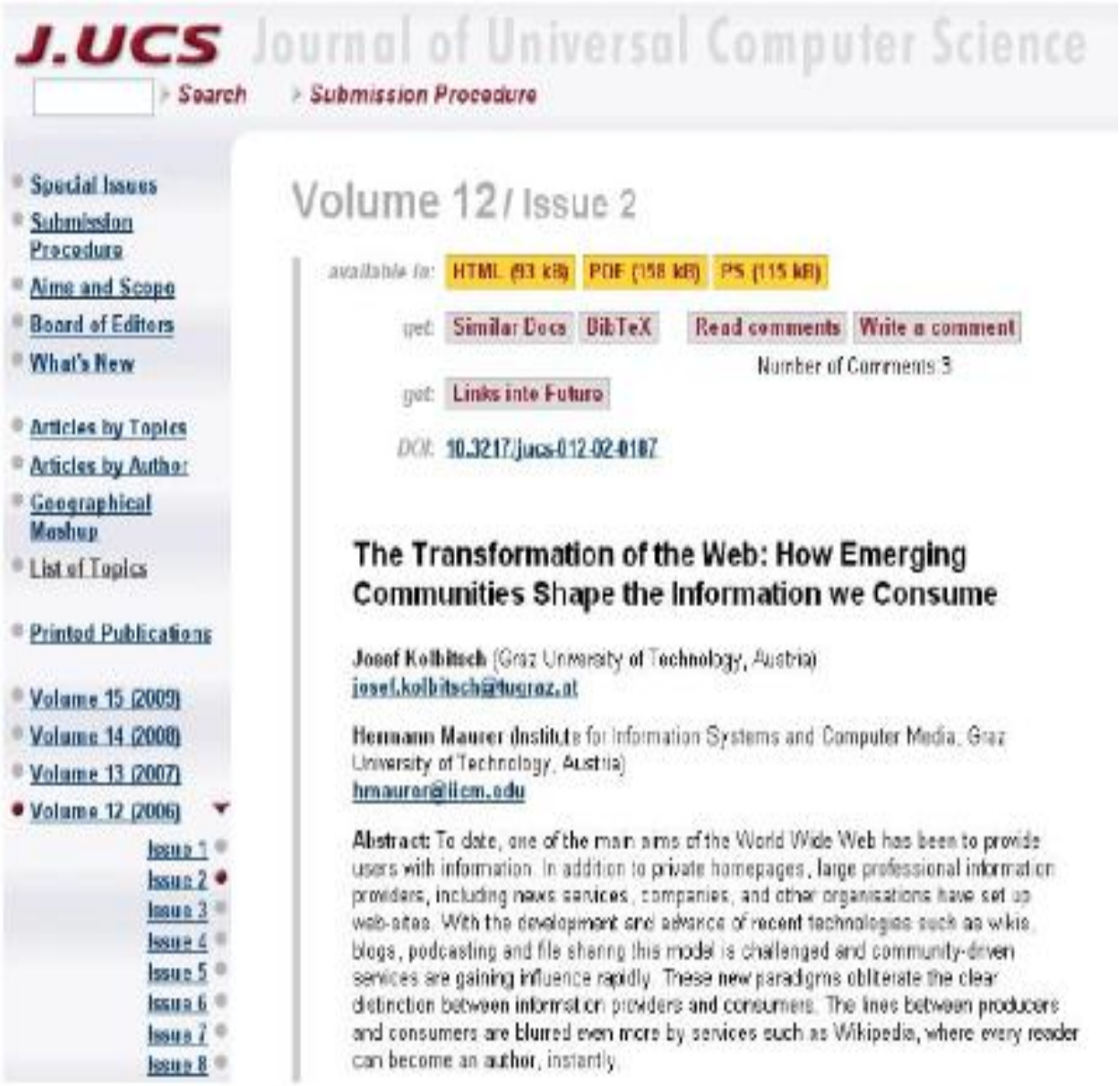


Figure 2: J. UCS interface for viewing a paper

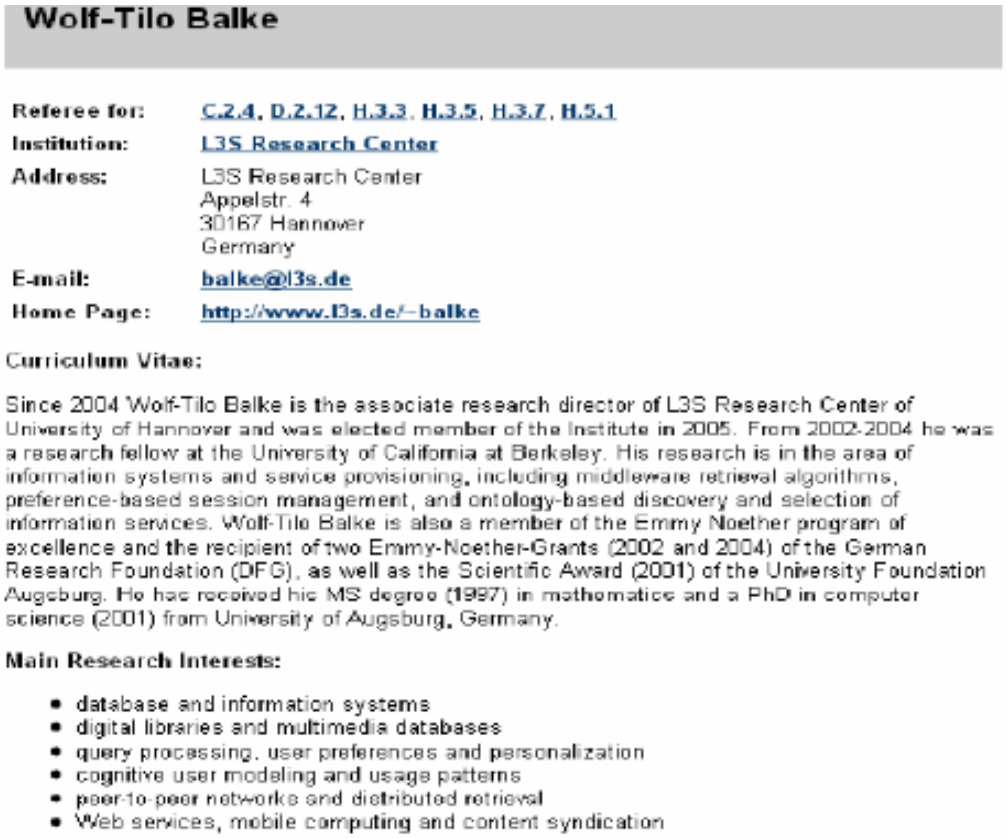
When the user clicks on the 'Links into Future' button, he is redirected to a screen as shown in Figure 2. This was implemented using a java servelet. The servelet receives a reference of the viewing paper as a parameter. The servelet subsequently fetch data from different database tables. On the top of this visualization, the focused paper and its metadata are shown. The lower part of the screen is divided into two columns, the left part is dedicated to visualize 'Links into the Future' i.e. related papers written in the same area in future dates as compared to the publication date of the focused paper as explained in [Afzal et al., 2007], while the right part of the screen visualizes the experts associated with the topics of the focused paper. As already mentioned, experts are categorized into two categories: 1) the editors (reviewers) assigned by the editor-in-chief, and 2) the potential experts flagged by the system. Both categories of experts are shown in this visualization. To find more information about experts, the experts are further

linked within J. UCS and with Faceted DBLP [Diederich et al., 2007]. The current section gives details about reviewers' linkage within J.UCS while section 5.2.2 explains how discovered experts are linked with Faceted DBLP.

There are more than 300 editors serving as reviewers for J. UCS. There is a many-to-many association between editors and topics. Every editor is usually assigned to multiple topics and each topic is assigned to multiple editors. According to current statistics, there are 45 topics in J. UCS which have more than 10 editors associated. If we visualize all editors for all topics of the paper at one place, then it would become a problem to locate required information for users. To avoid such a situation, an indirect way was used. Initially, the topics of the paper are visualized. The user can follow any topic to look for all associated editors and published papers in the focused topic. For example, a user is interested in finding editors of 'H.3.5: Online Information Services'. On click, the user is redirected to the screen**.**

Linking Editors Profiles in J. UCS

The information about editors is maintained by the J. UCS administration in a highly structured way. This information normally includes: short biography, assigned topics for review, institution, address, email and homepage of editors. For example, when a user clicks on "Balke Wolf-Tilo" to view the details, he is redirected to the screen as shown in Figure 3. The user is then able to read a brief biography of the expert and can follow to expert's homepage for recent contributions in the area.



Wolf-Tilo Balke

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Since 2004 Wolf-Tilo Balke is the associate research director of L3S Research Center of University of Hannover and was elected member of the Institute in 2005. From 2002-2004 he was a research fellow at the University of California at Berkeley. His research is in the area of information systems and service provisioning, including middleware retrieval algorithms, preference-based session management, and ontology-based discovery and selection of information services. Wolf-Tilo Balke is also a member of the Emmy Noether program of excellence and the recipient of two Emmy-Noether-Grants (2002 and 2004) of the German Research Foundation (DFG), as well as the Scientific Award (2001) of the University Foundation Augsburg. He has received his MS degree (1997) in mathematics and a PhD in computer science (2001) from University of Augsburg, Germany.

Main Research Interests:

- database and information systems
- digital libraries and multimedia databases
- query processing, user preferences and personalization
- cognitive user modeling and usage patterns
- peer-to-peer networks and distributed retrieval
- Web services, mobile computing and content syndication

Figure 3: Editor profile

Linking Discovered Experts' Profiles to Faceted DBLP

The potential experts (discovered by the system) are shown after the aforementioned visualization as can be seen in Figure 2. Only the active research areas (having contributions in the last five years) and their experts are visualized. For example, the focused article in Figure 2 belongs to five topics and all of them remain active research areas in the last five years in J. UCS. The top 10 ranked experts are visualized for each topic of the paper. To gain deeper insights into the experts' contributions, these experts are further linked with Faceted DBLP [Diederich et al., 2007]. This Faceted DBLP is build upon the large collection of DBLP dataset. For example, a user clicks on the author's name "Jong Hyuk Park" (topic H.5.1) in Figure 2. The user is redirected to the screen. This was achieved by querying Faceted DBLP http://dblp.l3s.de by adjusting author's first, middle, and last names using some heuristics. The Faceted DBLP is based on the large repository of DBLP (DBLP currently index more than 1.3 million computer science publications). In the figure, there are 65 publications of the author "Jong Hyuk Park" found in Faceted DBLP. A user can search using different facets as shown on the left side of the figure like: publication years, publication type (article, proceedings, etc), venues (journals, conferences etc), authors, and the Grow Bag graph. Based on the user selection, search results are shown on the right side of the figure.

For example, a user can search all papers of the focused author which were co-authored with any of the authors shown on the left side. The user can restrict the search results to find papers which appeared only in any of the venues (like: computer communication, The Journal of Super computing, etc). The user can characterize the result set in terms of the main research topics and filter it according to certain subtopics. The Grow Bag terms may be very useful for the user. For example, a user can restrict the result set to see only papers of the focused author which deal with any of the shown Grow Bag terms (like security, pervasive computing, privacy protection etc). Therefore, a user may find required information more efficiently and accurately using this interface and instantly becomes aware of the research areas of the authors, his collaborators list, the venues where the author has published, etc.

Conclusion and recommendation

This paper presented a new system to identify and visualize current and potential experts in topical areas of a scientific discipline. It is used in the context of a computer science journal to identify and assign reviewers to areas of computer science, however, it can easily be generalized to other scientific communities. Expertise Recommender System is highly recommended for Scientific Community at all times.

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Determinants of Health Care Seeking Behaviour Among Dwellers of Oron Urban in Oron L. G. Area, Akwa Ibom State

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ABSTRACT

Poor, delayed or inappropriate health seeking for a sick person with acute illness is associated with high morbidity/mortality. Delay in health seeking is implicated with fatal complications and prolonged need for health services. Thus, health seeking behaviour is an important factor in health management and it becomes relevant among underprivileged populations like urban slums, tribal populations. This study assessed the determinants of health care seeking behaviour among dwellers of Oron urban, in Oron Local Government Area of Akwa Ibom State, Nigeria. A community based descriptive study was adopted in the study. Five hundred and thirty participants were selected for the study using simple random sampling method. A researcher's structured questionnaire was used to collect the data and was administered after obtaining valid informed consent from the participants. Among 530 study participants, majority (40.7%) seek health care from Government owned health facilities for various illnesses. Also 27.2% of the study participants visited the patent medicine dealers/Pharmacy and 20.6% preferred private health facilities. Among various morbidity conditions, cold/fever (29.1%) and pain (19.4%) were the most common reasons for visiting a health care facility. Individual's income was significantly associated with the healthcare seeking behaviour of the study participants ($p<0.05$). Affordability, and accessibility were reported as most common reason for preferring to the Government owned health facility. On other hand, private practitioners were preferred due to their emergency services and quality of care. The choice of participants of health facility was statistically significant ($p<0.05$). Healthcare seeking behaviour of the study participants was influenced by health care facilities, income and the morbidity conditions hence, strengthening of public health care system to offer quality basic health services could improve health seeking behaviour of people. One of the recommendations was that provision of a seamless supply system, infrastructural support, and technical support for soft skills could minimize the turnaround time which is critical.

KEYWORDS: Health, Seeking, Behaviour, Morbidity, Facility, Choice

Introduction

Health is the main aspect of human life. Although a healthy life is the desire of everyone, the reality is that everyone is not healthy. An essential aspect of preserving health is to identify the factors that enable or prevent people from making healthy choices in either their life-style or their use of medical care and treatment, the underlying assumption being that behaviour is best understood in terms of an individual's perception of their social environment (Tipping and Segall, 1995). Health care seeking behaviour refers to decision or an action taken by an individual to maintain, attain, or regain good health and prevent illness (Sudharsanam, 2007). The decision made encompasses all available health care options like visiting facility, self-medication and use of home remedies or not to utilise the available health services etc. (Chauhan *et al*. 2015). Sheeram and Abraham (1996) categorized the range of behaviours that has been examined using health belief model into three broad areas: preventive health behaviour, sick role behaviour and clinic use. In this type of model, individual beliefs offer the link between socialization and behaviour. When individuals make decisions in relation to their health, they weigh up the potential risks or benefits of a particular behaviour. They do so in a way that is influenced by their immediate physical environment, social rootedness, life-style, religious belief and their whole outlook on life generally (Norman and Bennet, 1996; WHO, 2002; Orubuloye, 2003). Thus, various authors (Egunjobi, 1983; Aregbeyen 1992; Orubuloye 1992; Ademuwagun, 1998) have noted that in a pluralistic medical milieu in which the rural dwellers find themselves, the decision to seek care, where to do this and the form of care perceived as appropriate are all influenced by a multiplicity of factors relating to the person, the facility and the socio-cultural environment.

As for health care system in almost all the developing countries, the public and private health sector coexist but private care providers are usually preferred all around due to easy accessibility even in the night, quick relief and individual attention (Sudharsanam, 2007). Whereas, public hospital in Nigeria are known for low quality treatment, long waiting period, long distance, inconvenient location and inadequate facilities (Orubuloye, 2003). However, some public hospitals charges money to free services (Varges *et al.* 2013). Also, owning to lack of money to access care at private hospitals, many poor people resort to self-treatment and by-pass primary healthcare providers (Gotsadza *et al.* 2005).

Health seeking behaviour is a result of a complex interaction of provider, patient, illness and household characteristics (Tipping and Segall, 1995). Health seeking behaviour is influenced by a variety of socio-economic variables, including sex, age, the social status of women, the type of illness, access to services and perceived quality of the service etc. This has been found to be associated with type of illness and gender of ill-person, income group and area of residence (Pillai et al. 2003; Sudha *et al*. 2003).

Planning for health care services provision depends on the health needs and health seeking attitude of the population. Determining the health care seeking behaviour is essential to provide need based health care services to the population. While hospital data remains the main source of information regarding the disease pattern, community based studies well reflect the preferences in seeking health care services. This study therefore sought to examine the determinants of health care seeking behaviour among dwellers of Oron metropolis, Akwa Ibom State.

Materials and Methods

Study area and design

A descriptive study was conducted in Oron metropolitan area in Oron Local Government Area of Akwa Ibom State. It is a coastal area which lies on latitude 4.8222 and longitude 8.2337 coordinates and altitude above sea level. The climate of the area is favourable for cultivation and extraction of agriculture and forest products. The population is majorly Christian, ethnically Oro, most are farmer, fishermen and petty traders. There is a primary health centre and a General hospital, which serves the community.

Study population and sample size: This comprised of households with children under five years old and other adult within the study community. The sample size was calculated using Yamane (1967) formula.

$$n = N/1 – N(e)^2$$

where n is the sample size, N is the population size, and e is the level of precision at 95% confidence level ($p<0.05$). This resulted in a sample size of 530. Household were randomly selected from the list of villages that made up the metropolis of the study area and the household selected were included in the study.

Data collection

Researcher structured questionnaire was use to collect data by house to house visit. Interview scheduled was administered to the household head and all the available study participants. The questionnaires were divided into two parts. Data was collected on demographic characteristics, educational level, occupation, family size, possible morbidity problems, health care seeking behaviour and reason for non-utilization of a particular health facilities etc. A house to house survey was done during May to September 2018 and trained interviewers were employed in relation with the participants in all the household visited. Where any of the selected household was not found at the time of visit, then they visited again. Two return were made to household where eligible members were not available for interview during the first visit. Informed written consent and/or assent were taken from all the participants/guardians before the initiation of the interview. All available adult members in the household were interviewed and the information about the health seeking behaviour during illness was collected from their mother or primary caregiver.

Definition

Choice of provider was defined as the place of first contact following an illness (Government owned health facility or public hospital, private health facility, patent medicine dealer/chemist or pharmacy, traditional/herbal healing center or spiritual healing homes). The alternative of traditional healers or self-medication refers to those who sought treatment outside the home from a traditional healer, drugstore or pharmacy. Those who seek remedies from herbs from their home were also included in the traditional/herbal healers. Another alternative sources of care were those who sought the services of spiritual healers or prayer houses.

Statistical analysis

Data collected were subjected to statistical analysis using standard student's distribution t- Test and Analysis of Variance (ANOVA). Significant difference was established at 95% confidence level ($p<0.05$). Result of the data analysed were presented in tables in percentage as well as figures.

Results

The result of this study is shown below as presented in tables below.

A total of 530 participants were considered for this study. The socio-demographic characteristics of the respondents as shown in table 1 indicate that majority (54.1%) of the respondent were female and also majority (51.3%) were household who were currently married. Many of them were within the age of 30-39 (27.9%). However, 37.2% of the participants had secondary education and majority (23.8%) were into trading.

Common illness among the participant were cold/fever (29.1%), pains (19.4%) and diarrhea (17.5%). Others common morbidity were diabetes/hypertension (11.7%), respiratory problems (10.9%) and accidents/wounds (7.2%) (fig. 1). Also, majority (4 0.7%) of the participants reported to visit Government owned health facilities for various illnesses. However, those who preferred patent medicine dealer (chemist/pharmacy) (27.2%) were more than the choice of private clinics (20.6%). Others seek health care through traditional/herbal healing centers (9.1%) and spiritual healing homes (2.4%) (fig. 2).

Various determinants like age, education, occupation, income and morbidity were found to be significantly ($p< 0.05$) associated with the choice of a particular health facility patronized by the participants. Among various reasons for preferring a particular health facility, affordable cost, emergency services, easy access, neat environment, and quality of services were some of the reported reasons. Most of the common reason for the choice of government owned facilities were affordable cost (76.9%) and easy access (41.3%). Others preferred private clinic because of quality of services (39.3%) and emergency services (42.0%) (table 3).

Table 1: Socio-Demographic Characteristic of Respondents

Demographic characteristic	No. Of respondents N = 530	Percentage %
Gender		
Male	243	45.9
Female	287	54.1
Age (Years)		
<18	78	14.7
18 -29	107	20.2
30-39	148	27.9
40-49	123	23.2
50-above	74	14.0
Educational Status		
No formal education	73	13.8
Primary	144	27.2
Secondary	197	37.2
Post-secondary	116	21.8
Occupation		
Civil/public service	51	9.6
Artisan	73	13.8
Trading	126	23.8
Fishing	88	16.6
Farming	91	17.2
Unemployed	101	19.0
Marital status		
Never married	159	30.0
Currently married	272	51.3
Divorced/separated	78	14.7
Widowed	21	4.0
Income Per Month (Naira)		
Below 10000	131	24.7
10000-50000	232	43.8
50000 and above	167	31.5
Family size		
Equal or<5	304	57.4
>5	226	42.6

Children below 13 years of age were excluded in the study

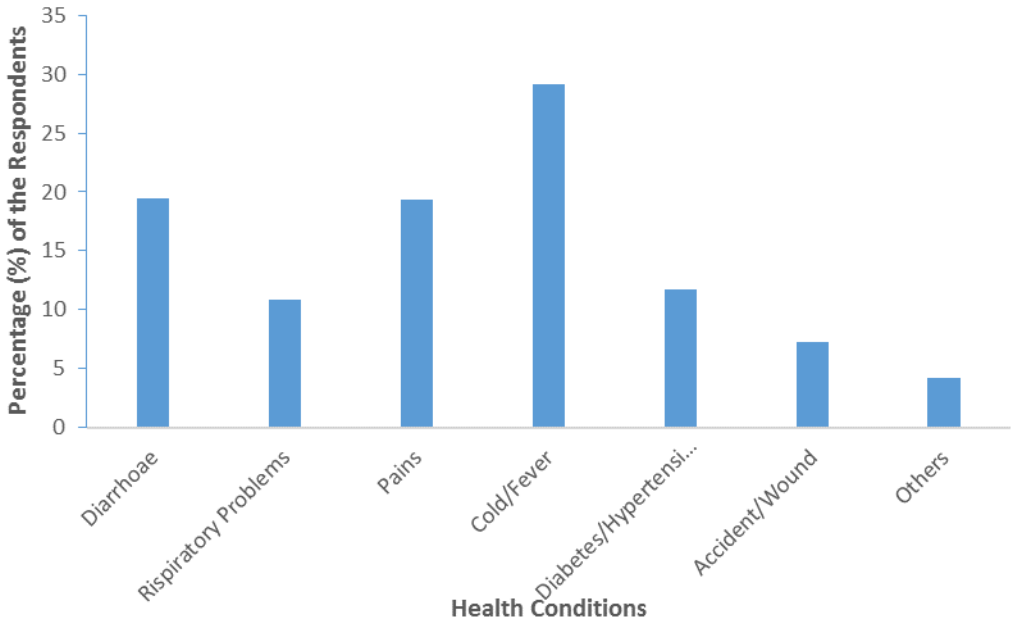

Fig 1: Morbidity condition last experienced by the respondent

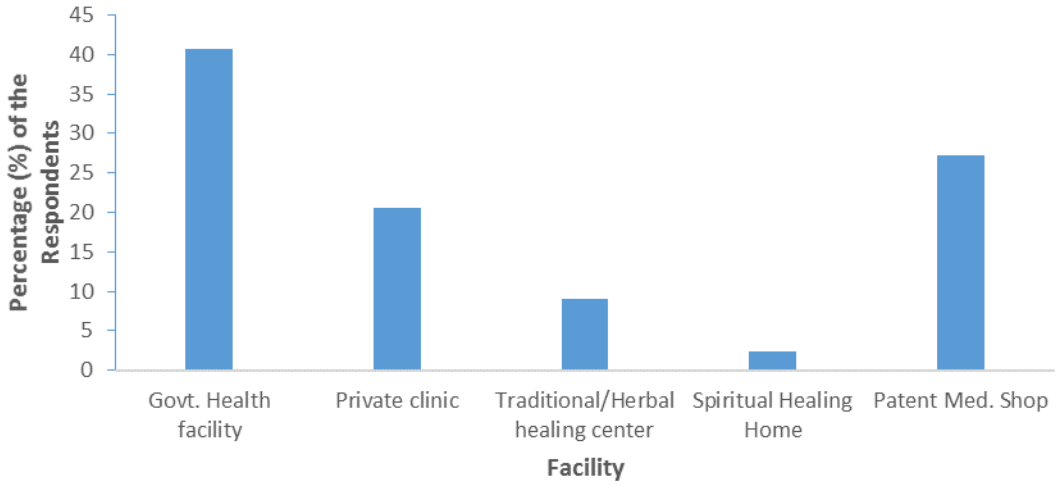

Fig 2: Choice of Place/Facility for Seeking health care

Table 2: determinants of health facility used by the study participant

Determinant	Govt. owned hospital	Private hospital	Patent medicine shop (chemist)	Others	P value
Age group					
Adolescent	19(24.4)	21(26.9)	25(32.1)	13(16.6)	35.320
Adult	184(48.7)	77(20.3)	100(26.5)	17(4.5)	
Elderly	13(17.6)	11(14.9)	19(25.6)	31(41.9)	
Sex					6.465
Male	99(40.7)	56(23.0)	66(27.2)	22(9.1)	
Female	117(40.8)	53(18.4)	78(27.2)	39(13.6)	
Education					
Illiterate	16(21.9)	7(9.6)	34(46.6)	16(21.9)	0.461
Literate	200(43.7)	102(22.3)	110(24.1)	45(9.9)	
Occupation					
Artisan	28(38.4)	19(26.0)	18(24.6)	8(11.0)	7.353
Trading	56(44.4)	26(20.6)	34(27.0)	10(7.9)	
Fishing	34(38.6)	21(23.9)	21(23.9)	12(13.6)	
Farming	26(28.5)	25(27.5)	22(24.2)	18(19.8)	
Civil services	33(64.7)	11(21.6)	5(9.8)	2(3.9)	
Unemployment	39(38.6)	7(6.9)	44(43.6)	11(10.9)	
Monthly income					17.779
<10,000.00	60(45.8)	10(7.6)	48(36.6)	13(9.9)	
10,000 – 50,000.00	85(36.6)	47(20.3)	64(27.6)	36(15.5)	
>50,000	71(42.5)	52(31.1)	32(19.2)	12(7.2)	
Morbidity					
Chronic disease	33(34.1)	21(34.4)	2(3.3)	5(8.2)	1.889
Febrile illness	58(37.7)	38(24.7)	41(26.6)	17(11.0)	
Pains	17(16.5)	26(25.3)	44(42.7)	16(15.5)	
Others	108(50.9)	24(11.4)	57(26.9)	23(10.8)	

Table 3: Factors for the choice of a particular facility

Factors	Government Hospital	Private clinic	Patent medicine	Others
Affordable cost	131976.9)	9(5.5)	23(14.2)	3(1.8)
Emergency services	7(14.0)	21(42.0)	20(40.0)	2(4.0)
Easy access	33(41.3)	13(16.3)	27(33.7)	7(8.7)
Staff attitude	3(5.1)	19(32.2)	26(44.1)	11(18.6)
Quality of service	12(21.4)	22(39.9)	19(33.9)	3(5.4)
Knowledge of ownership	-	14(35.9)	13(33.3)	12(30.8)
Neat environment	21(58.3)	11(30.6)	3(8.4)	1(2.7)
No specific reason	9(20.0)	-	13(28.9)	22(50.0)

f_{cal} = 1.047, df(3,28) ($p<0.005$)

Discussion

The present study seeks to determine the healthcare seeking behaviour among the people of Oron metropolis, considering the fact that, they have been an alarming concern in the under-utilization of health services provided by the government in the public sector at the global scale, mostly in the developing countries. On the other hand, private healthcare sector is growing rapidly in developing countries and has flourished everywhere because it focuses mainly on public good health such as antenatal care, immunization, family planning services and treatment of diseases (Aljiunid, (1995); Berman and Laura, (1996); Bennett *et al*. (2012); Chauhan et al. (2015).

In the study, it was observed that majority of the respondents were women, this was similar to the finding reported elsewhere (Oberlander and Elverdan, 2000). The norm being that the well-being of the home is the joint responsibility of parents; the women as caregivers and the men, as providers and decision makers (Oberlander and Elverdan, 2000). The marital status tends to have a weak predictive value on health seeking decision of the respondents. The place of education is effectively predicting the health seeking behaviour has been established while gender also as a factor especially given the peculiar nature of disease and related socio-cultural conditions associated with it. In this study, majority of the respondents (37.2%) had education at secondary school level. However, Oluwadare and Ibirinde (2010) and others agreed that 10 years of education is enough to spur desirable health behaviour. But there must be other favourable conditions especially in the cultural and health system environment.

The participants in this study generally represent a low socio-economic status compared to the large social environment known for high literacy level, public salaried citizens and relatively better health care system. Owumi and Jerome (2008), and Oluwadere and Dada (2008) affirm that poverty encourages the patronage to indigenous healing therapy which most of the time is cheaper, closer and culturally analogous to the parents. The low socio-economic status also relates to not so enviable knowledge of disease which may likely fuel the epidemic.

The result of this study indicated that majority (40.7%) of the participants seeks their health services when they are ill in the Government owned facilities. This could be related to the available income of the participant. Since most of the government owned health clinics provides free health services and doctors in the private clinic does not. This finding corroborates the finding of Van der Hoeven *et al.* (2012) and Chauhan *et al*. (2015) who observed in their study where participants preferred public health clinic than private practitioners. On the contrary, this study contradicts the study in Bangladesh where majority of the participant were accessing private clinic for health care services. Also their study indicate that majority of the participant were low income people. As this influence their choice of health facility for care.

