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Editorial

I am happy to welcome you to the sixth volume of Makerere Journal of Higher Education (MAJOHE). I am also happy to inform you that, over the last year, new people from various parts of the world joined the journal's management board. These people are colleagues with whom our paths crossed at various international meetings and we shared with them about their work and the goals and development of MAJOHE. It delights me enormously that they found the journal worthy of their contribution when we requested them to join its management board. As we welcome them to the board, and as the journal enters its tenth year, we also remind ourselves of the legacy of Professor Samuel Olajide Owolabi (RIP) as the founding editor of the journal. I had the rare privilege of working with Professor Owolabi for seven years and I would be deeply honoured when, in 2009, I was invited to serve as editor of the journal he'd founded five years earlier, while he occupied the Commonwealth Chair in Educational Planning at the Department of Higher Education, now the East African School of Higher Education Studies and Development.

Professor Owolabi provided indispensable guidance and always emphasised that the development of a learned journal depends mainly on the expertise and commitment of its board and authors. Therefore, I request members of the board to give the journal both their expertise and commitment to advance its contribution to the field. I also request authors contributing to the journal to submit the *best* manuscript that they can prepare. I am optimistic that in that way, the journal will enjoy the long life that Professor Livingstone Luboobi, Makerere University's Vice-Chancellor at the time of inaugurating the journal in 2004, wished it in his foreword to its maiden edition. On behalf of the East African School of Higher Education Studies and Development, and on my own behalf, I thank the outgoing members of the journal's management board for their contribution. They have brought MAJOHE a long way and we owe it to their contribution to carry the journal forward.

This issue presents seven papers touching on three themes: ICT; higher-education-labour-market alignment; and open and distance learning (ODL). From Maasai Mara University, Mukuna discusses the integration of ICT into teacher training and professional development in Kenya. Makuna's paper starts with posing a sobering question: how can teachers that were not trained in the integration of ICTs in their teaching promote Kenya's goal of integrating ICT

in its education system? Subsequently, the paper argues that, among other factors, technology refusal in schools in the country is linked to gaps in technology integration in teacher training after which it discusses recommendations for closing these gaps in pre- and in-service teacher training. Alabi and Akinnubi report on the findings of a survey that delved into the use of ICT in decision making in universities in the North-Central Geo-Political Zone of Nigeria. It is interesting to note that these authors report improved accessibility of ICT ware and that the role of ICTs in decision making is more prominent a proxy of increased adoption! From Makerere University Business School, Bada, Laamanen and Miro report their experience in using a project-based learning approach to teach robotics basics to undergraduate business computing students. These authors report what they achieved from using the approach as well as the pros and cons of the latter.

Under higher-education-labour-market alignment, Wamala, Tagoole and Omala attempt to respond to the question of whether graduates of general education in Uganda possess vocational skills. Noting that the contemporary labour market demands graduates that possess a range of practical skills, these authors investigated the extent to which a sample of finalist students at Makerere University possessed these skills. They report a low level of vocational skills attainment among the students that participated in their study. Quite interestingly, in the next article, Ochen, Olowo-Onyango and Mpyangu report and reflect on their experience in coordinating the internship programme that the University is mainstreaming across all its undergraduate study programmes to enhance the fit between its training and the demands of the contemporary labour market. On the other hand, from Nigeria, Ayonmike reports on the state of Technical and Vocational Education in Delta State. It is my hope that readers will appreciate the meetings points between these articles and their implications for reform and extend the discussion on higher-education-labour-market alignment.

Finally, Ozurumba and Oladunjoye report on the findings of a study that delved into aspects of quality assurance in ODL in Nigeria. As ODL is expanding access to higher education to more people, including groups that traditionally lacked systematised access to higher education, this study is particularly timely. It could guide efforts to ensure that the benefits of expanded and diversified access to higher education that ODL is presenting are not attained at the expense of quality.

Editor



Integration of ICT into Teacher Training and Professional Development in Kenya

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Abstract. Teachers can only effectively integrate technology in their instruction if they are themselves knowledgeable about the technology. In Kenya, integration of ICT into the curriculum has been the subject of extensive research and various researches have reported challenges encumbering integration: resistance of teachers to embrace innovation; lack of infrastructure for ICT integration; negative attitudes of teachers towards integrating ICT; and school management related problems. These challenges beg several questions: What is missing in the teacher education and training curriculum? Is there skill training and maintenance for teachers? Do the teacher training institutions have the necessary infrastructure for ICT integration? This paper reports on the findings of a study that attempted to respond to these questions.

Keywords: ICT; Curriculum innovation; Teacher education.

1 Introduction

UNESCO's planning guide for Information and Communication Technology (ICT) in teacher education cites three key principles for effective ICT development in teacher education that were put forward by the Society for Information Technology and Teacher Education (SITE, 2002). These were; to infuse technology into the entire teacher education programme, technology should be introduced in context, and that students should experience innovative technology supported learning environment in their teacher education programmes. The teaching profession needs to migrate from a teacher-centred lecture based instruction to a learner-centred interactive learning environment. To attain this aspiration, an ICT enabled teacher education is fundamental. There is an urgent need to equip African teachers with ICT skills so as to develop their learners as critical citizens in a digital world.

With the emerging new technologies, the teaching profession is evolving from an emphasis on teacher-centred, lecture-based instruction to student centred, interactive learning environments. Research shows that technology only provides raw materials for enhanced educational strategies. Meaningful technology integration into pedagogy depends on how teachers plan for and use it in the classroom for effective instructional delivery. Technology is a channel for helping teachers to communicate better with their learners. Teachers can use technology in their classrooms when they are first and foremost informed and knowledgeable as stated above. Technology is only a tool to help teachers overcome obstacles that impede effective teaching and learning. The teacher's role is to ensure use of technology-based methods in both learning theory and teaching practice. The technology use should match specific teaching and learning needs. The teacher needs to use technology in more innovative ways to make his/her teaching better and enforce parent-teacher collaboration in curriculum development.

Research shows that technology only provides raw materials for enhanced educational strategies; meaningful technology integration into pedagogy depends on how teachers plan for and use it in the classroom for effective instructional delivery. Technology is a channel for helping teachers communicate better with the learners (Doering & Robleyer, 2007). It can make teaching better but not make bad teaching good. The teacher needs a wealth of knowledge on technology so that he shapes the future of his/her learners. Each teacher should use technology to articulate the vision of education by acquiring skills to help toward realizing the vision. The technology use should match specific teaching and learning needs. There should be informed use; teachers should also know the technological pedagogical and content knowledge (TPACK) thus knowledge of content and teaching strategies including technological knowledge.

There are various technological resources at the disposal of teachers to use. All the integration strategies require both the hardware (equipment) and software (programmes). The software to support pedagogical and content knowledge is divided into three;

- Instructional programmes designed to teach skills or information through demonstrating examples, explanations or problem-solving.
- Productivity programmes designed to help teachers and students to plan, develop materials and keep progress records.
- Administrative programmes administrators at school, county, nation, district or province use to support record keeping and exchange of information among various stakeholders.

The hardware includes computer laboratories, work stations, laptops, desktops, mobile phones, radios, calculators, projectors and video recorders. The software

includes desktop publishing, word processing, email, power point, chat room, drills, videos, simulations, instructional games, internet, instructional software and multi-media.

Over the last decade, many countries that included ICTs in education were slow to also include it in teacher education. Only recently have national agencies begun to realize the importance of educating teachers at the beginning of their careers. Younger people are more likely to be familiar with ICTs, to be adaptable, and to not yet have formed habitual modes of instruction that are more difficult to change with more experienced teachers. It is in the pre-service stage that they are most open to learning how to infuse technology into instruction. Based on their long experiences with traditional modes of learning, teacher educators may find it challenging to incorporate ICTs into their own instructional practices. They may also lack experience in developing the complex partnerships between higher education and schools that facilitate technology- rich contexts for training student teachers.

Designing and implementing successful ICT-enabled teacher education programmes is the key to fundamental, wide-ranging educational reforms necessary for the realization of Vision 2030. Teacher education institutions may either assume a leadership role in the transformation of education or be left behind in the swirl of rapid technological change. For education to reap the full benefits of ICTs in learning, it is essential that pre- and in-service teachers are able to effectively use these new tools for learning. Teacher education institutions and programmes must provide the leadership for pre- and in-service teachers and model the new pedagogies and tools for learning. To accomplish these goals, teacher education institutions must work closely and effectively with administrators, national or state educational agencies, teacher unions, business and community organizations, politicians and other important stakeholders in the educational system. Teacher training institutions also need to develop strategies and plans to enhance the teaching-learning process within teacher education programmes and to assure that all future teachers are well prepared to integrate ICTs in their classrooms for teaching and learning.

As Kenya moves towards vision 2030 considering the pressure to move with the times of this information and digital era, the school curriculum should be made relevant and useful to the needs of the learners. Several questions must be put into consideration such as are teachers' views included? Are teachers involved right from the planning stage? Have needs assessments in various subject areas been done? Have these ideas been incorporated in the in-service and pre-service training? Have teachers been inducted to do internal instructional supervision? How do teachers receive the innovation? What is expected of them? What is missing in the teacher training curriculum? Is there skill maintenance training for teachers? Do schools have necessary

infrastructure for practice, e.g. Electricity, policies, software and hardware, finances?

In Kenya today, there is an upsurge of primary teacher training colleges and universities. Due to these increased numbers, there is a strain on available resources. Some of these universities and teacher training colleges do not have learning resource centres let alone a well equipped library. This poses a great challenge to these teacher training institutions to link theory and practice. Many pre-service teachers in the TTCs end up not doing educational media practicals which would otherwise equip them with knowledge and skills on integration of ICTs in the classroom. The end result is teachers who are technologically incompetent. The little or no levels of interaction with technology during their pre-service training culminate into resistance to integrate ICTs in classrooms.

Another challenge confronting our educational systems is how to transform the curriculum and teaching-learning process to provide students with the skills to function effectively in this dynamic, information-rich, and continuously changing environment. Education is at the confluence of powerful and rapidly shifting educational, technological and political forces that will shape the structure of educational systems across the globe for the remainder of this century. Many countries are engaged in a number of efforts to effect changes in the teaching/ learning process to prepare students for information and technology based society. There is an urgent need to reconsider the curriculum content, design, implementation strategies and evaluation procedures in Kenya.

There have been several curriculum changes in Kenya in the past that take so long to be implemented. The main reason most researchers give is resistance by teachers to implement the new curriculum. In most researches, incompetence of teachers and lack of training prior to introduction of the new curriculum have been cited. Most studies have focused on methods of teaching, overload of the curriculum, scope, sequence/and overlaps, content, teachers' attitudes towards the subjects, teaching and learning materials, but not on the teacher as the implementer of the curriculum. The role of the teacher in the changed curriculum is very critical to say the least; it is the engine of the curriculum change. How the teacher understands the curriculum change, owns it and implements it is dependent on how much knowledge he/she has on the curriculum change. It depends on the characteristics of the innovation, context and content (Fullan, 1992; Otunga et al, 2011). The objectives, practicality, simplicity, or complexity, adaptability of curriculum must be put in perspective. The teacher needs to understand why the change and how it will benefit him/her and the learners. S/he must understand how s/he is expected to fit the changes in his lessons (Ornstein & Hunkins, 2004).

A good curriculum is invalid without quality teachers to implement it. We should go beyond the assumption that teachers know it all and will somehow find their ways around. We should not assume that teachers' knowledge

doesn't need renewal. If continuous professional development (CPD) is done, we believe that teachers will not only embrace the curriculum changes and institutionalize them but will do their best. If they are taught the 'how' and are mentored or supervised using clinical supervision, then Kenya Institute of Curriculum Development would have achieved its aim of transforming the curriculum to meet the needs of Vision 2030. It follows that the pre-service curriculum needs to be overhauled; the Policy on Teaching Practice in colleges and universities needs to be re-drawn to fill the gaps. The Lecturers and other instructional supervisors also need CPD to understand the curriculum changes so that Monitoring and Evaluation of the same is effective.

This paper argues that teachers in Kenya should have technological, pedagogical and content knowledge for them to effectively use ICTs in their classrooms. It goes further to offer guidance on how teacher training in Kenya can not only offer technological and pedagogical skill training but maintain it through continuous professional development of teachers, administrators and technicians. The paper further proposes a framework for ICTs in teacher education, describes the essential conditions that must be met for successful technology integration and provides guidelines for the development of a strategic planning process. It also identifies important strategies for managing the change process in the teacher education programme as technology becomes a catalyst for transforming the teaching-learning process.

2 Essential Conditions for Technology Integration

Integration of ICTs into pedagogical practices needs the following conditions. These conditions were summarized by ISTE's NETS for Teachers (2008). These include:

1. A shared vision for technology integration. This vision should be shared by the school, district, county and nation at large. Educational leaders must view ICTs as a core value. The planning for integration of ICTs into the curriculum should involve all the stakeholders who are parents, community leaders, school management committees, district and county teachers. There is need to increase the technology budget; and teachers should be trained in integrating ICTs into the classroom and linking technology to curriculum needs.
2. Empowered leaders: stakeholders at all levels must be informed about the goals of the community, district, county and school.
3. Standards and curriculum support: the content area and technology should be assigned to complement each other.

4. Required Policies ó there need to be policies that ensure appropriate behaviour, safety, equitable treatment of all students, financial assistance incentives and accountability.
5. Access to hardware, software and other resources for sustainable integration.
6. Skilled personnel and opportunities for professional development ó pre-service training should have a component of integration of ICTs into the classroom practices. However, since technology keeps changing continuing staff development is an essential condition for effective technology integration. Schools must have a plan for CPD for teachers, administrators, technicians, etc not only to learn the latest technology, but more importantly the most effective pedagogy related to integrating the technology into the classroom.
7. Technical assistance: technical support and maintenance for students and teachers is crucial.
8. Appropriate teaching and assessment approaches.
9. Engaged communities: partnerships and collaborations.

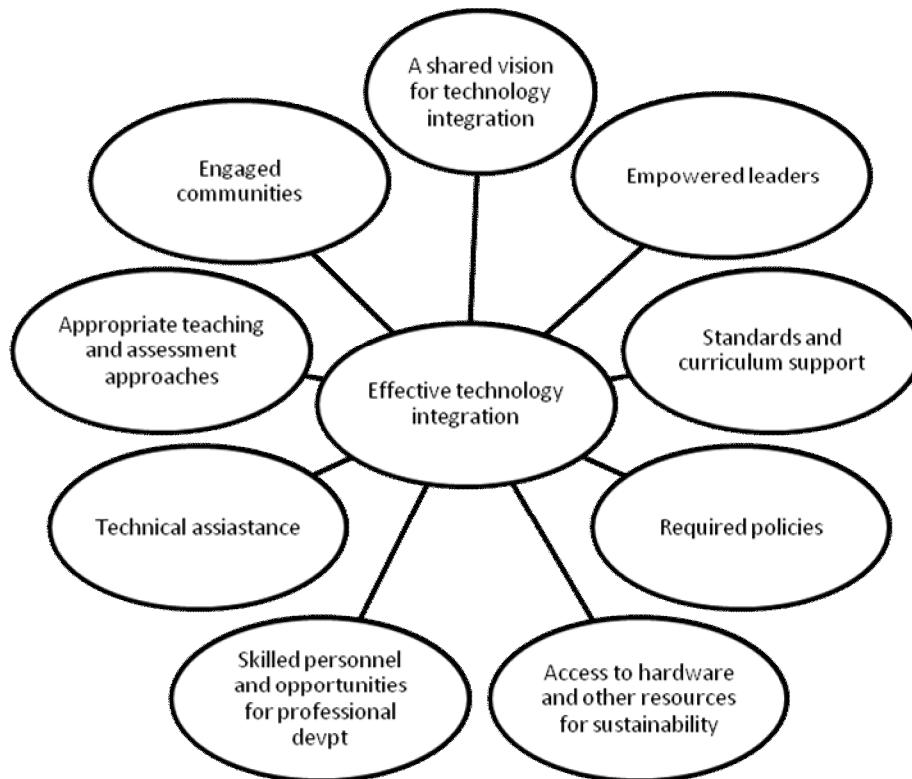


Figure 1: Effective Technology Integration

3 Stages of Professional Development of Teachers in ICTs

It will not be surprising to find computers in classrooms collecting dust; computer labs locked because there is no one trained to run them or pupils playing non-educational games on computers for hours on end. The Jubilee government has set aside millions of shillings this year to be spent on buying laptops for every child entering class one in 2014. Much of this money will most likely be wasted because teachers are not trained to use technology effectively. Educational technology is not, and never will be, transformative on its own ó it requires teachers who can integrate technology into the curriculum and use it to improve student learning. In other words, computers cannot replace teachers. Teachers are the key to whether technology is used appropriately and effectively. That said, designing and implementing successful teacher professional development programs in the application of technology is neither easy nor inexpensive. The leadership of this country have a very noble idea but they have failed to allocate funds for training teachers, school management and technicians on integration of ICTs into the classroom. Making Kenya digital by 2030 may become a pipe dream if there is no constant revision of teacher professional development programs related to technology.

Teachers remain the gatekeepers for students' access to educational opportunities afforded by technology: they cannot and should not be ignored. Providing technical skills training to teachers in the use of technology is not enough. Teachers also need professional development in the pedagogical application of those skills to improve teaching and learning. Traditional one-time teacher training workshops have not been effective in helping teachers to feel comfortable using technology or to successfully integrate it into their teaching. Instead, a new paradigm is emerging that replaces training with lifelong professional preparedness and development of teachers. This approach includes pre-service and in-service training, as well as ongoing pedagogical and technical support and mentoring.

While technology increases teachers' training and professional development needs, it also offers part of the solution. Information and communication technologies (ICTs) can improve pre-service teacher training, by providing access to more and better educational resources, offering multimedia simulations of good teaching practice, catalyzing teacher-to trainee collaboration, and increasing productivity of non instructional tasks. ICTs can also enable in-service teacher professional development at a distance, collaborative learning, and individualized training opportunities. Finally, ICTs can overcome teachers' isolation, breaking down their classroom walls and connecting them to colleagues, mentors, curriculum experts and the global teacher community on a continuous basis.

Approaches to the professional development of teachers must be dependent on context and culture. Since there are a variety of approaches, an overview of the many stages in which teachers receive teacher education may prove helpful. Professional development to incorporate ICTs into teaching and learning is an ongoing process and should not be thought of as one 'injection' of training. Teachers need to update their knowledge and skills as the school curriculum and technologies change. Individuals develop in stages and mature over time. Personal development must be accompanied by organizational development in schools, training centres, and universities.

In many regions, teachers engage in preparation before they start teaching in schools, a stage referred to in this paper as pre-service teacher education. When pre-service teachers begin to teach, they may be given additional support to handle the complexity of their work for the first to third years of their career. This stage of professional development is called induction. The induction stage demands a great deal of effort and commitment, and research in developed countries reveals that around 30% of teachers may drop out during this time. Some teachers do not have the benefit of a preparatory course and must learn while teaching in schools, a condition referred to as on-the-job training. Such training is probably carried out within the school, perhaps with the teacher receiving some release from normal duties.

Teachers and teacher educators develop ICT competence in stages. Those who are fluent with technology may not appreciate how difficult it is for technology novices to appropriate ICTs into their professional practice. Teacher educators often find this task even more difficult than teachers do, because they typically have higher levels of content and pedagogical expertise that must be respected. Teacher educators, because they have to work in multiple contexts—both the home institution and the field where students are placed to observe and practice teaching—may also be more influenced by the absence of the essential conditions for ICTs in teacher education.