Also, a high number of the respondents preferred seeking health services from patent medicine dealers (chemist and pharmacist) (27.2%) than that of the private clinics (20.6%). It was observed in this study that patronage to patent medicine shop (chemist) for health service by the respondents was rampant. This is an aspect of self-medication which is found to be common among community people (Okeke and Okafor 2008). This study recorded some participants seeking health care from traditional/herbal healing center. This was not surprising because in many homes, the usual pattern of treatment began at home with herbal remedies or drugs purchased from patent medicine shop which often are administered inappropriately. It is only

when home treatment is obviously not working that one is taken to the health facility. It has also been reported elsewhere that high proportion of health episodes are often treated at home and that self-medication is a common practice (Derming *et al.*, 1989). Also the result of this study agrees with the finding of Espino, (1992) where many participant seek health services from traditional and spiritual healing homes. The implication is that; they are not important providers of health care services. Therefore, spiritual healers are not targets for intervention measures aimed at providing optimal health services.

The need for protection and the financial cost of treatment of certain ailments far overweight the respondent's knowledge for government or private health facility is better than native therapy (Oluwadare and Ibirinde, 2010). In this study, respondents give various reason why a certain health facility is being patronized. This include affordable cost, emergency services, easy access, staff attitude, quality of services, knowledge of ownership, neatness of the environment and others. In the present study, majority of the respondents preferred government owned health facility as a result of cost effectiveness. However, financial consideration has a weak impact on the decision making about seeking health services (Atre, 2004). This assertion confirms that the choice of health facility for health services is dependent on the financial strength of the individual as the social factors. This may bring about delay in seeking health care. However, Coping (2008), report that delay in seeking health care may also account for the fear emerging of non-utilization of health facility. This could be attributed to non-availability of Doctors, poor attitude of staff, lack of access because of cost, prolonged waiting time. Similar finding was noted in other studies (Rucbush, 1995; Ahorlu, 1995). Although the quality of services provided by private health care practitioner is also questionable but many factors like accessibility makes participants in this study to consider them as their preferred choice, particularly those that don't have any financial constraint. This was in line with the report of Kamat, (2001).

Conclusions

The present study reveal that, many of the participants visit health facility because of febrile illness (29.1%) and pains (19.4%). Others common morbidities for health facility visit include diarrhea, respiratory problems, chronic disease such as diabetes/hypertension and accidents/wounds. The outcome of this study was similar to that of Chauhan *et al.* (2015). In the present study, participants between the age group (19 – 49), showed high preference to government owned health facility while majority of the adult preferred seeking health care from private medical practitioner. This could be as a result of their financial strength and choice of quality of service. This finding was in agreement with the earlier work by Oluwadare and Ibirinde, (2010) and Chauhan *et al*. (2015) where majority of majority of the adult seek health care from public facility. Both males and female from this study utilises government health facility more compared to the use of private clinics. This could be due to household preference and cost effectiveness of public health facility. The choice of female participants to public health care facility in the presents study could be due to availability of female health care officers in most public health care facilities than in private sector (Puthuchira *et al*. 2014; Barua and Kurz, 2001).

Finally, from this study, it could be concluded that the type of illness suffered by the people influence their reason of health seeking behaviour in the study area while affordability is the most significant factors influencing their choice where the seek health care. The study

however, conforms to the studies carried out by Aregbeyen (1992), Adeagbo, 1998 and Omotosho (2010) on health care utilization in Nigeria.

Recommendations

1. It is quite obvious that perception and attitude of people toward health is dependent on the quality of health care services in health centers. These has to change to attract patients more to government hospitals and health centers. This can be done through strengthening of health care system to offer quality basic health services.
2. Health seeking behavior can be improved with the provision of a seamless supply system, infrastructural support, and technical support for soft skills.

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An Assessment of Change Management as an Organizational and Project Capability

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ABSTRACT

Change is a fundamental part of organizational project management and how change is managed impacts how successful a project will be. On this note, both project management and change management have a role to play in the management and delivery of organizational changes. At an interpersonal level, different skills are needed in the practice of change management and project management. While project management focused on supplier, budget, planning, resourcing, schedule, and risk related issues. By contrast, change management focuses on alignment, communication, reconciling viewpoints, politics, and training. These different areas of interest, the relatively small amount of time that these disciplines have been working together on organizational change projects, and a lack of commonly accepted guidelines on how these disciplines should cooperate, have contributed to the different opinions that practitioners of these disciplines hold regarding how they should relate to each other. Some level of integration between project management and change management is necessary if organizational project management is going to consider and address the whole organization during the conception, initiation, delivery, maintenance of organizational changes and response to some of the factors that are relevant to successful delivery. The study therefore concludes that effective organizational project management needs to find a balance between project management and change management.

KEYWORDS: change management, project capability

Introduction

Organizational project management can generally be considered to be the management of initiatives that contribute to the achievement of strategic objectives (Chia, 2013), involving the multilevel integration of portfolio management, strategic alignment, and governance issues (Aubry et al, 2007). It has also been described as an integration of project-related work throughout the hierarchy of an organization (Drouin et al, 2016). It can be argued that all projects involve an element of organizational change, as the larger organization expands and contracts around an internal temporary project organization. For example, Hornstein (2015) commented that "change is an inevitable consequence of project implementations, and how the change is 'managed' impacts how successful the project will be". Söderlund (2010) identified that there are an increasing number of business projects that involve some element of change. Change is a fundamental part of organizational project management, and although in some cases the products

of a project may be effectively distinct from the delivering organization, this is rarely the case in organizational project management. Both project management and change management have a role to play in the management and delivery of organizational changes. Many authors have identified the potential ways in which these two management disciplines can potentially collaborate to deliver organizational changes (Leybourne, 2006; Boddy & Levasseur, 2010). Parker et al. (2013) have stated that using a project- based approach is a business imperative, as it increases the chances for the success of organizational changes, while Hornstein (2015) has made a case for change management to be a fundamental part of the training of project managers, commenting that they are complementary and mutually supportive disciplines that contribute to the successful.

Differences between the Disciplines

Although there are an increasing number of advocates for greater unity between project management and change management, they are traditionally perceived as separate ways of delivering organizational changes. Practitioners are commonly associated with one discipline or the other, with a minority crossing this professional boundary. Both of these disciplines are used to create change in organizations, but "project management and change management have been, and in most cases are, sold, practiced, and managed as two almost mutually exclusive project disciplines" (Jarocki, 2011).

This divide can be examined in terms of:

1. the theoretical underpinnings that support the disciplines;
2. the heritage and capabilities of the practitioners of these disciplines; and
3. the emphases that these disciplines bring to the management and delivery of organizational change.

The two fields are supported by significantly different academic literatures, and this has contributed to the different world views that are associated with proponents of these fields (Garfein & Sankaran, 2011), with some suggesting that these roles should be managed by different people in some cases (Crawford & Nahmias, 2010). Project management, and later developments such as portfolio management and program management, have been strongly influenced by early developments in the systems thinking movement, a branch of thinking that predominantly developed in the United Kingdom following the Second World War. In particular, Project management has been influenced by cybernetics. Morris (2002) has also stated that project management has been influenced by techniques from systems analysis and systems engineering.

All three (3) approaches are examples of hard systems thinking. Hard systems thinking is a branch of the broader systems movement that emphasized control, quantitative analysis, the assumption that problem definition is not fundamentally problematic, and the tendency to perceive problems as discrete from the broader environment. The early development of project management has also been influenced by the industries in which it was originally practiced, such as the aerospace industry (Morris, 2013), and later widespread application in construction. In these environments, problems are often of an engineering type, involving quantifiable questions related to tangible product and material performance. As a result of the clarity that comes with

more easily measurable outputs, contracts are often signed with a minimum of margin, leading to a focus on delivery efficiencies.

Crawford and Nahmias (2010) described the influence of organizational development, strategy, communication, and human relations in the development of the field. The field is arguably less clearly defined that project management, and there is a wide assortment of tools and techniques available to practitioners. A more detailed discussion of the development of change management as a discipline has been conducted by Cao and McHugh (2005). Change management has been developed exclusively within the context of creating change within organizations, focusing on strategic alignment, developing and communicating a vision, developing change ownership, and engaging leadership in a change effort. Unlike the focus on method and technique common in much of the project management literature, change management places a greater degree of emphasis on the organizational dynamics experienced during change (Lehmann, 2010). The field arguably does not bring disciplinary baggage to the practice of organizational project management that is not directly relevant to an organizational project management context.

At an interpersonal level, it has also been found that different skills are needed in the practice of change management and project management (Garfein & Sankaran, 2011). These disciplines have been found to require different competencies and skills (Crawfor & Nahmias, 2010). Hornstein (2015, p. 295) has also identified that their "… respective proponents arise out of different parts of the organization and have different functional and educational backgrounds." Practitioners of these two disciplines have found that they have significantly different areas emphases (Pollack & Algeo, 2016), with project management focusing on supplier, budget, planning, resourcing, schedule, and risk related issues. By contrast, change management was found to focus on alignment, communication, reconciling viewpoints, politics, and training. These different areas of interest, the relatively small amount of time that these disciplines have been working together on organizational change projects, and a lack of commonly accepted guidelines on how these disciplines should cooperate, have contributed to the different opinions that practitioners of these disciplines hold regarding how they should relate to each other (Pollack & Algeo, 2016). In addition, while project management was seen as an operational activity, change management was perceived as strategic. This is consistent with the normative project management literature, with PMI (2013) implying that change management functions should report to project or portfolio management.

In summary, project management and change management appear to view the management of organizational change projects significantly differently. The disciplines have developed based on significantly different intellectual heritages, which have shaped their respective views on what organizational change is, and how it should be managed. Inevitably, this has translated into practitioners of these disciplines working in different ways, with disparate suites of tools and techniques.

The Roles of Change Managers and Project Managers

There are strong similarities between the roles that change managers and project managers play in organizations. This can partly be explained through the common emphasis in the disciplines on delivering specific, defined changes, within a set time frame. In addition, there is some evidence that the fields are converging. For example, it has been found that there is an

increasing emphasis in the project management literature on topics that could be considered more typically indicative of change management. Similar findings were echoed in Pollack and Adler's (2015) research. There has been an increase in the emphasis that can be seen in the project management literature on topics such as teams, motivation, and leadership (Kloppenborg & Opfer, 2002), and an increasing emphasis on people over process (Leybourne, 2007). A shift is also apparent when specific topics within project management are examined. For example, Lehmann (2010) examined the ways that communication was discussed in the project management literature and found that there was a growing convergence in how the literatures discussed communication.

The study by Pádár et al. (2011) produced comparable results when examining the ways in which stakeholder roles are discussed in the respective literatures. The publication of the Project Management Institute's Managing Change in Organizations: A Practice Guide (PMI, 2013a), and the reissue of the Project Management Body of Knowledge (PMI, 2013b), which is arguably the world's most recognizable text on project management practice, including a key knowledge area on stakeholder management, suggest a further shift in the discipline. The intellectual convergence of the disciplines, and the tendency for practitioners of both to be singly, or jointly, given responsibility for the delivery of organizational change projects, has led to some crossover between the two. Jarocki (2011) described an "obvious overlap between the two disciplines" leading to a lack of clarity about the boundary between them. Perhaps as a result of this lack of clarity about the boundary and working relationship between the disciplines, it has been identified that "there is evidence of a degree of rivalry between Project Managers and Change Managers concerning who should be managing business change" (Crawford & Nahmias, 2010). Review of the literature indicates that there is a lack of consensus, and perhaps some conflict, regarding the forms that cooperation between these disciplines should take (Jarocki, 2011)

The Need for Integration

Some level of integration between project management and change management is necessary if organizational project management is going to consider and address the whole organization during the conception, initiation, delivery, and maintenance of any organizational change. Project management and change management each only respond to some of the factors that are relevant to successful delivery. The Project Management Institute has identified that "Project management, in terms of simply focusing on scope, time, and budget, is not sufficient for managing the scale and rate of change that is the norm in most organizations" (PMI, 2013a). Using either approach to the exclusion of the other seems, not necessarily doomed to failure, but leaves a greater proportion of success to chance than would otherwise be the case. The divide between these disciplines, and they ways in which they can play a complementary role will be discussed in terms of focus on: • the project output versus the context the output will occupy; and delivery to a goal versus a response to strategy. Project management is fundamentally focused on the product to be delivered.

Although there is argument that some aspects of project management are shifting towards a service-dominant logic (see Sankaran & Agarwal, 2012), the majority of tools and techniques used in traditional project management start with the assumption that there is a clearly definable product that will be the central output of the project. If the product cannot be clearly defined, then comprehensive deconstruction of a product into work packages becomes problematic. Early

definition of project goals is typically seen as a positive factor. In project management, a reductionist perspective presupposes that goals can be clearly defined. The centrality of the tendency towards reductionism can be seen in the pivotal role that work breakdown structures play in the standard project management process. The most commonly used scheduling techniques are based on the breakdown of work into smaller packages. Contracts for subcontractors are often based on a work breakdown structure, with the prime.

Accordingly, budgets are typically monitored on a component-by-component basis. Testing and commissioning processes progress from lower levels in the breakdown structure, up the hierarchy, until properties can be tested that are only present at the level of the whole system. Abstract organizational qualities do not lend themselves to breakdown, and a consequence of this focus on the tangible product of a project is that the product can be seen as an end in itself. The original need, which the product was designed to satisfy, may become lost during the development process. This is not an issue if the success of the project remains contingent on its ability to satisfy the original need, but it is significantly simpler to assess a product's compliance to specification than a project's satiation of a need, and the latter may readily become lost. Change management does not have a suite of practitioner tools and techniques that are as universally accepted and consistently applied as project management does. This makes discussion of the norm in change management more open to question. However, it is safe to say that a reductionist definition of any products associated with a change does not play a central role in approaches to change management. The scope of work of change is usually significantly different to that of project management, focusing on increasing support for a change, rather than directly implementing the change. For example, a common change management technique, the change readiness survey, will provide information about the current organizational climate, knowledge, and acceptance of a change. It can be used to highlight divisions in an organization where dissent may be forming, or topics that have not received effective communication or training. Change management focuses on developing stakeholder engagement and support, removing roadblocks to change, and harnessing and aligning leader support. The context is created in which change can happen. This can be a very effective approach, but it implies a different approach to control. Change is not directed. The conditions under which change can occur are created. The embodiment of the actual change often relies on the staff in the organization who are the subject of the change initiative, rather than staff assigned to a change management team. The contrast is that while project management focuses attention on delivery of the product, it does not emphasize the context the product will occupy.

Change Management

Change management emphasizes creating the conditions under which change can occur, but does not directly create the change. Contracting, scheduling, budgeting, and delivery are not a core focus of change

Change management might be used to create a climate where change can occur, but without management of the delivery or control of the complicated outputs that might be needed to create the change. Both approaches together could be used to assist in efficient delivery and in acceptance and uptake. The difference between the disciplines can also be understood through reference to the roles they traditionally play in the process, from initial conception of an idea to organizational-benefits realization. At the opposite end of the life cycle, although the length of a project manager's involvement with a project varies, it typically concludes with, or soon after, a

product is accepted at practical completion. The process of capturing the lessons that have been learned on a project is often an afterthought, given a fraction of the attention that consideration for organizational learning would require. In addition, project evaluation typically occurs at, or soon after, the product of the project has been delivered. Projects are typically assessed in terms of the iron triangle of the time taken to completion, the cost of the project, and the quality (or scope) of what has been produced. These are important metrics, but should surely take a subordinate position to consideration of the contribution that the project has made to the client's and supplier's organizational strategies (Fahri et al, 2015).

Alternatively, change management may be coupled to the end of a project management process as a way of increasing uptake or transitioning to business as usual. PMI (2013a, p. 27) describes this process as: "Change management requires undertaking activities that align projects and programs with the strategy of the organization as well as activities that transition project results into operations to realize benefits." A consequence of this approach is the maintenance of clear links to strategy, but a lessened emphasis on direct control over the actual products that are developed to enable or create a change. Project management and change management have different foci, and this provides great opportunities for complementarity. Project management focuses on the product, while change management focuses on the context in which a change will take place. Together, they can ensure that a product is delivered efficiently and effectively, and that the climate and context are ripe to receive it. Project management focuses on delivery to predetermined goals, while change management focuses on the expression and communication of a vision for change. Together, they could help to bridge the divide between strategy and project goals, at both the front- and back end of projects. "Key factors for successfully building a competitive advantage with the strategy execution framework of organizational project management are embedded with change management" (PMI, 2013a).

However, obstacles stand in the path of the complementary use of these approaches. One obstacle relates to the way in which change management is portrayed within the project management normative literature.

Differing Perspectives on Change Management

To understand how these two approaches can complement each other, the remainder of this chapter will first discuss how change management is represented in the project management literature, and contrast this with how change management represents itself. The chapter will then argue that a reconceptualization of change management within the project management literature is needed, if the benefits of change management are to be realized for organizational programs and stand-alone projects begin with the formulation of the change and its planning; change is then implemented through one or more projects that produce tangible deliverables (products, services, and results) for the business (PMI, 2013a).

The interpretation of change management shares many of the emphases present in these earlier publications. The guide has a strong emphasis on process, particularly focusing on documents that should be prepared at various stages of an organizational change. A hard systems thinking approach is also apparent in the guide, particularly in the use of a repeated discussion of the inputs to, and outputs of, processes. Although the guide takes an interesting approach in discussing change management in the context of portfolio, program, and project management, the imposition of this framework seems to have been more limiting than illuminating. It reads as

if the authors were trying to incorporate change management, while making a minimum of alterations to an established, organizationally embedded, and socially accepted hierarchy between portfolios, programs, and projects.

Change Management in Leading Change

There is a broad selection of models and processes for the management of organizational change (Pillay et al., 2012, Smith, 2011, Stewart and Kringas, 2003).

Readers who are interested in a comprehensive comparison of these models are referred to Brisson-Banks (2010) and Stewart and Kringas (2003). Of the many models available, Leading Change is one of the most widely recognized texts on change management. It is far from the only approach to change management, but is arguably one of the most influential. In addition, there has been chosen as representative as it has adopted a process-based approach to change. This is more comparable with the approach to change management adopted by the Project Management Institute than many other change models, such as the critical success factor approach adopted by Hiatt's (2006) ADKAR. Eight-stage process of creating a major change has been recognized.

Kotter's model has gained significant popularity with organizational leaders looking to implement changes to their organizations (Brisson-Banks, 2010). This approach to change 'became an instantaneous success at the time it was advocated and it remains a key reference in the field of change management'' (Appelbaum et al., 2012). Kotter's eight-stage process of creating a major change is summarized as the follows in Leading Change (1996) and his subsequent publications:

1. Establishing a sense of urgency
2. Creating the guiding coalition
3. Developing a vision and strategy
4. Communicating the change vision
5. Empowering broad-based change
6. Generating short-term wins
7. Consolidating gains and producing more change
8. Anchoring new approaches in the culture

The eight-stage process describes a set of steps that can be taken to implement a top-down mandated change in an organization. It has been described "as a vision for the change process", that emphasizes the role of leadership in the change process (Raineri, 2011).

A review of Kotter's process shows no clear divisions between the aspects which relate to the portfolio, program, and portfolio levels of an organization. Kotter's process is a whole-of-organization approach to change management – a single process that can be used to guide change, rather than a set of different processes at separate organizational levels. Research has suggested that this process can be used in an iterative way, replicating the process with different management and stakeholder groups throughout an organization, but the process remains broadly unchanged at different levels of the organization (Pollack & Pollack, 2015). This is a significantly different approach to change management to that presented in PMI (2013a).

Kotter's Model of Change Management

In Kotter's model, a vision is created, groups are formed to lead and represent the change, key messages are communicated, successes are reinforced, obstacles are removed, and effort is invested into embedding and sustaining the change process. The model is applicable to small management groups, whole-of-organization initiatives, or to iterative application cascading throughout an organization. Comments within PMI's guide to change management suggest that it was intended that their model for change management should be a whole-of-organization response. "The change process spans all levels of a business" (PMI, 2013a, p. 29). However, their discussion of change management remains limited to the hierarchical separation between portfolios, programs, and projects, with different processes and activities mandated at each level, focusing on a cascading system of control throughout the organizational hierarchy. Fitting Change into a Project Management Mould A central issue associated with trying to fit change management into a structure predetermined by project management has to do with compatibility between the paradigms that have informed these two disciplines. Control at a micro level, delivery to a predetermined and detailed plan, and minimization of variation, are key themes within project management. This emphasis on control is barely present in change management. Control is only exercised at a macro level in leader-led approaches like the Kotter process and is almost entirely absent in approaches that take an emergent or consensual approach to change.

This guide comments that "Project management tools such as change control processes for adjusting scope or requirements are not sufficient to address the types of change needed" (PMI, 2013). As mentioned above, hard systems thinking has influenced the development of project management. Systems theories and cybernetics models both emphasize the maintenance of order, and where change is allowed, it occurs as small adjustments that are allowed as they increase or stabilize a larger order of control. These approaches "… have generally given an impoverished account of change". The text of PMI (2013a) can be taken a simplying that some project managers may not be comfortable with the levels of ambiguity found in organizational change. The techniques of traditional project management are not designed for high levels of ambiguity, and thus the training that many project managers receive is less likely to prepare them for such situations. Project managers are typically trained to work within the hard systems thinking paradigm. Being able to move comfortably between a traditional project management paradigm and one that takes a fundamentally different view of the virtue of control would involve a level of pluralism that many practitioners would find difficult to achieve. Psychologically, barriers to adoption relate, in various ways, to the "problems of an individual agent moving easily from one paradigm to another".

To apply change management tools with a project management mindset risks losing many of the advantages that change management could otherwise provide. Using change management, but maintaining project management's emphasis on control and deviation minimization would entail a form of imperialism that would mean that many of the benefits of the second paradigmatic perspective would be lost. However, it is just this way of combining project management with change management that is suggested by PMI (2013a).

Models of the Relationship between Project Management and Change Management

In this model, there is a simple hierarchical progression from strategic management to portfolio management processes. The parts of change management that are relevant to portfolio

management help at this level of the organization. Portfolio decisions are then passed down to program management processes, and the parts of change management that are relevant to program management help at this level of an organization. A similar process happens at the project level, before the results of the project are handed over to operations.

However, change management, as discussed in the change management literature, makes little reference to the levels of portfolio, program, or project management. Change management is one activity, used to manage the delivery of organizational change across the whole of an organization. It can, and is, used to deliver change projects without reference to portfolio, program, or project management. Restructuring it to suit a portfolio, program, and project management framework distorts its intent, and arguably reduces its efficacy. PMI (2013a) provides a useful framework for introducing change management into organizations with a mature approach to portfolio, program, and project management, but is simultaneously restrictive in how change management is described.

Change management sits alongside these areas, working with them to achieve shared organizational project management objectives. Change management will take direction from senior leaders about organizational objectives, but will also work with them to develop and communicate the vision for change, form and coordinate guiding coalitions, and set the context for change. Change managers will work with project and program delivery to communicate early wins and build momentum around a change.

They will also work with operations to make sure that the context in which a change will be created is ripe to receive it. Some of this activity may involve building awareness and removing barriers to adoption or uptake, or empowering actions that support the change. Some might involve lower levels of an organization, such as users of project outputs, but it could equally involve work with senior management to make sure that organizational communication, senior management behavior, and organizational structural mechanisms are consistent with the change intent. A simple hierarchical progression from the top of an organization down is not consistent with change management. For a change manager to be effective, they must operate at a variety of different organizational levels at once. Many practitioners will not be comfortable operating from a traditional project management perspective and a change management perspective at once, and it is suggested that in many cases a joint project management and change management response to organizational project management will require separate specialists, each taking responsibility for the change.

Conclusion

It has been argued that effective organizational project management needs to find a balance between project management and change management. Each of these approaches can be used to deliver organizational change projects independent of the other. However, using one to the exclusion of the other risks losing opportunities that a combined approach could provide. It was argued that although project management and change management are based on significantly different intellectual heritages, and are supported by different techniques, they provide complementary perspectives that can be of benefit in providing a more effective response to the challenges of organizational project management. Project management and change management share macrolevel goals; namely, the achievement of specific, unique organizational goals, within time constraints.

However, they interpret the best actions to take to achieve these objectives in significantly different ways. PMI (2013a) is an important text because it raises the awareness of change management within the project management community. In addition, it acknowledges the strategic role of change management. However, superimposing change management onto a portfolio, program, and project management framework risks diluting some of the existing strengths of change management. It risks representing change management as an optional extra to established portfolio, program, and project management approaches.

Recommendation

From the result of this research, it was recommended that to measure the quality of one's work in the same field, it is better to calculate the number of citations a person receives rather than just considering the impact

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Influence of Teachers' Knowledge of Instructional Media on Teachers' Performance in Secondary Schools in Uyo Senatorial District.

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ABSTRACT

The study sought to examine the influence teachers' knowledge of instructional media on teachers' performance in secondary schools in Uyo Senatorial District. Two objective and hypothesis were formulated to guide the study. The study adopted a survey design. The population of the study included all the male and female teachers and students in 96 secondary schools in the 6 local Education Committees (LEC) of Uyo Senatorial district of Awa Ibom state. The researcher developed an instrument tagged "Media Utilization Questionnaire (IMUQ) and Questionnaire on Students' Perception of Teachers' Performance (QSPTP)" for data collection. To ensure that the instrument is reliable, split-half reliability estimate using 0.86 and 0.73 reliability coefficient was run on the questionnaire. The hypotheses were analysed using t-test analysis. From the result of the findings, it was seen that there is significant effect of teachers' knowledge of instructional media design strategies on teachers' performance. It was also seen that there is significant effect of teachers' knowledge of instructional media design strategies on teachers' performance. It was thereby concluded that Teachers' has adequate knowledge of instructional media design strategies and instructional media production. One of the recommendations was that Audio-visual units should be established in the secondary schools to help the teachers design and produce instructional media for use during every lesson.

KEYWORDS: Teachers' knowledge, instructional media, teachers' performance, secondary schools, media design strategies, Uyo Senatorial District

Introduction

In all nations the world over, the aim of education has always been to train youths to acquire secular knowledge to fit into all fields of human endeavour. Within the Nigerian context, Adaralegbe (1998) states that the genesis and foundation of education in Nigeria indicate that education was meant to train the youths to acquire secular knowledge as teachers in their local schools, as clerks for the local courts and as interpreters in the churches. This includes the acquisition of relevant skills, values, right attitudes and modified behaviours in order to make a meaningful living in the society. The Nigerian nation came up therefore with a laudable policy regarding its education. Notable among its aims and objectives is the nation's desire to acquire appropriate skills, ability and competencies both mentally and physically to equip the individuals to live in and make useful contributions to the development of the society, training of the mind to understand the world around and the inculcation of national consciousness and unity.

In an effort to make the teaching-learning process more interesting and meaningful, the Federal Government of Nigeria in her National Policy on Education (2004, Section 6) emphasized the enviable role of the field of educational technology, thus to enhance teaching and improve the competence of teachers and to make learning more meaningful for students. The teaching-learning process involves the use of instructional media to initiate and transfer encoded message and information to learners who decode them by analyzing and interpreting them (Ibe-Bassey, 1993). The teacher needs instructional materials to ensure that students' needs are adequately provided for. There is an urgent need to integrate instructional media into the secondary school system where a variety of these media would be an asset in supporting and improving teaching and learning. There is need for alternative sources of information as more and more teachers and students need to turn to them to satisfy their teaching-learning needs. The teacher needs instructional media to enable him analyze what the educational programme is supposed to accomplish (Prostano and Prostano, 1997). According to them, the task of diagnosing students' needs on a continuing basis and of prescribing the experiences required for the students to perform to the maximum would be difficult and almost impossible without adequate instructional media.

Statement of the Problem

The spiraling cost of funding education today has created lots of problems in the educational system. This has further been compounded by the poor budgetary allocation to this sector. This situation makes it practically difficult for the classroom teachers to provide for instructional media which are needed for teaching and learning. However, researchers have shown that instructional media can enhance effective teaching and learning. Sadly enough and with nostalgic reference to developing countries, most classroom suffer from paucity or dearth of ready-made sophisticated instructional materials. This, no doubt, has some adverse consequences on the teaching and learning of most subjects in the secondary school curriculum including Government. Consequently, the fundamental problem of this study is to determine the effect of teacher's knowledge of instructional media design strategies and production on teacher's performance as perceived by the students in secondary schools in Uyo Senatorial District of Akwa Ibom State.

Objective of the Study

1. To determine the effect of teachers' knowledge of design strategies of instructional media on teachers' performance

2. To assess the effect of teachers' knowledge of production of instructional media on teachers' performance.

Research Question

The following are the research questions of this study

1. Can teachers' knowledge of instructional media design strategies affect teachers' performance?

2. Will teachers' knowledge of instructional media selection affect teachers' performance?

Research Hypothesis

The following are the hypothesis of this study:

1. There is no significant effect of teachers' knowledge of instructional media design strategies on teachers' performance.

2. There is no significant effect of teachers' knowledge of instructional media production on teachers' performance.

Literature Review

The utilization of instructional media in teaching-learning situations is based on certain conceptual framework of this study. Effective use of instructional media has been found to increase the rate of learning of students and saves teachers' time as instructional delivery may be accomplished with ease. There are abundant research evidences in the literature to support this statement. Schramm (1979) illustrated that all instructional media can instruct and learners can learn from virtually all media.

Instructional Media Design Strategies and Teachers' Performance

Within the Context of instruction, the decision of what to design and how to design is uniquely designers' and teachers' idea or insight. Akpan (1997) comments that the act of design is the first stage of instructional media utilization. Bassey (1999) sees instructional media design as a unique tool which the designer or teacher employed acquired skills, knowledge or wealth of experience to bring the world of imagination into the world of reality. Hence, adequate instructional media design offers a significant avenue to efficient teaching to efficient teaching performance in the classroom. Okon (1998) asserts that within the frameworks of effective instructional media design, planning and development of instructional media serve as sacred avenues through which teachers or designers can vividly employ. The two elements serve as brainchildren to effective instructional media design.

In conventional curriculum planning, decisions are most often made in intuitive fashion and may be based on ambiguous purposes. Subject content is the basis for planning, and only casual attention are given to other details. It is now recognized that the instructional processes is complex and that attention must be given to many interrelated factors if outcomes are to be successful (Ekpo, 1993). The success of learning outcome is based upon adequate pre-planning and planning of instructional media design. Ibok (1994) adds that the term instructional development applies to the broad process of design of an instructional programme – whether a single module, a complete unit or a total course-using an objective, or systematic procedure. Ibok (1994) further identifies three questions based on this fact. Such questions like:

(1) What must students learn? (The objectives)

(2) What procedures and resources are required to accomplish the learning? (The teaching and learning strategies)

(3) How will you know when the required learning has taken place? (The evaluation)

These three elements – objectives, strategies and evaluation form the framework of instructional development procedures. Ibok (1994) asserts that taking all these together, we can develop and instructional designing plan which consists of these interrelated components.

- Choose topic to be treated
- State general purposes to be served by the topic
- Enumerate the important characteristics of the student group for which the instruction will be designed.
- Indicate the subject content that will lead to the objectives.
- Specify the learning objectives to be achieved as related to the content and purposes.
- Develop pretests to determine each student's background and present level of competence with the topic.
- Select teaching/learning activities and instructional resources that will treat the subject content to accomplish the objectives.
- Coordinate necessary support services, such as budget, personnel, facilities, equipment and schedules to carry out the instructional plan.
- Evaluate student learning in terms of the accomplishment of objectives, with a view to revising and re-evaluating any phases of the plan that need improvement.

Review of Instructional Media Design Strategies and Production

Planning is the key to designing of instructional media. The instructional system design makes the specification of instructional media to be produced as an important part of design efforts (Akibuiro, 2002). Here emphasis is on verification which deals with internal and external validity of such products and the maximum utility of such products in achieving predestined objectives. In this perspective, however, design and production of instructional media form an integral part of the teaching learning process. Hence the teacher designed and produced instructional media for specific purposes.

Certain principles are followed in the process of designing and producing all forms off instructional media. The designer or teacher is to be sure that a suitable instruction will include the development and planning of instructional specifications, methodology and strategies for the use and evaluation of the materials. The materials should aim at achieving the desired, substantive, managerial and appraising instructional functions (Ibe Bassey, 1996). Imogie (2003) stated that before embarking on any form of media design and production, it is necessary to asses the relative worth of such materials. Imogie (2003) listed some criteria as follows:

- The materials should seek to validly illustrate and provide messages to specific lesson,
- They should be simple, readily, replicable and durable,
- They should be cheap enough to ensure meaningful cost reduction

- The design of instructional media involves the teacher or planner knowing the ability and level of the learners, the instructional objectives and learning goals of the learners, the environment and cultural variations of the schools as well as the adaptability of the learners to instructional procedures.

Such design procedure will not be complete without the evaluation of the prototype so produced.

Akubuiro (2002) had given guidelines for designing instructional media and the designer has to perform some design functions which include:

- Identification of the problem
- Analysis of the target audience
- Stating the behavioural objectives
- Analysis of the concept.

Instructional media are designed for specific purposes. Designers and teachers should therefore adopt a standard basic approach I planning and designing instructional media. Ellington (1993) has given the guidelines on the procedures as thus:

- The designer should identify the specific instructional role that the material should play. This will involve taking a detailed look at the learning objectives that the designer is trying to achieve. The specific area overall context of the lesson and the instructional strategy to be adopted,
- Formulate a basic plan for the materials, identify the roles the instructional media are intended to play. Decision is taken on the type of instructional material the designer intends to use, then draw up the outline and classify the designers' thinking,
- Write out the materials. This embodies displaying the creative work, filling and writing out the basic ideas and concept and finalizing the lay out depending on whether such material will be used for individualized instruction or integrated set of resources for exercises, stimulation or participative instruction. The systematic approach is therefore used to:
- Match content to the design objectives and target population e.g what will the user achieve after using the materials.
- Adopt the writing style that is appropriate to the type of materials and to the ability of the users.

It becomes imperative that secondary school teachers must ensure that instructional media are designed systematically and structured in such a way that meaningful teaching and learning are facilitated. Lessons must be designed to make them easy for comprehension by the learners. Designing involves embodiment of thinking and creating patterns, systems, models, etc to be used in solving particular educational problems. It involves taking decisions from alternatives and adopting better means and alternatives of solving the problem before designing such materials or models.

Ogunmilade (1994) opined that some specific tactics which are detailed events of instruction must be planned in order to achieve specific instructional goals. It is required that the teacher should design topic and then design instructional media for the topic of at least modify the existing ones if the instructional system must be reasonable. In a seminar tilted ''The Needs for Adequate Design and Production of Instructional Media in Secondary Schools in River State'' conducted by the Rivers State Ministry of Education, Nnadozie (2004) reported that appropriate instructional media design and production must follow a systematic procedure, careful planning and implementing what was already planned bearing and mind the state of the lesson. Hence the instructional media and produced by the teachers must move the students in the direction of the stated objectives.

Designing and producing instructional media are based on subject content and casual attention is given to other variables and details. It is observed that the instructional process is complex attention and must be given to many interrelated factors if qualitative outcome must be achieved successfully. Pertinent questions must be answered:

- What must students learn as indicated by the instructional objectives
- What resources and procedures are required to accomplish the learning (teaching and learning strategies)
- How will you know when the required learning has taken place (evaluation)

These three elements – objectives, strategies and evaluation form the frameworks of instructional development procedures and instructional media development and production.

Instructional media design and production consist of the under listed interrelated components:

- Choose topics to be related
- State the general purpose to be served by the materials
- Analyse the audience
- Indicate the subject content
- Specify the learning objectives
- Develop – pretest to determine each student's background and present levels of competence with the topic
- Produce the materials
- Evaluate the prototype

Indeed, what must be learnt should be stipulated and should also be achieved during a given learning process so that one can predict the method of evaluation (Etim, 1998). The material designed and produced should be able to explain itself clearly on specific subject matter so that in the absence of the teacher, the student can learn if they have access to the instructional media.

For effective design and production, examination of the systematic planning procedure is necessary to provide a framework within which the selection of the instructional media takes place. The design process requires a high degree of creative intellectual activity which the secondary school teachers must exercise to ensure the production of a meaningful and purposeful instructional media for effective and efficient teaching and learning, to guarantee quality output form our secondary school system.

Methods

Research Design

For the purpose of the study, survey-research-design was used.

Area of the Study

The area for the study was Uyo Senatorial district which covers Uyo, Nsit Ibom, Etinan, Uruan, Nsit Atai, Ibesikpo Asutan, Itu, Ibiono, and Nsit Ubium, inhabited by Ibibio speaking people.

Population of the Study

The population of the study included all the male and female teachers and students in 96 secondary schools in the 6 local Education Committees (LEC) of Uyo Senatorial district of Awa Ibom state. The population of the teachers was estimated at 2,864 representing 1,534 males and 1,330 females. The enrolment figure of Senior Secondary Two (SS2) students in the area at the time of the study (2007/2008 academic session) stood at 32,689 representing 17,962 males and 14,727 females.

Sample and Sampling Technique

The sample consisted of 600 secondary school teachers and 360 SS2 students from 30 selected secondary schools. Stratified random sampling technique was used in the study to categorise the sampled area into 6 strata. The hat-and-draw method was further used to randomly select 5 secondary schools from each strata making a total of 30 schools and 12 SS2 students.

Instrumentation

The instruments for data collection were designed by the researcher. They are: Instructional Media Utilization Questionnaire (IMUQ) and Questionnaire on Students' Perception of Teachers' Performance (QSPTP).

Validity of the Instrument

Face, content and construct validation of the two instruments were ascertained by experts in measurements and evaluation.

Reliability of the Research Instrument

In order to ensure the reliability of the instruments, split-half reliability estimate using 0.86 and 0.73 reliability coefficient was run on the questionnaire.

Method of Data Analysis

Data generated was analysed using t-test analysis.

Hypotheses Testing

Hypothesis One

The null hypothesis states that there is no significant effect of teachers' knowledge of instructional media design strategies on teachers' performance. In order to test the hypothesis, two variables were identified as follows:

1) Teachers' knowledge of instructional media design strategies as independent variable

2) Teachers' performance as dependent variable.

T-Test analysis was used in comparing the mean scores of the high teachers' knowledge of instructional media design and low teachers' knowledge of instructional media design strategies, in order to produce t-value.

Table 1: T-test Analysis of the Effect of Teachers' Knowledge of Instructional Media Design strategies on Teachers' Performance

VARIABLES	N	X	SD	T
High knowledge	477	54.22	10.21	15.23*
Low knowledge	123	39.17	7.80	

***Significant at 0.05 level; df = 598; critical value = 1.96**

From Table 1, the obtained t-value was 15.23; the calculated value was tested for significance by comparing it with the critical t-value (1.96) at 0.05 level with 598 degree of freedom. The obtained t-value (15.23) was found greater than the critical t-value (1.96), hence the result was significant. The result signifies high positive influence on the two variables. It means that the higher the teachers' knowledge of instructional media design strategies the higher or more effective the teachers' performance in the classroom and vice versa. The significance of the result caused the null hypothesis to be rejected while the alternative one was accepted. The result therefore means that there is significant effect of teachers' knowledge of instructional media design strategies on teachers' performance.

Hypothesis Two

The null hypothesis states that there is no significant effect of teachers' knowledge of instructional media production on teachers' performance. In order to test the hypothesis, two variables were identified as follows:

3) Teachers' knowledge of instructional media production as independent variable

4) Teachers' performance as dependent variable.

T-Test analysis was used in comparing the mean scores of the high teachers' knowledge of instructional media production and low teachers' knowledge of production, in order to produce t-value.

Table 2: T-test Analysis of the Effect of Teachers' Knowledge of Production of Instructional Media on Teachers' Performance

VARIABLES	N	X	SD	T
High knowledge	436	56.78	7.31	32.80*
Low knowledge	164	36.12	5.56	

***Significant at 0.05 level; df = 598; critical value = 1.96**

Result from Table 2 showed that the obtained t-value was 32.80; the calculated value was tested for significance by comparing it with the critical t-value (1.96) at 0.05 level with 598 degree of freedom. The obtained t-value (32.80) was found greater than the critical t-value (1.96), hence the result was significant. The result signifies high positive influence on the two variables. It means that the higher the teachers' knowledge of instructional media production, the higher or more effective the teachers' performance in the classroom and vice versa. The significance of the result caused the null hypothesis to be rejected while the alternative one was accepted. The result therefore means that there is significant effect of teachers' knowledge of instructional media design strategies on teachers' performance.

Discussion of Findings

The result of the analysis in Table 1 was significant due to the fact that the obtained t-value (15.23) was greater than the critical t-value (1.96) at 0.05 level with 598 degree of freedom. The result is in agreement with the opinion of Eshiet (1996) who stated that instructional media design is a unique tool which the designer or teacher employed acquired skills, knowledge, technique or wealth of experience to bring the world of imagination into the world of reality or creativity. He also affirmed that adequate instructional media design strategies offer a significant avenue to efficient teaching performance in the classroom. Okon (2002) hereby summarises that media personnel and others filling the role of instructional designers can assist teachers or teaching teams to develop effective instructional design plans, decisions and developments for proper production of instructional media.

The analysis in Table 2 revealed that there is significant effect of instructional media production on teachers' performance in the classroom. The result of the data was significant due to the fact that the obtained t-value (1.96) at 0.05 level with 598 degree of freedom. The significance of the result is in agreement with the opinion of Udoette (2001) who states that production par excellence is a practical implementation of what was already planned, decided and developed by the designer or teacher. He also asserted that production of instructional media cannot be done haphazardly, but should follow a careful or systematic procedures bearing in mind the learners' needs, community, cultural setting and environmental influence for effective teaching and learning in the classroom. Ekong (1994) also comments that where instructional media are properly designed and produced, they can serve as another teacher or help the teachers to teach their subjects effectively at all levels of learning.

Conclusions

This study concludes that:

1. Teachers' has adequate knowledge of instructional media design strategies and instructional media production.
2. There is significant effect of teachers' knowledge of instructional media design strategies on teachers' performance.
3. There is significant effect of teachers' knowledge of instructional media production on teachers' performance.

Recommendations

The following recommendations are put forward for adoption:

1. Audio-visual units should be established in the secondary schools to help the teachers design and produce instructional media for use during every lesson.
2. Instructional media should be designed and produced for virtually all lessons in the secondary schools.
3. Secondary school teachers should be caused to attend seminars, workshops and symposia on media design and production to enrich their skills and update their knowledge.

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Influence of Social Media on Academic Information Sharing Among Vocational Education Students in University of Uyo, Akwa Ibom State

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ABSTRACT

The study assessed influence of social media on academic information sharing among vocational education students in University of Uyo, Akwa Ibom State. Two specific objectives, two research questions and two null hypotheses were postulated to guide the study. The study involved a survey design and a population of 161 respondents. Simple random sampling technique was used in selecting a sample of 115 students. A questionnaire with 15 structured items was used for data collection. The questionnaire was face validated and had a reliability coefficient of 0.86. Mean and standard deviation were used in answering the research questions while t-test statistics was used in testing the null hypotheses at 0.05 level of significance. The findings of the study revealed that there was great extent to which social media influences academic information sharing among vocational education students in the University of Uyo. Based on the findings, it was concluded that effective use of social media by the students would greatly help to enhance their academic achievements. The study recommended that students should apply appropriate skills on the use of social media on information sharing as this will create an avenue for public relations as well as increasing their academic achievements.

KEYWORDS: Vocational education, academic knowledge sharing, social media, social network, and social networking sites.

Introduction

The emergence of social media has led to the expansion of the level of socialization among individuals in the society in general and schools in particular. University students now find it very easy to express their thoughts, ideas and beliefs through social networks like facebook, twitter, myspace, e-mail, skype, yahoo messengers, etc. with the aid of internet connectivity. The mention of an online community in academia brings to mind an image of students chatting aimlessly. New technologies have probably changed the way most students share knowledge as well as their academic work environment and will very likely do so even

more in the future into the direction of a more virtualized world. E-mails are already prevalent, and newer tools are in the marketplace (Olasina, 2013).

The increased use of Social Networking Websites has become an international phenomenon in the past several years. Vocational education students have especially embraced these sites as a way to connect with their peers, share information, reinvent their personalities, and showcase their social lives (Boyd, 2010). According to Utuk, Udofia and Udoh (2019), vocational education is that aspect of education that is concerned with the world of work; aimed at acquisition of knowledge, skills and attitude in specific trade areas. Broadly, these trade areas include; business education, technical education, agricultural education and computer education. In the recent times, social media websites offer vocational education students in the University of Uyo a new way to interact with each other and communicate with the world at large. The university authority approved online registration of courses; up till now, school fees are paid online as well as checking of semesters' result. Facebook, for example has over 500 million members and it is still growing and approximately 85% of undergraduate students are Facebook users (Schneider, 2017). These numbers are expected to grow since Facebook users will continue to grow. And this is not only true for Facebook, numbers for YouTube users closely follow as well (University of New Hampshire, 2019). Social networking websites provide tools by which students can communicate, share information, and create new relationships.

Social networking sites are web-based services that allow individuals to either construct a public or semi-public profile within a bounded system, or articulate a list of other users with whom they can connect, view, and traverse their list of connections and those made by others within the system (Boyd and Ellison, 2007). According to Ellison (2010), the first recognizable social network site was launched in 1997. Facebook began in early 2004 as a Harvard-only social networking site (Cassidy, 2006). The nature and nomenclature of these connections may vary from site to site. Social networking websites have affected social interaction by changing the way people interact face-to-face, how information is shared, and the dynamics of our social groups and friendships (Asur and Huberman, 2010).

Academic knowledge sharing can be described as a process of communication whereby two or more parties are involved in the transfer of academic information (Usoro, Sharratt, Tsui and Shekhar, 2007). Knowledge sharing can be referred to as a social interaction where individuals interact and participate in sharing knowledge with one another in the group. Nowadays, knowledge is easily shared through the use of social media. Social media can be described as a group of Internet-based applications that is based on the ideological and innovative foundations of Web 2.0 (Andreas and Haenlein, 2010).

Since the most populous social media such as facebook, encouraged interconnectivity among individuals in remote locations, it has been observed that these veritable tools are also used to share information relating to assignments, examinations, time tables, lecture hours, group readings, seminars, and research.

Statement of the Problem

The educational system in Nigeria is faced with so many challenges which have certainly brought about a rapid decline in the quality of education. There is a deviation, distraction and divided attention between social networking activities and their academic work. It is observed

that students devote more attention to social media than they do to their studies. The world today is a global market in which the internet is the most important source of information. Since the advent of social media sites in the 1990s, it is assumed in some quarters that the academic performance of students is facing a lot of neglect and challenges.

Students' addictiveness to social networks, and their frequency of exposure to social network, has been part of the discussions in recent times as they affect the students' academic performance. Instead of students reading their books, they spend their time chatting and making friends via the social media and this might definitely have influence on their academic performance, because when one do not read, there is no way one can perform well academically. It is a common sight to see a student chatting in sensitive and highly organized places like church, mosque and lecture venues. Some are so carried away that even as they are walking along the high way, they keep chatting.

This study therefore sought to investigate if students of vocational education in the University of Uyo use these social media to share academic information, the challenges to their use of such invaluable devices to share information relating to academics and their course work, and the prospects for the effective use of social media for academic information sharing.

Purpose of the Study

The purpose of this study was to determine the influence of social media on academic information sharing among vocational education students in the University of Uyo. Specifically, the study sought to:

1. determine the influence of facebook on academic information sharing among vocational education students in the University of Uyo
2. determine the influence of WhatsApp on academic information sharing among vocational education students in the University of Uyo

Research Questions

The followings research questions guided the study

1. To what extent does the use of facebook influence academic information sharing among vocational education students in the University of Uyo?
2. To what extent does the use of WhatsApp influence academic information sharing among vocational education students in the University of Uyo?

Research Hypotheses

The followings null hypotheses guided the study and it was tested at 0.05 level of significance:

H_{O1}: There is no significant difference between the mean responses of male and female students on the extent to which facebook influences academic information sharing among vocational education students in University of Uyo.

H_{O2}: There is no significant difference between the mean responses of male and female students on the extent to which WhatsApp influences academic information sharing among vocational education students in University of Uyo

Research Methods

The study adopted a descriptive survey design and was carried out in the University of Uyo, Akwa Ibom State. The population of the study consists of 161 vocational education students in the University of Uyo, Akwa Ibom State. A sample size was 115 of the total population. The sample was determined statistically using Taro Yamane formulae. Stratified random sampling technique was adopted for this study. A structured instrument called "Influence of Social Media on academic information sharing Questionnaire" (ISMAISQ) with a 5-point rating scale of very great influence (5points), great influence (4 points), moderate influence (3 points), little influence (2 points) and very little influence (1 point), was developed by the researcher and used to collect data for the study. The instrument was face-validated by three research experts in University of Uyo. A reliability coefficient of 0.86 was obtained using Cronbach Alpha analysis. The researcher administered the instrument to the students. Mean and standard deviation were used in answering the research questions whereas independent t-test statistics was used to test the hypothesis at 0.05 level of significance. Decisions were based on real limit of the Mean rating.

Research Question 1

To what extent does the use of facebook influence academic information sharing among vocational education students in University of Uyo?

Table 1: Mean responses of the respondents on the extent to which facebook influences academic information sharing among vocational education students in University of Uyo. n = 115

S/N	Items	Mean	SD	Decision
1	Facebook software transmits research information among students and lecturers	2.62	0.52	GE
2	Uses of social media materials complement students' class work	2.59	0.54	GE
3	Passing of academic information through facebook platforms enhance students performance	4.23	0.94	VGE
4	Facebook assist lecturers on sharing academic information	2.10	1.06	GE
5	Library promotes use of facebook platform for rendering their services.	3.85	0.83	ME
	Grand Mean	**3.08**	**0.78**	**GE**

VGE = Very Great Extent; GE = Great Extent; ME = Moderate Extent

The results presented in Table 1 revealed that Facebook social media have the grand mean of 3.08. This indicates that facebook social media have great influence on academic information sharing among vocational education students in the University of Uyo. This shows that the mean range of the influence of facebook social media on academic information sharing among vocational education students in the University of Uyo was between 2.10 and 4.23 and most of the means range were above the cut-off point of 2.50, while one item was below the cut-off point. The standard deviation ranged from 0.52 to 1.06 which is not far away from the mean as the score clustered around the grand mean of 3.08. This means that there is great influence of

facebook social media on academic information sharing among vocational education students in the University of Uyo.

Research Question 2

To what extent does the use of WhatsApp influence academic information sharing among vocational education students in the University of Uyo?

Table 2: Mean responses of the respondents on the extent to which WhatsApp influences academic information sharing among vocational education students in University of Uyo. n =115

S/N	Item	Mean	SD	Decision
1	WhatsApp software transmits academic information among students in the university community within short time	3.12	0.62	GE
2	Uses of WhatsApp group help students to share academic information fast.	3.39	0.75	GE
3	WhatsApp group contributes immensely to students academic achievement	4.23	0.89	VGE
4	Students WhatsApp group help institution in sharing academic information	3.24	0.99	GE
5	students uses WhatsApp to promote group learning process	4.85	1.10	VGE
	Grand Mean	**3.77**	**0.87**	**GE**

VGE = Very Great Extent; GE = Great Extent; ME= Moderate Extent

The results presented in Table 2 revealed that WhatsApp social media have the grand mean of 3.77. This indicates that WhatsApp social media have great influence on academic information sharing among vocational education students in the University of Uyo. This shows that the mean range of the influence of WhatsApp social media on academic information sharing among vocational education students in the University of Uyo was between 3.12and 4.85 and all the mean range were above the cut-off point of 2.50. As it was observed that the standard deviation ranged from 0.62 to 1.10 which is not far away from the mean as the score clustered around the grand mean of 3.77. This means that there is great influence of WhatsApp social media on academic information sharing among vocational education students in the University of Uyo.

Research Hypothesis 1

H_{O1} There is no significant difference between the mean responses of male and female students on the extent to which facebook influences academic information sharing among vocational education students in University of Uyo.

Table 3: t-test analysis of the difference between the mean responses of male and female students on the extent to which facebook influences academic information sharing among vocational education students in University of Uyo. n = 115

Variables	N	Mean	t-cal	t-cri	Df	Decision
Male students	51	2.13	4.51	1.96	113	S
Female Students	64	3.12				

Note: NS = *not significant, S = significant@* $p \geq .05$, df= 113

Table 3 reveals t-test analysis of the influence of facebook on academic information sharing among vocational education students in University of Uyo. The table shows that the calculated t-value of 4.51 is greater than the critical t-value of 1.96 at 0.05 level of significant with 113 degree of freedom. With this result, the null hypothesis which states that there is no significant difference between the mean responses of male and female students on the extent to which facebook influences academic information sharing among vocational education students in University of Uyo is rejected and the alternative accepted which implies that there is significant difference between the mean responses of male and female students on the extent to which facebook influences academic information sharing among vocational education students in University of Uyo.

Research Hypothesis 2

H_{O2}: There is no significant difference between the mean responses of male and female students on the extent to which WhatsApp influences academic information sharing among vocational education students in University of Uyo

Table 4: t-test analysis of the difference between the mean responses of male and female students on the extent to which WhatsApp influences academic information sharing among vocational education students in University of Uyo n =115

Variables	N	Mean	t-cal	t-cri	Df	Decision
Male students	51	3.22	3.31	1.96	113	S
female Students	64	4.27				

Note: NS = *not significant, S = significant @,* $p \geq .05$, df= 113

Table 4 reveals t-test analysis of the influence of WhatsApp on academic information sharing among vocational education students in University of Uyo. The table shows that the calculated t-value of 3.31 is greater than the critical t-value of 1.96 at 0.05 level of significant with 113 degree of freedom. With this result, the null hypothesis which states that there is no significant difference between the mean responses of male and female students on the extent to which WhatsApp influences academic information sharing among vocational education students in University of Uyo is rejected and the alternative accepted which implies that there is

significant difference between the mean responses of male and female students on the extent to which WhatsApp influences academic information sharing among vocational education students in University of Uyo.

Discussion of Findings

The findings on Table 1, 2, 3 and 4 showed that social media has great influence on the academic information sharing among vocational education students in University of Uyo and that of male and female students were not significantly different in their responses on the extent to which social media influence academic information sharing among vocational education students in the University of Uyo. This finding is in congruence with the work of Benson (2011) who found out that social media has relationship with students' achievement in third world education system. From this finding, the researcher wishes to assert that the use of social media effectively for academic activities by students will enhance effective learning. It will also influence academic information sharing as well as academic performance of the students.

Conclusion

The use of social media for information sharing cannot be over emphasized. There is no doubt that the social media platform was originally meant for socialization. However, today, it can be used as a platform to promote information sharing relating to academics as well. The finding of this study shows that the social media is not mainly used for sharing information relating to academics. Rather, it is also used for socialization by students. These challenges could be avoided if a social media platform for academic activities is created for information sharing among vocational educational students.

Recommendations

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

1. The students should apply appropriate skills on the use of facebook account on information sharing, as this will create an avenue for public relationship and also increasing their academic achievements.

2. The students should be enlightened on how to make good use of WhatsApp social media for effective and efficient academic information sharing.

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Technical Education and Youths Unemployment in Bayelsa State

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ABSTRACT

This paper attempts to examine the concept of technical education, youths unemployment, causes and consequences. The descriptive survey research design was used in the study. The population for the study comprises of 150 professionals in Bayelsa State. Two research questions and two null hypotheses were formulated and tested at 0.05 alpha level of significance. No sampling technique was used because the whole population of the study was used. A questionnaire titled: Technical Education and Youths Unemployment (TEAYU) was used for data collection. The instrument was face-validated by three experts and the internal consistency determined using Cronbach Alpha procedure which yield a reliability co-efficient of 0.76. The data collected were analysed using mean, standard deviation and Chi-square statistics. The findings reveal among others that: Nigeria economy cannot develop until apprenticeship is encouraged among the youths through technical education in the school. Based on these findings the study among others recommended that apprenticeship should be encourage among youths as a pathway for alleviating poverty.

KEYWORDS: Technical Education, Youth, Unemployment

Introduction

Unemployment is one of the most serious problems facing Nigeria like many other countries in the world. Nigeria is becoming a predominantly youth society with high rate of unemployment. The development of youth is critical to economic survival and vibrancy of any nation. In order for a country to achieve her development aspiration, the youths need to have access to education that will enable them to enhance their standard of living and gain competitive skills that will be in high demand in the labour market. The changing nature of work today is placing increased pressure on the youths to acquire technical education skills. With the youths among the big losers of the recent economic crisis, technical education is often seen as the silver bullet to the problem of youth joblessness.

It is a fact that no country can develop without quality technical education (Ajaegbu, 2012). The development of any nation is critical to the economic survival and vibrancy of that nation. This holds particularly true for developing nation like Nigeria who is still grappling with chronic factors like unemployment and underemployment among the youths which have kept her in the perpetual bondage of economic frustration. The youth needs exposure in practical work experience in order to be proficient in their chosen career and be useful to them and contribute to

economic growth. Technical education affords individual the chance to acquire practical knowledge and requisite skill training needed in the job market for immediate self-employment (Ajaegbu, 2012). Adebambo (2007) stated that youth participation in technical education plays an instrumental role in the technological advancement and economic sustainability of many nations. Despite its contributions, Nigeria as a nation appears not to have given this aspect of education the attention it desires. This is viewed as one of the reasons for the nation's under-development. Technical education can open doors for economic and socially rewarding jobs and can help the development of small informal sectors business that could cater for youth unemployment and lead to economic development of a nation. Developing job related competencies among the youth is recognized as critical to progress in solving youth unemployment and economic development.

Technical education is that aspect of education that exposes the learner to acquisition of demonstrable skills that could be transformed into economic benefits (Akerele, 2007). According to Dike(2009), Technical education is that aspect of education which leads to the acquisition of skills as well as basic scientific knowledge. It is a planned program of courses and learning experiences that begins with exploration of career options, supports basic academic and life skills, and enables achievement of high academic standards, leadership, preparation for industry-defined work, and advanced and continuing education (Maclean and Wilson, 2009). The Federal Republic of Nigeria (FRN) in the National Policy on Education (FRN, 2013) sees Technical education as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life'. Technical education can therefore be seen as the formal training of persons to become technicians in different occupations. Thus any education that is geared towards teaching technical skills and attitudes suitable to such skills can be regarded as technical education.

The National Policy also enumerated the objectives of technical education in Nigeria as follows:

a. To provide trained manpower in applied science, technology and commerce particularly at sub-professional grades;

b. To provide the technical knowledge and vocational skills necessary for agricultural, industrial, commerce and economic development;

c. To provide people who can apply specific knowledge to the improvement and solution of environmental problems for the use and convenience of man;

d. To give an introduction of professional studies in engineering and other technologies;

e. To give training and impact the skill leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant and

f. To enable our young men and women to have an intelligent understanding of the increasing complexity of technology.

The above goals are intended to make technical education more practical, functional and job oriented. If all these goals were to be properly implemented, they could bring about the desired technological development.