Four stages are common, but they may be repeated with new forms of ICTs or applications of ICTs to new areas. The first stage for each individual is awareness, and the appropriate response at this stage is to provide information about a relevant application of ICTs and appropriate ways that it may be used in the individual's current professional or personal concerns. Please note the learner-centred nature of this approach; the concerns are not those of the supporter (the ICT expert) or the organization, but of the individual teacher educator. Teacher educators then explore the use of the application. They need support to put this ICT application into practice in a timely manner and to reflect on its effectiveness. Only after teacher educators have gone through these stages are they able to adapt their practice to make better use of ICTs, and then move toward the final stage to become innovators and modellers of excellent practice for their students and colleagues.

The advent of ICTs provides the opportunity to engage in this process from a new perspective and to model processes of learning for colleagues and students. It is acceptable for teacher educators to adopt only those aspects of ICTs that are relevant to their practice, but they must first be allowed to explore the range of possibilities, so that they and their students may become critically aware of, and competent in, diverse ICT applications. Of course, any teacher educators continually strive to be responsive to developments and innovations in education within and beyond their discipline.

To understand the strategies of professional development it is important to understand how they are embedded in the broader context of the planning and implementation of ICTs in teacher education. Teacher educators need to develop competence in the core themes of: pedagogy, collaboration and networking, technical competence, and social issues. This needs to be done within the local and global cultural contexts of: lifelong learning, leadership and vision, and planning and management of change.

Teacher education is an ongoing process of lifelong learning. The final stage, consisting of additional professional development, is called in-service teacher education. It is important to note that some very strong models of teacher education provide simultaneous professional development for more than one group. For example, pre-service preparation can be aligned with in-service teacher education. A practicing teacher may work with a pre-service teacher education student on an innovative educational project. This not only increases the research potential of the in-service teacher, but the pre-service teacher also experiences role modelling and, as a result, may have an easier transition into teaching.

Professional learning communities allow teachers to support the professional development of colleagues and receive support themselves. ICTs have increased the access to and reach of such professional associations. Mentorship can be fostered across geographic distances and supported by synchronous and asynchronous interaction. Professional development may also be enhanced by public or private partnerships with the community. Such partnerships may be particularly appropriate for professional development related to ICTs, with financial and technical support contributed by ICT companies, such as the Intel *Teach to the Future* Programme, or by local communities. The professional development of teacher educators is also essential. Unless teacher educators model effective use of technology in their own classes, it will not be possible to prepare a new generation of teachers who effectively use the new tools for learning. It is also important to consider the question of who may teach.

With ICTs, students often become teachers, using the processes of peer tutoring or reciprocal mentoring. Indeed, a teacher may facilitate learning by reversing the teaching-learning roles, with students acting as expert learners who model the learning process. ICTs provide extensive opportunities for this

to occur in ways that can increase the self-esteem, motivation, and engagement of students. Teachers need encouragement to adopt such strategies rather than to feel ashamed to be taught by young learners. Members of the community also may become teachers, or at least invited experts. ICTs extend the range of such opportunities and provide access to extensive relevant supporting materials. The teacher's role changes to manager and facilitator in many of these situations as the teacher helps the expert communicate with the learners and scaffolds the learning process. The teacher also acquires professional development by learning from the expert.

The focus of professional development should also be expanded to those who work with teachers: the classroom assistants, school leaders, and members of regional and national organizations for curriculum and professional development. A common vision for the role of ICTs in education is important for its success. Teachers may find it impossible to incorporate ICTs into their work without support and encouragement from colleagues, parents, and leaders. To bring this about, these community members may also need professional development, along with the teachers.

The most obvious technique for professional development for teachers is to provide courses in basic ICTs knowledge and skills, delivered by experts in the areas. These types of courses, taught at training centres or universities with a syllabus set by regional or national agencies, have been a common practice in many countries. However, this approach has had limited success without follow-on training and support, as compared to effective use of ICTs by trained teachers. Similarly, courses for teachers are difficult to implement in ways that result into application of ICTs in classroom instruction or other professional practices without additional support.

Teacher professional development in the use of technology should embody and model the forms of pedagogy that teachers can use themselves in their classrooms. As the need and demand for teacher professional development increases, the key challenges will be ensuring content quality, reliable and appropriate training delivery infrastructure, follow-up support, measurable outcomes, and all at acceptable cost. For example, these training programs should;

- Empower teachers to develop their knowledge and skills actively and experientially, in a variety of learning environments, both individual and collaborative.
- Include a variety of learning strategies, including direct instruction, deduction, discussion, drill and practice, induction and sharing.
- Aim at higher-order thinking skills.
- Provide an authentic learning environment so that teachers engage in concrete tasks within realistic scenarios.

- Emphasize ways that technology can facilitate and enhance teachers' professional lives.
- Encourage teachers to be mentors, tutors and guides of the students' learning process (rather than simple presenters of knowledge and information).
- Develop teachers' skills in learning how to learn (define learning objectives, plan and evaluate learning strategies, monitor progress and adjust as needed).
- Promote cooperative and collaborative learning.
- Be sensitive to the culture and diversity of teachers as learners, using a multifaceted approach so as to respond to different learning styles, opportunities, environments and starting points.
- Enable learning independent of time and place (anytime, anywhere learning).

A key for successful teacher professional development programs is a modular structure, corresponding to different levels of teacher expertise and experience using technology. Adapting materials to teachers' comfort level and starting points is essential. In this way, teachers new to technology can be exposed to the full series of professional development modules, while teachers higher up the learning curve can enter where their knowledge and skills stop, and help their less technology-savvy colleagues along. The basic principles of Adult Learning should be incorporated, meaning the training program is highly social and cooperative, with opportunities to share experiences and combine instruction with discussion, reflection, application and evaluation. In addition to these principles, technology enables an even more collaborative approach and maximizes peer-to-peer sharing of the challenges, frustrations, advantages and successes of using technology to teach and learn. Such an approach encourages the use of illuminating failures in the use of technology in the classroom, as well as examples of best practice. Finally, these principles of teacher professional development for technology imply the need to build community and systems of on-going support, from peers, mentors and experts. Single training events that leave teachers alone afterwards should be avoided.

4 Content of Teacher Professional Development Programs in the Use of ICT

What should be learned? What skills and attitudes do teachers need to develop? What knowledge do they need to construct in order to effectively use technology to improve teaching and learning? This topic has been extensively

discussed over the last ten years as information technology, and particularly the Internet, has been introduced to schools around the world. To begin with, the designers of a teacher professional development program for use of technology need to determine current levels of teacher competency in this area. The International Society for Technology in Education (www.iste.org) has produced a set of standards for teacher skills and knowledge in the use of technology, which serves as a useful diagnostic tool to determine competency levels and basic content of teacher professional development programs. While no single set of standards fits all and differing economic, social, cultural, educational, and technological realities require different approaches, some minimum guidelines and suggestions for the content of teacher professional development in the use of technology are warranted.

Policy makers should assume as a bare minimum requirement at least twenty-four (24) hours (three full days) of teacher training in the use of technology. This would include basic operating systems, word processing and spreadsheets. Obviously, the more time allocated for this, particularly hands-on time, the greater the mastery of these basic skills. Teachers should finish this basic course with at least the fundamentals necessary for them to practice and further develop their skills on their own back in their schools. Adding another sixteen (16) hours of training and Internet access would enable teachers to access information on the Internet, do some basic lesson planning integrating technology, and exchange e-mail messages and files with colleagues and experts. With this base of forty (40) hours of professional development, provided that the methodology of the course incorporates some of the key interactive learning principles described above, teachers should be able to begin using technology in the classroom.

Experience of the World Links program suggests that at least eighty (80) hours of professional development are required before teachers can really begin to integrate technology into their teaching. Additional content would include linking curricular objectives to technology-based activities, development of lesson plans and evaluation strategies that incorporate technology, construction of educational web sites, and discussion of ethical issues related to technology and education. Ideally, this would be provided in various stages, allowing time for teachers to experiment with and apply their new technological skills and knowledge in the classroom before moving on to more advanced applications. This approach also allows teachers to reflect upon and share their learning experience (both positive and negative) with their peers, promoting the social construction of knowledge.

World Links has been one of the pioneers in developing and delivering teacher professional development programs in the use of technology to improve teaching and learning in developing countries. It is by no means the definitive program nor the most easily replicated and scaled. However, for purposes of

illustration, the complete World Links Teacher Professional Development program includes two hundred (200) hours of training, equivalent to five 40-hour weeks. This takes teachers with no prior contact with a computer to full competency, over a two- to three- year period.

5 Motivation and Incentives

A key issue that must be addressed in Kenya is teacher motivation to participate in professional development workshops in the use of technology. While so-called 'champion teachers' will request and seek out professional development opportunities in the use of technology, the vast majority of teachers will not. Teachers are generally reluctant to change their teaching styles and habits, are cautious of time-consuming activities that may take away from other high-priority obligations (economic, familial or educational), have difficulty in seeing the potential pay-off beforehand of this kind of training, and may feel genuinely threatened by technology such that they want to distance themselves from it rather than embrace it. Incentives, both extrinsic and intrinsic, which could be used successfully to motivate teachers to participate in professional development ICT workshops, include the following: certification of training by Ministry of Education, public recognition and time allocation by supervisors, reduced isolation and increased Professional Satisfaction, enhanced productivity and opportunities to become a Trainer of Trainers.

Continuous Professional Development programmes should emphasize technology integration and interdisciplinary collaborative projects as the main topics for teacher training, and tie ICTs use to the development of basic skills in students. The teacher is responsible for establishing the classroom environment and preparing the learning opportunities that facilitate students' use of technology to learn, communicate, and develop knowledge products; consequently, it is critical that all classroom teachers are prepared to provide their students with these opportunities. Teacher preparation programmes must provide technology-rich experiences throughout all aspects of the training programmes.

Teachers must be prepared to empower students with the advantages technology can bring. Schools and classrooms, both real and virtual, must have teachers who are equipped with technology resources and skills and who can effectively teach the necessary subject matter content while incorporating technology concepts and skills. Real-world connections, primary source materials, and sophisticated data-gathering and analysis tools are only a few of the resources that allow teachers to provide heretofore unimaginable opportunities for developing their students' conceptual understandings.

Traditional educational practices no longer provide pre-service teachers with the skills necessary to teach students to survive economically in today's workplace. Teachers must prepare their students to apply strategies for problem solving, and to use appropriate tools for learning, calculating, collaborating, and communicating. ICT competencies must be integrated into the curricular and pedagogical content presented, preparing teacher candidates to create the new learning environments. The curriculum for teacher educators is often rich with strategies for presenting subject matter and pedagogy; however, it may be lean in terms of integrating technological tools for supporting that learning. Consequently, curriculum developers for teacher preparation programmes must be vigilant in identifying appropriate ways to apply ICT tools throughout the coursework and experiences planned for pre-service teachers.

The most critical factor in the successful integration of ICTs into teacher education is the extent to which the teacher educators have the knowledge and skills for modelling the use of ICTs in their own teaching practices. To enable them to develop these skills requires a well-conceived and sustained programme of professional development. This section focuses on the professional development of teacher educators and the programmes for which they are responsible, such as pre-service programmes and certificates for practising teachers.

6 Strategies Useful for CPD

Countries that have initiated efforts to infuse ICTs into teacher education have found four professional development strategies helpful in successful technology integration. First, professional development needs to focus on teaching and learning rather than on hardware and software. It should be designed by first considering what student teachers are expected to know and be able to do in a specific discipline, and then infusing ICTs into the learning process so that acquiring the knowledge and skills is more efficient. Second, professional development is practically useless unless leaders and teacher educators are provided with access to technology resources and have the time and support—when needed—to apply the new knowledge and skills that they have learned. A just-in-time approach to professional development is a model that works well. In this approach, professional development is provided to teacher educators when they have a need or opportunity to use a specific technology tool or application to enhance learning. Third, professional development in the use of ICTs is not a one-time activity. To keep current with new developments means that professional development in ICTs must be an ongoing process.

A further strategy for professional development is to start in a small way. Start by providing professional development in the use of ICTs to a small group of teaching staff. Perhaps this group will have volunteered or demonstrated that they have basic ICT competencies for personal use, or have expressed personal interest in using ICTs in their teaching. Working with this small group allows the professional development staff to determine the specific interests and needs of the teacher educators and what works best in the professional development process. Based on this experience, professional development may be provided to other small groups of faculty, thus expanding and refining the professional development efforts.

The opportunities for ICTs to create new paradigms of teaching and learning will depend largely on leadership and a shared vision, and on appropriate and continuing professional development. The planning and implementation of ICT-related professional development of teacher educators should be led by a planning group that includes representation and expertise from teacher educators, programme administrators, teachers, school administrators, technology experts, and business leaders. The diverse perspectives of the group should provide an understanding of the realities of the classroom, new views of the teaching-learning process, knowledge of the array of technologies that may be used to enhance learning, and community opinions.

An important aspect of professional development is not only enabling teacher educators to understand and use ICT tools in their teaching practices, but understanding how technology coupled with new approaches to teaching and learning, may enhance student learning. Many teacher educators recognize that approaches to education are changing and that new technology has the potential to improve education and student learning. They may also recognize the implications of increasing use of technology in society and employment, including employment directly related to their own disciplines and content areas. Less obvious are the implications for literacy and numeracy at the core of the educational process, and the need for teacher educators themselves to model good practice in their teaching so that their students can easily transfer these strategies into their own teaching practice. Teacher educators are experts in a domain, and it is important to respect this domain while helping them to revitalize and modernize their teaching with ICTs.

7 Framework for CPD of Teachers in ICTs

This study has recommended Teacher Knowledge Technological Pedagogical Content Knowledge (TPACK) as the framework for continuous professional development in ICTs. Teachers must consider the different knowledge domains

they bring to the classroom that impact teaching and learning strategies they use and ways in which they choose to integrate technology into the classroom. Historically, teacher education has centred on content knowledge and pedagogy. Shulman (1986) provides an analysis of these components (pedagogical content knowledge) and stresses the importance of them working together rather than separately. Hughes supports him and adds technology as another component of knowledge that is needed by teachers. In 2006, other scholars, Mishra & Koehler discussed in-depth the conceptual and theoretical framework of technological pedagogical content knowledge (TPACK). More research is still going on.

TPACK captures some of the essential qualities of knowledge required by teachers for ICT integration into classroom practice. Technological pedagogical content knowledge is an understanding that emerges from an interaction of content, pedagogy and technology knowledge. TPACK is the basis of effective teaching with technology and requires an understanding of the representation of concepts using technologies, pedagogical techniques that use technologies in constructive ways to each content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems; knowledge of student's prior knowledge and theories of epistemology and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones (Koehler & Mishra, 2006).

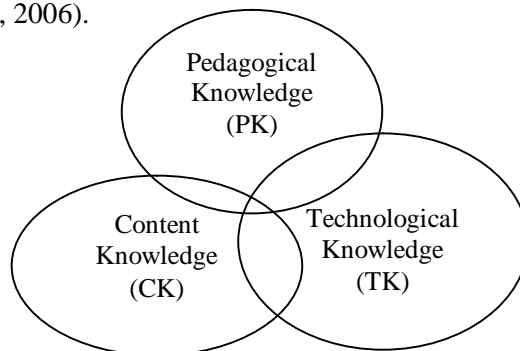


Figure 2: Technological Pedagogical Content Knowledge Model (TPACK)

Teachers require a combination of content, pedagogy and technology knowledge. The teachers must understand more than technology alone and more content alone. Teachers need to plan their lessons by using the Technology Integration Planning Model (TIP) for teachers. This model has six phases which outline a set of planning and implementation steps that help ensure that technology use will be meaningful, efficient and successful.

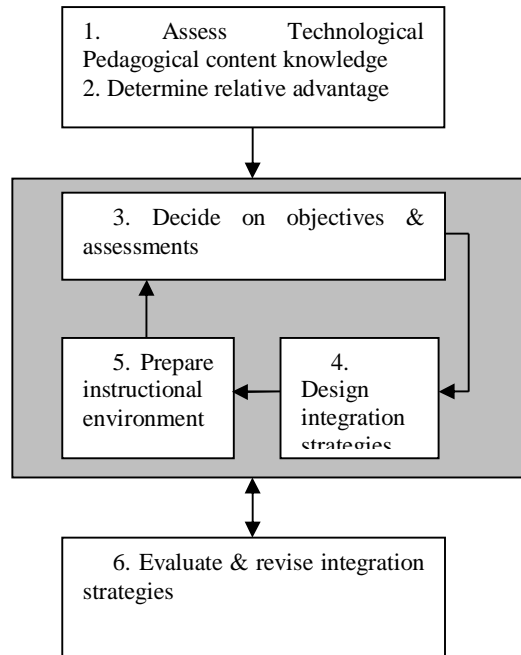


Figure 3: Technology Integration Planning Model

With the goal of enhancing a learning experience in a meaningful manner, technology integration follows a three-step process: planning the integration, implementing the integration and evaluating the integration. At each stage, several questions are asked. At the planning stage, the following questions are asked:

1. What are the goals of the current learning experience?
2. What is the content that learners need to learn?
3. Who are the target learners and what background knowledge and experiences do they have prior to the learning experience?
4. Are the learners motivated to learn this content?
5. How could learner motivation be increased and sustained?
6. What are the possible ways the learning could be experienced by the learners?
7. Where and under what condition should the learning experience occur?

At the implementation stage, the following questions are asked:

1. What are the potential types of technology most applicable to this learning situation?
2. What are the benefits and costs from selecting and using each of these potential technologies?

3. What are the steps and sequence involved in the integration of ICTs within the specific learning experience?
4. Who will implement and monitor the use of technologies within the target learning experience?

Evaluation phase which determines the effectiveness of the technology integration of the technology integration has the following questions:

1. To what degree did the implemented ICT enhance the learning experience?
2. What procedures should be followed to evaluate the impact of the enhanced learning experience?
3. What types of feedback would help optimize use of the technology.
4. What key obstacles to integration need to be addressed/ overcome?

The rapid infusion of technology into schools requires a new generation of leaders who are able to use the new tools to enhance their own productivity and decision-making activities and who understand the importance of integrating technology into the learning process. Leadership is often the most important factor in the successful integration of ICTs into the schools' instructional practices and curriculum. Research has shown that without effective and supportive leadership, changes in the teaching-learning process and widespread, effective uses of technology in learning are not likely to occur.

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ICT and Decision Making in Universities in North-Central Geo-Political Zone, Nigeria

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Abstract. This study investigated the use of ICT for decision-making in North-Central Nigerian universities. It adopted a correlation design, in which four out of the seven federal universities were chosen, using stratified random sampling techniques. A total of 240 participants responded to an instrument entitled: ICT and Decision-making Questionnaire. The data collected were analysed using means, frequency counts, percentage, rank ordering and chi-square. Findings revealed that printing ICT equipment were adequate while electronic equipment were fairly adequate in the universities. In addition, ICT has been effectively utilized for decisions on studentsø registration procedures and budgeting. Inadequate funding and ICT equipment were ranked topmost among problems of ICT in the universities. Based on the findings, recommendations towards more effective deployment of ICTs in the universities operations are made.

Keywords: Decision making; Nigerian universities; ICT.

1 Introduction

There are increasing societal demands on Nigerian modern educational institutions for good results in terms of the functionality of the type of education given. University education in particular is looked upon for meeting the manpower needs of the country. Thus, universities are complex organisations with multiple goals which are accomplished through their major roles of teaching, research and community service (FRN, 2004).