The need to link training in Technical education to employment either self or paid employment is at the base of all the best practices and approaches observed throughout the world. One of the most significant aspects of Technical education is its inclination towards the world of work and the emphasis of the curriculum on the acquisition of employable skills (Anyadike, 2012). Technical education delivery systems are therefore; well placed to train the skilled workforces that the nation needs to create employment for the youths and emerge out of poverty.

Concept of Youth Unemployment

Unemployment is a very complex phenomenon. It is quite very simple to notice but hard to define. Generally, unemployment may imply lack of employment. Thus, anyone who is able to work and above certain age limit and is unoccupied may be considered as being unemployed for that period. Normally, the term unemployment implies a condition of joblessness. Unemployment refers to a phenomenon where people who are willing and capable of working are unable to find suitable paid work.

The concept unemployment has been defined as a condition in which people who are willing to work at the normal wage rate are unable to find jobs (Akintoye, 2008). It is one of the problems which every responsible government is expected to check and regulate. The higher the unemployment level in an economy the higher would be the poverty level and associated welfare challenges. Unemployment is one of the developmental problems that face most developing economy in the 21st century; Nigeria is not an exception from this phenomenon. In recent times, the definition of unemployment is said to be more encompassing, the unemployed is a member of the economically energetic population, who are without work but available and seeking for work, including people who have lost their jobs and those who have willingly left work. (Akintoye, 2008).

Unemployment is a global trend, but occurs mostly in developing countries of the world, with attendant social, economic, political, and psychological implications. Therefore, massive youth unemployment in any country is a signal of far more complicated problems (Okafor, 2011). Unemployment in Nigeria can be classified into two categories: the older unemployed who lost their jobs as a result of retrenchment, redundancy or bankruptcy; and the younger unemployed, most of who have never being employed (Oyebade, 2013).

Youth unemployment, could be termed as numerous youths from diverse background, willing and able to work, but cannot find any. When the supply of labor surpasses the demand for labour, it results to joblessness and unemployment. Given the lack of sufficient employment opportunities in the formal sector, youths may be forced to engage in casual work and other unorthodox sources of livelihood, thus leading to underemployment. Youth unemployment has been increasing because most youths lack relevant marketable skills.

Causes of Youth Unemployment

Youth unemployment has been skyrocketing in Nigeria. The principal causes of youth unemployment have been classified by several scholars (Alanana, 2003;Ayinde, 2008;Anyadike,

Ukah and Emeh, 2012). The increase in population is one of the causes of unemployment in Nigeria; 140,431,790 as per 2006 census and is projected to be over 180 million by 2020 if the annual growth rate of 3.2% continues. While the population increases, the number of industries growth is dwindling and if nothing serious is done, both population and unemployment will continue to rise.

The youths lack the relevant skills required by employers' as well as for self-employment. The curriculum in our technical education institutions is said to be obsolete and the graduates of such institutions are deficient in terms of employability skills. Some scholars and commentators have maintained that as far as the formal sector is concerned, the average Nigeria graduate is not employable and, therefore, does not possess the skills required by the employers of labor for a formal employment. Often, this is attributed to the Nigeria's education system, with its liberal bias. Education is essentially an instrument of excellence for national stability and development. Education is a dynamic process that changes with the needs and aspirations of the society. For education to be functional there must be constant and careful evaluation and re-evaluation of the educational system. Emaikwu (2012) affirms that evaluation is a systematic process of judging the worth, desirability, effectiveness, or adequacy of something according to definite criteria and purpose .The course contents of most educational institutions in Nigeria lack contents that would enable graduates to acquire technical as well as entrepreneurial skills to become job creators rather than job seekers (Okafor, 2011). Institutions of higher learning in Nigeria have concentrated more on theoretical and abstract instructional deliveries, focusing only on cognitive development and consequently turning out no entrepreneurial skilled graduates into labour markets.

Another factor responsible for unemployment in Nigeria is the lack of employable skills due to inappropriate school curriculum which has contributed to the rising youth unemployment. Analysis has argued that in Nigeria generally, the skills that job seekers posses do not match with the needs and demands of employers (Mcgrath, 2011). According to him, the educational system in Nigeria has its liberal bias which indeed, over supplies the labour market with graduates who do not possess the skills required by employers. Many graduates in Nigeria lack entrepreneurial skills to facilitate self-employment.

The cause of youth unemployment is also as a result of public negative attitude towards technical education as education for the low status (Nwokomah, 2005). This stems from the low image of 'blue-collar' jobs which technical education offers. Before and after independence, the Nigerian education system prepared students for basic "white collar' jobs. Over time, the paucity of jobs led to high unemployment rate and also a high level of poverty in the society (Moja, 2000; Ebong and Leigha, 2006). The Nigerian society wrongly believes that those who are not academically inclined study technical education subjects. It is because of this reason that most parents are not willing to encourage their wards to study technical education subjects. The fact remains that most parents are apt to want an academic education for their children, whether or not graduates increasingly finds it difficult to get jobs or not. They do not want their children to go to schools for the purpose of becoming bricklayers, carpenters, mechanics (Nwokomah, 2005). The urge for certificates and degrees in preference to technical vocational skills stems from the fact that when it comes to political appointments, leadership positions and decision making, graduates with degree certificates in different fields are favoured most than their counterparts with technical vocational skills.

Consequences of Youth Unemployment

Unemployment of youths has several implications; it has adverse psychological, social, occupational and financial consequences on them (Shadare andTunde, 2012). Unemployment has serious impacts both on their present living conditions and their attitude in the future and on the society in which they are supposed to be part. Youth unemployment literally devastates them morally and raptures the ties and relationship they form.

Unemployment among youth serves as trigger to violent conflicts and a threat to national security. The exclusion of large population of youth either graduates or secondary school leavers, skilled and unskilled from attaining the level of development increase the risks of violence and insecurity. These youths may become viable tools for exploitation, hired as political thugs or militia as well as ethno-religious crusaders against perceived injustice. Gofwan, Goshi and Dogara(2015), stressed that a good number of graduates in Nigeria are roaming the street. According to them, these youths have become problem to themselves and everybody in the society. They also maintain that Nigerians abroad feel extremely sad and restless for what unemployment and other socio economic vices have turned Nigeria into. To Egunjobi (2007), many social problems such as prostitution, robbery, alcoholism, domestic violence, social, religious and civil unrest and suicide to mention but few, become more severe in times of high unemployment. This contributes threats to national security and development because youths are not positively engaged in the productive process through suitable and adequate employment so as to become assets for national security and development, their energies and potentials are not harnessed to enhance national security and to positively contribute to socio-economic development.

Unemployment have also multiplied the number of aggrieved youths and resulted in the emergence of area boys' and Almajiris who target the very society that alienated them.

Statement of the Problem

In Nigeria people go to school with the belief that education will enable them participate in the society. But from the look of things, full participation in Nigerian society requires technical education at all levels of our educational system, which will recognize the different skills and abilities and give an equal opportunity to all students to prepare for work.

Overtime, there has been a dwindling level of employment in the country and among the youth specifically. It has been noted that technical education has not been embraced by the youths, and this is as a result of one problem or the other. Youth employment can be increased throughout the country, but some factors will militate against attaining it most especially because there are a lot of graduates and under-graduates in the streets seeking for jobs without relevance skills and trainings.

However, very little can be said to have been done in terms of research on youth employment development and self-reliance as it is evident in some researches. Little analysis has been done on the potential benefits of technical education and this has not been enough to help improve the rate of employment among youths in the society.

Purpose of the Study

The main purpose of the study is to examine Technical Education and youth unemployment. Specifically, the study sought to:

1) determine the challenges of Technical Education
2) determine the prospects of Technical Education

Research Questions

The following research questions are formulated to guide the study:

a. What are the challenges of technical education?

b. What are the prospects of technical education?

Null Hypothesis

The following null hypothesis were formulated and tested at 0.05 level of significance:

HO_1: There is no significant difference in the responses of professionals on the challenges of technical education

HO_2: There is no significant difference in the responses of professionals on the prospects of technical education.

Methodology

The descriptive survey design was adopted for the study, and was carried out in Bayelsa State. The population for the study consisted of 150 professionals. The sample also consisted of all the 150 professionals in the State. The whole population was used for the study because of the small number. The instrument used for data collection was a questionnaire. The instrument was face validated by three experts, two in the departments of Industrial Technology and one in Science Education. Cronbach Alpha reliability co-efficient method was used to determine the reliability estimate of the instrument. The internal consistency was obtained and the index was found to be 0.76. Mean, standard deviation and chi-square was used to analyze the data collected

Results

The results are presented in tables based on the research questions and hypotheses.

Research Question One

What are the challenges of technical education?

Table 1: Mean and Standard Deviation of Responses of Professionals on Challenges of Technical Education

S/N	Items	N	Ẋ	SD	Decision
1	Lack of financial support	150	3.35	0.69	Agree
2	Lack of facilities	150	3.27	0.88	Agree
3	Lack of experts in the area	150	3.13	0.77	Agree
4	Lack of career guidance	150	2.73	0.97	Agree
5	Lack of employment security	150	2.43	0.91	Disagree
	Grand Mean	150	2.98	0.39	Agree

As shown in table 1, the respondents agree to all the items except lack of employment security. It can be inferred from the results that the respondents agreed to lack of financial support, lack of facilities, lack of experts in the area, lack of career guidance and disagree on lack of employment security.

Research Question Two

What are the prospects of technical education?

Table 2: Mean and Standard Deviation of Responses of Professionals on Prospects of Technical Education

S/N	Items	N	Ẋ	SD	Decision
6	Serves as a means of preparing for occupational fields	150	2.69	0.98	Agree
7	Serves as an integral part of general education	150	2.25	1.02	Disagree
8	Serves as an aspect of lifelong learning and a preparation for responsible citizenship	150	2.65	1.21	Agree
9	Serves as an instrument for promoting environmentally sound sustainable development	150	3.67	0.47	Agree
10	Serves as a method of facilitating poverty alleviation	150	3.23	0.90	Agree
	Grand Mean	150	2.90	0.56	Agree

As shown in table 2, the respondents agree to all the items except serves as an integral part of general education. It can be inferred from the results that the respondents agreed to serves as a means of preparing for occupational fields, serves as an aspect of lifelong learning and a preparation for responsible citizenship, serves as an instrument for promoting environmentally sound sustainable development, serves as a method of facilitating poverty alleviation and disagree on serves as an integral part of general education

Discussion of Findings

The findings on the challenges of technical education indicated a significant difference. The findings could be attributed to the fact that the sector is faced with lack of inadequate facilities, lack of experts in the area, lack of career guidance and disagree on lack of employment security and financial constraints. This finding of the study is in line with that of Akaninwor (2010), who opined that technological backwardness in the country could be traced to lack of infrastructure and equipment for technical education.

The findings on the prospects of technical education indicated a significant difference. The findings could be attributed to the fact that technical education serves as a means of preparing individuals for occupational fields, lifelong learning and a preparation for responsible citizenship and serves as a method of facilitating poverty alleviation. The finding of the study is in line with that of Ajaegbu (2012), and opined that technical education is a potent means for fast-tracking technological progress, citizens' capacities, economic growth and national development.

Conclusion

There is a high level of youth unemployment in Bayelsa State and Nigeria as a whole. According to research findings and statistical data, despite the initiatives of the government in coming up with several programmes to reduce the level of youth unemployment which has failed to yield the desired result. In order to eradicate or reduce the level of unemployment in Nigeria greater emphasis must be placed on technical education. No meaningful youth employment programme can be achieved without efficient and effective technical education program. The promotion of Technical Education program will lead to wealth creation, employment generation and sustainable livelihood in Bayelsa State

Recommendations

The following recommendations are made in order to mitigate or reduce the level of youth unemployment in Nigeria through technical education:

1) Bayelsa State government should partner with international agencies, NGOs, and foundations in order to ensure the goals and potentials of Nigerians are realized using technical education for job and employment creation.
2) There should be linkage between technical education institutions and industries by using some of the experienced supervisors as teachers. The industry based training should be financed and organized and delivered by public entities which is a private sector driven. The government should only come in when it comes to regulatory aspect of the training, for example to check the indiscriminate acts of some technical education providers.
3) The society needs re-orientation in order to change their wrong perception about technical education. In advanced nations, individuals with technical skills and experience in relevant fields are highly respected.

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Understanding the Rudiments of Research design and Methodology in Qualitative and Quantitative Researches

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ABSTRACT

An appropriate research study relies on the quality of research design adopted for the study. It is in order to understand the rudiments of research design that this work is carried out. Research design have been viewed as a plan or structured framework of how one intend conducting the research process in order to solve the research problem. The components of research design discussed here include: interpretive paradigm, ontological and epistemological considerations, qualitative approach and quantitative methods of research design. The characteristic of quantitative approach is the scientific search for 'cause and effect', while the qualitative approach is the search for an understanding of human experience. In the qualitative approach process the researcher has a major role to play as it is through the researcher's eyes and ears that data are collected, information is gathered, settings are viewed, and realities are constructed" The main difference between quantitative and qualitative approach fall on the distinction between 'explanation' and 'understanding' as the focus of exploration. The use of case study is necessary when the researcher has little control over the events related to the social phenomena. Three variations in case studies that are linked to the intent of the case analysis were recognized to include: the single instrumental case study as the first variable in which the researcher looks at an issue and chooses a case; The second one is the intrinsic case study that emphases on the case itself, because in this case the case presents a unique situation. The third variation of the case study is the collective or multiple case studies. In summary the methods that will be employed in the analysis of data rely solely on the type of research design adopted. Hence care must be taken on the type of research design adopted for a study as it affects the outcome of the study.

KEYWORDS: Concept of Research design, Research paradigm, Ontological assumption, Epistemological assumption

Introduction

An appropriate research study relies on the quality of research design adopted for the study. In agreement to this assertion, Flick (2007) argues that the quality of any research project is enhanced by solid crafting of the research design. Therefore, in line with Flick (2007) position, I commenced this work with the conceptualisation of a good research design, this was subsequently followed by the choice of paradigm which was critically explained.

Concept of Research design

In the opinion of scholars such as Scott and Morrision (2006), every researcher is a designer. For instance, in a profession such as town planning, it is obvious that a town planner would diligently structure and come out with a clear layout of the city before the actual commencement of the build-up of the city. From the educational perspective, researchers would not begin data gathering of any kind without an appropriate research design. This is because embarking on such a mission would render the research findings unreliable (Hancock, Ockleford & Windridge, 2009). Supporting this assertion, Maree (2011) avows that the adoption of an appropriate research design is a panacea that road-mapped any study to its logical conclusion. Now is pertinent to give brief definitions of research design.

In the context of the meaning of research design, Scott and Morrison (2005), refers research design to the schema or plan that constitutes the entire research study. In another vein, Babbie and Mouton (2007) view research design as a plan or structured framework of how one intend conducting the research process in order to solve the research problem. From the point of view of Babbie and Mouton (2007), the methodology and methods which a researcher adopts in conducting his/her research is what research design stands for.

From the perspective of McMillan and Schumacher (2009), a research design is a blueprint of research that deals with four problems namely; what questions to study, what data are relevant, what data to collect and how to analyse the data. This view gives credence to the formulation of appropriate and acceptable research questions since this will act as a guide in arriving at a workable research design. In furtherance to the above assertion, a particular research design informs the researcher the importance of certain data and the nature of the said data to his/her study. The methods that will be employed in the analysis of data rely solely on the type of research design adopted (Scott &Morrison, 2009). In summary, it may be concluded that a research design demonstrates that the problem for exploration is doable given available resources (McMillan & Schumacher, 2009). In this study, research design is made of the following components: interpretive paradigm, ontological and epistemological considerations, qualitative approach, methodology and methods that are unpacked below.

Research paradigm

The concept ‘paradigm’ is derived from a Greek word *paradeigma.* In the 15th century, this concept was first introduced in English to mean ‘an example or pattern’. However, for over 400 years, the word ‘paradigm’ was mainly used in English language to sort the verbs, nouns and other parts of speech. The use of paradigm in English language continued until 1960s, when David Baltimore used this term to refer to a theoretical framework in his research work on cancer (Mackenzie & Knipe, 2006). Baltimore’s application of paradigm in his study necessitated other

scholars not only in natural sciences but also in social sciences and education to use this term to conduct research study.

Types of research paradigms

In the context of types of paradigms, scholars such as Greene, Benjamin and Goodyear (2001) say that there are three research paradigms namely: positivism, post-positivism and interpretivism. However, a researcher like Coe (2012) reports that there are four types of paradigms and it include: positivist, post-positivist, critical and interpretivist paradigms.

a. Positivism

Positivism has been conceptualised by numerous researchers over the decades. For instance, Krauss (2005) argue that positivism embraces a four point doctrine. These doctrines are: (a) the rule of phenomenalism, which asserts that there is only experience, all abstractions be they "matter" or "spirit" have to be rejected; (b) the rule of nominalism – which asserts that words, generalisations, abstractions, among others are linguistic phenomena and do not give new insight into the world; (c) the separation of facts from values; and (d) the unity of the scientific method (Krauss, 2005, p.761). Bisman (2002) sees positivism as an epistemology which seeks to explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent elements. In conclusion, positivism prevails in science and assumes that science quantitatively measures independent facts about a single apprehensible reality (Healy & Perry, 2000).

b. Post-positivism

According to Zammito (2004), post-positivists believe that a reality exists, though he holds that it can be known only imperfectly and probabilistically. Ryan (2013) opine that post-positivism stress meaning and the creation of new knowledge, and are able to support committed social movements, that is, movements that aspire to change the world and contribute towards social justice. In postpositivism, it is believed that human knowledge is based not on unchallengeable, rock-solid foundations, but rather upon human conjectures (Zammito, 2004).

c. Critical paradigm

Critical paradigm is another school of thought that emphasises the reflective assessments and critique of society and culture by applying knowledge from the social sciences and the humanities (Morgan, 2012). In other words, critical paradigm is particularly focused on the issue of power relations within the society and interaction of race, class, gender, education, economy, religion and other social institutions that contribute to a social system (Asghar, 2013). However, critical paradigm does not only highlight and explain these social factors that cause oppressive and powerful groups to dominate the suppressed and repressed section of society, but it also strives for a social set up based on equality for all the members (Bohman, 2013).

d. Interpretive paradigm

The interpretivist tradition has exerted a strong influence on education research over the past 40 years. Interpretive paradigm is seen as an alternative to the positivist paradigm (Ponterotto, 2005). Interpretive paradigm in its purest form separates itself from social

constructionism, adherents of which argue that social reality can be described in different ways, all of which are equally valid (Scott & Morrison, 2005). An interpretive researcher assume that our knowledge of reality is gained only through social construction such as language, consciousness, shared meanings, documents, tools and other artefacts. Interpretive researchers argue for the uniqueness of human inquiry, therefore, to completely comprehend human action by means of interpretations is to argue for an altogether different aim from natural science.

If people take action on the ground of their interpretation of the actions of others, then meaning interpretations themselves are causal for humans. This is not true in nature. This billiard ball does not make sense of its environment. But the human actor in society does and different humans make sense different. They impute meaning to others' actions and take their own actions in accord with the meaning interpretations they have made. In a similar vein, Hansen (2004) avows that the interpretive researchers are of the views that reality is constructed in the mind of the individual, rather than being an externally singular entity. Additionally, the purpose of any research study within the interpretive paradigm is to understand and interpret a specific context as it is, rather than to generalise or replicate the study (Schwandt, 2014).

Myers (2011) argues that the premise of interpretivists is that access to reality (whether given or socially constructed) is only through social constructions such as language, consciousness and shared meanings. In another vein, Goldkuhl (2012) submit that the proponents of interpretive paradigm emphasise the goal of understanding the lived experiences from the point of view of those who live with it day to day. Additionally, the interpretive researchers seek to understand studied people through accessing the meanings that participants attached to those social worlds (Bryman & Bell, 2007). To be specific, interpretivism supported researchers in terms of exploring their world by interpreting the understanding of individuals (Thanh & Thanh, 2015).

Ontological assumption for the study

The concept 'ontology' used by social scientists was borrowed from philosophy. According to Ding and Foo (2001), ontology is the shared understanding of some domains of interest, which is often conceived as a set of classes (concepts), relations, functions, axioms and instances. Primarily, ontology means the theory of being (Dong, Li & Wang, 2006). Poetschke (2009) added that ontology is concerned with the question on how the world is built. Ontology focuses on what is the form and nature of reality, and what can be known about that reality (Morse, 2015). Blaikie (2000) give a brief definition of ontology as claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up and how these units interact with each other. In furtherance to the above, ontological assumption in any social science research is that the social world and what passes as 'reality' is a projection of individual consciousness; it is an act of creative imagination and of dubious intersubjective status.

According to Bryman (2001), reality is masked by those human processes which judge and interpret the phenomenon in consciousness prior to the full understanding of the structure of the meaning it expresses. It was a result of position held by Bryman (2001) that Scotland (2012) argues that in a qualitative study a researcher need to take a position regarding their perceptions of how things really are and how things really work. Based on this notion, however, what

constitute reality in a study is constructed in the mind of this researcher as it relates to the dynamics surrounding the people under study.

Epistemological assumption for the study

According to Cohen, Manion and Morrison (2011), epistemology focuses on the theory of knowledge. From Saunders, Lewis and Thornhill's (2007) perspective, epistemology dwells on what constitutes an acceptable knowledge in the field of study. In specific term, epistemological assumptions in social sciences focus on the knowledge-gathering process and ways of developing new models or theories which are better than rival models and theories (Scotland, 2012). The process in which knowledge is generated is continuously changing, never in a static or constant position. In light of the above, Wellington, Bathmaker, Hunt, McCulloch and Sikes (2005) argue that epistemological assumptions in any research are concerned with how researcher(s) knows, the nature of knowledge, what constitutes knowledge, where knowledge comes from and whose knowledge it is, and what it is possible to know and understand and re-present. In qualitative research approach, the question that usually in mind of researchers are: how we know what we know or what is the nature of the relationship existing between the knower or would-be knower and what can be known. According to Creswell (2012), there are three types of research approaches used by researchers. Creswell (2012) listed the approaches to include: qualitative, quantitative and mixed methods. Unquestionably, these three approaches are not as discrete as it appears. Qualitative and quantitative approaches should not be seen as polar opposites or dichotomies. Rather, they represent different ends on a continuum. However, the main difference between quantitative and qualitative approach fall on the distinction between 'explanation' and 'understanding' as the focus of exploration (Huysamen, 2001).

While the characteristic of quantitative approach is the scientific search for 'cause and effect', on the other hand, qualitative approach is the search for an understanding of human experience (D'amant, 2009). In another development, mixed methods approach is an inquiry that seeks to combines or associates both qualitative and quantitative approaches (Creswell, 2012). Mixed methods approach is more than simply collecting and analysing both kinds of data, rather, it also involves the use of both approaches in tandem so that the overall strength of a study is greater than either qualitative or quantitative research (Creswell & Plano-Clark, 2007). There are various ways in which qualitative researchers define qualitative approach. For example, Denzin and Lincoln (2000) define qualitative study as a broad class of empirical procedures designed to describe and interpret the experiences of research participants in a context-specific setting. Qualitative research is a means of exploring and understanding the meaning individuals or groups ascribe to a social or human problem.

Additionally, questions relating to 'why' and 'how' are generally pointed towards qualitative research (Flick, 2007). Furthermore, Denzin and Lincoln (2005) state that in qualitative research researchers attempt to reveal not only what happens but how it happens and, most importantly, why it happens and the way it does. Also, qualitative approach emphasises the lived experiences of the participants (Lichtman, 2006). In other words, the researcher tries to understand the world of the research participants and this can therefore be explained as understanding the life experiences of the persons. Therefore, the central aim of qualitative researcher is to see the world from the perspective of the participants, and understand the phenomenon from the participants' experiences. Furthermore, in the qualitative approach process the researcher has a major role to play. According to Lichtman (2006, p.12), it is through the

researcher's eyes and ears that data are collected, information is gathered, settings are viewed, and realities are constructed". However, detailed consideration is given to the holistic picture or situation of the study (Cohen, Manion & Morrison, 2011). Following a similar line of argument is Maree (2011), who says that qualitative research approach is aim at understanding a phenomenon by looking at the overall picture instead of focusing on it as isolated variables. Cohen, Manion and Morrison (2011) opines that the researcher can only interpret and bring meaning to the data collected if he or she is able to understand the data in a wider social, educational and historic context.

Case Study

Yin (2009) sees a case study as a research approach used in various situations to add to our knowledge and understanding of an individual, group, organisation, social, political and related phenomena. Saunders (2005) refers to a case study as an explanation or in-depth analysis of a "bounded system" (bound by time and/or place) or a single or multiple cases, over a period of time. In a similar vein, Swanborn (2010, p.13) defines a case study as a study of social phenomenon carried out within the boundaries of one social system (the case) or within the boundaries of a few social systems (the cases), such as people, organisations, groups, individuals, local communities or nation-states, in which the phenomenon to be studies enrols. Drawing from the above conceptualisation, it would be out of place to say that a case study is as a detailed examination of a social phenomenon within specific context.

In the context of the application of a case study in the research, Yin (2009) comes up with three main reasons for the adoption of the case study in the study. Yin (2009) says that the use of 'how' or 'why' research question(s) that seek to explain the present circumstance justify the engagement of the case study. However, the more the research question necessitates an intensive and in-depth explanation of the phenomenon, the higher the appropriateness of the case study approach in the study (Swanborn, 2010). Additionally, Yin (2009) says that a case study is a preferred approach when the researcher has little control over the events related to the social phenomena. In the context of the third reason, Yin (2009) indicates that a case study focuses on a contemporary phenomenon within a real-life context.

Another merit of the case study approach is its potential to allow for the use of different approaches or methods to gather information. In line with the qualitative research methodology, a case study connotes a detailed and in-depth study of a case or cases. It was also observed that a case study is concerned with a rich and vivid description of events relevant to the case. Similarly, the case study analyses relations between the factors that describe present status or influence change or growth (VanWynsberghe & Khan, 2007). Bassey (2007) goes on to argue that a case study involves being where the action is, taking evidence from the research respondents.

Creswell (2007) recognises three variations in case studies that are linked to the intent of the case analysis. Creswell (2007) mention the single instrumental case study as the first variable in which the researcher looks at an issue and chooses a case. The position held by Creswell (2007) was affirmed by McMillan and Schumacher (2006), Bassey (2007), who refers to it as multiple-site case studies. In another circumstance, Yin (2009) argue that the data gathered from multiple cases are often considered as being more convincing, and the study is thus understood as being more robust and rich. Furthermore, Yin (2009) opines that the analytical advantages of using multiple cases may be substantial. However, the criticisms regarding the use of a single

case approach largely mirror uncertainties about the uniqueness or artificial conditions related to the case (Yin, 2009).

Notwithstanding the views of Creswell (2007) and Yin (2009), Swanborn (2010) says that the major challenge facing the use of the case study approach is its lack of representativeness of the wider population or community. Interestingly, the implication is that the findings cannot be generalised in other places of interest aside from the study area.

Conclusion

Several concepts that relate to research design have been discussed exhaustively in this review. Such components as: interpretive paradigm, ontological and epistemological considerations, qualitative and quantitative approaches to research findings. It is important to note that: Paradigm is a set of interrelated assumptions about the social world which provides a philosophical and conceptual framework for the organised study of the world. There are three research paradigms namely: positivism, post-positivism and interpretivism; ontological assumption in any social science research is that the social world and what passes as 'reality' is a projection of individual consciousness; Epistemological assumptions in any research are concerned with how researcher(s) knows, the nature of knowledge, what constitutes knowledge, where knowledge comes from and whose knowledge it is, and what it is possible to know, understand and re-present, as research is based on assumptions. And finally, the characteristic of quantitative approach which is the scientific search for 'cause and effect', while the qualitative approach is the search for an understanding of human experience and the main difference between quantitative and qualitative approach which fall on the distinction between 'explanation' and 'understanding' as the focus of exploration.

Recommendations

1. Researchers should know that either quantitative or qualitative researches are very important and recommended for use. They should note that the type of research is strongly dependent on the topic and the researcher's intention.

2. The use of case study recommended when the researcher has little control over the events related to the social phenomena.

3. Care must be taken with respect to the methods that will be employed in the research for use appropriate statistics in the analysis of data.

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Enhancing Entrepreneurial Skills Using ICT among Business Studies Students in Akwa Ibom State Secondary Schools

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ABSTRACT

The study was carried out to investigate ways of enhancing entrepreneurial skills using ICT among secondary school students in Akwa Ibom State. The population of the study comprised all business studies students in Akwa Ibom State Secondary schools. The study adopted a correlational survey design, while multi-stage sampling technique was used to select a sample size of four hundred (400) students as respondents. The study made use of two instruments for data collection tagged "Information and Communication Technology Questionnaire" (ICTQ) and "Enhancing Entrepreneurial Skills Questionnaire" (EESQ) which were administered to the respondents. Data collected was analysed using simple regression analysis. The result showed that there is significant influence of ICT on enhancing entrepreneurial skills among secondary school students. It also showed that there a significant influence of ICT on creation of employment opportunities for secondary school students in Akwa Ibom State. Based on the findings, one of the recommendations was

KEYWORDS: Use of ICT, Enhancing Entrepreneurial Skills, Firm Foundation, Employment Opportunity and Wealth Creation

Introduction

Entrepreneurship has been in existence for decades, and is often used extensively in everyday conversation and as a common term in the field of Management and Economics. The goldsmith who stores people valuables and engages in exchange of goods and services is a typical entrepreneur. Again, our forefathers who were doing subsistent farming and later diversified into Craft trade to produce goods and services to satisfy their various needs were also into entrepreneurship without knowing it.

According to Geneva, (2010) there are three main entrepreneurship policy objectives such as firm foundation; employment; and wealth creation. This policy has indeed helped various institutions to incorporate entrepreneurship education into their educational system. Entrepreneurship education is an embodiment of the national innovation system concept which is proposed as a policy framework for Science, Technology and Innovation (STI) in developing countries. It is argued that a systemic approach to STI policymaking may be more appropriate to the needs of developing countries than earlier innovation models. The selected indicators capture inputs, outputs, and the impact of innovation, as well as the linkages among public, private and academic actors.

Recently, extremely quick developments in information-communication technology (ICT) can be witnessed. Researchers increasingly believe that investment in ICT and the existence of appropriate ICT support tools make it possible to create some kind of a knowledge repository and foundation for knowledge and learning management at different levels of human interaction (personal, community, society). ICT also allows for teaching the younger generations and for making them aware of ICT tools which might increase their employability or self-employment capabilities. Nowadays, almost all youngsters have basic knowledge about the computers which make it easier to teach them about ICT tools. However, it is important that students have the knowledge about ICT as well as specific ICT tools. Many of such tools can be used free of charge which is another reason, why they might be used for teaching and learning entrepreneurship.

Modern ICT could be used as a means to establish connections between the business and higher education sector. It represents an important opportunity to provide young people with business competencies and entrepreneurship education. This brings benefits to a variety of stakeholders as well but not only the students, faculties, other educational institutions at all levels and enterprises, (Hynes & Richardson, 2007). To achieve continuous improvements of entrepreneurial competencies learning should be implemented effectively. Educators should introduce ICT into entrepreneurship education which could be used to meet the market demands and to provide the students with the set of competencies needed for global challenges. For that reason, the use of ICT tools seems to be the best solution. Entrepreneurship education involve learning of a variety of business related competencies such as improvements of decision-making skills or skills to access information and using different ICT tools for creating a better working space. Entrepreneurship education enables students to be properly equipped with additional knowledge, attributes and capabilities with the aim of using these abilities in setting up enterprises or business. The ultimate goal is to be able to function effectively as an entrepreneur or in an entrepreneurial capacity (Wilson, 2012).

Problem Statement

The Nigerian society is faced with challenges of unemployable graduates from all Institutions of learning. It is a fact that employability is the ability to acquire sustainable employment appropriate to one's qualifications. This situation is also observed as common to Akwa Ibom State students. Also noted is lack of delivery of entrepreneurial skills through

innovative learning strategies. These students are dormant and are not well prepared towards becoming entrepreneurs as they are not given enough exposure in the use of ICT which is the very tool for enhancing entrepreneurial skills. Such tools involve facebook, email, whatsaps which could be used for advertising and purchasing of good and services.

Also, most of these secondary schools lack funds required to furnish the classroom with up to date facilities and equipment that can measure up with the global demands which is highly technologically bias. Lack of well-equipped ICT laboratories and even where there are some levels of equipment the issue of lack of technical 'know how' still rear its ugly head. Lack of experts to manage and maintain the facilities is also among the numerous factors militating against the proper delivery of entrepreneurial skills using ICT. Lack of awareness on the part of the students who are not well informed on the need for acquiring employable skills that will make them good entrepreneurs, which will enhance their relevance in the job market, is a very prominent problem. It is on this ground that this research is carried out to assess the use of information and communication technology (ICT) with respect to e-commerce, e-advertising and e-marketing as tools for enhancing entrepreneurial skills of business studies students in secondary schools in Akwa Ibom State.

Objective(s) of the Study

1. To determine the influence of ICT training on acquisition of entrepreneurial skills among Business Studies students in secondary schools in Akwa Ibom state.
2. To find out the influence of ICT training on creation of employment opportunities for Business Studies students in secondary schools in Akwa Ibom State.

Research Questions

1. What is the influence of ICT training on enhancing entrepreneurial skills among Business Studies students in secondary schools in Akwa Ibom State?
2. What is the influence of ICT training on creation of employment opportunities for Business Studies students in secondary schools in Akwa Ibom State?

Hypotheses

The following hypothesis will be tested:

1. There is no significant influence of ICT training on enhancing entrepreneurial skills among Business Studies students in Akwa Ibom state secondary schools.
2. There is no significant influence of ICT training on creation of employment opportunities for Business Studies students in secondary schools in Akwa Ibom State.

Literature Review

This chapter presents the review of the related literature under the appropriate sub-headings:

Theory of entrepreneurship education, (Mar, 1991)

Theory of entrepreneurship education helps to comprehend the phenomena better. Various theories of entrepreneurship have been propounded by thinkers, one of such is Mar.

Mar (1991) states that the very main spring of the exercise of the entrepreneurial function is the powerful will to assert economic leadership. The entrepreneur is not (necessarily) the one who invents new combinations, but the one who identifies how these new combinations can be applied in production. This line of reasoning implies that a business owner is considered an entrepreneur only if he is carrying out new combinations. The entrepreneur moves the economic system out of the static equilibrium by creating, new products or production methods thereby rendering others obsolete.

Contemporary issues in education and economic development are dominated by three main theories, namely: the human capital, the modernization and the economic dependence theories (Okojie 2008). While human capital theory emphasizes that education increases the productivity and efficiency of workers by increasing the level of their cognitive skills, the modernisation theory focuses on how education transforms an individual's value, belief and behaviour with exposure to modernising institutions such as schools, factories and the mass media, and thereby inculcating modern the values and attitudes. The dependence theory arose from Marxist conceptualizations based on the dynamics of the world system that structure conditions for economic transformation in both the core and the periphery of the world economy (Okojie 2008). Thus, the proponents argue that the prevalence of foreign investment capital, the presence of multi-national corporations, concentration on exporting of primary products and the dependence on imported technologies and manufactured goods, constrain long-term economic development. Its critics, however, point to the evidence of widespread unemployment and its negative impact on economic growth. The theory has tended to make people more cautious and skeptical about the presumed positive economic impact of education.

The psychological theories of career development focus on the individual as a crucial variable in the career decision making process. These theories have in common the assumption that the individual has some freedom in the choice of an occupation; that is, he can exert at least a modicum of control over his vocational future by mere fantasy and perception (Ocansey, 2007). They posit that perception and choice are determined, primarily by the characteristics or functioning of the individual and only indirectly by the environment in which he lives. One of the psychological theories of career choice is the trait and factor theory.

The implication of this theory is that the students will see the need of learning with ICT through social means to develop them entrepreneurially. That is why both the teachers and students will find this theory useful to them in their daily teaching and learning.

Entrepreneurship education

Entrepreneurship education which has recently gained wide popularity means different things to different educators. Kourilsky, (1995) defines entrepreneurship education as

opportunity, recognition, marshalling of resources in the presence of risk and building a business venture. Bechard and Toulouse, (1998) defines it as a collection of formalized teachings that informs, trains, and educates anyone interested in business creation or small business development. It also means different things at different levels of education. At the primary and secondary school level the aim is mainly to create awareness for a career option and thus it serves as a vehicle for the development of academic skills and emphasis on the importance of school subjects. This thus leads to mastery of school subjects especially English and Mathematics by the school children. The implication therefore is that the overall purpose of entrepreneurship education is the development of expertise as an entrepreneur. It is the process of providing individuals with the ability to recognize business opportunities, the insight, the zeal, the knowledge, the courage and skills to act on them.

Entrepreneurship therefore seeks to prepare people especially youths to be responsible and enterprising individuals; to develop deep thoughts on entrepreneurship and consequently contribute to economic and sustainable development of their communities. It encourages creative thinking and promotes a strong sense of self worth and accountability. Through entrepreneurship education graduates, especially those of tertiary education are equipped to find new methods of doing things and enabled to be their own bosses and job "creators" rather than job "seekers".

Entrepreneurship education is a product of the rising challenges in the society. Its curriculum content must be responsive enough to address the obvious short comings of our present school system. That is why Ogunkunle (2009) remarked that global changes in recent times call for innovations in the school curriculum. Entrepreneurship education is aimed at meeting the challenges of the Millennium Development Goals (MDGs) its curriculum must be responsive and relevant to the current and anticipated needs, problems and aspirations of the learner (Emah, 2009). Entrepreneurship education is an aspect of both responsive and functional education whose curriculum contents are mutually interrelating and overlapping.

Why entrepreneurship training

The essence of introducing entrepreneurship training is to equip the students with necessary skills and mindset require for successful entrepreneurship. It is also to instill in the students the self-confidence and assurance required for launching a business.

Entrepreneurship education does not only embrace economic life style but help to stimulate economic development. Bandura, (1992) observed that more educational institutions now offer a wide range of entrepreneurial programmed and training activities which appeal to be influencing the students in terms of entrepreneurial interest and engaging in the business of their choice. With the need for new skills created by globalization, there is a search for enhanced competitive advantage. Bandura, (1992) point out that though formal education is necessary, it is not sufficient to meet challenges of the globalized world.

The abundant natural, human and material resources in most developing countries, without entrepreneurship education, as well as people with the psychological disposition, have the tendency of resources of the nation remaining unexploited. Nwangwu (2007) argues that the

failure of tertiary education to inculcate self-reliance in the students have led to wastage of both human and natural resources. Tertiary education is the education provided after secondary education either in universities, colleges of education, monotechnics and polytechnics including those offering correspondence courses. Omolayo (2006) points out that university education was in the past oriented towards making graduates suitable for only white collar jobs. This underscores why many university graduates roam the streets in search of non-existing white collar jobs. Omolayo (2006) points out that Nigeria universities should stimulate economic growth through a deliberate agenda of production of entrepreneurial graduates.

Functional education is that which is imparted on the individual to prepare him/ her to face the challenges of achieving the national goals of the country.

Shai (2009) came out with a three components categorization of Entrepreneurship Education curriculum considered comprehensive enough to equip the products of the school system with the needed skills and capacities of future life.

Personal Development – it should build confidence, motivate progress, strengthen the entrepreneurial mindset, foster a desire to achieve and inspire action.

Business Development – Technical, financial literacy and skills to engage in self employment and in entrepreneurship that can lead to self-improvement. This will include the expected business and functional curricula.

Entrepreneurial skill's development – it should provide training in social skills, networking, creative problem – solving, opportunity seeking, interviewing, presentations, group leadership, community cooperation, seeking dealing with bureaucracy, local cultural norm and how they affect business etc. Every entrepreneurship curriculum must have the above as its integral elements so as to provide the students with the cherished skills and capacities that can make them self sufficient and highly productive in the society.

Information and communication technology equipment and entrepreneurship education of students

The roles played by information and communication technology in the entrepreneurial development of students cannot be over emphasized. Information and communication technology has been seen as very useful equipment for effective preparation of student for skill development and future employment. Suleiman, (2006) observed that with the introduction of information technology in teaching entrepreneurship education, emphases are placed on practicable teaching methods that are more useful in vocational and technical training and the experiencing of realities in the course of learning.

OMANJAF, (2013) reports that Entrepreneurship in Nigeria started when people produced more products than they required such that they had to exchange the surplus. Early Entrepreneurship started with trade by barter even before the advent of any form of money. With colonial masters Modern Entrepreneurship came into place which relegated the Nigerian entrepreneur to the position of middleman ship by becoming retailers of wears and items of the

colonial masters. Also, with the inception of formal education Nigerian became employed in civil service and less attention was given to entrepreneurship thereby increasing the dependence on the colonial masters and their products. United African Company (UAC) being substantially responsible for import and export trade had a policy of dealing directly with producers and rejected the use of services of Nigerian entrepreneurs. The rejection of these services by these expatriates inhibited the expansion and acquisition of the necessary skills and attitude of the local business men. This had a negative result on entrepreneurship in Nigeria which slowed down many entrepreneurs who either folded up or were demoralized. However with more awareness through education and the fact that the government could not employ more school leavers, economic programmes were established to encourage individuals to go into private businesses. For instance People Bank of Nigeria provided funds for Small-Scale Industries (FUSSI), Co-operative Societies and others to help establish entrepreneur in Nigeria (OMANJAF, 2013). Entrepreneurship education is geared towards training students to develop and acquire skills, trade or business that results in being employable, creation of job opportunities for empowerment of individual, society and economic development of the nation at large.

According to Enu, (2012) entrepreneurship education is rebranding education meant to guarantee a comprehensive educational system, reengineering arising from the obvious differences of the existing educational system. It helps to equip the student's requisite skill and competencies needed in the current world of work. Modern ICT could be used as a mean to establish connections between the business and higher education sector. It represents an important opportunity to provide young people with business competencies and entrepreneurship education.

Research Methods

The study adopted a correlational survey design and was carried out in all Secondary schools in Akwa Ibom State. The population of the study comprised of all business studies students in Akwa Ibom State secondary schools. A sample size of 400 respondents of the total population was used. The sample was determined statistically using Taro Yamane formulae. Multi-staged sampling technique was adopted for this study. A structured instrument called "Information and Communication Technology Questionnaire" (ICTQ) and "Enhancing Entrepreneurial Skills Questionnaire"*(EESQ)* with a 5-point rating scale of very great influence (5points), great influence (4 points), moderate influence (3 points), little influence (2 points) and very little influence (1 point), was developed by the researcher and used to collect data for the study. The instrument was face and content validated by research experts. A reliability coefficient of 0.79 was obtained using Cronbach Alpha analysis. The researcher administered the instrument to the students. Simple Regression analysis was used to test the hypothesis at 0.05 level of significance.

Hypothesis One

The null hypothesis states that there is no significant influence of ICT training on enhancing entrepreneurial skills among Business Studies students in Akwa Ibom state secondary schools. In order to test the hypothesis simple regression was used to analyse the data, (see table 1).

Table 4.1: Simple regression of influence of ICT training on enhancing entrepreneurial skills among Business Studies students in Akwa Ibom state secondary schools.

Model	R	R Square	Adjusted R Square	Std. error of the Estimate	R Square Change
1	0.89a	0.79	0. 79	0.65	0. 79

***Significant at 0.05 level; df = 398; N = 400; critical r–value = 0.113**

The table 1 shows that the calculated R-value 0.89 was greater than the critical R-value of 0.113 at 0.5 alpha level with 398 degree of freedom. The R-square value of 0.89 predicts 89% of the influence of ICT training on enhancing entrepreneurial skills among Business Studies students in Akwa Ibom state secondary schools.

This rate of percentage is highly positive and therefore means that there is significant influence of ICT training on enhancing entrepreneurial skills among Business Studies students in Akwa Ibom state secondary schools.

It was also deemed necessary to find out the extent of the variance of each class of independent variable as responded by each respondent (see table 4.2).

Table 4.2: Analysis of variance of influence of ICT training on enhancing entrepreneurial skills among Business Studies students in Akwa Ibom state secondary schools.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	629.88	1	629.88	1513.63	.000[b]
Residual	165.62	39	0.416		
Total	795.49	39			

a. Dependent Variable: Entrepreneurial Skills
b. Predictors: (Constant), ICT

The above table 4.4 presents the calculated F-value as (397.51) and the critical f-value as (000). Being that the critical f-value (000a) is below the probability level of 0.05, the result therefore means that there is significant influence exerted by the independent variables ICT on the dependent variable which is Entrepreneurial Skills.

Hypothesis Two

The null hypothesis states that there is no significant influence of ICT training on creation of employment opportunities for Business Studies students in secondary schools in Akwa Ibom State. In order to test the hypothesis simple regression was used to analyse the data, (see table 4.3).

Table 4.3: Simple regression of the influence of ICT training on creation of employment opportunities for Business Studies students in secondary schools in Akwa Ibom State.

Model	R	R Square	Adjusted R Square	Std. error of the Estimate	R Square Change
1	0.93a	0.86	0. 86	0.53	0. 86

***Significant at 0.05 level; df = 398; N = 400; critical r–value = 0.113**

The table 1 shows that the calculated R-value 0.93 was greater than the critical R-value of 0.113 at 0.5 alpha level with 398 degree of freedom. The R-square value of 0.86 predicts 86% of the influence of ICT training on creation of employment opportunities for Business Studies students in secondary schools in Akwa Ibom State.

This rate of percentage is highly positive and therefore means that there is significant influence of ICT training on creation of employment opportunities for Business Studies students in secondary schools in Akwa Ibom State.

It was also deemed necessary to find out the extent of the variance of each class of independent variable as responded by each respondent (see table 4.4).

Table 4.4: Analysis of variance of influence of ICT training on creation of employment opportunities for Business Studies students in secondary schools in Akwa Ibom State.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	673.32	1	673.32	2380.14	.000[b]
Residual	112.59	39	0.28		
Total	785.91	39			

a. Dependent Variable: Employment
b. Predictors: (Constant), ICT

The above table 4.4 presents the calculated F-value as (2380.14) and the critical f-value as (000). Being that the critical f-value (000a) is below the probability level of 0.05, the result therefore means that there is significant influence exerted by the independent variables ICT on the dependent variable which is Employment.

Discussion of the Findings

The result of the data analysis in table 1 was significant due to the fact that the calculated R-value 0.79 was greater than the critical R-value of 0.113 at 0.05 level with 398 degree of freedom. The result implies that there is significant influence of ICT training and acquisition of entrepreneurial skills among graduating students. The result therefore is in agreement with the

research findings of Shai (2009) who came out with a three components categorization of Entrepreneurship Education curriculum considered comprehensive enough to equip the products of the school system with the needed skills and capacities of future life. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

The result of the data analysis in table 3 was significant due to the fact that the calculated R-value 0.86 was greater than the critical R-value of 0.113 at 0.05 level with 398 degree of freedom. The result implies that there is significant influence of ICT training on creation of employment opportunities for graduating students of the institutions of higher learning in Akwa Ibom State. The result therefore is in agreement with the research findings of OMANJAF, (2013) who asserted that entrepreneurship education is geared towards training students to develop and acquire skills, trade or business that results in being employable, creation of job opportunities for empowerment of individual, society and economic development of the nation at large. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

Conclusions

Based on the findings of this study, it is therefore, concluded that

There is significant influence of ICT training and acquisition of entrepreneurial skills among graduating students. There is significant influence of ICT training on creation of employment opportunities for graduating students of the institutions of higher learning in Akwa Ibom State.

Recommendations

Based on the findings of the research work, the following recommendations were deemed necessary:

1. Educators should introduce ICT into entrepreneurship education which could be used to meet the market demands and to provide the students with the set of competencies needed for global challenges.
2. The government should ensure an adequate electricity power supply that will enable digital and electronic devices functioning.

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An assessment of Local Content Policy and Human Capital Development as the Determinants of Sustainable Business Performance in the Nigerian Oil and Gas Industry

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ABSTRACT

This study examined the extent to which the Local Content Policy has impacted on human capital development and sustainable business performance in the Nigerian Oil and Gas Industry, following the enactment of enabling legislation. Primary data were employed, which were obtained through the administration of structured questionnaire to purposively selected oil servicing companies in Niger Delta, the home to more than eighty percent of the indigenous oil companies in Nigeria. The results showed that Local Content Policy had significant impact on the development of human capital in the Oil and Gas Industry. There was a paradigm shift in the educational capacity of the Management of the oil servicing firms as over 70% of them had at least first degree or its equivalent. Through oil sector linkages, the firms had strengthened their absorptive capacities to internalize the technological and managerial skills that flow to them. This had consequently boosted the business performance of indigenous oil servicing firms in terms of growth in profit, market share and returned on investment (ROI). The study concluded that the Local Content Policy had achieved significant success in enhancing the development of human capital which in turn positively influenced business performance of indigenous companies in the Oil and Gas Industry in Nigeria. One of the recommendations was that government should fully fund and equip the Nigerian tertiary institutions and public research institutes, so they can engage in efficient linkages with indigenous oil companies

KEYWORDS: Local Content, Human Capital, Business, Oil and Gas Industry

Introduction

With increasingly globalisation, human capital as a necessity for industrial productivity has continually attracted both academic and public interests. Human capital is widely acknowledged as an agent of national development. Providing education or training to people is one of the major ways of improving the quality of human resources as no nation can survive with

unseasoned workforce. Human capital development is crucial as humans are the ultimate capital that propels productivity. Humans beings are the most important and promising source of growth in productivity. Equipment and technology are products of human minds and can only be made productive by humans. The success of any productive program and project depends on human innovative ideas and creativity. Human capital refers to the education, skill levels, and problem-solving abilities that will enable an individual to be productive. Human capital, in general, and education, in particular, helps people to perceive, evaluate and implement new production techniques and inputs (Cosar, 2011). Thus, human capital development refers to the process of acquiring and increasing the number of persons who have the education, skills, and problem-solving abilities which are critical for industries' performance and the economic growth of the country. In Nigeria, this can be achieved through the increase in Local Content which is the value added or created in the Nigerian economy through the utilization of Nigerian human and material resources for the provision of goods and services. As developing countries like Nigeria seek to improve their industrial base through the development of human capital, Local Content Policy has been widely viewed as a central part of this effort. Since 1956 when oil was discovered in commercial quantity in Nigeria, human capital development in the Petroleum Industry had been relatively low. The Nigerian Government invest enormously into its Oil and Gas Industry, but only very little portion of the profits from the investments is spent in developing her industrial base as the lion shares were paid to foreign firms for services such as Fabrication, Engineering Procurement Construction (EPC), Front End Engineering Design (FEED), conceptual designs and seismic studies.

This often resulted in capital flight as the 76 profits from the oil business were repatriated abroad; thus, providing employment opportunities for citizens of other countries, and in most cases developed countries (Ihua, 2010, Monday, 2012). In recognition of the anomaly in the Nigerian Oil and Gas Industry, the Federal Government introduced the Local Content (LC) Policy in the year 2000, and precisely a decade after, signed the enabling legislation. The essence was to increase the local content and consequently boost human capital development and competitive capabilities of indigenous firms in the Oil and Gas Industry. The level of human capital is a key factor in explaining the level of technology diffusion from multinational companies to their host countries and it provides a competitive advantage (Xu, 2000). Therefore, the main aim of this study was to examine the progress of the local content policy and how it has impacted on human capital development and business performance in the Nigerian Oil and Gas Industry.

Literature Review

At the discovery of oil in Nigeria in 1956, the country was not yet independent and almost the whole venture into the oil and gas business was carried out by foreigners. The technology, equipment, personnel and risk was their own both in exploration, exploitation, processing and management of product. All efforts in the industry were owned by foreigners and the country only owned the resources (Ozigbo, 2008). Thus, Nigeria depended on royalties from the operators. Under this arrangement, only the Nigerian government earned money directly from the oil and gas business. At that time, the educational and technological advancement of the country had not reached the stage which they could participate in the industry. Over time as the country's socio-economic status grew, joint venture agreements were drawn between Nigeria and the participating oil companies in the industry aimed at partnering all aspects of the trade with

Nigerians with the view to transferring technology as work progresses. The Nigerian Petroleum Industry has come of age yet foreign participation was still found to dominate the scene in all aspects including carriage of crude oil. Scholars and industry experts confirmed low local content as the major cause of the situation. This drove the Nigerian Government to initiate the Local Content Policy in the year 2000 (Ihua, 2010). The government pushing for increased local content in the Petroleum Industry gave a legislative backing in early 2010 through the enactment of the Local Content Act (Ozim, 2010; Monday, 2012). Local Content (LC) in the Petroleum Industry has been defined as a set of deliberate orientation and actions to build domestic capacity and sustainable culture of service quality and capabilities exceeding customers' expectations and comparable to international standards through key indigenous personnel and management (Obuaya, 2005). A more comprehensive definition was offered by the NNPC (2006), as "The quantum of composite value added or created in the Nigerian economy through the utilization of Nigerian human and material resources for the provision of goods and services to the Petroleum Industry within acceptable quality, health, safety and environment standards in order to stimulate the development of indigenous capabilities". It can also be defined as the integrated contributions to myriad of operations or inputs in the crude oil and natural gas extraction process, which are made by Nigerian personnel, local contractors, wholly owned Nigerian companies or by Nigerian registered companies in which Nigerians effectively own a majority of the equity (Nwosu et al., 2006). Thus, Local Content Policy generally seeks to promote a framework which ensures that local competencies are built (to internationally acceptable standards) through the active participation of Nigerians, and the deployment of local resources and raw materials, in oil and gas related activities. Local Content helps to drive employment, develop local skills, transfer technology, promote R&D performance, and create wealth in the petroleum industry. This is however subject to demonstration of capacity in equipment, personnel and other aspects of handling the contract. Where these criteria are met, such a Nigerian company shall be given preference over a non-Nigerian company. A Nigerian company is any company with ownership and/or infrastructure in Nigeria that allows it to conduct manufacturing and service production in the country; that is, a company with staff who are Nigerians (Heum et al., 2003). In a nutshell, the essence of Local Content Act is to give Nigerian oil companies first consideration in the award of contracts and employment, and to contribute significantly to human capital development in the Petroleum Industry. The term "human capital" has been defined as the stock of accumulated skills and experiences that make workers more productive. Organisation for Economic Co-operation and Development (OECD) in 2001 defined human capital as "the knowledge, skills, competencies, and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being". A more comprehensive definition of human capital was given by Marimuthu et al. (20009) as the processes that relate to training, education and other professional initiatives in order to increase the levels of knowledge, skills, abilities, values, and social assets of an employee which will lead to the employee's satisfaction and performance, and on business performance.

Therefore, human capital is a key element in improving a firm (likewise industry) assets and employees in order to increase productivity and sustain competitiveness. Human capital development is about supporting cum investing in human capital, coaching, training, internship and human capital management (Enyekit et al., 2011). It presupposes investments, activities and processes that produce vocational and technical education knowledge, skills, health and values that are embodied in people. It implies building an appropriate balance and critical mass of human resource base and providing an enabling environment for all individuals to be fully

engaged and contribute to goals of an organization, industry or a nation. Any effort to increase human knowledge, enhance skills, productivity and stimulate resourcefulness of individuals is an effort of human capital development (Erluwua, 2007). Human capital development refers to the process of acquiring and increasing the number of persons who have the skills, education and experience which are critical for industries' performance and the economic growth of the country. The significance of developing human capital in any industry cannot be over-emphasized. In the assessment of 192 countries, human capital on the average accounted for 64% of the total wealth while physical and natural capital accounted for 16% and 29% respectively. Thus, investment in human capital is an objective of development; it is a way to fulfil the potential of people by enlarging their capabilities. This implies empowerment of people which enable them to participate actively in their own development. Human capital development is a source of innovation and improvement toward achieving organizations' goals. Human capital in the form of skilled labour isa major determinant of productivity level (Benhabib & Spiegel, 2002). In the same vein, Cosar (2011) revealed that technology diffusion does not only take place through formal R&D, but through the employment of skilled labour in general. Therefore, human capital facilitates technology adoption. Adequate investment in human capital serves as catalyst for improved industrial productivity. Substantial studies were carried out on human capital and their implications on firm's performance on widely basis and the results showed that human capital enhancement results in greater firm's competitiveness and industrial performance (Barney, 1995; Simon-Oke, 2012) UNCTAD/CALAG (2006) pointed out that increasing local content could have positive effect on human capital in form training and education, which is an instrument to increase productivity and sustain competitiveness in the organization and industry. Human capital development tend to create a significant contribution on organizational competencies which in turn becomes a great boost for further enhancing innovativeness. Literature to a large extent supports the fact that business performance is positively impacted by the presence of human capital practices (Noe et al., 2003; Youndt et al., 2004; Marimuthu et al., 2009); and some even endorsed that human capital development is a prerequisite to sustainable business performance. The development of human capital is positively influenced by the educational level of employees and their overall satisfaction. Therefore, development human capital has a direct impact on return on investment (ROI) of firms. Similar studies (Shrader & Siegel, 2007; Monday et al., 2012) have shown that the relevance of human capital to business performance has also become prevalent among the technology-based new ventures, and it seems that the use of human capital tool (emphasizing quality of employees) in small technology-based new ventures tends to have a great impact on the firms' success. From the foregoing, a simple conceptual model is developed to show the relationship between local content policy, human capital and business performance. Conceptual model linking local content policy, human capital, and business performance based on the literature reviews, it is therefore postulated that local content policy stimulates investment in human capital which consequently leads to greater business performance. Business performance can be viewed as the financial performance. In the Petroleum Industry, financial performance includes return on investment (ROI), market share and growth in profit.

Local Content which is well known for its value addition to the industrial base of an economy has drawn the attention of many policy-makers and researchers, both in developed and developing nations. Several authors have conducted researches on how Local Content Policy has impacted on human capital development and corporate performance in the Nigerian oil and gas industry. Recent studies by Ozigbo (2008) addressed the impact of local content policy on local

capacity building in the Nigerian Oil and Gas Industry. He found that the local content in the industry was still very low as over 60 percent of the work value in the oil and gas sector was carried out abroad. This, he said, has led to dearth in skills development, capacity building/utilisation and poor business performance. The study concluded that partnering or alliance formation of various forms (especially with the multi-nationals) is an important tool in the development of the Oil and Gas Industry, especially where the required capital and indigenous technical capacity are relatively in short supply. Ihua (2010) examined the relationship between local content policy and the business performance in the Oil and Gas Industry. He revealed that the local content policy has not yet achieved significant success in enhancing higher indigenous participation, use of local technology, higher contract awards to indigenous firms and stimulating joint venture arrangements between indigenous and foreign oil firms. This study further identified the hindrances to the policy efficacy to include lack ofthe Local Content Act, cumbersome prequalification and entry requirements, underfunded and ill-equipped educational institutions, *laissez faire* attitude of multinationals, ineffective monitoring and control by regulatory authorities, and inadequate financing options for indigenous SMEs. In the most recent study by Oyejide and Adewuyi (2011) on the implications of Local Content Policy and the extent of the linkages that the oil sector has created with the rest of the Nigerian economy, found that the linkage between the oil servicing firms and the oil majors as well as with the local research centres or universities to be weak, although Local Content Policy has ma de some significant impacts in the oil sector in terms of contract awards. Vaaland et al. (2012) investigated how local content can be enhanced in the oil and gas industry in a developing country like Nigeria. The empirical base was in-depth interviews of professionals directly or indirectly related to the Nigerian oil and gas industry. The interviews revealed barriers for indigenous companies in accessing the industry. These were related to three major capabilities; capital, competence and delivery possibilities. It is suggested that the barriers can be solved by recognition of the interdependencies between actors associated with these capabilities. The actors include in addition to the foreign companies and the indigenous companies, educational institutions, legal system, educational and R and D institutions, financial institutions, industrial regulators and providers of infrastructure.