The more complex an organisationø structure is, the greater the need for coordination within and between sections and departments. However, central to the needed coordination is information. This view is buttressed by Ekwere (1990) that the information needed for effective decision making in universities cannot be provided from peopleø often deficient memories. To be effective

therefore, a university needs a system that creates knowledge, stores the knowledge so created and established to ensure continuity of thought, reason and adaptive academic pursuit; and recall at will and disseminate the stored knowledge or information for use in taking decisions which are in the interest of the society at large (Adedipe, 1995).

In the university system, information is supplied to people both within and outside the system. Information is made available on:

1. Degree offered;
2. Courses/departments/faculties available and their requirements, to parents and prospective students;
3. Consultancy services to be rendered to people within and outside the university campuses;
4. Plans and performance standard to the government through the National Universities Commission (NUC).

For the Nigerian university system to meet the manpower needs of the country, relevant and timely information is needed in some areas on which to base decisions on its activities. Such areas include:

1. Demographic data on potential secondary education output;
2. Student population, composition, socio-economic background, male/female ratio, assessment of academic progress;
3. Staff categories, salaries, workloads, evaluation, updating of knowledge;
4. Accounting data, both for planning and operational purposes;
5. Data for evaluation of curricula and teaching methods;
6. Utilization and relative utility value of services such as material resources and student welfare services.

1.1 Theoretical Background

ICT is part of today's reality and should be accessible to all categories of people in educational institutions at all levels. Information and Communication Technologies are defined as a set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information (UNDP, 2000). Such technologies include radio, television, video, DVD, telephone, satellite systems, computers and network hardware and software as well as the equipment and services associated with these technologies such as video-conferencing and electronic mail (UNESCO, 2002).

Information is knowledge, communicated by others or obtained by study and investigation, upon which intelligent action is based. The function of information is thus to reduce the amount or range of uncertainty under which decisions are made. In the opinion of Oyeboade (1997), effective information

management processing, flow and utilization are vital to the survival of any organization. This is more so in complex organizations like the universities. For organizational members to achieve the desired interdependence towards goal attainment there must be effective communication channels.

Decision making is an integral part of the management of any organisation. As such, the quality of managers' decisions is the yard stick of their effectiveness and of their value to the organisation. Ogunsaju (1990) posited that solutions to administrative problems can only be provided through the process of decision-making. A decision is a choice made from, at least two alternatives, making the choice only part of the decision-making process. According to Swann (1993), decision-making is an interactive process involving the recognition of an opportunity or a problem, obtaining data, understanding the information content, seeking alternatives, evaluating them, making choices and implementation.

Decision-making process is influenced by many factors, including information on the organisation's internal and external environments, and managers' ability and motivation (Libby and Luft, 1993). In the same vein, Cowan (1991) concluded that decision-making starts with the initial recognition of a problem, or an issue that is worthwhile making decision about, through the collection of data, the identification of the real situation, the development of alternatives, and the evaluation to the final choice that is implemented and controlled. Thus, as elucidated by Donnelly, Gibson and Ivancevich (1995), the sequence of events that lead to effective decision include problem identification, developing and evaluating alternatives, choosing the best alternative, implementing the decision and monitoring the decision using the built-in information (control and evaluation).

Within the Nigerian university, decision-making procedures start with information emanating from the different departments and units. The information (both on academic and administrative matters) is passed to the administration for necessary action. The universities make use of committee system in taking decisions. It is however, crucial that deliberations, recommendations and ultimate decisions should be based on accurate, comprehensive and up-to-date information, if they are to be effective.

Therefore, for effective decision to evolve in the university system, receiving information from, and supplying to people within the system, is a necessity (Alabi, 1999). The information so communicated must be accurate and up-to-date to cope with uncertainty (Stahl, 1995). There is therefore the need for effective ICT to ensure effective decision making.

1.2 Rationale for the Study

Information has become the sixth major corporate resource, assuming a value just as any of the 5M's – Money, Material, Machines and facilities, Men (people) and Management (Thierauf, 1987). Hence, information must be planned, preserved, protected, controlled and utilized maximally, as these other resources. So, considering the globalized nature of the society brought about by information explosion, there is the need to ensure that Nigerian universities, as the citadels of learning, employ effective ICT. This would enable the universities to base their major decisions on relevant, appropriate, timely information for global competitiveness of their process and outputs.

1.3 Statement of the Problem

In view of the complex nature of Nigerian universities, availability and effective use of ICT are imperative. Effective generation and use of information is necessary for the universities to develop good plans, policies, programmes and activities towards the achievement of the goals of university education in the country. The concern of this study is on the existing ICT and the extent to which information generated there from is put to use in deciding on the different aspects of university administration.

1.4 Research Questions

1. How adequately equipped are the Nigerian universities in the North Central zone in terms of ICT equipment?
2. Are administrative decisions on programmes and activities based on information from ICT?
3. What problems do Nigerian universities encounter in generating information and utilizing the information generated by the ICT?

1.5 Research Hypothesis

There is no significant difference among students, lecturers and senior administrative staff in the use of ICT in decision making on student personnel services.

2 Methodology

The study was designed to examine the use of ICT by Nigerian universities for decision making on students' personnel services and budgeting. Using stratified random sampling technique, four federal universities were chosen out of the

seven in the North Central Geo-political zone. These were universities of Ilorin and Abuja, Federal university of Agriculture Makurdi and Federal university of Technology, Minna.

A total of 240 participants comprising 100 lecturers, 60 senior administrators and 80 student leaders responded to questionnaires entitled ICT and Decision-making Questionnaire (ICTDQ) I, II and III for students, lecturers and senior administrative officers, respectively. The instruments consisted of items to indicate available ICT equipment and the use of ICT for decision-making on student personnel services and budgeting. Available ICT equipment investigated included Electronic (Computers, Telephones, Telex, Fax, E-mail and Communications Satellites and Radio) as well as Printing such as Postal Services, Administrative Files and Publications (Handbooks, Bulletins, Brochures etc). There were items to determine the use of information generated from ICT for Budgeting, Student Services such as Programme Application and Courses Registration, Examination Conduct and Results, and Hostel Accommodations. The reliability of the questionnaires was ascertained through test re-test method within a three-week interval, with reliability coefficients of 0.83, 0.89 and 0.81 for ICTDQ I, II and III, respectively.

Descriptive statistical methods of frequency counts, mean, percentage and rank ordering were employed to answer the research questions raised in the study, while chi-square statistical method was used to test the hypothesis at .05 significance level. A NORM was set at 50% for adequacy of ICT equipment. The results of the analysis are presented on the basis of research questions raised and the hypothesis formulated as follows:

3 Findings

Research Question 1: How adequately equipped are universities in the North Central Geo-political Zone, Nigeria?

Table 1: Adequacy of MIS Equipment in the Universities (N=240)

Variable	Adequacy					
	Very Adequate		Fairly Adequate		Not Available	
	f	%	f	%	f	%
Electronic	76	31.6	144	60.2	20	8.3
Printing	167	69.5	73	30.5	0	0
Combined	205	85.3	35	14.7	0	0

Results from Table 1 indicate that MIS electronic equipment such as computers, telephones, intercoms, Telex, fax, e-mail and communications satellites were adjusted by most respondents as fairly adequate 144 (60.2%). Postal services, publication and administrative files were adjudged very

adequate 167 (69.50%) while combination of both electronic and printing equipment were rated as very adequate 205 (85.3%).

Research Question 2: Are administrative decisions on student personnel services and budgeting based on information from ICT?

Table 2: Use of ICT in Decision-making on Students' Personnel Services and Budgeting

Variable	Students		Lecturers		Senior Administrators		Remarks
	Mean	%	Mean	%	Mean	%	
Student Personal Services							
a) Registration Procedures	4.156	51.95	4.567	57.09	4.781	59.76	Effective
b) Conduct of Examination	3.400	37.77	4.00	40.00	4.47	48.06	Ineffective
c) Release of Examination Results	3.10	34.67	3.49	43.82	3.575	48.81	Ineffective
d) Allocation of Hostel Accommodation	3.906	39.72	3.35	43.76	3.944	43.82	Ineffective
Budgeting	NA	NA	NA	NA	3.033	60.66	Effective

Note: NA means Not Applicable

Research Question 3: What problems do Nigerian universities encounter in generating information and utilizing the information generated by the ICT?

Table 3: Rank order of the ten most prominent problems of ICT in Nigerian universities

Problem Statement	Mean	Rank
Poor support from management	3.133	5
Poor support from university staff	3.190	4
Inadequate funding of ICT	3.762	1
Inadequate ICT equipment in the university	3.620	2
Inadequate qualified personnel for ICT Operation	3.010	6
Poor communication network	3.267	3
Inadequate security for stored information	2.690	9
Lack of customised software for the use of the university	2.860	8
Inadequate literacy in computer by key university officers	2.910	7
Ignorance of ICT knowledge by university personnel	1.890	10

Research Hypothesis: There is no significant difference among students, lecturers and senior administrative staff in the use of ICT in decision making on student personnel services.

Table 4: Use of ICT on student personnel services among students, lecturers and senior administrative staff

Items	Lecturers	SA*	Students	Total	df	X ² Value	Sig.	Remark
Registration Procedure	28	18	32	78				
Conduct of Examination	18	15	21	54				
Release of Examination	35	14	17	66	6	9.183	0.167	Not Significant
Allocation of Hostel Accommodation	19	13	10	42				
Total	100	60	80	240				

* Senior Administrators; P=0.167

Table 4 shows that there was no significant difference ($X^2 = 9.183$, $df=6$, $p>.05$) among students, lecturers and senior administrative staff in the use of ICT in decision making on student personnel services.

4 Discussion

Table 1 shows that electronic ICT equipment are adjudged fairly adequate by 60.2% of the participants in the universities in North Central Nigeria, while printing equipment were adequately available (69.5%). Combination of both electronic and printing equipment gave a very adequate availability (85.3%). This general inadequacy of ICT electronic equipment does not augur well for effective decision-making based on accurate and timely information (Alabi, 2000). This equipment is compulsory for any successful ICT-driven programme (Trotter, 2001).

Table 2 reveals the use of ICT-based information for decisions on students personnel services and budgeting in the universities. Only registration procedures and budgeting had relative effectiveness in the use of ICT (average percentages of 56.27 and 60.66, respectively). Information on examination process and results as well as allocation of accommodation to students has not been effectively based on electronic ICT. It is noteworthy that applications into Nigerian universities are done online. Registration of courses in most of them is also online. However, internal examinations are mainly through Pen-and-Paper Testing (PPT) method. With the exception of university of Ilorin that employs Computer Based Testing (CBT) for, on the average, 88 courses per session (Alabi, Issa & Oyekunle, 2012). In addition, allocation of hostel accommodation to students at the University is done online with some degree

of objectivity and fairness. Admission and registration procedures usually done online, have brought a lot of improvement to the admission into the Nigerian universities (Blurton, 2002).

Table 3 gives the rank-order of the problems confronting ICT operations in the universities. These problems ranged from inadequate funding and ICT equipment, poor communication network to inadequate human resources capacity to exploit the technology. This finding corroborated The National Governors Association (2002) that listed as constraints to ICT operations in education, lack of: ICT infrastructure, affordable connectivity with sufficient bandwidth, and a reliable supply of electricity. The three most important goals of university education ranked by academic staff were teaching postgraduate and research (Oduwaiye, 1998). Hence, students, according to Baldrige (1991), are at the centre of all the activities and programme of the university. In practical terms, the activities include admission/registration of students, examination administration and certification. However, as important as student certification is, prompt grading and timely release of examination results, which precede certification, is rated as inadequate. The poor support from management could emanate from the perspective of funding and policies, while the poor support from staff could be due to inadequate computer education. Lack of customised software and inadequate security for stored information in computer ranked 8th and 9th, respectively.

Table 4 implies that there was no significant difference among students, lecturers and senior administrative staff in the use of ICT in decision-making on student personnel services. It can be deduced from the results of the analysis that lecturers, senior administrators and students are exposed to the use of ICT in student personnel services. There is no gainsaying the fact that ICT has become a natural part of man's daily life; hence, its effective use in the university system is becoming a necessity (Galbreath, 2000). Sule and Akinnubi (2012) submitted that lecturers' roles and responsibilities in their work place can be enhanced through effective use of ICT. Gbadamosi (2006) noted that ICT is a factor that can promote quality instruction and administration in higher education. Also, communication is a fundamental act of the education process. Therefore, to enhance effective decision-making in Nigerian universities, adequate attention must be given to the use of ICT.

5 Conclusion

ICT is part of today's reality and should be accessible to all categories of people in educational institutions at all levels. However, in spite of the global awareness for ICT-driven sectors of the economy, especially the education

sector, much is still expected of the university system in the area of procurement and use of ICT equipment for the crucial decision areas of university administration. Such important areas involve student services and overall budgeting of the university system.

Universities in North Central Geo-political zone of Nigeria have fairly adequate electronic ICT equipment. Probably due to this, there is ineffective use of ICT for decisions on student personnel services of examination conduct and release of results as well as accommodation. However, decisions on admission/registration procedures and budgeting are based on ICT.

6 Recommendations

The use of ICT, specifically CBT is recommended for examination of courses to ensure prompt and timely release of students' results. These results are needed by students (and their parents too) to know their performances and where to proceed, based on these performances.

Software is the medium of communication with the computer, using the machine language. Hence, for utilizing the full capacity of the computers in taking care of specific areas of operation of each university, there is the need for development of customized software.

Any form of ICT development is capital intensive. As necessary inputs to effective management systems in the universities, computers and their accessories as well as other related technologies such as telephone system, telex, fax and e-mail services need to be provided, to ensure appropriate and adequate dissemination of necessary information within and outside the university system.

In each university, there is the need for a common database of objective and systematic information on which to base decision on students' services. For instance, allocation of halls of residence to students should be online for objectivity and on faculty basis, so as to bring about useful interaction and exchange of ideas and knowledge among the students of various disciplines.

Though ICT is effectively employed for budgeting in the universities, budgetary procedures can still be improved. To encourage more allocation from governments, it is recommended that uniform accounting system which seeks to organise and harmonise methodically the financial records of all the universities should be introduced using appropriate software.

As it is the practice at the University of Ilorin, CBT should be employed for assessing students in the university-wide and faculty courses. With time, CBT should be extended to all courses.

It is also recommended that every university should emulate the University of Ilorin in establishing an FM Radio Station. The University of Ilorin 89.3 FM station is used in disseminating crucial information on administrative and academic activities to the University community. Lectures and explanations on general and specific university courses such as English Language and General Studies are delivered on the Radio. The Radio station delivers educative, informative and entertaining programmes to the entire university community and its environs.

As any form of ICT development is capital intensive, other Nigerian universities should learn from the University of Ilorin by involving private organisations as partners in progress to finance CBT.

For a successful ICT-driven decision making process, there must be a properly focused and consistent ICT policy orientation in each university to support building of pervasive ICT infrastructure, focused capacity building in human resources and favourably enabling legal, regulatory and policy environments. Towards this end, staff and students of the universities need adequate competencies in computer skills through adequate computer skill acquisition training programmes.

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A Project-based Learning approach for teaching Robotics to Undergraduates

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Abstract. In this research we used a project-based learning approach to teach robotics basics to undergraduate business computing students. The course coverage includes basic electronics, robot construction and programming using arduino. Students developed and tested a robot prototype. The project was evaluated using a questionnaire. The evaluation result shows that students developed skills in circuit design, problem-solving and robot development for addressing real world problems and team work. The students had challenges of using limited resources for robot circuit design and construction. The research results indicate that robotics education through project-based learning motivates students to learn and implement computer artefact that addresses real world problems.

Keywords: Robotics; Project-based learning; ICT.

1 Introduction

Robotics is a fascinating discipline that easily engages computing students. Educational robots are stimulating and motivating (Soto, Espinace & Mitnik, 2004; Hamblen & Hall, 2004; Alves et al, 2011; Howard & Graham, 2007), there are good reasons for introducing robotics activities very early in course curricula, and this allows students to easily perceive the relationships between undergraduate courses, in their theory and practice.

Experience has shown that better learning happens when students are engaged and motivated (Galvan, Botturi, Castellani & Fiorini, 2006; Mok, 2012; and Pink, 2009). According to Alves et al (2011), robotics can be used as a motivating element, and Rawat and Massiha (2004) verified that student feedback after robotics class was overwhelming positive. Educational robotics recommends the use of robots as a teaching resource that enables inexperienced

students to approach topics in fields unrelated to robotics. One of its objectives is to aid students in building their own representations and concepts of science and technology, through the construction, handling and control of robotics environments, as well as through collaboration teamwork. The main idea is that knowledge is constructed rather than being discovered, and that students' learning significantly improves when they participate in building something meaningful to themselves. These approaches are based on educational theories such as Piaget's constructivism (Piaget, 1967).

1.1 The significance of robotics education

Science and technology have gained popularity among the youth today. These disciplines when introduced earlier in education can motivate students to develop careers in science. With progress in technology, the accessibility of robotics to children in lecture room has improved. Two decades ago, robotics kits for students were limited to simple structures and motors but now they include a multitude of sensors and motors as well as the interface with desktop computer to allow for robust programming experiences, all at affordable cost making them accessible to the classroom.

Kits in classroom learning are valuable in classrooms and they help to attain the following:

- 1) *Hand-on learning and engagement:* Students of all ages enjoy hand-on construction activities. In these practical activities children demonstrate competence in many different subsystems that involve structure, motion, sensors, programming, and manipulation; these bring opportunities for them to find something that suits their particular interests.
- 2) *Problem solving and training for future careers:* Robotics enables students to become problem solvers as they develop robots that have well defined tasks to accomplish before the actual construction of the robot begins. The design process used by engineers begins with understanding the capabilities and limitations of their tools and equipments, researching and getting to understand the existing problem, conceptualizing a solution to that problem, constructing the envisioned solution, testing the solution to find its performance, and revising the solution based on this performance.
- 3) *The inclusion of a computer programming allows for deeper understanding into issues such as remote sensing, control, and autonomous functioning.* The issues faced when constructing and building a robot promote better appreciation of what nature achieves in smaller and lighter packages.
- 4) *Creative ways to keep the learning going:* Many projects in robotics have been successfully developed children using robotics kits in lecture room or laboratory settings. Some of the projects worth noting include:

- a) *Adaptations*. Here students develop complete robots using minimum resources given in the robot kit. The design should not sacrifice speed and other important functional requirements of the robot.
- b) *Genetics*. The structure of an organism is determined by the components that comprise it. The students need to spend some time to study the components of an organism and after that they should come up with a challenge and construct a robot to address the challenge.
- c) *Language arts*: Writing of project manuals, technical manuals, documentations can be incorporated into robotics project, and the outcome can be posted on the Internet to add an additional technology element to the project.

1.2 Research Motivation

Robotics education has not been implemented in institutions of higher learning in Uganda. This has created digital divide in this ICT discipline between Uganda and other countries where robotics is taught and robots are practically developed by students in laboratories. Students can creatively apply robotics knowledge and skills to solve real world problems. In this project, a group of students construct and test a robot to demonstrate how robots can save mankind in difficult situations like earth quake, flood, war and other natural disasters. The major objective of this research was to develop working prototype of a robot using project-based learning approach in order to demonstrate the capability of robot to solve real world problem. In particular, the requirements necessary and available for design of a robot were established; the robot prototype was developed and tested to demonstrate the functionality of the sensors. The research has created robotics education awareness in the student community and it has also demonstrated application of computer technology to solve real world problems.