Methodology

The research was conducted in the Niger Delta since more than eighty percent of the indigenous oil companies in Nigeria have their operational bases located in the area (PETAN, 2010). The study employed primary and secondary sources of data. Primary source of data was structured questionnaire which was administered to respondents in the indigenous oil companies, while the secondary sources included firms' annual reports, and publications of the Petroleum Technology Association of Nigeria (PETAN) which provided the list of registered indigenous oilfield service companies in the oil and gas industry. Previously tested questionnaire used in African Oil and Gas Services Sector Survey by United Nations Conference on Trade and Development (UNCTAD) in collaboration with CALAG Capital (2006), and some list of variables used by Oyejide and Adewuyi (2011) in their study of "Enhancing Linkages of Oil and Gas Industry in the Nigerian Economy" were consulted in designing the questionnaire for this study. The study was carried out in 2012. According to PETAN (2010), the population of local oil companies operating in the Niger Delta was thirty-eight (38). This represented the sample size for this study as the method of investigation was the census survey which provided an opportunity of describing the prevalent situation in the Nigerian oil and gas industry. Purposive

sampling technique was employed to gather data from the heads of administration, human resources as well as those of operations/engineering and technical services in each of the companies. According to Arundel (2005), stakeholders in the European policy community preferred detailed descriptive analysis for policy-related studies, particularly when combined with case studies. Since this study is policy-related and with a case study of indigenous oil companies in the Niger Delta, the method of data analysis was predominantly descriptive.

Results and Discussion

Out of the 38 copies of the questionnaire administered, 24 were thoroughly filled and returned giving a high response rate of 63%. Research (Cohen & Arieli, 2011; Haer & Becher, 2012) acknowledges the difficult nature of obtaining data in conflict regions like the Niger Delta. The analysis of this study was based on the retrieved copies of the questionnaire. Local Content development is an initiative on the part of the Nigerian Government to enhance the performance of oil servicing companies. This can be achieved through the development of educational and professional competence of indigenous personnel, and effective oil sector linkages. This subsection investigates the extent that the Local Content Policy has affected the human capital development and business performance of local firms following the enactment of the Nigerian Oil and Gas Industry Content Act 2010.

Impact of Local Content Policy on Human Capital Development in the Oil and Gas Industry

Human capital development begins with development of management capabilities to increase the pool of skilled personnel for institutional networking. Vaaland et al. (2012) expressed that there is a significant knowledge gap between indigenous oil companies and foreign oil companies, especially in the area of management competence such as project management and quality assurance. Their study revealed that indigenous oil companies suffered from fundamental lack of quality management, limited compliance with international quality standards, and poor preventive and operational maintenance attitudes, which lead to poor maintenance of oil facilities. Local Content Policy, therefore, makes it pertinent for local entrepreneurs to upgrade their academic qualifications and professional experience which consequently boost their management capabilities to compete favourably in the industry. Heum et al. (2003) and Ihua (2010) articulated that the Nigerian petroleum industry lacks adequate locally trained experts and skilled manpower. The analysis in Table 1 showed that there is a paradigm shift in the educational capacity of the management of the indigenous oil companies. Today the industry has an appreciable pool of locally trained experts and skilled manpower as almost all the major oil business owners (70.8%) possess university degrees. About 29% classified as 'Others' constitutes holders of National Diploma (ND), vocational certificate and high school certificate with training abroad in oil and gas operations or worked in oil and gas companies abroad. In terms of professional experience, about 17% of the owners studied petroleum related courses abroad, 63% of the owners attended oil & gas training abroad, while 42% worked in oil companies abroad.

A five-year human resource profile of the selected indigenous oil companies. Based on the findings by the studies of Oladele (2001), Heum et al. (2003), Neff (2005), Ihua (2010), and Monday et al. (2012), the Nigerian oil and gas industry was dominated by foreign workers who created more jobs for their brothers in the oil service sector because local oil companies were alleged to comprise of less skilled employees. With the presence of the Local Content Policy,

there has been an increase in the human resource profile of indigenous oil companies. According to the information supplied by the companies, the total skilled workforce was 1,283 in 2006 and in 2010; it has risen to 2,735 Nigerians which is approximately 47% increase. Besides, many of the employees were experienced in the oil business as they had spent considerable number of years in the industry. Although the increase appears not too significant, it gives us the hope that the Local Content Policy is positively contributing to human capital development in the Nigerian oil and gas industry. Therefore, the policy has also promoted local participation in the industry

Local Content Policy and Linkages in the Nigerian Oil and Gas Industry

Creating linkages between the oil and gas sector and other sectors of the Nigerian economy has been found to be a concrete solution to the problem of low technological capacity and poor business performance (Oyejide & Adewuyi, 2011; Vaaland et al., 2012). Oyejide and Adewuyi further stressed that the overall objective of the policy is to promote local value addition, build local capacity and improved linkage between the oil and gas industry and other sectors of the Nigerian economy. Local content policy is therefore a critical means of creating and/or promoting linkages in the oil and gas industry. This study showed the various ways of creating linkages in the oil industry which include encouraging research and development in domestic firms, encouraging partnership between firms, universities and research institutes involved in R&D, organising and supporting training programmes, providing access to financial and non-financial business services and consultancy. The experiences of the domestic oil servicing firms with their collaboration and alliance partners were encouraging (see Table 3). The study showed that all the indigenous oil companies were involved in some form of linkages with indigenous companies or institutions as well as foreign companies outside the borders of Nigeria. From the analysis in Table 3, the mean score of collaborations with other indigenous oil companies was 2.83 out of a possible maximum score of 3.00, suggesting an effective (94.3%) networking among indigenous oil companies. This is possible due to the clustering of the oil companies at Trans Amadi Industrial Layout in Port Harcourt and Airport Road in Warri. Contrary to previous findings obtained before the enabling legislation on Local Content Policy was signed, there is appreciable linkage between the indigenous oil companies and the multinational oil companies. This was attested to by a mean score of 2.19 out of a possible maximum score of 3.00, depicting an appreciable (73.0%) collaboration.

The local oil companies now partner with foreign companies to execute contracts; which if done with technically competent foreign companies could result in technical expertise, transfer of knowledge and technology. The linkage between the domestic oil companies and the Higher Education Institutions (HEIs) which comprise universities and polytechnics, ranked the least with a mean score of 1.91. This is an indication of a fair (63.7%) collaboration due to the weak standard of the Nigerian educational system. The academic institutions should be a focal point for research and production of skilled manpower and trained experts. As emphasized by Ihua (2010), “oil and gas business is a high risk business, requiring skilled technical manpower and that, only an effective educational system that understands the human resource needs of the industry and tries to match their resources to meeting those needs, can enhance the prospects of higher local content; without which the whole idea of local content would be a mirage, only ending as prospects”. The interfaces between the graduate students, researchers and local oil business community are weak, resulting in weak exchange of knowledge and feedback loops (Vaaland et al., 2012). Also, linkage between the local oil companies and Research institutes

(RIs) recorded a mean score of 2.17, depicting an appreciable (72.3%) level of collaboration. These oil servicing firms collaborated with the universities, polytechnics and research institutes in the areas of training, research and consultancy. Building inter-organizational relationships between the oil companies and HEIs/RIs promotes exchange of research, educational, managerial and technological skills which consequently enhance competitiveness of both parties.

Interestingly, the domestic oil companies engaged in collaboration activities more with training institutes such as the Petroleum Training Institute (PTI), Nigerian Institute of Welders (NIW), technical colleges, etc. This was attested to by a mean value of 2.53, indicating a high level (84.3%) of collaboration. In the areas of funding and infrastructural supports, the linkages between the indigenous oil servicing firms and Nigerian financial institutions (Commercial, Bank of Industry, and Microfinance Banks) as well as Government Ministries/Agencies have been encouraging to some extent. The mean scores of 2.64 for financial institutions and 2.67 for Government Ministries revealed high level (88% and 89% respectively) collaborations. The local oil companies collaborated with local financial institutions for funding, and training in financial proficiency, and with Government Ministries/Agencies such as the Ministry of Energy and Petroleum Resources, Niger-Delta Development Commission (NDDC), and Petroleum Trust Development Fund (PTDF).

Impact of Local Content Policy on Business Performance of the Oil Companies

Considering the performance of the local oil companies, Table 3 showed that the Local Content Policy has actually stimulated human capital development and linkages between the oil and gas sector and other sectors of the Nigerian economy, which have resulted in enhanced capabilities in winning contract awards and increased profitability of the indigenous oil companies. The analysis in Table 4 showed the financial performance of the indigenous oil companies after the enactment of the Local Content Act.

The mean score of growth in profit was 2.46 out of a possible maximum score of 3.00, depicting a significant (82%) growth in the profit of indigenous oil companies. In the same vein, growth in market share had a mean score of 2.36, indicating a significant (78.67%) growth in the firms' market shares. Also, the firms' return on investment (ROI) recorded a mean score of 2.01 while growth in ROI was 2.08, out of maximum score of 3.00. These results indicated an appreciable measure of return on investment of the indigenous oil companies. From the foregoing, it is obvious that local content policy has contributed in no small measure to business performance in the Nigerian oil and gas industry.

The increase in the business performance of the indigenous oil companies cannot be viewed as significant enough to help in curbing the unemployment in the country as it is expected that the oil and gas sector would help create enormous job opportunities, especially for youths from the oil producing Niger Delta region. Government needs to encourage the local production and fabrication of required materials and equipment in Nigeria. This can be done by enhancing a more friendly business environment such as the granting of special concessions, free land and tax breaks for companies who agree to come and set up production factories. The resultant effect of this is that, it would not only develop Nigeria's thin industrial base; but would also provide sustainable job opportunities for unemployed youths and prevent incidences of civil disturbances and social vices (Ihua, 2010).

Conclusions

The ultimate goal of the Local Content Policy is to promote the business performance of indigenous oil companies through effective human capital development and linkages with the oil sector as well as the rest of the Nigerian economy. Based on the survey data, Local Content Policy has made significant contributions to the development of human capital and business performance of the Nigerian oil and gas industry as all of the companies were involved in some form of linkages which have strengthened their absorptive capacity to internalize the technological and management skills that flow to them. However, the linkages between the indigenous oil companies and the universities/polytechnics were rather weak. This can lead to poor performance of research and development (R&D) and inability to develop and use local technology in the industry.

Recommendations

This study therefore recommends that Government should fully fund and equip the Nigerian tertiary institutions and public research institutes, so they can engage in efficient linkages with indigenous oil companies. Besides, local oil companies should endeavour to sponsor more training and educational activities of their workers as well as upgrading their technology in order to meet the required standard of the oil industry.

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Some Linguistic Features of the Ikwere Language

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ABSTRACT

This paper is an overview description of some linguistics features of the Ikwere language. Ikwere is spoken in four (Emohua, Ikwerre, Obio/Akpor and part of Port Harcourt) local government areas of Rivers State of Nigeria. It comprises twenty-four mutually intelligible dialects. Ikwere is an Igboid language of the West Benue-Congo family of the Niger-Congo Phylum of languages . The language records twenty -eight phonemic consonants , nine phonemic oral vowels and eight phonemic nasalized vowels. As a tone language , it has two level (high [ˊ] and low [`]) tones; a downstep [↓], and two contour (falling [ˆ] and rising [ˇ]) tones. The syllable structures of the language are V, and N, CV and CGV. Among other things, the work observed that verb inflections in Ikwere are marked predominantly by suffixes, sparingly by auxiliaries accompanied by prefixal element, and or tonal modifications. Conversely, verb derivation is predominantly marked by attaching prefixes to verb root to form gerunds, agentives, instrumentals, etc. It is believed that this study will be relevant to scholars interested in language study as the insight provided here will serve as a motivation to explore certain linguistic features of other languages.

KEYWORDS: Ikwere, orthography, Ikwere sound system, Ikwere word structure, Ikwere Word classes.

Introduction

Speakers of the Ikwere language refer to both their language and themselves as ‘Ikwerre’, which is written as ‘Ikwere’ in the Ikwere orthography. The present work uses single ‘-r-‘, as in the orthography since it represents the exact pronunciation of Ikwere but double ‘-rr-‘ when referring to official documents.

Speakers of the Ikwere language occupy four out of the twenty-three Local Government Areas (LGA) of Rivers State, namely, Port Harcourt, Obio/Akpor, Emohua and Ikwerre LGAs. The Ikwere people constitute one of the major ethnic groups of Rivers State of Nigeria and their language is one of the major languages of Rivers State. Thus, like Kana, Kalabari and Ekpeye, which are the other major languages of Rivers State, Ikwere is used in broadcasting in the electronic media. It is the L1 of most indigenes born and bred in the rural areas of the Ikwere language communities and the L2 of some others, particularly, those born in the urban areas.

The territory of the Ikwere people is bounded on the north by Imo State and Ogba/Egbema/Ndoni LGA of Rivers State; on the west by Ahoada East LGA; on the south-west by Abua/Odual LGA, on the south by Asaritoru and Degema LGAs; on the south-east by

Okirika, Eleme LGAs and Abia State; and on the east by Etche LGA. Map 1.1 shows the location of Ikwere. Crozier and Blench (1992:55) and Grimes (1996:349) put the population of Ikwere at about 200,000, as contained in the National Population Census of 1963. This figure, however, rose to 674,402 and 1,235,412 as contained in the final results of the National Population Census of 1991 and 2006, respectively.

The Occupation of Ikwere

The traditional occupation of the Ikwere people is farming. Their main farm produce are yam, cocoa-yam, three-leaf-yam, cassava and plantain. Other farm produce are pepper, corn, pumpkin, melon, okra, garden egg, orange, pear, apricot, etc. The Ikwere people also do some palm-wine tapping and hunting. Those that live along the river coast engage in fishing, in addition to farming. Currently, a greater percentage of the adult population of the working group have acquired Western education and the major source of their occupation has shifted to jobs in the public service, teaching in primary, secondary and tertiary institutions, etc. Those who are not so fortunate to acquire western education, engage in some form of menial jobs and/or trading.

A Brief History of Ikwere

Concerning Ikwere history, there are divergent hypothetical views of the origin of the Ikwere. Nduka (1993:22) gives a summary of four hypotheses of the origin of Ikwere. The first hypothesis claims that the Ikwere people migrated to their present abode from Ọgba and Ẹkpeye , further tracing their origin to the Bini Kingdom of old. The second hypothesis traces Ikwere migration from Arochukwu Igbo. A third hypothesis also sees Igbo land as the ancestral home of Ikwere. The fourth hypothesis traces part of Ikwere descent to the Ijaws.

Linguistic Classification

Linguistically, Williamson (1988:67, 71) classifies Ikwere as one of the Igboid group of languages. Williamson and Blench (2000:31) locate Igboid under the node of the West Benue-Congo family of the Niger-Congo Phylum of languages.

Ikwere Language Communities

Politically, the communities that speak the Ikwere language are located in Ikwerre, Emohua, Obio/Akpor and some parts of Port Harcourt LGAs of Rivers State. Some individuals and groups of persons have made attempts to group the Ikwere communities according to their linguistic relatedness.

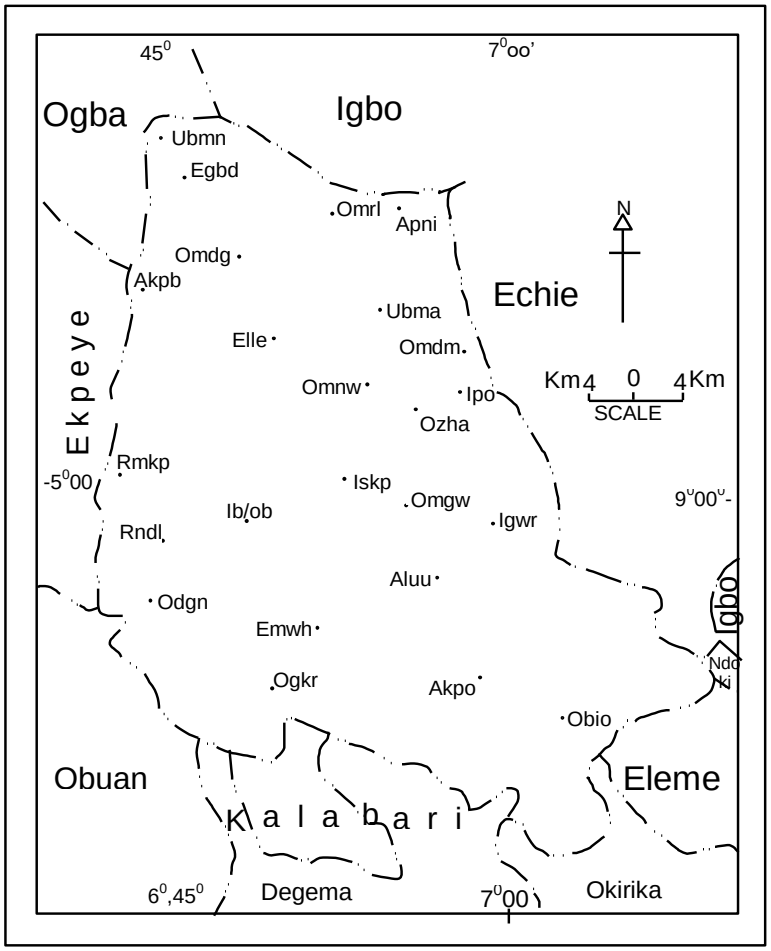
Amadi (1993:34) suggests seven major groups of communities in Ikwere . They are Eleele, Isiokpo, Rumuji, Ẹmowha-Ọgbakiri, Aluu-Igwuruta, Akpọ and Obio. The problem with this grouping is its inability to specify which communities can be classified as belonging to or not belonging to one of the major group of the communities in Ikwere. This classification was not done on clear linguistic grounds.

Ọgbakor Ikwerre convention , the body that makes vital decisions concerning the generality of the Ikwere people, recognized four major groups of communities in Ikwere. The first among them is Risi-Mbam, which comprises Eleele, Omudiogna, Ubimini, Omerelu, and

Egbedna. Next is Risi Mini (Reo) consisting Rumuji, Ẹmowha, Ọgbakiri, Ọdeegnu, Rumuekpne and Rundele . Another is Esilawuru incorporating Alụu , Igwuruta, Isiokpo, Ipo, Ọmuanwa, Ozuaha, Ubima, and Ọmademe. Finally, is ỌPA, which includes Obio, Port Harcourt and Akpọ. Our impression is that the latter grouping is clearer than the former grouping because it is somehow closer to the dialectal differences, which will be discussed in this work. There are also certain communities that are not accounted for. Some of these are Akpnabu, Ibaa/Obele and Apnani.

A more scholarly attempt at a reliable linguistic grouping is that proposed by Kay Williamson (1980). She uses the terms Southern and Northern Ikwere , i.e., two major grouping, according to the linguistic spread of the Ikwere communities . The southern Ikwere includes Ndele, Ẹmowha, Ọgbakiri, Akpọ, and Obio , while Egbena , Omerelu, Apnanị, Eleelẹ, Ibaa, Ọmagwna, Isiokpo, Alụu and Igwuruta belong to the Northern Ikwere. This grouping, reliable as it is, does not represent all the communities and consequently the dialects. It is simply a sample selection of dialects corresponding to the southern and northern Ikwere communities.

Alerechi (2007a, 2007b, 2008a) recognize twenty-four dialects of Ikwere. Using different linguistic features, she identifies three different types of north and south dichotomy of the dialects of Ikwere; East and West division; East, West and Extreme North dialects; East-Central, West-Central, and North and South dialects, etc. while some of the groupings conform to earlier grouping, others do not. The communities whose dialects Alerechi (2007a) identifies are shown on Map 1. They are Rumuekpne , Rundele, Ọdeegnu, Ẹmowha, Ọgbakiri, Akpọ, Obio, Alụu, Igwuruta, Ọmagwna, Isiokpo, Ibaa/Obele, Ipo, Ozuaha, Ọmuanwa, Ubima, Akpnabụ, Egbedna, Ọmademe, Eleele, Ọmudiogna, Ubimini, Ọmerelu and Apnanị.



IKWERE LANGUAGE COMMUNITIES AND NEIGHBOURS

Key

Rmkp	-	Rumuekpne	Igwr	-Igwuruta	Akpb	-	Akpnabu
Rndl	-	Rundele	Ọmgw	- Omagwna	Egbd	-	Egbedna
Ọdgn	-	Ọdeegnu	Iskp	- ísiokpo	Ọmdm	–	Omadeeme
Ẹmwh	-	Ẹmowha	Ib/Ob	- Ibaa/Obele	Elle	-	Eleele
Ọgkr	-	Ọgbakiri	Ipo	- Ipo	Omdg	-	Omudiogna
Akpọ	-	Akpọ	Ozha	- Ozuaha	Ubmn	-	Ubimini
Obio	-	Obio	Ọmnw	- Ọmuanwa	Omrl	-	Omerelu
Alụu	-	Alụu	Ubma	- Ubima	Apnị	-	Apnani

The Orthography

After the Nigerian independence and the creation of states, the Ikwere people, like other ethnic groups began to assert their independence. The newly created Rivers State Government also recognized Ikwere as one of the major languages of Rivers State. *The Rivers Peoples' Golden Age* (1967) records the first translation into Ikwere of the speech of the first military Governor of Rivers State. One of the works produced in Ikwere as part of the efforts to assert Ikwere as a language is the orthography. Alerechi (2007a) observes some discrepancies in the

orthography of some of the early works in Ikwere, which she traced to the old Protestant Igbo orthography in which the Bible, the Anglican prayer book and hymnbook were written (Ogbalu, n.d., C. 1951).

One of the early works written in Ikwere orthography is Ekwulo's (1970) *Ikwere Mbom*. In 1981, Ekwulo revised *Ikwere Mbom* and this time, Ikwere bears double –rr- as *Ikwerre Mbom.* The following is a list of the letters of the alphabet in the two editions for easy comparison:

1970 edition:	a		b	ḅ	d	e	f	g	gh	i	-	j	k
1981 edition:	a		b	gb	d	e	f	g	gh	i	ị	j	k
1970 edition:	l		m	n	ṅ	o	ọ	p	kp	r	s	sh	t
1081 edition:	l		m	n	ṅ	o	ọ	p	kp	r	s	-	t
1970 edition:	u	-	v	w	y	z	ch	gw	kw	nw	ny	wh	
1981 edition:	u	ụ	v	w	y	z	ch	gw	kw	nw	ny	wh	

The lists above show that the first edition gives 35 letters of the Ikwere alphabet, while the second edition gives 36. The letter 'b' written with a diacritic in the first edition, is replaced with the diagraph 'gb' in the second edition. While 'sh' in the first edition is not included in the second edition, the new orthography includes 'ị' and 'ụ' , which are omitted in the first. The letters of the alphabet were changed to agree with the orthography used in the Rivers Readers Project. The discrepancy in the orthography of the two editions of *Ikwere Mbom* shows that some works in Ikwere were influenced by the Igbo orthography while some others followed the approved orthography of Ikwere.

The Rivers Readers project was formed to develop the local languages in Rivers State of which Ikwere was one. The first official textbook, Wugo's (1970) *Ọkwukwo ke Mbom n'Ikwerre* was written for elementary one pupils and published by the Rivers Readers Project. This textbook was published along with *Teachers Notes on Ọkwukwō Ke Ǹbom̄ nu Ikwerre* and *Reading and Writing Ikwere.* As the name suggests, *Reading and Writing Ikwere* explains the way learners can read and write the Ikwere language. This work has relevance for the final solution of any problem in the orthography, language teaching, and language development and communication technology in Ikwere.

In 1985, Donwa-Ifode and Ekwulo presented the Ikwere orthography at a language conference organized by the Federal Ministry of Education in Lagos. In 1987, it was published in *Manual V of Orthographies of Nigerian Languages*. All the recent works in Ikwere are based on this orthorgraphy . Alerechi (2007a), however, recognizes 'ẹ' a ninth vowel that is not included in the Ikwere orthography.

Recent Effort in Developing the Language

The Ikwere language is yet to develop a standard dialect. Currently, works of interest to the Ikwere ethnic nationality such as the Ikwere orthography, the New Testament Bible translation and the ongoing curriculum development in Ikwere for primary and secondary school pupils tend to follow mainly the southern (Obio) dialects and sometimes with a mixture of the northern (Alụu) dialects. Obio seems to be particularly favoured because people from other areas are exposed to it as it is the dialect used in the capital territory of Rivers State, while Alụu is used because it is the dialect of late Mr. S.A. Ekwulo who had done much work on Ikwere. Scholarly

researches also are being carried out in different dialects of the language. Students of the Department of Linguistics and Communication Studies of the University of Port Harcourt are encouraged to carry out research on Ikwere. Ikwere is used in broadcasting in the electronic media.

Ikwere Sound System

There are twenty-eight phonemic consonants in Ikwere namely, /m n ɲ ŋ ŋ^{w} p b t d k g k^{w} g^{w} β ɓ tʃ dʒ f v s z ɣ h^{w} h r j w l/. They are orthographically represented as 'm n ny ṅ nw p b t d k g kw gw kp gb ch j f v s z ghwh h r y w l', respectively. Alerechi (2007a:98) observes that the number of the phonemic consonants in each of the dialects, however, varies. It ranges from twenty-six to twenty-eight. Normally, the Ikwere consonants occur in morpheme initial and morpheme medial position in verbs and sometimes in nouns. It is only /m/ that occurs morpheme-finally. Examples of the various distributions of consonants in the language are given in (1a-1c):

1a. [gọ̀] 'deny' b. [ọ̀hárā] 'sweat' c. [ákám] 'thatches'

The language has nine phonemic oral vowels /ɪ ɪ e ɛ a o ɔ u ʊ /, orthographically represented as 'i ị e ẹ a o ọ u ụ' , respectively, and eight phonemic nasalized vowels /ĩ ɪ̃ ẽ ã õ ɔ̃ ũ ʊ̃ /. The nasalized vowels are represented in the orthography by inserting 'n' between the consonant and vowel of the affected syllable. The vowels occur in all environments (morpheme initial, morpheme medial and morpheme final positions) in the language as in [úbèrè] 'belch'.

Vowel Harmony

The vowels of Ikwere are divided into two sets by a principle called vowel harmony, 'a principle which rules that vowels of a neighbouring syllables have similarity with each other' (Westermann and Ward 1990:127). Ikwere vowels may be distinguished by the expansion of the pharyngeal wall by advancing the root of the tongue, or by lowering the larynx or both. Conversely, the pharynx may be contracted by either retracting the root of the tongue, or by raising the larynx or both (Williamson 2004, Alerechi 2009:119).

Tones

Williamson (1980), Worukwo (1983), Alerechi (1987) and Azunda (1987) identify five tones in the language. The five tones consist of two basic tones, low (̀) and high (́) tones; a downstep represented here as (᷇), and two contour tones - falling (̂) and rising (̌) tones. As noted in the literature, the presence of a floating tone between two high tones causes either the raising of the preceding tone or the lowering (down step) of the following tone (Clement 2000:153). In Ikwere, the floating tone causes the lowering of the following high tone. On the other hand, the falling and rising tones can be analyzed as a combination of high and low (HL) and low and high (LH) tones, respectively. Rising tone is rare in some of the dialects of Ikwere. Tones can be used to distinguish the meaning of identical words or sentences as in (2) and (3), respectively:

2a. àznṵ̂ 'back
b. áznṵ̀ 'fish'

3a. Ò jnè-gà ọ́rò

3SG go-PROG house
'He is going home'

b. Ò jné-gá ọ̀rò
3SG go-PROG/NEG house
'He is not going home'

Tone, therefore, performs lexical and grammatical functions in the language. Lexically, example (2) illustrate that the meaning of a word depends totally on tonal placement, while (3) show the grammatical function of tone. Alerechi (2007a) and Williamson et al (2010) identified eight noun tone classes in Ikwere. This number, however, ranges from four to eight depending on the particular dialect in question. The different noun tone classes observed in the different dialects are based on disyllabic nouns. Conversely, the verbs are classified into three tone classes of mono-syllabic verbs.

The Syllable Structure

The syllable structures of Ikwere are V, CV, N, and CGV. Examples are given in (4):

'chief'/'king' 'in-law' 'loose' 'draw (ear)' 'give (name)' 'market' 'swallow'
4a. é.zè b. ọ́.gò c. tọ̀ d. dọ̀ e. g^{w}ù́ f. á.hjá g. rwé
V.CV V. CV CVCV CV V.CGV CGV
'Beauty'
h. ṁ.mā
N.CV

The syllable structure of Ikwere can be summarized as:

T
(C(G)) *S,* where

C = consonant e.g /p/, G = glide e.g. /w/ /j/, T = tone e.g/ ̀/, S = vowel or syllabic nasal e .g /o/, CS = consonant and vowel e.g /ré/ 'sell', CGS = consonant, glide and vowel e.g /swé/ 'grow'

Ikwere Word Structure

The level of linguistics that studies the structure of words in any language is morphology. Morpheme is the basic unit of morphology. It is the minimal indivisible unit which has meaning or a specific grammatical function (Amfani 2007:139; Anagbogu et al 2010:140). In Ikwere, for example, the word *jnèbé* 'start going' comprises the morphemes *jnè* 'go' and *-be* 'start', which are meaningful. However, while *jnè* occurs in isolation, *-be* cannot. Thus the language has both free and bound morphemes.

A free morpheme, usually full word, can stand on its own in an utterance. Examples are**,** áwhọ́ 'belly' , ákâ 'hand' , rá 'lick' , gnṵ́, 'read', ṁmā 'beauty' , etc. On the other hand , bound morphemes such as o -/ọ-, -ga, -le/-la/-ne/-na, -kọ, etc., cannot stand alone in an utterance. They must be attached to a verb root to be meaningful. Thus Ikwere verbs consist of a root to which affixes can be attached. The affixes may be attached before or after the root known as prefix or suffix, respectively. Affixes in Ikwere are classified as prefix and suffix based on their position in relation to the root to which they are attached. They further can be classified into inflectional and derivational affixes based their grammatical function in an utterance. This implies that some

affixes in the language may be inflectional in nature when they are added to certain root, while others are derivational when attached to certain others.

Verb inflections in Ikwere are marked predominantly by suffixes, sparingly by auxiliaries accompanied by prefixal element, and or tonal modifications. Such inflections are used to express grammatical categories such as factative, habitual, progressive, present perfect, inceptive perfect, durative, potential and negation. Examples are given in (5) – (14):

5. Ọ́chì dị̀-rì n' áhiá.
   PN be-FACT PREP market
   'Ochi was in the market'

6. Ézè jnè-kọ̀ úbì (Emphatic)
   PN go-HAB farm
   'Eze goes to the farm'

7. Kèlé tè-gà úsnè
   PN pound-PROG pepper
   'Kele is pounding pepper'

8. Ọ̀ zà-lá ọ́rò
   3SG sweep-PERF house
   'S(He) has swept the house'

9. Ò sè-bè-lé ákwâ
   3SG draw-INCEP-PERF egg
   'S(He) has started drawing the egg'

10. Ò dè è-rí míní
    3SG FUT-AUX PR-drink water
    'S(He) will drink water'

11. Ò jnè-kàtà-rà íjnè, ínwē gwụ́ ā
    3SG walk-DUR-PST walk breath finish 3SG
    'S(He) walked until s(he) got tired'

12. Ọ̀ gnụ̀-lì érí
    3SG sing-POT song
    'S(He) can sing'

13. Í rì-è
    2SG NEG eat-NEG
    'Don't eat'

14. Ò kpé-è mọ́nó-mọ́nô
    3SG be-NEG oil-oil
    'It is not red in color'

Examples (5) – (14) demonstrate that respectively the suffixes –rV, -kọ̀, gà, -lá, -kàtà, -lì, -è, etc. are used to express past, habitual, progressive, perfect, durative, potential state or action in Ikwere. It is noted that the vowel of the past, perfect, negation or prohibition have variant forms based on the pharyngeal, nasal and or lip features of the vowels of the verb host, while markers of habitual, progressive, durative, potential are unaffected by the quality of the vowels of the verb root in terms of expandedness or non-expandedness, nasal or lip rounded features.

Conversely, verb derivation is predominantly marked by attaching prefixes to verb root to form gerunds, agentives, instrumentals, cognate noun, qualificatives, etc. Examples are given in (15) – (20):

15. zà	'sweep'	ọ̀zìzá	'(act of) sweeping'
16. shì	'cook'	Òshi nri	'one who cooks (a cook)
17. Vọ̀	'comb (v)'	ḿvọ̀	'comb (a tool for combing)'
18. Jọ̀	'ugly (become)'	njo	'badness' / 'ugliness'
19. chị̀	'laugh',	ọ́chì	'laughter'
20. gnú	'count'	ọ́gnū	'count(n)'

Examples (15) – (20) show the attachment of a prefix o -/ọ-/m-/n- to the verb root to derive agentive, instrumental and qualificative noun in the language, while (15) demonstrates that in addition to attaching the o -/ọ- prefix to the verb root , gerund is formed by a partial or complete reduplication of the verb root . Note that while the choice for o -/ọ- is based on the expanded or non-expanded feature of the vowel of the root that of m-/n- is dependent on homorganicity.

Ikwere Word Classes

The meaning of words is not fully realized in isolation. For speakers to communicate meaningfully with each other, words are combined in particular order to form larger grammatical unit. By implication, certain rules govern the manner in which words are put together to form meaningful and grammatical phrases, clauses and sentences. In fact, Ikwere is an SVO (subject verb object) language. This section identifies some of the word classes that combine with each other to form phrases, clauses or sentences. They are classified into open and closed classes. The open class words are nouns, verbs, adjectives and adverbs, while those in the closed class are pronouns, prepositions, conjunctions, determiners and auxiliaries. For lack of space, brief comments are made on some of them in the following sub-sections.

Ikwere Nouns

Nouns in Ikwere are used to name persons e.g., *Ihuoma*, places e.g., *Omuanwa*, objects e.g., *àmụ́mú* 'sharpening stone', things as in mọ́nô 'palm oil' ideas as in úchè 'thought' , etc. The foregoing examples show that nouns in the language can begin with either a vowel or a consonant but note that those beginning with vowel are more predominant than those that begin with a consonant . Nouns in Ikwere are head of noun phrase as in ọ́rò m 'my house' . Syntactically, they function as the subject, object and complement of the sentence. Examples are shown in (21) – (22):

21. Ihuoma zụ̀ mọ́nō n' áhiá
PN-SUBJ buy oil-OBJ PREP market
'Ihuoma bought the oil at the market'

22. Áwhnà á bū Ógè
Name 3SG be COMP
'Her name is Oge'

Examples (21) – (22) demonstrate that noun can function as the subject, object, complement, etc. in the language.

Ikwere Verbs

A verb is used to express an action or a state of affair . All verbs in Ikwere are consonant initial. They are more often monosyllabic (containing one root) in nature as in ré 'sell', tà 'chew' zọ̀ 'step on', etc., than those consisting of two independent root as in kwù -gbú (beat kill) 'beat', rí-jné (climb go) 'climb up', etc. or a root and a verbal extension as in bnànyâ 'enter towards the speaker'.

Verbs in Ikwere may be classified as either dynamic or stative verb in terms of semantic notion. While a dynamic verb is used to express an action or event , the stative verb expresses a state of being. Examples of dynamic verb are zà 'sweep' , dnà 'fall', while those of stative verb are dì 'be', dnụ̀ 'live', etc.

Ikwere verbs may also be divided into main verbs (lexical) or auxiliary (helping) verbs. While the main verbs can occur independently in a sentence, an auxiliary verb is always followed by a lexical verb, which comprises a participle prefix and the verb root in the language. Whereas a lexical verb in Ikwere has an independent semantic content, an auxiliary verb may be used to mark future aspect or negation as examples (23) – (25) demonstrate:

23. kele gbā ásọ́
PN run run
'Kele ran'

24. kele dà à-gbá ásọ̄
PN AUX-FUT PR-run run
'Kele will run'

25. kele mâ à-gbá ásọ̄
PN AUX-NEG PR-run run
'Kele did not run'

While example (23) show the lexical verb gbá occurring independently , (24) and (25) demonstrate the presence of the auxiliary verbs dà and mâ marking future aspect and negation , respectively, in the language.

Adjectives

Like in many African languages, the Ikwere language records few adjectives. Alerechi (2016) specifically, identifies six adjectives, and they may be arranged in three antonymous pairs as *oma* 'good' and *ojoō* 'bad'; *ochnichna* 'white' and *ujiji* 'black'/ 'dark', and *kwu* 'big' and ogbede / nti 'small'. Adjectives in Ikwere are preceded by the noun they modify. This implies that they occur attributively in the language. See examples in (26) and (27):

26. ewu + ochnichna ewu ochnichna
goat white 'white goat'

27. ewu + ujiji ewu ujiji
goat black 'black goat'

Adverbs

According to Anyanwu (2007:203), 'adverbs provide specific information about place, time, or manner to the meaning of a verb, an adjective or even a whole sentence'. In Ikwere, adverbs may be expressed by amaa 'well' or nominal elements, which are usually totally reduplicated or with an ideophone. It is interesting to note that the morpheme -kwa used to mark how well an activity is carried out is attached to the verb root in addition to the adverb amaa to mean 'very well'. See examples in (28) – (30):

28. Ógè kpà-kwà-rà íshì á àmáà
PN shave-well-PST head 3SG well

'Oge shaved his head very well'

29. Íké snụ́ ọ́nù á ògbèdé-ògbèdè
PN wash mouth 3SG small-small

'Ike washed his mouth slowly'

30. Ọ̀ dnà kpùrùkném
3SG fall suddenly

'S(He) fell suddenly'

While the nominal element can be moved to sentence-initial position with a periphrastic phrase, *àmáà* 'well' and *kpùrùkném* 'suddenly' cannot be focused. Consider examples (31) – (32):

31. ògbèdé-ògbèdè bụ̀ hné Íké jì snụ́ ọ́nù á
small-small be thing PN use wash mouth 3SG

'It is slowly that Ike washed his mouth'

*32. Àmáà bụ̀ hné Ógè jì kpà-kwà-rà íshì á
Well be that PN use shave-well-PST head 3SG

Pronouns

Ikwere records pronouns such as the personal, reflexive, interrogative, demonstrative and logophoric pronouns. The personal pronoun marks three distinct grammatical persons such as the first person (the speaker), the second person (the addressee) and the third person (the non-perticipant referent). It can also mark distinction in terms of number lexically. Thus, we recognize the singular (one entity) and the plural (more than one entity) forms of the personal pronouns. There is no gender distinction. Personal pronouns in Ikwere also record different cases in relation to their syntactic positions or function in the sentence. They are the subjective or nominative, the objective or accusative and the possessive or genitive cases. There is, however no overt morphological case marking in the pronominal system of the language. For lack of space, the summary of personal pronouns in Ikwere taken from Alerechi (2008b) is shown in table1.

Table 1: Summary of Ikwere personal Pronouns

Number	Person	Subject	Object	Possessive
Singular	1st	mé, (N)…m 'I'	mé, m 'me'	m 'my/ mine'
	2nd	gé, ì/ị 'you'	gé, ì/ị 'you'	i/ị 'yours'
	3rd	yá, o/ọ 's(he)/it'	yá, á 'him/her/it'	a 'his/hers/its'
Plural	1st	ayî 'we'	áyî/àì 'us'	aı 'ours'
	2nd	anị̂ 'you'	ánị̂ 'you'	ánị̂ 'yours'
	3rd	wé 'they'	wé 'them'	wé 'theirs'

Prepositions

Preposition is used to express some kind of relation with respect to time or space between things and events (Hursford, 1994). In Ikwere, it is marked by *nị/ nụ*, which derives its meaning as 'in', 'on', 'for', 'at', etc., based on the context of usage. It is noted that *nị/nụ* is a homophonous item as it represents a preposition, an additive coordinator and also serves as a subordinator that introduces noun clauses in Ikwere. The vocalic element of the preposition assimilates completely to the vowel of the following word if it begins with a vowel but remains invariant if the following word begins with a consonant. See examples in (33) – (34):

33. Ò dị nà áhiá
3SG be PREP market
'S(He) is at the market'

34. Ájnā dị nì mọ́nô
Sand be PREP oil
'There is sand in the oil'/ 'The oil is sandy'

Whenever the vocalic part of the preposition is identical with the contiguous vowel right to it, it is contracted and written with an apostrophe in the orthography as in n'áhiá 'at the market'.

Conjunction

Conjunctions in Ikwere may be used to link items that are of equal or unequal status; or offer a choice between two things or a list of things from where one of the possible alternatives can be made. While *nị* 'and'is used to link objects and persons, *mà nị* 'but that', which is optional, is used to connect facts that are opposed to each other. See examples (1) – (4):

35. mé nị gé
    1SG CONJ 2SG
    'You and I'

36. Ézè bịa ọ́rò (mà nọ̀) ọ̀ mâ à-hnṵ́ m̄
    PN come house but that 3SG AUX-NEG PR-see 1SG
    'Eze came to the house but he did not see me'.

According to Joshua and Alerechi (2018:39), Ikwere records two alternative coordinators marked with the phrase *mà ọ̀bụ̀* 'or it be' and *sì ọ̀bụ̀* 'or it be', whose English equivalent is 'or'. Whereas, *mà ọ̀bụ̀* 'or' is used for commands, *sì ọ̀bụ̀* 'or' is used for alternative questions. Examples are given in (37) – (38):

37. Gwè-ré úbnē mà ọ̀bụ̀ ọ̀yìkpà!
    Take-ASRT pear but it be corn
    'Collect pear or corn!'

38. Ọ̀ gbà-gà ásọ́ sị ọ̀bụ̀ ọ̀jnè-gà íjnè?
    3SG run-PROG race or 3SG be 3SG go-PROG walk
    'Is s/he running or walking?'

Conclusion

This paper reveals that Ikwere is an Igboid language comprising twenty-four mutually intelligible dialects. The dialects have been dichotomized into major groups such as North and South; East and West; East-Central, west-Central and North-South groups, etc. using different linguistic features. The language has nine phonemic oral vowels and eight nasal vowels. It also records twenty-eight consonants. Among other linguistic features identified in this paper are the tones, syllable structure, word structure and some word classes. Areas such as the phrases, clauses, sentence types, etc. are not treated here and so require further investigation.

Recommendations

This work gives a brief overview of the linguistic features of the Ikwere language. While some of these features have received fair description from some scholars, others are yet to be explored. It is therefore recommended that:

1. Scholars should carry out more investigation into different aspects of the linguistic features of indigenous languages like Ikwere for their development and preservation.
2. Government and non-governmental agencies should encourage researchers through grants in order to document and describe indigenous languages such as Ikwere as that implies documenting aspects of African cultures

Endnotes:

The following abbreviations are used in this paper: ASRT = Assertive, AUX = Auxiliary verb, COMP =Complement, CONJ = Conjunction, DUR=Durative, 1SG = First person singular, 2SG = Second person singular, 3SG= Third person singular, FACT = Factative, FUT = Future, HAB=Habitual, NEG=Negation, OBJ = Object, PERF = Perfective, PN =Proper name, POT = Potential , PR = Prefix, PREP = preposition, PROG = progressive, PST=Past, SUBJ = Subject

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Enhancing Hygienic Practices among Food Vendors in Primary Schools in Uyo Local Government Area of Akwa Ibom State, Nigeria

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ABSTRACT

The study investigated the strategies for enhancing hygienic practices among food vendors in Primary schools in Uyo local government area of Akwa Ibom State, Nigeria. Two research questions and a null hypothesis guided the study. Descriptive survey was adopted for the study. The population of the study comprised all vendors and all primary school heads in Uyo. A sample of 185 respondents was drawn for the study. The instrument used for data collection was a questionnaire developed by the researcher. Cronbach alpha method was used in estimating the internal consistency of the instrument and a reliability of .76 was obtained. Mean score and t-score were used to present the data. The findings of the study revealed, among other things, that hygienic practices needed by the vendors include: wearing clean clothes, aprons and caps. It was recommended, among others, that hygienic practices and instructional material should be developed for food vendors in schools.

KEYWORDS: Hygienic practices, food vendors, strategies, primary schools, Uyo Local Government Area Akwa Ibom State, Nigeria

Introduction

The Federal Government in a bit to fulfil one of its campaign promises, and also ameliorate the economic hardship of parents decided to embark on "operation feed primary school pupils all over the nation". It is imperative to investigate the hygienic nature of food given to the pupils in primary schools in Uyo municipality in particular and Akwa Ibom state in general. Hence, the need for this research.

Food is indispensable to human existence. It is a basic need of every individual in the society. Good nutrition promotes good health and at the same time enhances the social and psychological wellbeing of the individual. Food, as a basic human need, therefore, must be wholesome and safe so that it would not be hazardous to human health.

Onoja (2013) defined food as "any substance, prepared by people to take care of their physiological needs". This implies that food is any substance processed, semi-processed, or even in raw state which is intended for human consumption to ensure normal growth and development of the body. Similarly, Ohiokpehai (2010) viewed food as "any liquid or solid material which when taken or ingested can provide the body with nourishment". Thus, food is water, juice, fruit,

nut and any other substance which when taken, provides the body with nutrients needed for normal functioning.

Food hygiene ensures that the food the general public consumes is healthy. Clark and Fox (2009) defined food hygiene as "preventing harmful bacteria from growing in food, keeping the kitchen appliances, tools and oneself clean as well as washing, cooking, preserving and storing food properly". Thus, food hygiene is very vital in health. It should be pointed out that food vendors that maintain proper food hygiene prevent harmful bacteria from growing in food thereby preventing food contamination and poisoning.

Food vendors are service providers that sell food. Their products range from normal dishes like bread, akara balls, moimoi, rice, beans, agidi, garri, fruits, drinks and different types of snacks (Onoja, 2013). Common observation shows that street foods compromise public health because most of the food vendors lack knowledge about safe handling of food. This is informed by the fact that the vendors are not regulated by the local health authorities, so they prepare food anyhow. The consumers of food more often than not fall victim of consuming from the vendors fatty and oily food that are high in salt and sugar and food that are not prepared hygienically. Unhygienic practices by food vendors expose the consumers to health problems like vomiting, abdominal constipation, abdominal pains, diarrhea and other forms of health risks in the environment. Also, some people have lost their lives as a result of contaminated foods. All this affect national development. Sequel to this, it is necessary to device strategies for enhancing hygienic practices among food vendors in our schools in Uyo. With a good hygienic practices, good and balanced diet food would be produced which will go a long way in promoting physical, mental, social, and all round stables school pupils, the consumers. This will in turn brings about healthy and conducive school environment and society at large. Barbara and Cambridge (2000), Adeoyo (2007) and Clark and Fox (2009) advocated that food vendors should maintained proper personal hygiene, using handkerchief while sneezing, clean mouth regularly and used disinfectant to keep the kitchen free bacteria and other harmful rodents. Oyechere (2010) proposed that seminars and workshops be organized for food vendors to sensitize them on the important of food hygiene in the society. Vendors are advised to stick strictly to the stated rules and regulations to ensure that food being served by the food vendors to the school pupils (consumers) was not contaminated but well preserved and processed following hygienic methods.

Statement of the Problem

Observation points to the fact that food vending in primary schools has come to stay as a good gesture of the Federal Government but despite all the effort from the government that food substances that get to the consumers are safe for consumption, some food vendors in schools in Uyo still do not have the interest of the consumer at heart. Some of these service providers do not maintain adequate food hygiene in terms of personal and environmental hygiene, procurement of healthy foods, preservation, storage, preparation process in kitchen and delivery to the customers.

This has been a serious matter of concern to many Nigerians. Thus, if unhygienic practices among food vendors are not checked, the purpose of this government's gesture will be in jeopardy. It is against this background that this study investigated the strategies for enhancing

hygienic practices among food vendors in schools in Uyo Local Government Area of Akwa Ibom State.

Purpose of the study

The purpose of this study was to determine the strategies for enhancing hygienic practices among food vendors in schools in Uyo.

Research Questions

The research questions raised in the study were as follows:

1. What are the hygienic practices needed by food vendors in primary schools in Uyo?
2. What are the strategies of enhancing hygienic practice among food vendors in primary schools?

Hypothesis

One research hypothesis was postulated and tested at .05 level of significance:

There is no significant difference between the responses of food vendors and the heads of Primary Schools on the strategies for enhancing hygienic practices among food vendors.

Methodology

The study adopted a descriptive survey design. The population of the study included all 681 food vendors and 221 heads of primary schools in Uyo. The sample of the study included 140 food vendors and 45 heads of Primary Schools in Uyo local government area. Schools in Uyo are classified into categories A to D. A purposive sampling was used to sample three categories from the four for the study. The criteria for selecting three include:

1. schools with pupils population not less than 800
2. schools that are located near health centre or do have visiting health personnel
3. schools with bore hold water supply.

The instrument used was a questionnaire titled ‘’Hygiene Practices for Food Vendors’’ (HPFV). The questionnaire was made up of 31 items which were divided into two subsections. The first section with 20 items focused on eliciting information on hygienic practices for food vendors, while the second section with 11 items focused on strategies for enhancing hygienic practices among food vendors. The respondents were instructed to rate the items on Likert 4-point scale of Strongly Agree (4 points), Agree (3 points), Disagree (2 points) and Strongly Disagree (1 point). The instrument was validated by two health personnel from Quality Assurance Department of the Ministry of Education, uyo and one lecturer in Home Economics Unit, Vocational Education Department, University of Uyo. The validators were requested to vet the items for clarity of words, and adequacy in addressing the objectives and problems of the study. Their comments and corrections were incorporated into the final form of the instrument.

The research questions were answered using mean scores while independent t-test was used to test the hypothesis. The mean ratings of the respondents were categorized by using the

real limit of numbers of responses made. A mean score of 2.5 and above was taken as an index for agreement, while a mean of below 2.5 was taken as an index of disagreement. The researcher and 5 research assistants that were trained at a one-day workshop on administration of questionnaire helped the respondents to fill their questionnaire. The research assistants were Master's degree students who had already finished their course work at the University of Uyo, Uyo.

Results

Research question 1

What are the hygienic practices needed by food vendors in schools in Uyo?

Table 1: Mean Rating of Hygienic Practices needed by the Food Vendors.

S/N	Items on hygienic practices needed by the food vendors	Mean	SD	Decision
1	Buying and cooking only uncontaminated foods.	3.60	0.64	Agree
2	Wearing clean clothes, aprons and caps regularly.	3.46	0.66	Agree
3	Washing hands with clean water and soap after using the toilet	3.73	0.53	Agree
4	Using handkerchief to cough and sneeze.	3.12	0.69	Agree
5	Washing hands after coughing and sneezing	3.33	0.71	Agree
6	Keeping clean finger nails.	3.21	0.67	Agree
7	Bathing regularly.	3.27	0.72	Agree
8	Cleaning mouth and teeth with tooth brush and paste twice daily.	3.28	0.75	Agree
9	Covering open wounds with neat dressing.	3.02	3.77	Agree
1o	Washing foods before cooking	2.70	0.90	Agree
11	Having a standard waste bin.	3.46	0.66	Agree
12	Covering waste bin always.	3.02	0.77	Agree
13	Using insecticide around the stores.	2.70	0.91	Agree
14	Washing the kitchen regularly.	3.28	0.75	Agree
15	Having enough stores for food items.	3.27	0.22	Agree
16	Washing plates with clean water and soap after use.	3.60	0.64	Agree
17	Ensuring that people do not urinate around the serving premises.	3.73	0.53	Agree
18	Using clean towel to dry-clean washed plates and hands.	3.12	0.69	Agree
19	Displaying foods in clean coolers.	3.43	0.71	Agree
20	Using clean spoon to fetch foods from the food warmer and covering it after serving.	3.21	0.67	Agree

Criterion mean: 2.5

Results from table 1 above indicate that all the items listed on hygienic practices needed by food vendors were agreed on by the respondents. None of the items was rejected.

Research Question 2

What are the strategies for enhancing hygienic practices among food vendors in schools?

Table 2: Mean Ratings of the Responses of the Respondents on Strategies for Enhancing Hygienic Practices among Food Vendors in Schools.

S/N	Items on the Strategies for Enhancing Hygienic Practices Among Food Vendors in Schools.	Mean ($\bar{x}$)	SD	Decision
1	Setting up food committee.	2.86	0.84	Agree
2	The food committee should inspect the food before they are served to the consumers.	2.75	0.70	Agree
3	Seminar should be organized for food vendors every two months.	3.26	0.82	Agree
4	Developing food hygiene and instructional manual for the food vendors.	2.90	0.88	Agree
5	The general public should be educated on the need to eat healthful food.	2.92	0.86	Agree
6	Educating the food vendors to keep cooked food separate from raw foods to reduce the risk of contamination.	3.02	0.78	Agree
7	Sensitizing the vendors on the need to get adequate cooking utensils.	3.07	0.79	Agree
8	Banning any food vendor that appears dirty from serving in the school.	2.87	0.85	Agree
9	Free medical check-up should be conducted for food vendors to find out their medical fitness.	3.40	0.62	Agree
10	Food vendors should be educated on hygienic practices.	3.54	0.62	Agree
11	The food committee should trace food vendors to their houses.	1.83	0.83	Disagree

Criterion mean: 2.5

Results from table 2 reveal that more than 90 percent (90%) of the strategies that were listed for enhancing hygienic practices among food vendors were agreed to by the respondents.

Hypothesis one

There is no significant difference between the responses of food vendors and the school heads on the strategies for enhancing hygienic practices among food vendors in schools.

Table 3: Independent t-test analysis of the difference between the responses of food vendors and heads of the schools.

Group	Mean	SD	df	t-cal	t-critical
Food vendors	140	2.82			
			288	-1.68	.87
Heads of schools	45	0.57			

Results on table 3 indicate that the calculated t value of -1.68 is less than the critical t-value of .87 for 228 degree of freedom at .05 level of significance. Therefore, the null hypothesis which states that there is no significant difference between the responses of food vendors and the school heads on the strategies for enhancing hygienic practices among food vendors in schools is accepted.

Discussion of Findings

From the analysis of data generated for the study, the hygienic practices needed by the food vendors include; buying and cooking only uncontaminated foods, wearing clean clothes, aprons and caps, washing hands with clean water and soap after using the toilet, using handkerchief to cough and sneeze, and keeping clean finger nails. Others include; bathing regularly, cleaning mouth and teeth with tooth paste and brushing at least twice daily, covering open wound, washing food before cooking, having standard waste bin and covering waste bin always. The hygiene practices needed by the food vendors also include using insecticides around the stores, washing kitchen regularly, having store for food items, washing spoons and plates after used, ensuring that people do not urinates around the serving places, using clean towel to dry-clean washed plates and hands.

Equally, from the analysis of data generated for the study, the strategies for enhancing hygienic among food vendors in schools area; setting up food committee that would inspecting food before they are served, organising seminars for food vendors, developing food hygiene and instructional manual and educating general public including the schools on the need to eat foods that are not contaminated. Other strategies include: sensitizing the food vendors on the need to get adequate cooking utensils, banning any food vendors that appears dirty from serving food in schools, educating them on hygienic practices and the food committee should trace the vendors to their houses.

The findings of the study are consistent with the observations of Barbara and Cambridge (2000), Adeoyo (2007) and Clark and Fox (2009) that advocated that food vendors should maintain proper personal hygiene, use handkerchiefs while sneezing, clean mouth regularly and use disinfectants to keep the kitchen free from bacteria and other harmful rodents.

This finding agrees with the assertion of Onyechere (2010) that seminars and workshops be organized for food vendors to sensitize them on the importance of food hygiene in the society.

Also, the study revealed that no significant difference exits between the responses of food vendors and the heads of schools on the strategies to be used to enhance hygienic practices among food vendors. Both the service providers and the heads of schools responded positively on the strategies for enhancing hygienic practices among the food vendors.

Educational Implications

Education can be seen as the sum total of all experiences which affect habits, thinking and decisions of individuals. It enables individuals to adapt themselves to their social environment and meet its demands with at least some measures of success. Thus, education is a weapon for acquiring skills, transmitting what is worthwhile to generations as well as accelerating national development.

From the findings of this study, the following implications have emerged. The state Ministry of Education should embark on mass literacy and enlightenment campaigns on food hygiene. Also, the Ministry of Health should develop food hygiene and instructional manuals that would regulate the operations of food vendors in the state.

Conclusion

Food is indispensable to human existence and development. It is imperative therefore that the procurement, preparation and serving of food is hygienically handled. Food vendors who are service providers to the public should, as a matter of priority, have identity cards and they should be educated on the various aspects of food hygienic practices in order to promote good health among consumers. Food vending therefore calls for team approach among the stakeholders. The food Monitoring Committee, Sanitary Inspectors, Ministries of Education and Health and the Heads of Schools should adopt and utilize appropriate strategies in enhancing hygienic practices among food vendors in schools in Uyo Local Government Area of Akwa Ibom State.

Recommendations

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

1. There is need to develop food hygiene and instructional materials for food vendors
2. Seminars and workshops should be organised periodically to sensitize the food vendors and the general public on the importance of food hygiene practice.
3. The government should through the health workers monitor the activities of food vendors.
4. The Heads of Schools in conjunction with the State Government, should set up food monitoring committees that would regulate the activities of the vendors and inspect the foods before they get to the pupils.

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Application of Wax Prediction Model to Electrical Heat Tracing

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ABSTRACT

Reservoir hydrocarbon fluids usually contain heavy paraffin that may form solid wax phases at low temperatures. Problems associated with wax formation and depositions are a major concern in production and transportation of hydrocarbon fluids. The problem of wax deposition is even more pronounced in offshore production platforms and in very cold regions of the world such as the Alaska North Slope (ANS). Due to the rising world energy demand and depletion of conventional onshore fields, much of the world's recent hydrocarbon discoveries is found offshore. However, the ambient temperature in these locations is considerably lower than the wax appearance temperature [WAT]. Therefore, wax is more readily deposited, resulting in reduced productivity, increased pressure drop in flow lines, and general loss in production. Over the years, considerable effort has been directed by the industry and the academia towards generating reliable experimental data and developing thermodynamic models for estimating wax phase boundaries. Moreover, different techniques of solving the problem of wax deposition have been devised, but most of these methods are reactive, instead of proactive. One of the new methods of solving the problem of wax deposition is the method of electrical heat tracing. This method has been found to be very effective and efficient as it solves, not just the problem of wax deposition, but also other flow assurance problems such as hydrate formation. However, its greatest shortcomings are its high prohibitive cost and long distance viability. Hence, this work looks at how wax prediction models can be utilized in proactively solving the problem of wax deposition, using a modified electrical heat tracing technology, in the most economical way possible.