2 Methodology

2.1 Project-based Learning

Project-based learning or problem-based learning is defined as a learner-centred approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem (Savery, 2006).

In a traditional learning environment, students are taught a new course using lecture approach. After introducing a problem, a project is then given to

students to find solution either in the lecture room or in a laboratory, based on the course already taught. On the other hand, in a project-based learning, real world problems or projects are first presented to the students and these problems or projects become the focus for teaching and learning directed by a teacher. The students begin to learn specific subjects and attain generic skills to solve problems or do those projects.

Project-based learning provides students with generic professional skills such as problem-solving ability, team skills, and the adaptability to change, communication skills, self-directed learning, and self-assessment skills (Woods, 1995).

A project-based learning approach has proved to be successful in teaching engineering courses as it provides a successful mechanism to help students achieve high-level learning goals and deal with real problem-solving activities. In project-based learning, the instructor has a less central role, and students are more responsible for their own learning, which results in higher learner-centred approach in the learning environment (Andersen, 2002).

In this research project, students developed a rescue robot using problem-based learning approach. The students were first introduced to basic electronics and circuit design, this was followed by programming of robot actions using arduino open source software development environment. The students assembled the components of a robot to get a working robot prototype shown in Figure 1:

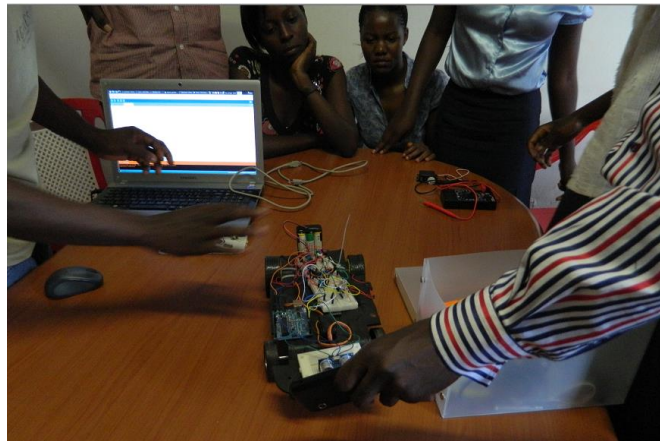


Figure 1: Robot development

2.2 Electronic Components for Robotics Project

The electronic components which were used by the students to develop the robot prototype are shown in Table 1.

Table 1: List of used electronic components

<ul style="list-style-type: none"> • 2 x Arduino Duemilanove • 3 x Breadboards / Prototyping boards • ~ 50 x Jumper wires • 16 x Rechargeable batteries • 3 x Battery cases • ~30 x Leds (different colours) • ~50 x Resistors (different sizes 100ohm - 100K ohm) • ~20 x Capacitors (different sizes) • 3 x 5V Regulators • 3 x Photoresistor 	<ul style="list-style-type: none"> • 1 x Thermoresistor • ~ 20 x Diodes • 4 x L293D motor controller • 4 x DC-motors • 4 x Servo motors • 6 x Switches • 2 x Ultrasonic sensor • 1 x Liquid crystal display (16x2) • 2 x Potentiometers (10K ohm) • 10 x Transistors (NPN) • Piezo buzzer • 4 x Buttons
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2.3 Development environment: Arduino

Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments. Arduino can sense the environment by receiving input from a variety of sensors and can affect its surroundings by controlling lights, motors, and other actuators. The microcontroller on the board is programmed using the Arduino programming language (based on Wiring) and the Arduino development environment (based on Processing). Arduino projects can be stand-alone or they can communicate with software running on a computer. We chose to use Arduino-board because of the easiness of use. It is fast to get in and learn. There is also great amount of material that can be freely found from internet. Most of the materials are constructed by common hobbyists working for the benefit of the community. This material was also used in explaining the opportunities within Arduino's environment. "The open-source Arduino environment makes it easy to write code and upload it to the input/output board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and other open source software. In Arduino's website there is a free programming environment provided. Environment contains all the essential tools for getting started with Arduino development.

3 Evaluation of Project-based Learning for Robotics Education

The project was evaluated using questionnaire with open-ended questions. The evaluation results show that students acquired skills in electronic circuit design, programming, problem-solving and robot assembling. The students are also ready to promote robotics education among the students' community by

creating awareness of the value of robotics in society. The evaluation results are summarized in the section below. The following is the evaluation criteria.

1. Purpose of the course
2. Knowledge/skills gained
3. Opportunity to study robotics
4. Challenges experienced in robotics project
5. Suggestions for course improvement
6. Robotics course awareness creation
7. Robotics applications for development
8. Robotics learning resources

3.1 Purpose of the Course

The students were asked to state the purpose of the course they had done in the project-based learning activities. This was asked to test their appreciation of the course and to find out their individual aims in the course. The following responses were given:

1. "To equip us with necessary skills up and beyond what we were studying."
2. "To equip us with robotics building and programming skills."
3. "To learn basic electronics and how implementing natural science to help improve our daily lives."
4. "To equip me with the basic knowledge about robotics. Like what they can do, the different tools used in designing them, and also to be able to come up with a robot on my own and also pass on the knowledge to other students."
5. "To introduce the concepts of robotics that is to say the coding of a robot, the basic components to use in assembling a robot, how to connect the different parts in order for the robot to work smoothly."
6. "To equip students with the knowledge of how robotics are developed and their purpose in the community."

3.2 Knowledge and Skills Gained

The students were asked to list everything they learned in the course. This question was asked to find out the skills gained and knowledge acquired by students in the two and half months of the project. The students responded with the following statements in quotes:

- "I learned how to program robots."
- "I learned to use arduino software environment."
- "I covered some electronic basics."
- "Robotics technological environments like operating a robot from a distance e.g. the mars rover project."

- I have managed to learn programming in C++ using arduino and some bit of java programming.
- I have got knowledge about basic electronics and how some of the appliances we use work.
- My knowledge sharing skills have been improved through consulting and passing on the different ideas to other group members.
- I have learnt how to work as a team and how to assign tasks to different members so as to achieve the set objectives within a particular period.
- I have been equipped with teaching skills through explaining to the team members the different ideas and basics that I had acquired from the different sources.
- I learned to unite and share different ideas from other students within the project to come up with a final robot we all needed to design using the different tools. For example we used arduino and blink application through their libraries and examples (my servo, blink, distance) during the coding session. I was able to upload the different codes into the arduino raspberry board which was connected to our simple robot so that it could execute the different tasks assigned to it.
- I connected different parts like the servo motors which cause the turning effect and DC motors, resistors, light emitting diode, light dependent resistor (to measure the reflection of light), diode, switches, sensor (SRO4), regulator, resistors, L293D, masking tape using the different wires on to the board.
- I used the soldering machine to solder different wires on the switches, used the multi-meter to measure the voltage and amps for the resistors.
- During the connections I should always ensure the board is not powered to prevent the circuits or instead use diodes in case of any wrong connections.
- Online controlling of a robot in Finland while following and basing on the compass direction, humidity and spectrum to detect the magnetic fields.
- I have learnt that making/establishment of a robot is not a hard task therefore to be left for only the white people but we the black people can manage to establish our own robots.
- I have also learnt that a robot does not only mean a moving metallic artificial creature in form of a human being but it can also be in any other form.
- I have also learnt that in order to code a robot to move and do some tasks, you need not to be familiar with a lot of many programming languages but depends on some one's commitment.

- On addition to the above, I have learnt the different basic components to be used in assembling a robot, their names, their purposes and how to connect them in order to achieve my goal.
- I have also learnt how to code /program a robot according to what I want my robot to do. This involves an understandable programming format, as well as the commenting of the code for easy usage or makes it easy to understand what the code does.
- I have learnt that a human is capable of doing anything so long as there is teamwork and cooperation among the people involved in the activity. For example we were in position to come up with a simple rescue robot due to teamwork and cooperation.
- I also learnt the coding of the programs using languages like python, visual basic and c ++ in order to come up with a working prototype.
- I also learnt how to connect various components like the led, the sensor, motors, connecting wires, resistors and jumpers among other components.

3.3 Opportunity to Study Robotics

An opportunity to study robotics in projects was also investigated. The students were asked whether they would be willing to participate in more robotics projects in the future. The following were the responses given to the question:

- I really feel and believe there is so much more I can do apart from this. The sky is the limit.
- Yes I believe I can develop a robot which can monitor a particular area.
- Yes! If I have all the basic parts I can educate the other students who are not part of the group the basics of robotics.
- Yes I feel there are other projects I can do in future apart from what I have done. For instance in future when I have enough funds, I want to start a project on establishment of a more advanced robot.
- Yes, I feel I can come up with a robotic that can be used in organizations to deliver products to their different destinations. Like papers from one office to the other.
- I feel I can also come up with a robotic that can be used in hospitals to take medicine to respective patients and it can help in cleaning the hospital.

3.4 Challenges Experienced in Robotics Project

Students were asked to give challenges they experienced when learning robotics. The responses given include technical issues, personal challenges and infrastructural challenges. The following were the students' statements:

- òI had no laptop yet it was an essential requirement on the programming side of it. There were a few parts available for all of us. The time of study sometimes conflicted with personal obligations.ö
- òLimited internet access which slowed down the learning process.ö
- òInsufficient materials to implement all the Ideas that I had and those from the club members.ö
- òLimited time that was allocated to the project since it was running within the semester (at the same time with school programs).ö
- òA power shortage since my laptop's standby battery is not functional.ö
- òI was not much familiar with most of the parts òelectronicsö and I had less physics knowledge. So at first I found a lot of hardships in the connections and also coding in arduino was complex it needed a lot of time to understand the different steps.ö
- òThe connection of the different components was not easy at the beginning since it needed knowledge of physics. For example measuring of resistance among other thing that I was not familiar with.ö
- òThe components were not enough for the students to incorporate in the system prototype.ö
- òThe coding of the program involved using of c++ language, in which I lacked enough knowledge.ö
- òThe timing of the project was also unfavourable since it was conducted during the course of the semester hence we could not concentrate much in the project due to other academic work.ö

3.5 Suggestions for Course Improvement

The students were asked to give suggestions for improving robotics course. They expressed many issues mainly with limited resources for the course and having limited expertise to learn everything in robotics within the given short timeframe. The following responses were given by the students:

- òBy getting or making more research on the programs needed for robotics. By improving on my Arduino programming. By innovating other ideas on how to integrate robotics environments to business. More robotics parts to facilitate the building part of it. More time required for the robotics workshop. By putting up a robotics Club which can help in spreading the knowledge about robots and a whole.ö
- òI think we can improve the workshop through research and implementation of the various ideas shared over the internet.ö
- òThrough providing support as a tutor to train other members who might be interested in the project.ö

- "Share the positive ideas with different people with the potential to support the project."
- "Using the project as a source to solve some of challenges faced by the community I live in."
- "I would increase more working parts to be used at least an arduino to be used by a group of three to two students."
- "I would also award gifts to the best designers so that I encourage the others to work hard and acquire them."
- "I would also introduce the robotics basic knowledge to the young minds. E.g. students of o-level classes so that they grow up with the passion of doing it and understand more of the physics techniques since it works more with electronics."
- "The major and main challenge I faced while working in robotics was managing time for the studies and the robotics project."
- "The other challenge was lack of my own machine (laptop). This was also a challenge to me because I after leaving the workshop area I could not add or revise through what we had done that day."
- "The other challenge that I faced was learning how to code the arduino so that to enable the robot to work smoothly."
- "The project should be carried out during holiday such that the students have enough time for the robotic project."
- "More components should be available to the students in order to come up with a better prototype that can give to the end-users for evaluation."

3.6 Robotics Course Awareness Creation

The students were asked whether they would encourage fellow students to learn robotics. This was asked to find out the level at which they value robotics and how they can promote robotics education in the University. The following responses were given by the students:

- "It is one of the first things one can ever be involved in. It widens our innovation and technological scope. Students should make a way or even develop positive attitudes about robotics. Robotics can be the new centre of development."
- "I would advise all students especially computing students to take up robotics not only as a hobby but also as a way of acquiring hands on skills, more knowledge to support their computing carrier and competence and to put in practice what they have learnt."
- "I would advise them to have passion interest and patience in whatever robotic project they would be taking up. Because robotics education needs a clear mind which can generate different ideas, it's all about creativity and

most of the parts used in designing them are common and easy to work with. Though most people think to come up with a simple robot is something so hard *“wrong perception”*

- *“The advice I would give other students is that in case any other opportunity comes their way regarding robotics education, they should not let it pass because it makes them get familiar with technology since it’s the way to go.”*
- *“I would advise my fellow students to always come up with boldness whenever there is an opportunity to do anything for example in such a project. Student should not fear but instead just pick in interest in the research project.”*

3.7 Robotics applications for development

The students were next asked to suggest areas in which they feel robotics can be applied to determine solutions to real world problems. This question was asked to test the students’ problem-solving skills and technology applications to real world problems. The following responses were given:

- *“Robotics can easily become a very valuable investment tool under both the private and public sector. Employment explosion, which can increase on the standard of living. It can develop the export / import sectors (Trade). It can contribute to the work output and input in the corporate market.”*
- *“Technological advancement.”*
- *“I think Robotics can help to improve on the mode of education delivery where various models can be developed for demonstration purposes such as storytelling.”*
- *“Robotics can also promote the level of innovation among the citizens through modifying various equipment to suit their different needs hence reducing on the costs of importing such technologies or equipment.”*
- *“It can also help to reduce on the costs of living where people won’t have to always pay for the basic connections and repairs in their day to day domestic appliance.”*
- *“Robots reduce on tiresome, manual work in an organization since robots do not become tired.”*
- *“They can also be used to improve security measures.”*
- *“They also improve on communication in Uganda.”*
- *“I think robotics contribute in the development of Uganda when implemented in the information technology (IT) departments of Uganda.”*
- *“When robotics is implemented in the security areas of Uganda, it will reduce the use of manual labour therefore contributing to the development of the country.”*

- "In the manufacturing industry and this will ease work and same time hence increased output and quality in production."

3.8 Robotics Learning Resources

In the question we investigated the adequacy of the learning resources for robotics experiments in the project-based learning approach. Some students felt the components were enough for experiments while other expressed dissatisfaction with the availability of resources for learning. The following were the views of the students:

- "No, we did not have enough parts, but our lecturer in this case on project was so helpfully and made sure everyone is on the same page. So hope we can be able to get enough that's if we are to move on."
- "No. We did not have enough components to develop the prototype for example we had only four wheels."
- "Yes I believe we had enough components for learning the basics."
- "Yes! I think we had most of the equipment for learning basics in robotics, since we worked with the different components at a time."
- "To a larger extent the components were enough for learning the basics in robotics."

4 Discussion and Conclusion

Robot construction motivates students to learn robotics science. The students are enthusiastic to see the results of their work by developing and demonstrating a physical robot. Project-based learning approach was used in the research. The students were faced with the problem of developing a rescue car robot prototype. The students designed the robot circuit, programmed the robot actions, and constructed the physical robot using the basic electronic components, arduino, motors and sensors. This project was evaluated using open-ended questions in a questionnaire. The evaluation results indicate that during the project-based learning activities, students developed skills in circuit design, robot programming, problem-solving and collaborative work. Students very much liked to extend their basic robotics knowledge to an advanced one by doing more related projects. The students also face a number of challenges that include limitations in electronic devices for robot construction, limited programming expertise, and limited time for robotics learning since it was not a regular course on the teaching timetable. There is need to promote robotics education in universities. Institutions should invest in robotics hardware and skills development. Contextualized robots have not been developed to address

variety of problems in Uganda in the areas of health, agriculture, education, tourism, fishing, climate change, floods and landslides. Little research has been done on the use of robots for development.

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Do Graduates of General Education in Uganda possess Vocational skills?

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Abstract. Promoting vocational education and training is considered globally as one of the major strategies towards developing the human and social capital needed for sustainable economic growth and development. However, majority of students, particularly in the developing countries, enrol for general education programs that prepare them for white-colour jobs. A questionable aspect is whether these students have any vocation skills that would prepare them for job creation upon graduation. In this study, we provide insights into the level and patterns of vocational skills acquisition among general education students in Uganda. Our investigations are based on primary data obtained from 410 final-year undergraduate students of Makerere University School of Statistics and Planning, in the 2012/13 academic year. A low level of vocational skills attainment was found to characterize the graduates of general education.

Keywords: General education; Vocational education; Curriculum reform.

1 Introduction

General education builds the analytical skills, knowledge and critical thinking of an individual while Vocational Education and Training (VET) develops the craftsmanship, practical experience, and practical problem solving (Education International, 2009, p.5; Silke, 2011). Although general education and VET are inseparable, there is a distinction with regards to the objectives of the two forms of education. In affirming to the close link between the two forms of education, it is argued that critical thinking and analytical skills are needed in the case of a good plumber or electrician who must routinely make judgments in order to solve problems. Equally, a good surgeon needs a large set of practical skills to masterfully operate a patient (Education International (2009, p.5).

Tarun (2008, pp.59-61) classifies VET by seven broad fields: (i) Agriculture, (ii) Business and commerce; (iii) Engineering and technology; (iv) Health and paramedical; (v) Home science; (vi) Humanities, and (vii) Others, comprising

mainly beauty, pre- school education, and audit visual assistants. A similar classification could be adopted for the vocational skills (VS) attained in each of the seven classifications of VET. A skill, defined by Alexander and Winne (2006) as a particular procedural routine that one uses to accomplish a goal, requires knowledge accumulation, integration, automation and tuning for its acquisition. The fact that acquisition of skills requires knowledge accumulation and integration affirms the strong linkage between general and vocational education. In any case, acquisition of skills is not limited to training through formal institutions; informally, skills can also be attained through part time employment, practical lessons at school, volunteering and family engagement. Similarly, competence in a particular skill is to a large extent not subject to an individual's source of VET. For example, a plumber who attained the skills from a formal institution could have similar competence in the field when compared to one who acquired the skills through part-time employment.

Notably, promoting VET is considered worldwide as one of the major strategies towards developing human and social capital needed for sustainable economic growth and development. This argument is supported by evidence from the developed economies. The consensus among development economists is that the post-war economic success of Japan and German was attributed to the well-developed social and VET system (Cantor, 1989). In Japan according to Cantor, vocational education which is aimed at preparing students for specific occupational studies is compulsory after secondary education.

Consequently, many developing countries are promoting VET in a bid to tackle the prevailing high unemployment rates. Particularly, implementation of VET is considered as the major solution to Uganda's high unemployment rate among the youth estimated at 50% according to the country's National Development Plan 2010/11-2014/15 (NPA, 2010). Since 2011, the country through the Ministry of Education and Sports (MoES) started implementing the "Skilling Uganda, 2011-2020" program aimed at creating employable skills and competencies relevant in the labour market (MoES, 2011).

A major challenge to this initiative is that the largest proportion of the country's total enrolment in tertiary education joins universities (UNCST, 2010; UBOS, 2012) where general education courses are mainly offered. It is not surprising that total enrolment in universities increased by 41% in the period 2007-2011. On the other hand, only a 2% increase in enrolment was noted in the Business, Technical and Vocational Education and Training (BTVET) institutions in the same period (MoES, 2012). Further, the ratio of BTVET to university enrolment in the country is 1:14; implying that BTVET enrolment constitutes about 7% of the total enrolment. Based on the country's total number of tertiary education graduates (university and BTVET) in the period 2004-2008 (FUE, 2011), the proportions of BTVET graduates were 8.6%, 18.3%, 12.2%, 9.1% and 8.5% respectively. Thus, the Federation of

Uganda Employers (FUE) is justified to conclude that there is a heavy emphasis in the country on general education compared to VET.

As a matter of fact, Uganda is noted among the countries with the least enrolment in VET estimated at 4% (African Economic Outlook, 2013). It is therefore not surprising that the country's unemployment rate of 16% (UBOS, 2010) among the youth (18-30 years) is higher than that of Rwanda whose enrolment in VET is estimated at about 36% (African Economic Outlook, 2013). The fact that about four-fifths of the country's workforce does not have any specialized training (UBOS, 2011, p.15), the rate of unemployment is expected to rise in the subsequent years.

The high demand for general education in Uganda does not augur well with the country's vision of increasing BTVET graduates to 450,000 annually (MoES, 2011) by the year 2020. Quite often, VET is considered as a last resort for students who have failed to join university education. With the exception of a few secondary schools in the country that provide vocational courses which are largely more theoretical than practical - there is hardly any room for VET in the country's model of education. Uganda follows a 7-4-2-3+ model of education, with seven years of primary, four years of lower secondary, two years of upper secondary and three years of tertiary education. Thus, majority of students complete their secondary education with the ultimate goal of enrolling for university education which is predominantly based on general education. This evidence suggests that majority of general education enrollees complete their undergraduate studies with no vocational training at all. Given that only 20% of university graduates are absorbed in the labour market annually (UBOS, 2010), the country's unemployment rate is expected to rise further if enrolment in BTVET is not enhanced.

The low rate of absorption of graduates into the labour market has been attributed among other factors to shortfalls in relevant skills that promote entrepreneurship and competitiveness of the country's labour force both locally and internationally (FUE, 2011). This evidence points to a low level vocational skills attainment at the various levels of education in the country. However, there is no documented evidence to support this claim. Thus, the level and patterns of vocational skills attainment among general education university students in Uganda have not been investigated. All the same, the evidence in the literature cannot explicitly explain the situation in the country despite providing information needs required for evaluating the level and patterns of vocational skills attainment. Perhaps, this has to do with differentials in academic cultures and contexts between developing and developed economies, among other factors. This study therefore sought to provide an understanding of this issue among general education students in Uganda, a developing country.

2 Methods

The study was a cross-sectional survey based on a quantitative approach to data and methods. The study population comprised all 685 final-year students at School of Statistics and Planning (SSP), Makerere University, in the 2012/13 academic year. The students were enrolled on the five programs offered at SSP i.e., Bachelor of Science in Quantitative Economics (N= 156), Bachelor of Statistics (N= 110), Bachelor of Actuarial Science (N=91), Bachelor of Business Statistics (N=178) and Bachelor of Population Studies (N=150). Primary data was obtained from a sample of 410 students using a self-administered questionnaire comprising three major themes namely, status of vocational training and/or skills attained, students' characteristics and attitude towards VET.

In the assessment, the type of VET and/or skill(s) attained by the time of the study was based on Tarun (2008) classification which identifies seven broad categories namely, Engineering and Technology, Agriculture, Business and Commerce, Home science, Paramedical as well as Humanities. The status of vocational skills attainment was modelled in the study using a binary outcome of whether or not a student had attained vocational training and/or skill(s) by the time of the study. An assessment of status of vocational skills attainment was made by students' characteristics and attitude towards vocation education. Four modes of vocation skills' acquisition were investigated namely: (i) training in a vocational institution, (ii) part time employment/ voluntary employment, (iii) passed on by parents and/or guardian, (iv) practical lessons at school.

The characteristics of students investigated in the study were: (i) gender, (ii) family social class based Neo-Weberian Class Model (Saunders, 1990), (iii) academic achievement of students in their bachelors programs and their Advanced Level (A-Level) of secondary education, (iv) status of students' exposure to vocational subjects in secondary education, (v) status of students' exposure to vocational occupation in their families; (vi) area of permanent residence. The attitude of students towards VET was assessed using a five-point Likert scale comprising of 10 questions on the subject matter. In the analysis, however, an index of attitude was generated based on factor analysis (Pett, Lackey & Sullivan, 2003; Blaike 2003).

The analysis was made at three stages: First, an assessment of the characteristics of students and status of vocational skills attainment was made using frequency distributions. Second, a Univariate logistic regression was fitted on each of the variables in turn to identify potential predictors of vocational skills attainment for further investigations. In other words, all variables with a relatively small probability value in the Univariate logistic regression ($p < 0.5$) were considered for further analysis at the multivariable

stage (Hosmer, Lemeshow, & Stardvant, 2013), unless otherwise indicated. At the third stage, the variables that satisfied the inclusion criterion were modelled using a multiple logistic regression. The final model was investigated for appropriateness using the link specification test (Glidden, Shiboski & McCulloch, 2012). The assessment at the three stages of the analysis was based on a complex survey design. The data was converted to survey data by computing survey weights for each of the programs at SSP. The weight for each program was the proportion of students in the sample in comparison to the total number of students in a particular program during the 2012/13 academic year. The Primary Sampling Units (PSU) was the students identified by their registration numbers.

3 Results

The characteristics of students assessed in the study are summarized as follows: predominantly urban (71.2%) with regards to area of permanent residence and were of the salaried social class (62.20%) families; had Upper Second class of degree with regards to their CGPA at the time of the study. Pertaining to their performance in A-level of secondary education (UACE), about 60% scored between 14-19 points; slightly more than a half (57.3%) were exposed to vocational subjects in their secondary education. There was a slightly higher proportion of males (53.4%) compared to the females (46.6%).

3.1 Attainment of Vocational Skills

Tables 1-3 present a distribution of students with regards to the status and type of vocational skills attained as well as their mode of attainment of the skills; a summary of the results is made subsequently.

Table 1: Status of vocational skills attainment

Status of vocational skills attainment	n	Percentage (%)
Attained VS	120	29.3
Not Attained VS	290	70.7
Total	410	100

Table 2: Summary of vocational skills attained

Vocational skills by Classification	n	Percentage
Engineering and Technology		
Computer Applications	35	81.4
Computer Engineering and Assembly	2	4.7
Laboratory Technician	1	2.3
Information Technology	2	4.7
Brick Laying And Concrete Practice	2	4.7
Carpentry And Joinery	1	2.3
Total	43	100
Home Science		
Fashion Designing	8	27.6
Commercial Art and Design	3	10.3
Nutrition and Dietician	2	6.9
Tailoring	7	24.1
Baking	2	6.9
Catering	5	17.2
Total	29	100
Business and Commerce		
Business Administration	9	34.6
Transportation	3	11.5
Packaging	3	11.5
Travel And Tourism	3	11.5
Marketing	8	30.8
Total	26	100
Agriculture		
Poultry	7	41.2
Mixed Faming	10	20
Total	17	100
Arts and Humanities		
Music	3	60
Counselling and Guidance	2	40
Total	5	100

Table 3: Mode of attainment of vocational skills

Mode of attainment	n	Percentage
Training in a vocational Institution	34	28.6
Voluntary employment/Part time employment	35	29.2
Parents/Guardian	28	23.6
Practical lessons at school	23	18.6
Total	120	100

About three-in-every ten students (29.3%) affirmed having attained vocational skills by the time of the study. According to results in Table 2, the highest proportion of students attained skills in Engineering and Technology (35.7%, n = 43), followed by those in home science (24.2%, n =29) and business and commerce (21.7%, n = 26). With regards to the mode of acquisition in Table 3, the highest proportion of students obtained vocational skills through voluntary/part time employment (29.2%) and training in vocational institution (28.6%). The rest obtained the skills from either their parents/guardian (23.6%) or through practical lessons in their schooling (18.6%) prior to university education. It is evident that the practical skills are not attained from the from the bachelor's program on which the students are registered for.

3.2 Attitude towards VET

Table 4 presents responses of students on 10 questions evaluated on a five-point Likert scale.

Table 4: Distribution of responses regarding students' attitude towards VET

Items	Responses (%)					Mean	Rank
	SA	A	UD	DA	SD		
Vocational graduates have low social class	11.4	27.8	9.8	37.6	13.4	3.14	10
Vocational education is mostly for male students	10	20.7	6.6	43.2	19.5	3.42	8
Vocational education is for students who do not qualify for university	7.1	18.8	6.3	39	28.8	3.64	6
Vocational education is for students who can't afford university tuition	6.6	23.9	11.5	35.9	22.2	3.43	7
Vocational graduates don't get well-paying jobs	7.6	25.1	7.8	38	21.5	3.41	9
Vocational graduates have few employment opportunities	3.7	15.4	6.8	48.8	25.4	3.77	4
Vocational education is for students good at sciences	3.2	14.9	6.3	45.9	29.8	3.73	5
Vocational graduates have low demand in the market	2.9	16.6	8	49	23.4	3.84	3
Vocational graduates can't create jobs for them selves	5.4	7.3	5.6	34.6	47.1	4.11	1
Vocational skills not relevant for university graduates	5.6	5.6	5.9	38.3	44.6	4.1	2

Note: assessment is made on all students in the study; where, SA - Strongly Agree; A - Agree; UD - Undecided; DA - Disagree; SD - Strongly Disagree

Overall, results according to Table 4 show that the students had a progressive attitude towards VET. The aspects where the students' attitude was largely positive were: (i) vocational skills being relevant for university students/graduates (82.9%), (ii) vocational graduates being in position to create jobs for themselves (81.7%), (iii) vocational education not for students who are good at sciences (75.7%), (iv) vocational graduates having many employment opportunities (74.2%), (v) vocational graduates having high demand in the labour market (72.4%), and (vi) vocational education not being for students who do not qualify for university education (67.8%). On the other hand, varying opinions were noted with regards to vocational graduates having low social class and their chance of getting well-paying jobs.

3.3 Likelihood of Vocational Skills

Table 5 presents results of the Univariate logistic regression on students' characteristics and their attitude towards VET. As earlier indicated, the analysis at this stage is geared towards identifying potential predictors of vocational skills attainment i.e., variables for further assessment at the multivariable stage.

From the results in Table 4, the variables with relatively high probability values ($p > 0.5$) in the Univariate logistic regression were performance at A-level, exposure to vocational subjects in secondary school and sex. With the exception of gender, the rest of these variables were excluded from the analysis at the multivariable stage. The variable gender was included in the analysis at the subsequent stage due to its importance noted in the literature.

Table 5: Vocational skills attainment in a Univariate logistic regression

Explanatory Variables	OR^a	LL^b	χ^2	p-value
Performance at A-level				
20 points above [†]	1	0	.	.
14-19	1.04	-247.8	0.038	0.846
<=13	1.04	-247.8	0.011	0.915
University performance				
Second Class Upper and above [†]	0	1	.	.
Second Class lower	0.63	-245.8	4.053	0.044
Pass	2.52	-246.3	3.154	0.076
Exposure to vocational subjects in secondary school				
No [†]	1	0	.	.
Yes	1.04	-247.8	0.028	0.868
Family social class				
Salaried [†]	1	0	.	.
Intermediate	0.46	-238.7	8.787	0.003
Working Class	0.63	-247.1	1.467	0.226
Residence				
Rural [†]	1	0	.	.
Urban	1.23	-247.4	0.728	0.394
Exposure to vocational skills in the family				
No [†]	1	0	.	.
Yes	1.84	-243.9	7.816	0.005
Gender				
Female [†]	1	0	.	.
Male	0.9	247.7	0.244	0.621
Attitude	1.16	-247.1	1.526	0.216

[†] represents reference categories adopted in the analysis

^a Odds Ratio

^b Likelihood Ratio Estimates

^c Chi-square estimates

Table 6 presents results of a multiple logistic regression on the variables with the exception of performance at A-level and exposure to vocational subjects in secondary education.

Table 6: Vocational skills attainment in a multiple logistic regression

Explanatory Variables	Coef. ^a	OR ^b	Std. Err ^c	p-value
University performance				
Second Class Upper and above [†]	0	1	.	.
Second Class lower	-0.31	0.74	0.209	0.135
Pass	0.52	1.69	0.902	0.265
Family social class				
Salaried [†]	0	1	.	.
Intermediate	-0.81	0.44	0.126	0.005
Working class	-0.63	0.53	0.224	0.135
Residence				
Rural [†]	0	1	.	.
Urban	0.26	1.29	0.333	0.316
Exposure to vocational occupations in the family				
No [†]	0	1	.	.
Yes	0.59	1.81	0.412	0.009
Gender				
Female [†]	0	1	.	.
Male	-0.01	0.99	0.237	0.956
Attitude	0.11	1.11	0.143	0.396
Constant	-0.89	.	0.312	0.005

Note. Analysis is based on a survey data analysis; where, $F = 1.99$, $p > 0.05$, $n = 410$.

[†] Reference categories adopted in the analysis

^a Coefficients

^b Odds Ratio

^c Linearised standard Errors of coefficients

The link specifications test was carried-out to assess the appropriateness of the logistic function adopted in the investigations. Specifically, the test was carried out to investigate whether: (i) the logistic transformation was the correct specification for the outcome variable; (ii) a linear combination of the predictors was supported; (iii) a logistic transformation is explained by a linear combination of the predictors. Table 7 presents results of the specification test.

Table 7: Specification test on logistic function

Logistic function	Coefficient	Std. Err ^c	p-value
hat ^a	1.54	0.486	0.004
hatsq ^b	0.32	0.261	0.300

^a Hat-statistic is estimated linear predictions from the MLR

^b Hat-square statistic is the square of the estimated linear predictions from the MLR

^c Linearised standard errors

The results in Table 7 show that the model is well specified as predicted by the hat-statistic ($p < 0.05$). Results of the hat-square statistic show that no additional variables in the MLR were significant ($p < 0.05$). These results implied that a linear combination of the predictors on a logistic transformation was the proper specification of the data adopted in the investigations. These findings show the appropriateness of using the model in Table 6 in explaining the data in the investigations. The result in Table 6 shows significant variations in the odds of having attained vocational skills by family social class and exposure to vocational skills in the family ($p < 0.05$). No significant associations with vocational skills attainment were established by the rest of the variables, namely, performance at university, residence, gender and attitude towards vocational education ($p > 0.05$).

4 Discussion

In the results about three-in-every ten students (29.3%) had attained vocational skills by the time of the study. This figure does not compare favourably with estimates in the developed countries. For example, in Austria (Schneeberger & Nowak, 2010) and China (OECD, 2010), about 80% and 50% of the students respectively attain vocational skills before joining tertiary education institutions. These findings suggest that a considerable number of general education students in Uganda graduate with no practical skills required for job-creation. Thus, the FUE is justified to conclude that the country lacks a culture of entrepreneurship and this is especially apparent among the youth currently joining the labour market (FUE, 2011, p.14). With over 70% of the country's total enrolment in tertiary education enrolling for university education based primarily on general education (UNCST, 2010), the escalated skills gap between labour supply and demand markets certainly renders the country's labour force largely uncompetitive (FUE, 2011). Thus, employers in the country are justified to outsource labour from other countries. The unemployment rate is expected to rise in the subsequent years given that: (i) 20% of graduates are absorbed into the labour market annually (UBOS, 2010); (ii) a fifth of the workforce has specialized training (UBOS, 2010, p.15). The shortfalls point to the need to strengthen vocation education and training at the various levels of general education particularly prior to university enrolment. A recommended approach to enhancing vocational skills attainment among general education enrollees is mandatory VET prior to university enrolment (Schneeberger & Nowak, 2010; Elias, Hernaes & Meredith, 1994).

The results in this study add to literature that identified social class (Ozioma, 2011; Udoh & Sanni, 2012; CDS, 2011; European Commission, 2011) and

exposure to vocational occupations in the family (Udoh & Sanni, 2012; European Commission, 2011) as predictors of vocational skills attainment. Particularly, individuals in the lower social class are consensually regarded to have reduced odds of vocational skills attainment. However, Kai (2002) concluded otherwise on this aspect ó Kai's study reveals no significant influence of family's social class and career choices of children. This evidence suggests that the influence of social class on vocational skills attainment may vary between individuals and/or countries. The reduced odds vocational skills attainment among individuals in the lower social class is attributed mainly to three factors. First and foremost, stereotype of social status that makes individuals consider vocational occupations as being inferior compared to the white-colour office jobs (Kassotakis, 1978). Second, there is a high competition for prestigious and lucrative occupations between the rich and poor families (Udoh & Sanni, 2012). In citing Onyejiaku (1987), Udoh and Sanni (2012) argue that rich parents compel their children to train for the prestigious and lucrative positions in order to maintain the status quo while the poor do so with the goal of liberating their families from poverty. Third, a considerable number of individuals consider vocational education to be a 'dead end' (CSD, 2011, p.25). These reasons apply largely to individuals in the developing countries, including Uganda. However, the argument of competition for the prestigious and lucrative positions forwarded by Onyejiaku (1987) probably explains Uganda's situation better. Oftentimes, parents go an extra mile to secure school fees loans to ensure that their children join university education based on general education rather than enrolment in affordable vocational educational programs (DFID, 2007).

On the other hand, the increased odds of vocational skills attainment among individuals exposed to vocational occupation noted in the results was consistent with studies by Udoh and Sanni (2012) as well as European Commission (2011). The consensus is that personal experience between the parents and their children creates a positive attitude towards vocational occupations (Udoh & Sanni, 2012; European Commission, 2011). This evidence points to the need to promote vocational education particularly at family level so as to demystify the existing negative notions associated with VET in the society.

The association between residence and vocational skills attainment is debatable. While the results in this study collaborate with literature that does not regard residence as a predictor of vocational skills attainment (Adinarayana, Uma & Mahadeva, 2011), the findings according to the European Commission (2011) were otherwise. Rural respondents are regarded to have increased odds of vocational skills attainment compared to their urban counterparts according to findings by the European Commission. The choice for VET among the rural residents is attributed mainly to the high prospect of getting a job after school. This however is not the case in most developing countries, including Uganda,

because of the social prestige issue. As earlier stated, a considerable number of individuals in both rural and urban areas associate general education graduates with higher social class when compared to their vocational education counterparts.

With regards to gender, the results in this study add to literature that does not regard the variable as a predictor of vocational skills attainment (Adinarayana et al., 2011; Ozioma, 2011; Ahmed, 2007; Igbinedion, 2011). Contrary to these findings, Egun and Tibi (2010) consider females to have reduced odds of vocational skills attainment. Their argument is that a low level of self-efficacy among females discourages them from being involved in certain occupations that they consider to be predominantly male dominated. This however is not entirely the case in Uganda because of the increased advocacy for gender mainstreaming in all aspects including but not limited to education, employment and politics. A similar conclusion could be applied to the situation in other developing countries promoting gender equality.