KEYWORDS: WAT, WDT, thermodynamic model, electrical heat tracing, paraffin

Introduction

The problem of wax deposition is as old as the petroleum industry. The term wax refers to a complex mixture of high molecular weight alkane (also known as paraffin) of the structural types, namely straight chains, branched chains and cyclic alkanes. They are usually called paraffin because they have little affinity for other substances. That is, because they are saturated hydrocarbons, they are not very reactive. The figure below shows different structures of paraffin (from waxes and asphaltines by geochemical services).

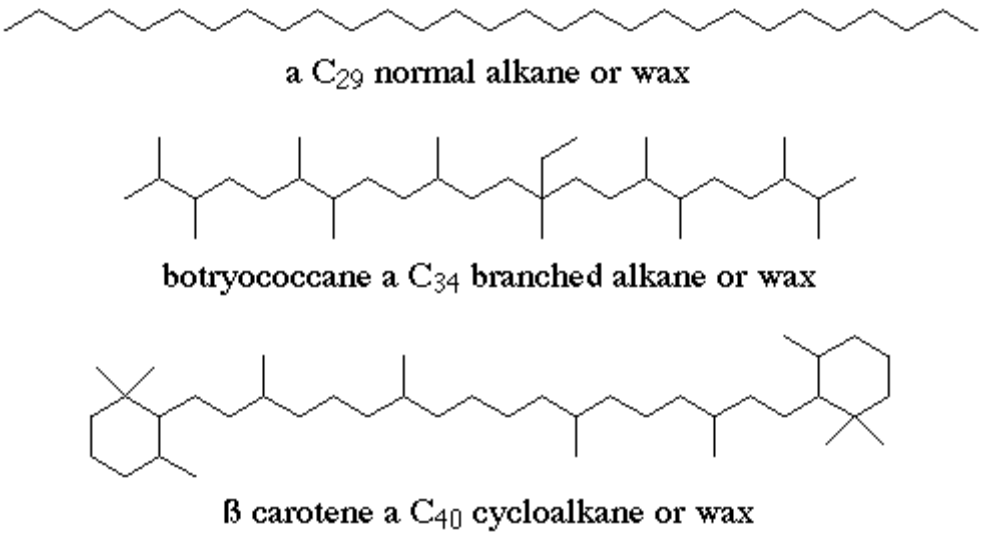

Figure1.1 structure of paraffin

This class of hydrocarbons is natural constituents of all crude oil systems and natural gas condensates. So long as they are in solution they pose no problem to the crude oil production system. However, as the temperature and pressure of the crude oil drops due to heat and pressure losses in the flow line, the wax will begin to precipitate out of the solution.

Effect of Wax Deposition

Every crude oil system has its cloud point. That is, the temperature at which the first element of wax begins to appear on a cooled crude oil system. The appearance of wax crystals could lead to wax crystallization and may result in wax deposition. This deposits accumulate in the wellbore, tubing, surface flow lines and storage facilities; thus creating very significant production problems. Wax deposition is more pronounced in subsurface platforms and in very cold regions of the world such as the arctic regions. With increasing world energy demand and depletion of conventional onshore fields, exploration and production companies have had to face up to the highly unfavorable and difficult tax of drilling and producing in these most challenging regions of the world.

One of the biggest challenges they have had to face so far is how to get the produced crude oil to the surface in these very cold climates. This is often referred to as the problem of flow assurance. Wax deposition is one of such problems. Wax is easily deposited since the WAT (wax appearance temperature) is much higher than the ambient temperature. In fact, whole platforms have had to be abandoned because of the problem of severe wax deposition. In the Niger Delta oil province, according to a research carried out by Sulaimon et al in 2009, a particular field having a recurrent case of wax deposition lost about 1500BOPD during the 2007 production year. Considering the price of oil in that given year, then the magnitude of the problem we are dealing with becomes even more glaring.

Figure 1.2 Picture showing verity of wax deposition

In the Lasmo field in the UK, wax deposition was so severe and frequent that the entire field was abandoned at a cost of over $100,000,000 (Singh et al., 2000; Nguyen et al., 2001). In truth, the real cost of wax deposition is enormous. This value cannot be ascertained with certainty. According to Elf Aquitane, the production down time cost for a period of forty days due to wax removal processes is about 25million US dollars. The cost of hiring divers to remove a blocked section of a subsea flow line is kept at 5million US dollars. Truly, a significant chunk of the operating expenditure is spent on keeping wax from blocking the flow line.

Figure 1.3 Picture showing Wax deposit reducing the effective diameter in a retrieved pipeline (Milind Deo et al., 2010).

Conventional Method of Wax Deposition Control

The technology evaluation report by Milind Deo et al [2010], considered these methods under three broad categories, namely:

- Mechanical methods.
- Chemical/biodegradation methods.
- Thermal methods.

The mechanical method includes such activities as; internal coatings, cold flow, pigging, etc.

Internal coatings are used to prevent wax crystals and particles from precipitating onto the internal walls of the pipelines. Common coatings are phenolics, epoxies, phenolic-epoxies, nylon, Teflon, etc. According to the technology evaluation report by Millind Deo et al [2010], the chemical nature of the coatings should work to prevent wax surface molecular interaction. Many studies have shown that the insulator nature of some of these coatings does more to prevent deposition than its chemical nature (Efner 1996, DEEPSTAR 3205.2 and HSU. 1997, DEEPSTAR 3205.3). According to the study by HSU 1997, nylon coatings seem to decrease wax deposition at high flow rates and temperatures close to the cloud point temperature.

Cold flow technology takes advantage of the fact that while there may be solid crystals present in the fluid being transported, the driving force for their precipitation either can be minimized or eliminated (Milind Deo et al, RPSEA 1201 controlling wax deposition in the presence of hydrates, a technology evaluation report). Thus, cold flow pre-cools crude oil before it enters the flow line. The crude oil is cooled to temperatures equal to the ambient temperature in a mechanical device. This ambient temperature is usually less than the wax appearance temperature for the crude oil system. This cooling causes the suspended solids in the crude oil to come out of the solution. The solids formed are then transported along with the crude oil system as sludge.

Pigging refers to the passing of specially engineered solids through a pipeline in order to clean or inspect the pipelines. It is one of the oldest means of removing wax deposits in the oil industry. A force balance for scrapper pigs has been developed in the literatures (Milind Deo et al, RPSEA 1201 technology evaluation report). It is giving as

$$Ft = Fb + Fs + Fws$$

Where,

Ft = Total Force to move Pig (Static force for constant velocity, no acceleration).

Fb= Baseline force (frictional) between Pig and Pipe Wall

Fs = Breaking force of wax (gel strength?)

Fws= Frictional force between Wax Plug and Wax Deposits.

Modern pigging designs incorporate the latest technology for dealing with traditional concerns such as multiple diameter lines, subsea lunching, and flow-by-pass.

Another method of wax control proposed in the literature is the *sonic method*. It is not very common. The concept is to position an ultrasonic generating device adjacent to the production tubing to disintegrate wax formed at the wall (Fowler et al 2007). Ultrasonic waves also increase the temperature of the flowing fluid. However, according to Milind Deo et al technology evaluation report, the scientific basis of these methods is not yet established.

Certain chemicals that are capable of decreasing the pour point temperature serve as useful wax deposition inhibitors. They can be used as *chemical inhibitors* in controlling wax deposition. Milind Deo et al [2010] reported on the effect of wax crystal modifiers on WAT, pour point, and viscosity. They reported that there was significant viscosity reduction and slight decrease in WAT with the use of inhibitors like *polyalkyl methacrylate* etc. However, these wax inhibitors have limited application and only decreases the rate of wax deposition. In offshore platforms and in arctic regions of the world with very low ambient temperature, their effect is not very pronounced. Moreover, the upfront cost of preparing and deploying sufficient volume of these chemicals is quite prohibitive.

Another method of wax control in the literature is the *biodegradation method*. It is true that the application of biotechnology in the microbial recovery of waxy crude has being well researched. However, less attention has been paid to the application of these methods to pipeline remediation. This might be due to the fact that microbial processes are typically slower than what might be required for faster pipeline operations. Hans Kristian Kotler et al [2007] recently reported wax control by bio-catalytic degradation of high paraffinic crude. They isolated a strain of Acinobacter and studied the degradation of long chain alkanes. The applicability of the method under flowing conditions, and in other environments will have to be investigated.

Thermal method is another very promising wax control technology that is been embraced today. The objective here is to supply heat continuously to the flowing crude oil system. One method of doing this is by circulating heated glycol-water mixture. This ensures that the crude oil temperature never falls below the wax appearance temperature. Alternatively, the heat can be supplied by direct electric heating. This is known as *electrical heat tracing*. This process utilizes the heating effect of electric current as it flows through a material of high resistivity. This method is also very important as it minimizes or eliminates hydrate formation. Currently this technology has been used in the Gulf of Mexico. The setbacks are its prohibitive cost and suitability for long distance flow lines and tiebacks.

Evolution of Wax Prediction Model

With the development of different technologies for wax prevention and control, it became evident that for us to effectively control or mitigate wax production, we need to understand fully the process of wax deposition. Hence, efforts to understand the phenomenon of wax precipitation and deposition were made. Attempts were made to develop models that can predict when, where and how wax will deposit. A number of such models are in the literatures. Let us look at some of them.

Won [1988] presented his first model for predicting wax appearance temperature. Using the Suave Redlich-Kwong (SRK) equation of state and employing a modified regular solution approach for solid-liquid equilibrium calculations (SLE). Activity coefficients were calculated using solubility parameters of individual components of hydrocarbon fluid. The critical

temperature, critical pressure and eccentric factors were estimated using correlations suggested by spencer and Daubert, Lydersen and Lee-kesler respectively. The fusion temperature and heat of fusion were correlated to molecular weight using experimental data predominantly for pure n-paraffin with odd carbon numbers.

In 1986, Won modified his first model by using an approach that combined the modified regular solution approach with the equation of Flory-Huggins for calculating activity coefficients in the liquid phase. The wax models proposed by Won was validated against cloud point temperatures measured for synthetic fuels, diesel fuels, and North Sea gas condensates, Many researchers have adopted Won's model sometimes without any modification, when developing their own model .

However, as pointed out by H.Y. Ji et al, there are several shortcomings in the model proposed by Won that limits its reliability for predicting wax phase boundaries. First, two different approaches are applied to the liquid phase for VLE and SLE; an EOS Is used for VLE, while an activity coefficient is used for SLE. This leads to inconsistencies in the description of the liquid phase and very often results in convergence issues. Secondly, the modified regular solution approach used for describing wax solid does not vary greatly from the ideal solid solution approach due to the similarity of the solubility parameter for n-paraffin. Both approaches lead to over estimation of the temperature of the wax phase boundary (Wax appearance temperature). Moreover, the model cannot provide reliable prediction of WAT at higher pressures. Finally, Won's model over estimates the amount of wax deposited. This is because it assigns the melting point of n-paraffin to all the hydrocarbon pseudo-components.

Hansen et al [1988] presented a wax model that uses the Suave-Redlich-Kwong (SRK) equation of state for Vapor Liquid equilibrium calculations. They applied the cloud point temperature for 13 North Sea crude oils. It is not surprising that the predicted WAT agreed with the experimentally measured WAT data for the same North Sea crude oils. Hansen's model had similar limitations as Won's model; Moreover, the polymer solution approach used by Hansen et al leads to activity coefficient in the order of 10^{-10}, which is not obtainable in reality.

Svendsen developed a mathematical model for prediction of wax deposition in both open and close pipeline systems by using a combination of analytical and numerical models. The model predicts that wax deposition can be considerably reduced when the wall temperature is below wax appearance point, provided that the liquid/solid phase transition expressed by the change in moles of liquid with temperature is small at the wall temperature. If, in addition, the coefficient of thermal expansion is sufficiently large, some components may separate and move in opposite radial direction at temperature below wax appearance temperature. Particle transport and sloughing were not considered.

Pedersen et al [1991] presented a wax model based on modifications to Won's approach. He applied a modified regular solution approach to both liquid and solid phases. He was able to distinguish between the wax-forming component and the non-wax forming component of a hydrocarbon system. Fusion properties and heat capacities where tuned to fit measured wax precipitation data for North Sea oils. The model was validated using experimental WAT data for the North Sea oils.

In 1995, Pedersen further modified this model, employing a cubic equation of state for consistency in description of the liquid phase for VLE and SLE calculations; the Ideal solid

solution approach was applied to the solid phase. Fusion properties were calculated using correlations suggested by Won. The problem however, with Pedersen's model is that it uses unreliable values for fusion properties and heat capacity. In addition, the approaches used to describe wax solids in the models led to an over estimation of wax phase boundary temperatures. The greatest shortcoming of this model is that it assumes ideal behavior for the solid phase.

Coutinho et al [1995] evaluated several approaches for calculating activity coefficients in SLE, including the Flory-Huggins Universal Functional Group Activity Coefficient (UNIFAC), Flory free-volume and entropic free volume. Consequently, in 1998, Coutinho presented a wax thermodynamic model that used a combined UNIFAC and Flory free-volume approach to describe the liquid phase, with the universal quasi-chemical (UNIQUAC) equation being used to describe wax solids. Coutinho's model was validated using experimental data for the amount and composition of wax precipitated for mixtures.

In 2000, Paul et al modified Coutinho's model. They used suave-Redlick-kwong equation of state for the description of the vapor and liquid phases. Critical parameters were obtained using correlations proposed by Twu. The Poynting correction term was used to extend the model to high-pressure conditions. Partial molar volumes required for calculating the Poyntin correction terms were estimated in accordance with crystallographic studies of n-paraffin solids. This model was validated using experimental WDT data for n-paraffin mixtures.

Modified Won's Model

The major criticism against Won's model is that it over predicts the amount of wax deposited at a given temperature. This is because it assumes that all the crude oil components are capable of forming wax. In reality, this is not the case. It is only the C_{7+} fractions that are capable of forming wax. Pedersen corrected for this by dividing the crude oil component into the wax forming and the non wax forming component. Pedersen also introduced new fusion parameters. Pedersen's model is not as accurate when predicting the wax appearance temperature of crude oil component. However, it does not over predict the amount of wax deposited. Hence, in other to be able to predict the WAT of a crude oil sample with the accuracy inherent in Won's model while not over predicting the amount of wax deposited, Won's model is corrected to account for the fact that only theC_{7+} fraction are capable of forming wax. Let us take a look at the basis for this model.

Consider a system undergoing equilibrium flash vaporization.

Carrying out material balance on the system,

$$F = L + S - - - - - - - (1)$$

Applying material balance to a particular component i, we have;

$$F.z_i = L.x_i - S.s_i - - - (2)$$

Since the solid and the liquid exiting the flash vessel are in equilibrium, we have that

$$s_i = K_i^{SL}.x_i - - - - - - (3)$$

Where K_i^{SL} is the equilibrium ratio of mole fraction of component i in the solid and liquid phases at a given temperature and pressure.

Combining equations 1 to 3, we have

$$F.z_i = (F-S).x_i + S.K_i^{SL}.x_i ---(4)$$

Simplifying, we have

$$x_i = \frac{z_i}{1+\frac{S}{F}\left(K_i^{SL}-1\right)} ----(5)$$

And

$$s_i = \frac{K_i^{SL}.z_i}{1+\frac{S}{F}\left(K_i^{SL}-1\right)} ----(6)$$

Since $\sum(s_i - x_i) = 0$, we have that

$$f\left({}^{S}/_{F}\right) = \sum \frac{(K_i^{SL}-1).z_i}{1+\frac{S}{F}\left(K_i^{SL}-1\right)} = 0 --(7)$$

Equation (7) above is known as the Rachford-Rice equation. In performing flash calculation, the feed moles F, feed composition z_i, Pressure P, and Temperature T are known. It is evident that if the equilibrium constant K_i^{SL} is known, we can find the other unknown parameters. Thus, the focus of the WAT prediction model is to develop an equation for calculatingK_i^{SL}.

According to Won's model, at equilibrium,

$$f_i^l = f_i^s \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(8)$$

Where f_i^l = liquid phase fugacity of component i

f_i^s = solid phase fugacity of component i

But

$$f_i^l = \gamma_i^l \, xi \, f_i^{ol} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(9)$$

Where γ_i^l is the fugacity coefficient of component $i$in the liquid phase.

x_i =mole fraction of component i in liquid phase.

Similarly,

$$f_i^s = \gamma_i^s \; si \; f_i^{0s} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (10)$$

Where γ_i^s is the solid phase activity coefficient of component i.

s_i= solid phase mole fraction of component i.

Combining equation (9) and (10) we have;

$$k_i^{sl} = \frac{s_i}{x_i} = \frac{\gamma_i^l f_i^{ol}}{\gamma_i^s f_i^{os}} \ldots\ldots\ldots\ldots\ldots\ldots(11)$$

Since there are no existing equations to describe accurately the volumetric behavior of a solid, we can find the ratio of f_i^{ol} to f_i^{os} using the following equation.

$$\ln \frac{f_i^{ol}}{f_i^{os}} = \left[\frac{\Delta H,^f}{RT}\left(I - \frac{T}{T_f}\right) + \frac{\Delta G}{R}\left(I - \frac{T^f}{T} + \ln\frac{T^f}{T}\right) + \int_o^p \frac{\Delta v}{RT}\, dp\right] \ldots\ldots (12)$$

Where T^f, ΔH^f, $\Delta C_{p,}$ and Δv are fusion temperatures, heat of fusion, heat capacity change during fusion, and volume change during fusion respectively; P and T are pressure and temperature respectively at which flashing is carried out.

Therefore equation (11) becomes,

$$k_i^{sl} = \frac{s_i}{x_i} = \left(\frac{\gamma_i^l}{\gamma_i^s}\right) exp\left[\frac{\Delta H^f}{RT}\left(I - \frac{T}{T^f}\right) + \frac{\Delta C_p}{R}\left(I - \frac{T^f}{T} + \ln\frac{T^f}{T}\right) + \int_0^p \frac{\Delta v}{RT}\, dp\right] \ldots\ldots\ldots (13)$$

Where

$$\Delta C_p = C_{p_i}^l - C_{p_i}^s \ldots\ldots\ldots\ldots\ldots\ldots (14)$$

Fusion Parameters

The correlation proposed by Won is used to calculate fusion parameters. They are given as;

$$\Delta H_i^f = 0.1426 MW_i T_i^f \ldots\ldots\ldots\ldots\ldots (15)$$

Where T_i^f =374.5+0.02617x MW_i -20172/ MW_i $\ldots\ldots\ldots\ldots (16)$

And MW_i. = molecular weight of component i, and T^f is the fusion temperature. The molecular volume of a component in liquid phase is obtained from Won (1986) as:

$$v_i^l = \frac{MW_i}{d_{25}^l} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (17)$$

Where d_{25}^l=0.8155+0.6272x10^{-4} − 13.06/ MW_i $\ldots\ldots\ldots$ (18)

Therefore, the molar volume of component i is given as;

$$v_i^s = 0.9x\ v_i^l \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (19)$$

Since the solid phase is anon-ideal mixture, this means that the ratio of the activity coefficients cannot be equal to

$$\frac{\gamma_i^l}{\gamma_s^l} \neq 1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (20)$$

Therefore, we use the regular solution theory by Florry Huggins to estimate the ratio of activity coefficients, thus;

$$\ln \gamma_i = \left(\frac{\bar{\delta} - \delta_i}{RT}\right)^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots (21)$$

Where $\bar{\delta}_i$ = solubility parameter for component i and $\bar{\delta}$= average solubility parameter of the mixture.

$$\bar{\delta} = \sum \varphi_i\, s_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (22)$$

Where φ_i= volume fraction of component i, it can be obtained for both liquid and solid phases as shown below.

$$\varphi_i^l = \frac{x_i v_i}{\sum x_i v_i} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (23)$$

And

$$\varphi_i^s = \frac{s_i v_i}{\sum s_i v_i} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (24)$$

From Pedersen correlations, we have that

$$\delta_i^l = 7.41 + 0.5914\ (\ln C_n - \ln 7) \ldots\ldots (25)$$

$$\delta_i^s = 8.50 + 0.763(\ln C_n - \ln 7) \ldots\ldots (26)$$

$$\frac{\gamma_i^l}{\gamma_i^s} = exp\left[\frac{v_i}{RT}\left(\left(\bar{\delta} - \delta_i\right)_l^2\right) - \left(\left(\bar{\delta} - \delta_i\right)_s^2\right)\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (27)$$

Therefore, equation (11) becomes, after simplification;

$$k_i^{sl} = \frac{s_i}{x} = exp\left[\frac{\Delta H^f}{RT}\left(I - \frac{T}{T^f}\right) + \frac{v_i}{RT}\left(\left(\bar{\delta} - \delta_i\right)_l^2 - \left(\left(\bar{\delta} - \delta_i\right)_s^2\right)\right) + \Delta v^f\left(\frac{p - p_{ref}}{RT}\right)\right] \ldots (28)$$

Considering the fact that not all the crude oil component contributes to wax formation as pointed out by Pedersen, the mole fraction of the wax forming component Z_i^s, is given as

$$Z_i^s = Z_i^{old}\left[I - (A + B.M_i).\left(\frac{\rho_i - \rho_i^p}{\rho_i}\right)^c\right] \ldots (29)$$

Where

$Z_i^{old} =$ Total mole fraction of feed.

Z_i^s =Mole fraction of potentially wax forming component.

M_i= the molecular weight of pseudo-component i,

Z_i^s is related to Z_i^{old} as shown above;

ρ_i = Density of the pseudo component at standard conditions,

ρ_i^p can be obtained from,

$$\rho_i^p = 0.3915 + 0.0675 \ln M_i \ldots\ldots\ldots\ldots\ldots (30)$$

Also,

$$Z_i^{no-s} = Z_i^{old} - Z_i^s \ldots\ldots\ldots\ldots\ldots\ldots (31)$$

Where Z_i^{old} is the mole fraction of the non-wax-forming component. The values of A, B, and C is gotten by tuning the parameters with experimental data. Thus, all the C_{7+} fractions are split into two: the wax forming parts and the non wax forming parts. The graph below compares the modified model with Won's model and experimental data.

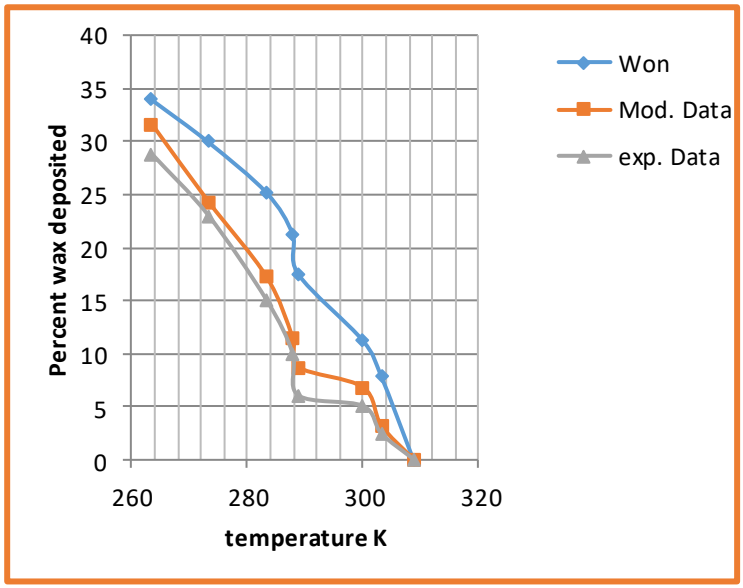

Figure 1.4: Graph showing accuracy of new model, Dauphin et al, 1999

From the graph above, it is evident that the modified model performs significantly better than Won's model when it comes to predicting the amount of wax precipitated at temperatures below

WAT. This is expected because it recognizes that only a fraction of the C_{7+} components actually contributes to wax formation. It also predicts the WAT of the given crude oil system as accurate as Won's model.

Similarly, the second graph confirms the validity of the improved model. The modified model predicts the WAT of the given crude oil sample with a lot more accuracy than the often used Won's model.

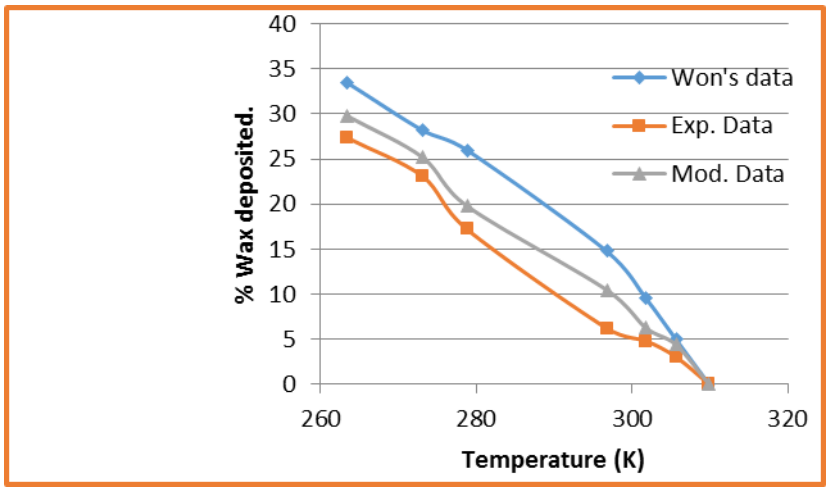

Figure 2.5: Graph showing accuracy of new model, Dauphin et al, 1999

Model Application

A number of factors affect wax deposition. Among these factors are; temperature, pressure, crude oil composition, pipe surface roughness, etc. Of all these factors, temperature is the most important. This is because no wax will be deposited no matter the condition, so long as the crude oil temperature is above the wax appearance temperature. Other factors will lead to wax formation only when the crude oil solubility limit (WAT) is reached.

A recent study carried out by Kellog et al (as reported by Milind Deo et al), ranked 10 benchmark wax mitigation technology. In it, active heating, which also includes electrical heat tracing, was co-ranked in third place with the coiled tubing technology. The major criticisms against electrical heat tracing were concerns over its long distance viability and high prohibitive cost of implementation. The ranking is shown in table 1.1. However, due to the depletion of conventional onshore fields and the rising cost of pigging in deep offshore platforms, there is an urgent need for a more proactive method of wax control. This need becomes more urgent if you consider the fact that major oil findings have been made in very cold regions of the world, such as the Alaska North Slope (ANS) field.

Due to the very low ambient temperatures in these places, wax is more readily deposited. This is because the rate of wax deposition is proportional to the temperature difference between the flowing crude oil in the pipeline and the ambient temperature. Considering the fact that the electrical heat tracing method which utilizes the heating effect of electric current is a proactive method, it becomes obvious that it is the most practical alternative to pigging. However, to make this method more economically attractive, a little modification needs to be made. Here comes the *modified electrical heat tracing technology.*

Table 1.1; Table showing benchmark wax mitigation technology, Milind Deo et al.

Technology	Cold flow applicability	Scientific basis	Long distance viability	Range of applicability	cost	Overall rank	comment
Pigging	10	10	9	10	5	8.8	A "must use" mitigation technology. Cold flow will be implemented with pigging back up options.
Cold seeding	9	8	7	5	7	7.2	Good scientific bases and possibility of long distance implementation. Range of applicability needs testing and cost could be higher than the benchmark.
Coiled tubing	7	9	3	8	7	6.8	Usually combined with advanced pigging. May be less applicable over long distance.
Active heating	9	10	5	7	3	6.8	Applicable technology. Sound technical and scientific basis. Concerns are long distance viability and cost.
Chemical inhibition	5	6	5	5	5	5.2	Case specific and can be expensive.
Internal coatings	3	2	9	1	3	3.6	Viable over long distance. Weak scientific basis.
Sonic methods	1	2	7	1	3	2.8	Not enough data to indicate proof of concept.
biodegradation	2	1	1	1	5	2	Shown not to be applicable in deep star work.
Magnetic methods	1	3	1	1	3	1.8	Not enough proof of viability.
Micro wave methods	3	3	1	1	1	1.8	No proof. Even if fundamentally applicable, difficult to implement.

The modified heat tracing technology seeks to lower the cost of its implementation by reducing considerably the total length of the flow line heat traced, thereby improving its long distance viability. How is this achieved?

Having predicted the WAT of a given crude oil system, the temperature profile of the flowing crude oil in the flow line is then modeled. With this model, we can predict exactly where and when wax will begin to precipitate in a given flow line. Thus, instead of heat tracing continuously throughout the length of the flow line, the regions where the wax will be formed is heat traced, thus allowing the crude oil temperature to be raised above its WAT. This implies discrete heat tracing.

Conclusion

With the application of this technology, electrical heat tracing of flow lines will become the most effective method of wax mitigation. The down time incurred while trying to pig flow lines will be eliminated. It will represent a huge step towards solving flow assurance problems. Hydrates will no longer be formed as the flow line temperature will be above the hydrate formation temperature. Moreover, the power requirement for transporting fluids in the flow line will reduce tremendously, as it is an inverse function of the fluid's viscosity. Also, due to the heating, the API value of the crude is expected to improve, as the heavier components will become partially cracked. Thus, all this benefits puts the modified heat tracing technology in good stead to become the industry standard for wax formation prevention and control.

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