Similar to related studies (Ramlee & Norhazizi, 2010; Ozioma, 2011; Ahmed, 2007), the results in this study show no significant association between attitude towards VET and vocational skills attainment. As a matter of fact, students in this study had a generally positive attitude towards VET. This is contrary to recent evidence that generally considers the attitude of students in Uganda towards BTVET to be negative (FUE, 2011). This implies that the generalization of a negative attitude towards VET across individuals at various levels of education and/or disciplines does not hold. In any case, the non-significant influence of individuals attitude towards vocational skills attainment is attributed among other factors to: (i) influence of parental social economic status whereby, children from highly educated families express less need for vocational subjects despite having interest in them (Ahmed, 2007; Ozioma, 2011);(ii) social interactions effects, feeling of personal respect, acquaintance and human relationships which neutralizing the influence of attitude (Ramlee & Norhazizi, 2010); (iii) gender stereotypes whereby few females engage in certain vocational occupations despite having interest in them mainly for fear of being sexually harassed (Ramlee & Norhazizi, 2010). This is characteristic of the situation in Uganda where some students enrol for general education programs because of either pressure from their parents or high grades attained in their at A-level of secondary education; however, on completion of their studies, these graduates take-up occupations that are not in any way related to the general education programs undertaken in their bachelors studies. Thus, it is not surprising that performance of students on their bachelor's program was not significantly associated with vocational skills attainment. Ideally, students who have excelled academically in the past are regarded as having a higher chance of successful performance in their subsequent academic endeavours (Alfan & Othman, 2005; Duff, Boyle, Dunleavy & Ferguson, 2004; DeBerard, Glen, &

Deana, 2004; Navarro, Vitamog, Tierra & Gonzalez, 2011; Shultz & Zedeck, 2011; Wamala, 2013). All the same, the findings corroborate with recent studies (CSD, 2011; Agodini et al., 2004) that arrived at the same conclusion. On the contrary, Ahmed's (2007) study associates vocational skills attainment with low academic achievers. Thus, this evidence implies that the influence of students' academic achievement in general education and vocational skills attainment is debatable.

In sum, the low level of vocational skills attainment in the study is characteristic of general education graduates in Uganda. This conclusion could be applied to general education graduates in many developing countries. This study identifies the major hindrance to vocational education as social stereotype that associates vocational education and occupations with low social class. In other words, the notion of focusing on self-esteem rather than self-efficacies in matters of career choices must be addressed at not only the family but also at the national level. Otherwise, it will take the country longer than expected to raise the current level of vocational skills attainment to match up with the figures in the developed countries. Failure to increase the level of vocational skills attainment in developing countries will not only have a negative impact on the absorption rate of general education graduates into the labour market but also the rate of economic growth and development subsequently.

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Reflections on Mainstreaming Internship in University Curricula with specific reference to the Experience of the College of Humanities and Social Sciences at Makerere University

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Abstract. Makerere University mainstreamed field based learning (internship) into all its undergraduate study programmes. Initially internship was conducted only in professional courses like Education, Social Work and Law. However, due to criticism that the University was producing graduates who are not in touch with the realities in the workplace, the University rethought its approach and now requires all second year undergraduate students to undergo internship. Although this change presented several opportunities, mainstreaming internship across a multiplicity of study programmes also presented numerous challenges. This paper provides an ethnographic reflection of three of the university's academics (involved in the supervision of students' internship) on these challenges. It also discusses their lessons from participating in the implementation of the internship programme.

Keywords: Internship; Curriculum innovation; Higher education reform.

1 Introduction

There seems to be a general opinion that a gap really exists between the quality of graduates produced and what the market demands (Bukaliya, 2012). That is why two years ago, Makerere University introduced internship programs in all her undergraduate study programs. Since 2010 and for three consecutive academic years, Makerere University has sent out students for internship as part of its strategic plan to produce well-prepared and equipped graduates who can meet the demands of the market place as elaborated in the field attachment policy (Makerere University 2007). Despite the

implementation challenges that are associated with a new policy shift, internship as a practice has been taking roots in several ways, both within Makerere and in other universities.

The roles that internships have taken are increasingly getting more important in education over the last few years. Internship plays a significant part in the lives of the students ranging from gaining experience and obtaining career-related direction to networking with other students from various institutions as they attend training at the organization providing the internship. The host institutions offering internship programs have also benefitted through increased cooperation and building networks with the universities.

Internship also caters for other nomenclature such as industrial training, field attachment, and school practice among others. It involves an equivalent of at least eight weeks of fulltime, academically relevant, practical experience in the students' field of professional interest. This takes place at the end of second semester for second year students.

For students of Humanities and Social Sciences, internship is undertaken in Non-governmental organisations, cultural institutions, historical sites, archaeological excavations, government ministries and departments, hospitals, media houses, theatres among many others. The internship is fundamental for students' learning experiences because it enables them to establish a practical connection between their academic theories and the marketplace and professional world. Most of the students joining higher education in tertiary institutions in Uganda are usually fresh from high school, having attained an advanced certificate in secondary education, without any work experience. They join university and within three to four years they complete and are sent out for employment, yet in many cases without having a prior exposure to the world of work. In the recent past, stakeholders have complained that much as the graduates were academically excellent, in many cases they were not able to execute the duties assigned to them, due to the lack of relevant skills.

Therefore, Makerere responded by putting in place a Field Attachment policy, which requires students to go out after second year to have a hands-on experience in the workplace. Internship aims at the following objectives:

- Providing students with an opportunity to have a hands-on experience with work
- Enabling students to experience and learn how to deal with the challenges, methods, constraints and procedures in professional life.
- Giving students a chance to experience the distinction between abstract academic theory and concrete daily practice

This paper analyses the experience of the College of Humanities and Social Sciences (CHUSS), one of the colleges in the university, in mainstreaming internship within the University's curriculum. In doing so it touches on various

issues such as internship and time, costing, supervision, assessment and evaluation of the internship process.

2 Methodology

This paper was written utilising a cross section of sources. This included reviewing relevant documents, students' reports, assessment of agency supervisors' reports and discussions with students to gauge their expectations regarding the internship process. Further data was collected through the actual supervision process over the last two years. These were used as organisers along which our reflections regarding the internships process has been categorised and presented. Data analysis was done using content and thematic analysis, paying attention to key issues raised in direct interviews and consultations as well as feedback that the various departments and schools received from the stakeholders.

3 The Internship Process

Placing students in agencies across the country is a very complex administrative and academic process. Considering that Internship in Makerere University college of humanities and social sciences (except other fieldwork-oriented programme such as social work, mass communication, development studies) is a second year phenomenon, the pre-placement period covers the period between reporting and registration of second year students, preparation of students (specialised lectures), visit and reconnaissance of agencies and briefing of academic staff regarding the supervision process.

The preparation of students should ideally be strategic and done well in advanced of the students' placement. Similarly visits, to the agencies to continue to engage the training institution (field) and bring them on board new partner to ensure that students are fully placed in agencies which have activities and appreciates the philosophy and spirit of the internship, the welfare of the students and any other issue which would enhance the success of the training and the accomplishment of the internship placement objectives. As we will discuss later in the discussion section, we shall show that while the Makerere university guidelines for internship are very elaborate and provide important steps that could ensure a very smooth placement, their actual implementation during the last two years was beset by administrative, contextual and other difficulties which could have presented difficulties in ensuring a smooth internship experience.

3.1 Duration and Timing of Internship

The current internship design allows for internship period of a minimum of 8 weeks per year. While the fieldwork manual (Makerere University 2007) unequivocally says the period should last for not less than 8 weeks, most departments have not been able to officially recommend a period exceeding 8 weeks due to the timing of semesters and the time third year students are expected to report back to the University. When Makerere was still under the terms system (1999 and before) some course like Social work were placing students for a maximum of 10 weeks during the long vacation (block placement) and a further concurrent fieldwork practice lasting from October to April of the academic year ending in June. Such an arrangement is however only feasible for certain courses. For the general student who never did internship as a direct professional requirement of the course, the current objective is to expose them to the world of work and make them relevant to their communities and Ugandan society in general.

3.2 Posting Students

This includes the actual allocations of the students to field agencies, making sure that as much as possible students are matched to their organisation of interest. Student placement is ideally supposed to be done by the Internship coordinator who does the actual visits to the agencies. He/she matches specific agencies according to their relevance to the courses and the student's interest. As stated in the Makerere Field attachment guidelines (Makerere University 2007), the criteria that the coordinators use to select suitable sites include:

- Availability of suitable field supervisors:
- Availability of supportive facilities for learning for the student
- Availability of on-going activities to provide learning experiences to the student(s)
- Gender needs
- Health and safety of the site

It is important to note that the student's placement is complete by the beginning of semester two. The coordinator then draws a list of all second year interns, the places where each student is going, their telephone contacts and the contacts of the agency contact persons. The list is displayed for the students to ascertain the accuracy of information as well as make changes where necessary. After the student's placement is confirmed and by the last few weeks of the semester, students are given briefings about the procedural matters and processes of internship by the student.

3.3 Students' Record Keeping

The students are expected to keep a weekly and daily record of all activities that they have engaged in. This daily journal/log book entry will serve specific purposes. **1.** Train students with the importance of record keeping, **2.** Generate accountability for time taken in the field, and **3.** provides a training framework for discipline and the importance of knowledge generation and institutional memory preservation.

The daily journal recording is done in a pre-arranged framework clearly bringing out the activities participated in, how that activity is relevant to the students learning and theories learnt in class and the lesson that the student has learnt in the process of carrying out the activity. Assessment of students' record keeping and their daily journal entries indicated that the majority of students had understood the utilisation of the reporting format and had adhered to it very well. However the section requiring application of the courses to practice and relatedness to the courses still gave some students difficulties, showing that many of the students either do not know the relevant social science theories or are not able to relate them to the work situation they had been exposed to.

3.4 Supervision of Students on Internship

Supervision is a very important component of internship and it takes two dimensions: supervision by the host agency; and supervision by the academic supervisor. In our experience of coordinating internship, we consider supervision to be a central and critical element of the programme. It ought to be done efficiently if students are to benefit from their time at any place of work. Reflecting on CHUSS supervision culture, it suffices to say that, it is dynamic because of the broad range of courses that are offered and the big numbers of students. Practically, each school prepares the lists of students that are distributed to academic supervisors who then go to various places to meet the students and evaluate whether some learning is taking place as the students put into practice what they have learnt so far. While at work, the students are assigned supervisors commonly referred to as 'host supervisors' who follow the internee on a regular basis to ensure that the expected work is done, work ethos, and in general to provide feedback to both the students and the academic supervisor. This interaction is very useful for assessing the students' progress as well as evaluating the relevancy of what is taught in class and what is done or expected in real-life situations of work.

Supervision is one of the most rewarding components of internship because through it the tripartite encounter takes place namely: the student, the host and the academic supervisor. In the learning context, it is a rewarding process

where the student receives feedback from both the field supervisor and the academic supervisor. This therefore, calls for carefully observation, handling, processing and communication so that the student benefits from it and is able to reflect on what he has been told. The field supervisor is the expert at work, the academic supervisor comes in handy to cross-check, offer clarity where it is needed and to align what is happening in the field to what the university expects of the students.

The Makerere University internship guidelines require that supervision is done at two distinct levels; the on-site level day-to-day supervision by the field supervisor and the academic supervisor from the university. The purpose of the internship supervision is to permit the student reflect on the practical experience gained in the field. It provides an opportunity for the student to describe what he/she has done, what he/she has learned, and to place the experiences within the context of the organization, the community and the Makerere University programs. The student is expected to reflect creatively about his/her contribution to the profession and the professional value of the placement.

4 Challenges involved in Internship

The process of placement for students of humanities and social sciences has not been easy for the last three consecutive years. Placement involves identification of potential and actual places of work that are relevant for training and learning. Ideally the process has to be managed by faculty coordinators of internship to enable students obtain places relevant for their disciplines. This is an engaging process but also heavily demanding in the example of CHUSS where student numbers are big but also variant in disciplines. Not only that but also other universities across the country release students for internship at the same time (mainly June to August) and so there is gross competition for attachment. Given that, the process requires serious networking, teamwork and early planning with appropriate facilitation

Implementation of the internship programme took four different stages beginning with the *organization of the field attachment, placement of the students, and supervision of interns during the field attachment work and the evaluation*. Previous studies also show that internship periods were criticized for being too short and even with Makerere; the majority of interns think that the most appropriate internship period should be more than the two months offered for internships. Mihail (2006) also found in his study that most of the interns preferred to have internship periods ranging from six to nine months instead of three months. This is a trend which shows that students prefer longer

internship period because it is only then when they can learn something sufficient and crystallize their field experiences.

At another level, internships are also negatively looked on as bringing into the workplace disagreement among workers in a range of ways. Internships sometimes dislodge paid workers and allow companies to dodge liabilities through the non-payment of intern labour. Interns accept the post with no pay because the duration of the internship is counted as a course unit being offered at the university. Such drawbacks can be understood at the different stages of the internship process. These different stages all carry different types as well as magnitude of drawbacks.

4.1 The Organization Stage

This stage begins with the registration of students for the field attachment exercise. As earlier stated, it involves the second year (Majors) in every subject. The registration process is abnormally very slow as many students do not take it serious. The registration is very important as it enables the coordinator to know the exact number of students he/she should budget for. This is also done to enable the coordinator know how many academic supervisors may be required for the supervision process. However, the students do not respond in time making the whole process sluggish.

Some students who are not very regular in class are often times ill informed about the requirements for internship hence may not even register for the paper. This complicates the exercise in a number of ways. First, the university bursar requires this list for funds to be disbursed to facilitate placement of students and when they do not register, the coordinator operates far below the actual number of students. Secondly, when funds are released for the students to go for the field attachment work, such students are not paid because their bio-data has not been captured and sent to the bursar. So when they are finally registered and the list sent, their moneys are processed late and they either receive it towards the end of the programme or fail to get it completely.

In 2012/2013 alone, 13 students of sociology and anthropology did not register in time and were not even placed. They reported at the time of departure for field attachment. Again it raised a number of drawbacks; finding places for them at the very last minute called for a lot of effort on the coordinator. With their lists sent very late to the bursar, they got paid money well after the attachment was concluded, and it meant that money for their supervision was never remitted because by that time requisitions had already been done and sent to the college.

The excessively long bureaucracy that Makerere University instituted for requisition and gaining access to funding is another obstacle which impedes the smooth running of the programme. The amount of time required for a

coordinator at the department to requisition and get funds is quite long. This has become a big impediment to the implementation of the program, for instance, whereas placement would be done in semester one, the funds are only available by mid semester two when all the universities around the country has placed their students. It was therefore quite a difficult task procuring placement for all our students.

4.2 Student Placement Phase

This phase entails the coordinator traversing the country looking for suitable places where the students can be placed to work. As mentioned earlier, the bureaucracy at the university creates complications for effective implementation of this process. Usually by the time the coordinators travel to the places (February ó March), other universities have already placed their students in the same organizations. It therefore becomes very difficult for coordinators to place the students.

Impediments are also faced in terms of inadequate funding for placement. The money released for this exercise is tagged on the number of students majoring in a given subject, hence even where one had a large number of students the money may not be enough for the coordinators to traverse the entire country to place the students in organizations that are relevant to their courses.

In the guidelines for field attachment it is stated that memorandum of understanding would be signed with organizations that take Makerere students for field attachment. However, there are very few MoUs that have been signed and it makes placement rely entirely on the coordinators own contacts and ability to negotiate with managers and directors in the participating organizations.

4.3 Supervision of Interns

The other challenge of internship is *supervision*. As indicated in the previous section is very important if internship is to be deemed beneficial at all. It is problematic in the sense that some organisations may not have enough staff to ably follow up the students. In the same scenario, some organisations have tight and very busy schedules that the supervision is irregular and lacking in rigour for an effective outcome. In another sense supervision is complicated by a gap in the planning period where the ideal would have been that before students reach their internship locations they already know both the field supervisors and faculty supervisors. So that preliminary arrangements can be made with regard to the exercise. The other problematic dimension of supervision is on the practicalities of faculty supervisors going to the various places to supervise the

students, some are hard to reach places, and others are not well profiled, so it is hard to establish the quality of staff that may be eligible for supervision of university students.

Obstacles during the supervision of interns begin with the bureaucracy that leads to the usually long delays in the release of funds for the exercise. In some cases, like it was the case in 2012/2013, some students were put on a one month internship while others started in the second month. There were difficulties with supervising the students who took part in the first month as funds were released after their period was gone.

There are students who worked in very remote areas where telephone network was very poor or not available and supervisors found it very difficult to get in touch with the students. Communication is a very vital element of the process of internship evaluation and when it fails it adversely affects the exercise. In addition, some parts of the country have very poor road infrastructure; for instance driving from Jinja to Kamuli on a very bad road surface is very problematic. Cases of such poor road network were reported in several areas including; Kabarole, Karamoja region, and Masindi. Such pitfalls affect the supervision process and impede the entire program.

Supervisors also complained of limited time they have to spend with the students. Many supervisors feel they should be able to observe the student practically engage in the work they are doing. However, that would involve the supervisors spending longer periods in the field and the university does not provide funding for that stay. Additionally, whereas the guidelines clearly stipulate that supervision will be done at least three times, supervisors are only sent once. This fact makes it easy for the students to leave their work places when the supervisors have already visited them.

The other practical challenge is the integration of internship in the curriculum. First of all CHUSS is multidisciplinary. For several departments internship is seen as an add-on, it is still not clear how many hours and therefore credit units it should be allocated. Moreover, at the places of work, the faculty is not in complete control of the workload given. For example some students on internship reported different schedules of work; whereas some worked Monday to Friday, others only reported for work three times a week. This remains challenging and also begs the question of quality assurance in the sense that how does faculty tell with absolute precision that the tasks/assignments or job description given to the interns are exactly what they are suited for? This in many ways is answered during report writing but even then, one needs to be provided with as much evidence as possible to be able to evaluate the success of the exercise and how it contributes to the overall performance of the students.

Comprehension of the program is still problematic to some students who are not very regular in class. The students find difficulties in relating what they are

doing in the organizations with the courses they have learnt at the university. Students perceive internship as a program that only relates to the courses they study in semester two of second year. Cases of students who have even forgotten what they studied in first year were quite common. In addition, though few, there are cases of students who did not work at all. They only report after learning that university supervisors have visited their work places. This indiscipline is largely reported of students who worked outside Kampala.

Evaluation of field attachment is done at two major levels; the on-site evaluation and academic evaluation. At on-site level, the supervisor appointed by the university is a person with practical experience based at the organization, while the academic evaluation is done by a qualified (Assistant Lecturer and above) academic staff.

There are several hiccups these evaluations face. There are cases where the on-site supervisors are less academically educated than the student. Some forms of derogatory relationship were found to exist between the student and the supervisor. This is a very delicate part of the process and when detected, the student is usually withdrawn, cautioned and placed elsewhere for the training. But that cannot be a panacea for such frictions; the students need to be socialized into accepting that established authority must be respected.

Makerere students are generally disciplined and know how to acquaint themselves with other people; so many of them end up as friends of their on-site supervisors who evaluate the student very high, for instance many students are awarded marks as high as 98% or 99%. There also exist situations where students work under direct supervision of their relatives or friends. The university has not set up a system to check for this anomaly. The remedy would be to allow the coordinators to fully take charge of placing the students. Again, that remedy cannot work because the amount of money that the students are given to go for internship is so little, therefore, they are allowed to go where they can manage to cater for their wellbeing. This lacklustre and lukewarm attitude with which Makerere University treats the program is undermining the progress of the internship.

The role of the cooperating institution where a field supervisor acts as a kind of mentor to the intern is very significant in making the internship program successful. The guidance and counsel given by the field supervisor is of the greatest importance in helping the intern's activities to be fulfilled. On-site supervisors complain that several of Makerere students could not write good reports. This is exhibited in either the weekly progress reports that the organization asks them to write or in the final academic report that they submit to the university. The students writing skills are generally poor and they do not even show knowledge of communication skills. Evidently, there is need for the University to place courses in communication skills in the curriculum to train

good and effective workers. The poor report writing is also apparent in the internship reports that the student presents at the end of the training.

The academic supervision that involves the academic supervisor travelling to the students' place of work is a very good idea. But the minimal facilitation and motivation that the university extends to these academics is demoralising. Every private sponsored student is charged 65,000 shillings for supervision. This amount of money is so little and the university does not supplement the contribution of the students yet these are university programs. The places where the supervisors go are so far stretching all over the country with some particularly far off from Kampala. For instance the supervisors find it very cumbersome to travel to Kaabong, Kotido and Moroto because despite being far from Kampala, the roads are almost impassable.

The marking of internship reports also leaves a lot to be desired. The university has not designed any standardized marking guide that supervisors can use to mark the reports. This leaves markers with the option of relying on impression to award marks. Just as the supervision tools are standardized, there would be a standardized marking guide for the internship reports.

Generally internship at the Makerere School of Social Sciences is implemented at the school level. However, with the collegiate system that Makerere University adopted, an increase in layers of bureaucracy curtails the smooth running of the program. The school being the academic unit where implementation is done would be most suitable for the disbursement of funds and supervision of activities related to internship. The college, therefore largely appears as a level that interferes with this process since it is neither an academic nor implementation unit but only administrative.

In terms of funding, the money for running the program is very small. There is need for more funding to cater for signing of MoUs, placements and increased supervision. The supervision of students is supposed to be done three times in the period of two months, but currently this is not the case. In many cases, the students leave the field immediately the supervisors visit them, because they know the supervisor will not return to the organization. The departments only send supervisors once to visit the student; therefore it leaves a lot to be desired.

Funding for the students is very minimal. Whereas the students pay this money, the amount refunded to them is too little to sustain the student for the two months period they spend in the field. The university appears to rely entirely on the students' contribution to run the program although it is in the mainstream university curriculum. The role and contribution of government and or the university is quite absent in this very important university program.

In several situations, students go to organizations of their choice for different reasons and not because they fall within their courses demands. The organizations where the students go for internships need to be ascertained by

the coordinators for their relevance to the courses before they are placed. This may involve the coordinator travelling to the organization to make an on-spot check, something that is not usually done at Makerere University.

In the field, the student is subject to supervision by an on-site supervisor who is not trained by the university on what the program is testing. These supervisors even evaluate and award marks to the student without proper and guidelines given to them. While some information is proved through the student pack, there is need for the on-site supervisors to be given a short term course on internship to acquaint them with the rudiments and requirements of internship to ascertain excellent quality university training.

5 Lessons Learnt

Our Reflections so far on the internship process and discussion with field supervisors as well as academic staff suggests a number of lessons which could help to improve the internship experience for all stakeholders: students, staff, University and host institutions.

Holding discussions with the interns before the commencement of the internship and talking about their/university/agency expectations, activities, areas of skills and knowledge development found in the courses they have studied. In these discussions, the coordinator also discusses activities, tasks and experiences and reviews progress, discussing successes and determining additional growth for the intern.

Early planning and especially with regard to placement arrangements, this is very important for the smooth running of other subsequent practicalities including supervision allocation. The success of the exercise lies much in how well planned it is, bearing in mind that the activities spring one from the other. Timely preparations right from the organization stage to the supervision makes the program to run smoothly. The time for internship is rather short and everything ought to be done as scheduled in the program. So, planning in good time has been an important lesson for CHUSS, given that the college has many students distributed throughout the country. This argument implies that as a unit last minute decisions ought to be avoided to enable all the stakeholders to operate within a clear framework spelling out all detailed arrangements. For example how many students a given institution will host, where will they reside for the eight weeks, do some of our students need special care? How does the host deal with such? It is apparently clear that a well prepared internship programme will undoubtedly enhance efficiency and effectiveness as well as stimulate the morale of the parties involved.

Effective communication and information flow to all stakeholders is paramount, in the sense that, participants will know what to do at a given time and what to expect. This is helpful for effective coordination because all responsible persons will in effect know and have control over what should be done. Internship is profoundly a people oriented activity which demands effective communication for it to succeed. Engaging all stakeholders at every stage (planning, execution and evaluation, etc), reporting and giving feedback in time is an important lesson because each party involved in internship has got expectations and a thorough discussion is necessary so that these expectations are shared out and treated with caution and a balance established to enhance a mutually acceptable work relationship which is beneficial to all the stakeholders. One way CHUSS has done this by inviting host supervisors and administrators to come and share as well as exchange ideas of how the programme could best be managed. This has had a rewarding impact on the relationship between the college and the host institutions.

Joint supervision as done in the School of Social Sciences makes the exercise less costly and effective. It is one sure way through which every student can be reached and the supervisor can relatively spend a little more time with the interns.

Good instruction to students at the preparation stage reduces the errors that students make during internship. For instance, recording daily experiences in the log book has been a problem to the students who missed out on the instructions. There is need to include internship in the university time table so that lectures on internship are mainstreamed in the curricular.

There is need for the university to source for adequate funding for internship. The students' contribution alone is not enough to cater for their welfare as well as fund the placement and supervision processes.

Evaluations at the end of the internship is good as it helps the units to adjust where things seem to go wrong and tailor the program to suit the needs of the learners and the employers.

Frequent consultations with strategic partners at the agency level with the university internship coordinators improves on the communication and general wellbeing of the student.

Another important lesson that has been learnt is the need to agree on standard format of internship training report writing, to be able to have a comparable report.

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Status of Technical and Vocational Education in Rural Institutions in Delta State Nigeria

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Abstract. This study was aimed at assessing the state of technical and vocational education in rural institutions in Delta State. Three research questions guided the study. A sample size of fifty (50) principals from 50 rural institutions in Delta State was used for the study. Data were collected using a questionnaire. The study reveals that the state of human resources for teaching technical and vocational subjects in rural institutions is poor. Also, the state of infrastructural facilities is inadequate. Based on the findings, it was recommended that Delta State government should employ qualified technical and vocational subject teachers and provide adequate infrastructural facilities for teaching technical and vocational subjects in rural institutions in the State. In addition, community leaders should donate consumable materials, machines and infrastructural facilities to rural institutions for teaching and learning technical and vocational subjects.

Keywords: Technical and vocational education; Higher education reform.

1 Introduction

According to UNESCO (2001), Technical and Vocational Education (TVE) is used 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 occupation in various sectors of economic and social life. More so, the National Policy on Education (Federal Republic of Nigeria, 2004), states that TVE refers to a range of learning experiences which are relevant to the world of work. However, Jean (2003:17) in Onjewu (nd.), Technical Education designates the aspect of the technical process which in addition to general instruction, involve the study of closely

related science and the acquisition of practical capacities, attitudes, understanding and knowledge related to trades of a different section of economic and social life. It is not necessarily vocational in the sense of preparing directly for the exercise of a trade or job. This teaching can be part of a study programme in progress with the purpose of continuing to a higher level of studies.

1.1 Goals of TVE in Nigeria

According to Federal Republic of Nigeria (FRN, 2004), the preparatory aspect of pre-vocational training offered to students is for the purpose of;

1. Introduction into world of technology and appreciation of technology towards interest arousal and choice of a vocation.
2. Acquiring technical skills
3. Exposing students to career awareness by exploring usable options in the world of work, and
4. Enabling youths to have an intelligent understanding of increasing complexity of technology

Consequently, the goals of Technical and Vocational Education (TVE) shall be to;

1. Provide sciences, technology and applied sciences, technology and business particularly at craft, advanced craft, and technical levels.
2. Provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development.
3. Give training and impart the necessary skills to individual who shall be self-reliant economically.

However, the above goals of TVE in institutions are unique but the problem in this study is that, there is information gap in respect of the state of TVE in rural institutions in Delta State since the state of human and material resources for teaching and learning TVE subjects in rural schools are not known. Therefore, this study was conducted to assess the state of TVE in rural institutions in Delta State.

1.2 Structure of TVE Curriculum in Nigeria

In line with the National Policy objectives on career-oriented education as outlined in the National Policy on Education document and with reference to the curricula for JSS and SSS are designed to achieve both technological and economic advancement of Nigeria (Ekpenyong, 2011). Also, Ekpenyong posited that, the following are structures of prevocational and vocational

courses in Nigerian institutions as contained in the 2004 edition of the National Policy on Education (FRN,2004). They are all elective subjects except Introductory Technology which has been listed as a core subject at the JSS level. At the JSS level, the pre-vocational elective subjects include; Agricultural Science, Business Studies, Home Economics, Local Crafts, Computer Education (Information Technology), Fine Arts (Creative Arts), Music, and Introductory Technology (Basic Technology). However, at the SSS level, the vocational education elective subjects include; Agricultural Science, Applied electricity, Bookkeeping and Accounting, Auto Mechanic, Commerce, Computer Education, Electronic, Clothing and Textiles, Food and Nutrition, Home Management, Metal Work, Technical Drawing, Woodwork, Shorthand, Typewriting, Fine Arts and Music.

1.3 Challenges in the Implementation of TVE in Institutions

According to Mohammed (2005), one of the problems of Technical and Vocational Education in Nigeria is the lack of motivated teachers and the reason for this lack of motivation could easily be traced to the low esteem of the teachers. More so, Onjewu (nd.) posited that the lack of funds on the other hand affects other essentials needed in the implementation of technical education like the provision of teaching aids, furnishing of offices, laboratories, workshops and even basic infrastructures like classroom, seats and tables, so that a common sight to find students of architecture for instance sharing a table where each ideally should have one because of the technical nature of their course. According to Ekpenyong (2011), there are a number of factors, which have in various proportions impeded the smooth implementation of the goals and objectives of Technical and Vocational Education and Training(TVET). Some of the outstanding factors affecting the implementation of TVET include;

1. Inadequate supply of technical teachers
2. Inadequate supply of equipment
3. Misinterpretation of policy and public perception of vocational technical education.
4. Technical college-industry relationship problem
5. Poor condition of services of technical teachers.
6. Inadequate guidance and placement services for technical students.

Consequently, UNESCO (2009) identified some issues of TVET, which include;

1. Low quality
2. Geographical, gender and economic inequalities
3. Poor public perception
4. Weak monitoring and evaluation mechanisms

5. Inadequate financing, poor management and ill-adapted organisational structures.
6. The low enrolment in formal TVE at.
7. The relevance of content of TVET.
8. The dearth of textbooks
9. Shortage of qualified and skilled instructors and teachers
10. Investment in TVET is very low

However, the National Board for Technical Education (NBTE, 2011), opined that, the underlining challenges of TVET sector include; low societal recognition, which translate to low enrolment and inadequate skilled workforce, obsolete instructional facility, inadequate funding, poor staffing, poor linkages with industry and general deficiency in quality. In addition, evaluation in all sectors of education tends to be by conventional examinations, which generally does not factor in practical techniques in the industry.

1.4 Statement of Problem

The state of Technical and Vocational Education (TVE) in rural institutions in Delta State needs attention. This became pertinent due to the lack of information on the state of implementation of the TVE curriculum in rural institutions in particular and institutions in general in Delta State.

1.5 Purpose of the Study

The main objective of this study is to generate information on the state of human and material resources for teaching technical and vocational subjects in rural institutions in Delta State. The specific objectives of this study are to:

1. Assess the state of human resources (subject teachers) for teaching technical and vocational subjects in rural institutions in Delta State.
2. Assess the state of infrastructural facilities for teaching technical and vocational subjects in rural institutions in Delta State.
3. Identify ways by which community leaders can help in improving the state of technical and vocational education in rural institutions in Delta State.

1.6 Research Questions

The following research questions were used to guide the study;

1. What is the state of human resources (subject teachers) for teaching technical and vocational subjects in rural institutions in Delta State?
2. What is the state of infrastructural facilities used in teaching technical and vocational subjects in rural institutions in Delta State?

3. What can community leaders do to improve the state of technical and vocational education in rural institutions in Delta State?

1.7 Scope of the Study

The scope of the study is on Assessment of the State of Technical and Vocational Education in Rural Institutions in Delta State. The study was limited to principals of government institutions in rural areas of Delta State.

2 Methodology

The survey research design was used for this study. The researcher considers this design appropriate because no variable will be manipulated in the study. The population of the study is all the four hundred and fifty three (453) public institutions principals in Delta State, Nigeria (Delta State Government, 2011). Fifty (50) principals were randomly selected from fifty (50) rural institutions (two (2) each from all the 25 Local Government Areas of Delta State).

A questionnaire was the main instrument used for collection of data for the study. The questionnaire contains 38-items, which was on a 5 point Likert Scale were used for the study. The questionnaire has 3 parts. Part A is on the assessment of the availability of teachers; Part B is on the assessment of the availability of infrastructural facilities and Part C is on how community leaders can improve TVET in rural institutions. The questionnaire was pre-validated by two lecturers in the Department of Technical and Business Education, Delta State University, Abraka, and possible corrections were made based on their suggestions. However, the pre-testing of the questionnaire was conducted with 10 respondents from rural institutions in Delta State. These respondents were not part of the real sample of the study. Thus, the internal consistency reliability co-efficient of the questionnaire assessed produced a satisfactory value of 0.73.

The data collected were analysed using simple frequency count and group mean. Using a 5-point Likert scale in assigning points for the respondents response (SA=5, A=4, UD=3, SD=2, D=1). The implication is that any response with group mean rating of 3.00 and above are accepted as 'Agree' and a group mean that is less than 3.00 is accorded to be 'Disagree'.

3 Findings and Discussion

3.1 State of Human Resources in TVE Institutions

Table 1: State of human resources in TVE Institutions

Institutions have the following qualified teachers:	Frequency					Mean	Decision
	5 SA	4 A	3 UD	2 SD	1 D		
Agricultural science	20	10	10	5	5	3.70	Agree
Business Studies	30	5	7	3	8	4.10	Agree
Home Economics	40	2	1	4	3	4.44	Agree
Local Crafts	0	2	10	30	8	2.12	Disagree
Information Technology	2	6	5	30	7	2.32	Disagree
Fine Arts	20	3	10	15	2	3.48	Agree
Music	2	3	12	31	2	2.44	Disagree
Basic Technology	3	7	3	7	30	1.92	Disagree
Book keeping and Accounting	10	3	4	31	2	2.76	Disagree
Commerce	7	3	6	29	5	2.56	Disagree
Clothing and Textiles	20	7	9	4	10	3.28	Agree
Food and Nutrition	30	5	2	3	10	3.84	Agree
Home Management	26	4	5	10	5	3.72	Agree
Technical Drawing	2	6	2	35	5	3.00	Agree
Woodwork	3	7	1	33	6	2.36	Disagree
Metal work	3	4	2	36	5	2.28	Disagree
Shorthand	1	3	10	35	1	2.36	Disagree
Typewriting	2	6	5	35	2	2.42	Disagree
Grand Mean						2.95	

SA=Strongly Agree, A=Agree, UD=Undecided, SD=Strongly Disagree, D=Disagree

In Table 1, the principals' decisions revealed that rural institutions in Delta State do not have qualified technical and vocational subjects teachers in the following subjects; Local Crafts, Computer Education/Information Technology, Music, Introductory Technology/Basic Technology, Bookkeeping and Accounting, Commerce Woodwork, Metalwork, Shorthand and Typewriting. This finding is in line with Ekpenyong (2011) who opined that, there are a number of factors, which have in various proportions impeded the smooth implementation of TVE, some of the outstanding ones include; inadequate supply of technical teachers and poor condition of services of technical teachers amongst others. Also, NBTE (2011) opined that, the underlining challenges of

TVET sector include; low societal recognition and inadequate skilled workforce.

3.2 State of Infrastructure in TVE Institutions

Table 2: State of Infrastructure in TVE Institutions

	Frequency					Mean	Decision
	5 SA	4 A	3 UD	2 SD	1 D		
Rural Institutions have adequate;							
Food and Nutrition laboratory	1	3	5	36	5	2.18	Disagree
Basic Technology Workshop	2	0	0	38	10	1.92	Disagree
Clothing and Textile Workshop	0	0	10	37	3	2.14	Disagree
Technical Drawing Room	2	0	0	45	3	2.06	Disagree
Creative Arts Studio	0	0	10	35	5	2.10	Disagree
Information Technology Laboratory	1	2	5	38	4	2.16	Disagree
Local Craft Workshop	1	1	5	40	3	2.14	Disagree
Hand tools	15	2	1	30	2	2.96	Disagree
Portable Power Tools	3	2	5	37	3	2.30	Disagree
Power Tools	0	0	5	43	2	2.06	Disagree
Consumables for Practical	3	3	3	37	5	2.28	Disagree
Woodwork Workshop	2	2	10	35	1	2.38	Disagree
Metalwork Workshop	3	2	5	25	15	2.06	Disagree
Music Studio	2	2	0	44	2	2.16	Disagree
Typewriting Studio	1	1	5	3	40	1.40	Disagree
Grand Mean						2.15	

In Table II, the principals decisions shows that rural institutions do not have the required infrastructural facilities used for teaching Technical and Vocational subjects. These facilities include; Food and Nutrition Laboratory, Basic Technology Workshop, Clothing and Textile Workshops, Technical Drawing Room, Creative Arts Studio, Information Technology Laboratory, Local Crafts Workshop, Hand Tools, Portable Power Tools, Consumables for practical, workshops, Music Studio and Typewriting Studio/Laboratory. However, this findings is in accordance with UNESCO (2009), some of the identified issues of TVET include; inadequate financing, poor management and ill-adapted organisational structure. Infrastructural facilities for technical and vocational education are very expensive. The implication is that, TVE requires adequate funding in other to combat the challenges of lack of required infrastructural facilities. In addition Ekpenyong (2011) states that, inadequate supply of

equipment impedes the smooth implementation of technical and vocational education.

3.3 Role of Community Leaders in Improving TVE

Table 3: Role of Community Leaders in Improving TVE

Community Leaders can help in improving TVE in rural institutions through the following;	Frequency					Mean	Decision
	5 SA	4 A	3 UD	2 SD	1 D		
Provision of consumables for practical	35	5	2	3	5	4.04	Agree
Provision of fund to employ contract technical and vocational subject teachers	40	2	1	5	2	4.50	Agree
Building and equipping technical and vocational subjects laboratory and workshop	36	5	5	2	2	4.42	Agree
Organizing fund raising ceremony for the purpose of procuring technical and vocational education instructional materials.	26	15	4	3	2	4.20	Agree
Sending appeal letters to government and nongovernmental organisation to address the needs of rural institutions with respect to technical and vocational education.	37	13	7	2	1	4.26	Agree
Grand Mean						4.28	

In Table 3: the principals' response shows that community leaders have role to play in improving the state of technical and vocational education in rural institutions in Delta State. Some of the roles of community leaders is; provision of consumables for practical, provision of fund to employ contract technical and vocational subjects teachers' building and equipping technical and vocational subjects laboratory and workshop, organizing fund raising ceremony for the propose of procuring technical and vocational education instructional materials and sending of appeal letters to government and nongovernmental organisation to address the needs of rural institutions with respect to technical and vocational education. This is in line with some projects which has been built by various firms operating in different communities.

4 Conclusion and Recommendations

Based on the findings, it was concluded that, the rural institutions in Delta State lack qualified technical and vocational subject teachers and also the state of infrastructural facilities is very poor. Hence, the implementation of TVE in rural institutions needs to be addressed by government and non-governmental organisation through the provision of the required infrastructural facilities for teaching technical and vocational subjects and the recruitment of qualified technical and vocational subject teachers. Based on the findings the following recommendations were made;

1. Delta State Government should employ qualified technical and vocational subject teachers in all the rural institutions in Delta State. However, the State Commissioner of Basic and Secondary Education, Delta State Ministry of Basic and Secondary Education, Delta State Post Primary Education Board, and Delta State Civil Service Commission needs to work collectively to establish an employment scheme and committee that will be made up of TVE professionals, (from industries and academic institutions) educational policy makers, and educational administrators that will be in charge of selection and recruitment of TVE subject teachers based on their level of education, competence and mastery in subject area, and ability to inculcate the curriculum content to the students. By doing this, the issue of lack of qualified and professional TVE subject teacher will be addressed and this will enhance students' performance, and the achievement of the goals of TVE.
2. Government should provide the required infrastructural facilities for teaching technical and vocational subjects in rural institutions. This could be achieved through the introduction of TVE Rural Education Development Fund. The fund will be generated from tax imposed on industries, non public servants, and public servants for the purpose of improving infrastructural facilities in rural institutions. This will lead to increase in enrolment of students in rural institutions because of the improved infrastructural facilities in the rural schools, parents will be discouraged from enrolling their children in urban institutions which are usually far from their home. Also, it will make teachers and students to be interested in the teaching and learning process.
3. Community leaders should provide consumable materials for practical and also donate infrastructural facilities for teaching technical and vocational subjects in rural institutions in Delta State. This can be achieved through public private partnership. The State Ministry of Basic and Secondary Education through the school principals, teachers, students, Local Education Authority, and Parents' Teachers' Association should write to

community leaders to assist in the provision of resources for the purpose of teaching and learning in schools in their locality. This is achievable when the school administrators has good community relations skills which will enable the principals to interact and relate well with the people of the community who can convinced their community members and leaders to give support to the schools.

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Distance Learning Centres and Administrators' Quality Assurance Implementation in Nigeria

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Abstract. Implementation of the concept of quality assurance is central to the performance of all educational institutions of learning and those operating outside the norm of traditional academic setting such as National Open Universities. Against this background, this study undertook to verify four hypotheses related to quality assurance in distance education in Nigeria. An ex-post facto research design was adopted for the study. A sample of 1,033 Academic staff were randomly selected from a population of two (2000) thousand staff. The selection was done through multistage sampling technique. A research instrument titled: Educational Administrator Quality Assurance Implementation Questionnaire. (EAQAIQ) was used for data collection. Pearson Product Moment Correlation was the statistical tool used for data analysis. The result of the study indicates that a significant relationship exists between quality assurance implementation and the systems performance. Based on the results, the study recommends that: Educational administrators should recruit qualified academic staff to teach and perform commensurate with their wealth of professional experience and qualification.

Keywords: Open and Distance Learning (ODL); Quality assurance; Nigeria.

1 Introduction

Nigeria's desire and quest for knowledge through excellence in higher education in the past ten years has culminated in the development of Distance Education. Today, Distance Education is one of the fast growing fields of education and training in the country. According to UNESCO (2000), realization of the importance of distance education as an essential component of the economy has influenced governments' interest in ensuring quality delivery through continuing education. Using this education institution as a pivot for its

(quality assurance) will remain unrealizable if administrators of these institutions are not efficient and effective in quality assurance implementation.

On this note, Adepoju (2000) asserts that no organization, public or private, formal or non-formal, can successfully accomplish its goals without any consideration for efficiency and effectiveness of its internal and external operations. Those who implements quality assurance programmes should involve the administrators of educational institutions in their efforts in such a way as to obtain better results of the goals of the distance learning institutions (ODL). This effort has to do with taking measures to remove any fault at the end of the production of educated, employable, disciplined and cultured individuals in the society.

In support of this opinion, Patru (2002) emphasized that ODL institutions should be stimulated by administrators' interest in the use of new technology based information and recognition that quality assurance in education requires innovative methods of restructuring the system for improved performance. Unfortunately, most of the nation's higher education administrators seem to be lacking in their administrative abilities and expertise of supervising programme of instruction, lacking of professional competence, inability to prudently manage available fund and poor curriculum organization and implementation (Vrah, 1995). Furthermore, Denga (1998) stressed that many school managers have non-challant attitude towards appreciating and rewarding teachers and students who are the key factors in the teaching learning process. With these problems and challenges the quality and quality assurance implementation of the school programmer may not be achieved.

Generally, the researchers has observed that; in Nigeria today, education has been counter-productive because it has undergone rapid changes with attendant policy somersault and implementation problems that arise mainly from lack of sufficient political will to foster quality assurance towards improvement of individuals and society. Nwaoku, (2002) observed that many programmes offered by Distance Learning educational Institutions are known to have been either destroyed due to school administrators' lack of vision and mission to plan, or made unworkable because of poor strategies for implementation. Therefore, as a matter of urgency, Government needs to embark on quality drive through teacher quality programme. Teachers, as resource inputs into the educational process, are the most important of all the inputs that would give assurance of quality implementation. This is pertinent because educational administrators' quality assurance, implementation requires teachers of the higher quality for a successful quality assurance results.

The issue of quality assurance implementation cannot be discussed without giving consideration to human resource of any country as its greatest asset. When the right quality of human resources in the right quality, is appropriately

deployed, would be able to convert the distance learning centres resources to useful products (Harvey, 1999).

In support of the above observation, Ramon-Yusuf (2002) affirmed that quality of human resources in the university system can only be attainable and implemented through effective instructional supervision and working with people who are working with students of the institution. According to Gooley and Lockwood (2006), the resources available for the development of knowledge are far from evenly distributed. This has contributed immensely to reducing administrators' effort towards quality implementation in school. Inputs into the system are inadequate. The nature of infrastructure and instructional materials are in the state of insufficiency. Mkpa (2008) posited that good quality resources are positively related to quality assurance implementation process.

Scholars like Ikenga-Metuh (1997), Yusuf (1995) Soyinka and Gana (1995) opined that the best way to change the Nigerian distance learning education was to strengthen our democracy and meet the challenges of this millennium is to guarantee a universal qualitative and excellent implementation of the system. Administrators of the educational system according to Vrah (1995) have a foresight and dynamism which can be a relevant launching pad to our yearning for a successful quality assurance implementation of educational programmes in distance learning institutions, practically however, only a few aspects of the quality assurance implementation policy are being realized while some of them still remain a mirage. This unfortunate situation could be blamed on government's consistent poor attitude towards the education sub-sector manifested in dishonest financial allocations to the sector and administrators ineffective financial management. In support of this opinion, Panda (2005) Peters (2005) and Umoru-Onuka (2001) affirmed that management (including planning) is central to and an essential part of distance learning. They concluded by asserting that obviously, management of distance learning educational institutions and their managers must be innovative and dynamic if quality assurance implementation of programmes is to be effective and successful.

For quality assurance implementation to be effectively implemented by educational administrators, a good quality management techniques or style must be built into any distance learning programme effectiveness and efficient service delivery for whereby teachers are adequately rewarded and recognized. More so, government apathy towards teachers' welfare has been a re-cycled problem affecting quality assurance implementation in our distance learning education system (Denga, 1998).

1.1 Statement of the Problem

Recent developments in the Nigerian open and distance learning university system seems to indicate that all is not well as expected with quality assurance implementation policy and programmes of school administrators. Ajayi (2005) maintained that the scenario appears worrisome when viewed against the background that Nigeria once served as the hub and most successful in the leadership of quality assurance implementation programme of tertiary educational institutions. As a matter of fact, today, things are no longer the same in distance learning institutions, as quality assurance implementation of the programme seems to be under serious threat due to ineffective leadership, poor financial management and infrastructural decay, lack of accommodation for students and unstable academic calendar among others (Okon and Ayuk, 2005). This situation brings to bear on the extent to which quality implementation of programmes is assured in these centres of learning. It is against this background that this study looked into the issues of quality assurance in Distance Learning Centres of our Universities.

1.2 Purpose of the Study

The main purpose of this study was to ascertain the extent to which educational administrators implement quality assurance in the administration of distance learning educational institution towards enhanced academic performance. Specifically the study was designed:

1. To ascertain the extent to which distance learning university administrators' instructional supervision relates with the performance of the system.
2. To ascertain the extent to which distance learning university administrators' attitude to lecturers' professional advancement relates with the performance of the system.
3. To ascertain the extent to which distance learning university administrators' maintenance of minimum academic standard relates with the performance of the system.
4. To ascertain the extent to which distance learning university administrators' management of fund relates with the performance of the system.

1.3 Hypotheses

The following hypotheses were formulated to guide the study:

1. There is no significant relationship between distance learning university administrators' instructional supervision and performance of the system.
2. There is no significant relationship between distance learning university administrators' staff development policy and performance of the system.

3. There is no significant relationship between distance learning university administrators' financial management with regard to quality assurance implementation and performance of the system.
4. There is no significant relationship between distance learning university administrators' maintenance of academic standard with regard to quality assurance implementation and performance of the system.

2 Methodology

This study adopted a descriptive ex-post facto design. The design was adopted because the variables under study had already occurred before the researchers conducted the research. The population of the study consisted of two thousand (2,000) staff of open distance learning centres in Nigeria. Through multistage sampling technique, one thousand and thirty-three (1,033) respondents were selected as sample for the study, which represent 51.6% of the population. The researchers appointed two assistant researchers in each centre who helped in collection of data from respondents. The process of data collection lasted for three months.

The instrument used for the study was Educational Administrator Quality Assurance Implementation Questionnaire (EAQAIQ) which was made up 60 items and structured to present the respondents with a fixed set of choices. A four-point Likert scale was used to rate the perception of the respondents. Strongly Agree (SA), Agree (A), Disagree (DA), Strongly Disagree (SD).

The validity of the instrument was established through submission of the copies of the instrument to two experts in measurement and evaluation to confirm their face and content validity. Ambiguous and irrelevant items were dropped and the instrument was reviewed and improved upon. The reliability of the instrument was determined through the split-half method using 50 lecturers in five centres. The subjects used in the trial testing did not constitute part of the main sample of the study although they had similar characteristics as the respondents. This was to avoid bias. The responses were then split into two for each respondent, such that all odd number responses were on one half while even number responses were on the other half. The aggregate scores of the respondents from the two halves formed pairs of scores for each of them. These pairs of scores were then correlated using Pearson Product Moment Correlation Coefficient (r). The result obtained was then subjected to Spearman Brown's prophecy formula to correct for the split. The indices of the variables ranged between 0.73 and 0.88 which was high enough to justify the use of the instrument for data collection.

Result

The result focus on the statistical analysis of data gathered for this study. The presentation of the data was done following the trends of the four (4) hypotheses directing this study. In this section therefore, each hypotheses of the study is restated, the variables are identified and the techniques for data analysis is specified.

Hypothesis 1

There is no significant relationship between administrators' instructional supervision and the system performance of distance learning institutions with regard to admission policy, learning environment, instructional services delivery, and academic record keeping.

The result of the analysis is presented in table one. The result of analysis in table one show that the calculated r-value for the relationship between educational institution administrator's instructional supervision and admission policy, (0.268), learning environment (0.433), instructional services delivery (0.396), academic record (0.385) and overall institution system performance (0.468) were each greater than the critical r-value of 0.062 at .05 level of significance with 1031 degrees of freedom. This means that there is a significant positive relationship between administrators' Instructional Supervision and all sub-variables of an overall institutional performance. That is the better the educational administrator's instructional supervision, the better the institution system performance, hence, the null hypothesis is by this result rejected.

Table 1: Educational Administrator's Instructional Supervision and Open University system performance (N = 1033)

Variables	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	R
Educational Administrators' Instructional Supervision	20137	409457		
Admission policy	17044	290142	337736	0.268*
Learning environment	18966	358990	377488	0.433*
Instructional service delivery	19570	37626	388609	0.396*
Academic record keeping	19431	375145	385926	0.385*
Overall institution system performance	182273	32734263	3628354	0.468*

* P < .0.5; df = 1031; critical r = 0.062

Hypothesis 2

There is no significant relationship between educational institution administrators' attitude towards lecturers' professional advancement and system performance of distance learning centres with regard to admission policy, learning environment instructional services delivery and academic record keeping. The result of the analysis is presented in Table 2.

Table 2: Relationship between Educational Administrators' Professional Advancement and System Performance (N = 1033)

Variables	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	R
Institutional administrators attitude toward advancement	17561	310777		
Admission policy	17044	290142	293178	0.328*
Learning environment	18966	358990	328080	0.493*
Instructional service delivery	19570	37626	337089	0.422*
Academic record keeping	19431	375145	335729	0.497*
Overall institution system performance	182273	32734263	3162170	0.550*

* $P < .05$; $df = 1031$; critical $r = 0.062$

Result of analysis in Table 2 show that the calculated r-values for the relationship between administrators' attitude towards lecturers' professional advancement and admission policy (0.328), learning environment (0.493), instructional service delivery (0.422), academic record (0.497) and overall system performance (0.550) were each greater than the critical r-value of 0.062 at .05 level of significance with 1031 degree of freedom. This means that, there is a significant positive relationship between educational institutional administrators' attitude towards lecturers' professional advancement and all sub-variables of all overall system performance. That is, the more effort the attitude of educational administrators towards staff development the better the institutional system performance. The null hypothesis is, by this result rejected.

Hypothesis 3

There is no significant relationship between institutional administrators' financial management and system performance of distance learning centres with regard to admission policy, learning environment, instructional service delivery and academic record.

The result of the analysis is preserved in table three which show that the calculated r-values for the relationship between administrators' financial management and admission policy (0.286), learning environment (0.513), instructional service delivery (0.532), academic record (0.536) and overall

schools system performance (0.062) of .05 level of significance with 1031 degrees of freedom.

This means that there is a significant positive relationship between administrators financial management and system performance. That is, if the administrator manages institutional finance very prudently the will be improved performance of the system. The null hypothesis, going by the result is rejected.

Table 3: Relationship between administrators' Financial Management and System Performance

Variables	$\sum x$ $\sum y$	$\sum x^2$ $\sum y^2$	$\sum xy$	R
Institutional administrators financial management effort	16922	299534		
Admission policy	17044	290142	28324	0.286*
Learning environment	18966	358990	319881	0.593*
Instructional service delivery	19570	37626	328074	0.532*
Academic record keeping	19431	375145	326168	0.536*
Overall institution system performance	182273	32734263	3075487	0.616*

* P < .0.5; df = 1031; critical r = 0.062

From the analysis above, the composite effect and the relative effect of distance learning institutions administrators effort towards quality assurance implementation and the system performance were further explored, using the multiple regression analysis. The result of the analysis is presented in table 4 and 5 respectively.

Results of analysis on table four are on the combined effect of the predictor variables on the criterion variable. The results therefore show that the calculated f-ratio of 229.951 is greater than the critical f-ratio of 2.09 at .05 level of significance with 1.026 and 6 degrees of freedom.

Table 4: Multiple regression analysis showing the composite effect of institutional administrators' quality assurance implementation on the institutions performance

Source of ss Variation	Df	Ms	F
Regression 55284.848	6	9124.141	229.951*
Residential 41111.808	1026	40.070	
Total	96396.658	1032	

R = 0.757

R² = 0.574

Standard error = 6.33009

* P < .0.5; df = 6;1026, critical F= 2.09

Table 5: Multiple regression analysis showing the relative effect of Administrators quality assurance implementation on institutional performance

Variables	B	STD ERROR	BETA	T	Sng
Constant instructional supervision	24.747 0.629	1.620 0.071	0.201	1527.3* 8.819	.000
Attitude to Professional Advancement of Lecturers	0.758	0.089	0.259	8.530*	.000
Financial Management	0.724	0.076	0.0274	9.533*	.000

P < .05

The statistical analysis implies that there is a significant combined (composite) effect of administrators' instructional supervision, attitude to professional, financial management on institutional performance.

Further examination of the result show that the general regression coefficient (R) was 0.757 implying that the predictors regressed significantly with the criterion. The R^2 value, which reflect the variances in the prediction accounted for by the variables used for the study was 0.574. That is, the variables used for the study accounted for 57.4% of the variability in the study. Accordingly, therefore, the results imply that the other 42.6% of the variable is accounted for by extraneous variables originally not controlled in the study.

Discussion, Conclusion and Recommendations

The result of the first hypothesis indicated a significant positive relationship between university administrators' instructional supervision and system performance of distance learning institutions. This means that distance learning institution perform better with an efficient administrators. The findings of this hypothesis is in agreement with Ogunsaju (1983) who pointed out that instructional supervision by an efficient school manager improves effective performance of educational institution so that these institutions can contribute maximally to the attainment of educational goals. He further submits that effective administrators focus on students' outcome through analysis of students' data, evaluate the curriculum and instructional approaches.

In support of this observation, Ajayi (2005) opined that administrators of educational institutions should endeavour to regularly carry out instructional supervision of their institutions to ensure quality especially in the areas of staff lesson delivery. In the same light, Adiomere and Ekwevugbe (2005) in their findings research revealed that school administrators' instructional supervision leads to effective monitoring of the learning environment and implementation of quality education programmes.

Contrary to this view, Okon and Ayuk (2005) posit that poor supervision of instruction in education institution has been responsible for poor school performance in academic studies. Their findings also show that inappropriate admission policy leads to high population of students in the distance learning of instructions and consequently poor performance of students and teacher. Confirming this assertion, Ocho (2005) observes that the fallen standard of education in the state could be attributable to the lack of job satisfaction among teachers.

The result of the second hypothesis indicated a significant positive relationship between Administrators attitude to staff professional advancement and system performance. This means that the more positive in attitude the school administrator is towards staff development, the better the performance of the school system. The findings of this study is in agreement with the work of Odigbo (2005) who carried out research in a distance learning and private education in Nigeria educational system with implications for quality assurance and system performance. He concluded that private schools have better qualified teachers than the traditional open distance learning institutions. This could be as a result of in-service training opportunity for their staff.

In support of this view, Adegun (2005) opined that staff development increase their productivity, enhance teachers' morale and assist them in adapting to the ever-changing technological world. Education institution managers whose attitude is to constantly provide for staff development, competence and good quality; often contributes to their job effectiveness towards quality assurance implementation of the school programme for improved performance.

Furthermore, the result of hypothesis three indicated a significant positive relationship between school administrators' financial and system's performance of open distance learning institution. This means that the better the financial management pattern of education institution leaders, the better the performance of the system. The findings of this hypothesis is in line with the result of a study by Unachkwu (2007) who opined that financial and property management as an aspect of educational accountability and progress, leads to quality assurance implementation of education programmes.

In another dimension, Ogbodo and Nwaoku (2007) asserted that without the management abilities of the open distance learning administrator, the administration of the school would crumble, quality implementation of programmes and the systems performance would remain unachievable. Nwaoku (2002) affirmed that an educational institution administrator can be effective in his management of funds, when he is not being wasteful but prudent in financial matters. This would lead to maintenance of transparent financial records, motivate staff, enhanced teaching and learning towards quality assurance implementation and improved academic performance.

From the analysis of the study, the researcher concluded that there is existence of positive relationship between open university administrator's instructional supervision effort and the performance of the school system. This indicates those university administrators who go round or make regular checks on staff that are performing their duties, are more likely to achieve a better performance of the system. His attitude to staff development or professional advancement enhances system performance. In other words, when the school administrators encourage issues relating to staff welfare, productivity could be enhanced despite the nature of the learning environment. To ensure implementation of quality in the education system there is need for adequate fund to be provided. This would no doubt contribute immensely to improvement of the systems performance.

Therefore, the university administrators should hold regular conferences, seminars and workshops with staff and address them on improvement of instructional supervision towards enhancement of the performance of the system. The open universities' distant learning authorities in conjunction with the Ministry of Education and state secondary education board should organize a well-planned growth oriented professional training/ in-service courses for sustenance of quality education. The university administrator should maintain transparent financial management ability by being prudent in financial matters. Finally, it is recommended that educational administrators recruit adequately qualified academic staff to teach and perform commensurate with their wealth of professional experience and qualification for improved performance.

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