

The Impact of Technology Acceptance Model on the Use of Information and Communication Technology in Training

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Abstract

Purpose: This study examined the impact of the Technology Acceptance Model (TAM) on the use of Information and Communication Technology (ICT) for training. The purposes of the research were to: ascertain the trainees and instructors perceived usefulness of ICT in training, ascertain perceived ease of use of available ICT facilities for training as well as examined attitude of trainees and instructors toward using, and actual user behavior. Salient issues were considered on the impact of TAM in the use of ICT for training

Design/Methodology & Approach: The methodology adopted was a contextual analysis that involved the review of materials ranging from publications, textbooks, and the relevant internet sources.

Implication: The ignorance of the TAM dependent variables by training institutions to infuse the use of ICT in training would not enhance training outcomes and would result in wastage of scarce resources.

Originality/Value: This paper concluded that the application of the Technology Acceptance Model in the use of ICT in training, would impact positively on training outcomes which are effectiveness, efficiency and optimal productivity.

Keywords: Technology Acceptance Model(TAM), Training, ICT, Use of ICT, training.

Paper Type: Conceptual research.

I. INTRODUCTION

Various theoretical frameworks/models have been devised to investigate ICT utilization in different fields and various training environments. The study examined Technology Acceptance Model(TAM) as it impacts on training environment/institution with regard to the impartation of knowledge through the teaching and learning process. The proponent of the Technology Acceptance Model (TAM) is Fred Davis in 1985 who hypothesized that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. The Technology Acceptance Model was specifically developed to identify the factors involved in the acceptance of the utilization of computers in general and Information and Communication Technologies (ICTs) by extension. The TAM

seeks to examine a variety of information technology usage behaviors. It is built on the theoretical framework that the intent to produce a behavior is dependent on two basic determinants; attitude toward behavior and subjective norms. Subjective norms refer to the reasons for producing a certain behavior or not and provide the link between the latter and an expected result. Whereas attitude toward behavior refers to the positive or negative value the individual associates with the fact of producing the behavior (Betrand and Bouchard, 2008). These two determinants would directly affect the adoption of ICT in training environments.

The term ICT has its origin in Information Technology (IT). Information Technology is a term that encompasses all forms of technology used to create, store, exchange, and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms). Also according Hagg, Cummin and Phillip,(2007) in World Bank (2002), Information and Communication Technologies (ICTs) consist of the hardware, software, networks, and media used for the collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services.

As the field of IT evolved, the term Information and Communication Technology are now used instead of Information Technology (IT) to recognize the convergence of traditional information technologies and telecommunications, which were once seen as distinct areas but now have become intertwined with the advancement in technology (Tella, 2011). Personal computer (either a desktop or laptop) Fuller,(2005) posits is the best-known example of the use of ICT in education, but the term multimedia is also frequently used. Multimedia can be interpreted as a combination of data carriers, for example, video, CD-ROM, floppy disc and internet and software in which the possibility for an interactive approach is offered. Multimedia now includes flash drive and other peripheral devices. Information and Communication Technologies (ICTs) have become key tools and have a revolutionary impact on how we see the world and how we live in it. As a tool, ICT improves the overall wellbeing of globally connected society with the right

perception and attitude. This is so because the proliferation of computer technology in both personal and professional lives, particularly during the last decade, has created an environment in which there are varying perceptions and ideas about the value of Information and Communication Technology (ICT) and computers. In order to benefit from this, especially in a training environment, a realistic perception of the worth of computers needs to be established (Thomas, 2007). Thus, the impact of the Technology Acceptance Model in the use of ICT for training cannot be overemphasized. In the context of this study, ICT is any technology that provides, produces, processes, preserves information and enables it to be communicated in audio, visual and text forms to effectively facilitate training.

Training in the words of Williams and Sawyer, (2002) connotes the impartation of knowledge or skills on individuals who have the ability to learn and practice or apply the same to given tasks. This assertion is buttressed by Bakar and Mohammed, (2008) in defining training as a process of imparting knowledge and skill on individuals who have the capability to learn and transfer such knowledge and skills on their job to achieve set goals. From this study, training could be seen in the context of continuous acquisition of specialized skills by the learner/ trainees for specific tasks. It is a systematic analytical base design of method and media that enable an individual or group to learn pre-determined knowledge or processes against predetermined objective and apply it to the required standard. Thus, training is an ongoing, long term change or evolution that occurs through many learning experiences (Elwood, 2002). This process of training is required for any discipline to achieve set goals. However, there are factors that could impact on the use of ICTs in training. These include the perception of both the trainees and instructors on the usefulness and the ease of use which are discussed extensively in TAM.

II. LITERATURE REVIEW

The acronym ICT stands for Information and Communication Technology. It refers to technologies that provide access to information through telecommunications. Information and Communication Technology (ICT) is the concern of every nation and organization because it brings innovation into information seeking and knowledge acquisition as it plays an important role in information sourcing, generation, processing, storage/retrieval and dissemination (Obioha, 2005). According to Tinio, (2002) ICT such as the World Wide Web, e-mail, telephones, fiber optics and satellites are revolutionizing the way in which societies interact and compete in international relations and politics. Information and Communication Technologies (ICTs) can enable organizations to produce, access, adapt and apply a greater amount of information and offer enormous opportunities for enhancing productivity. When used appropriately, ICT helps to expand access to education, strengthens the relevance of training to the increasingly digital workplace and raises the quality of education/training, helping to transform teaching

and learning into an engaging, active process connected to real life (Tinio, 2002).

Aldmour and Shannak, (2009) suggest an integrated definition of ICT. They defined ICT as the integration of software, hardware and people in a clear process to generate information that helps in decision making to facilitate the production of goods and services and enhance the efficient utilization of such products to promote better living standards. Therefore, the birth of ICT use is not unconnected with the revolution of Information Technology. The current trend in ICT has brought a phenomenon which can be termed the third revolution in IT. The first revolution comprised of films, radio, television, and satellite broadcasting, while the second comprised telecommunications and microcomputers. The integration of telecommunications and microelectronic technology in computing was termed the third revolution and came to be what is called Information and Communication Technology (ICT). The third revolution was said to promise not only a more productive person, a problem- solver and a life- long learner, but also a better informed, rational and participative citizen, a modern 'renaissance' person, living in the web and network of a worldwide electronic community (Kaino, 2004).

The concept of the use of ICT in training is paramount to this study. According to Atinmo, (2000) use is the ability to make effective and independent utilization of the resources and services. This implies that the materials are in the appropriate format and language for use. It also extends to the frequency of usage of the materials and services and the concomitant utility derived from the resources as observed by Adebayo, (2007). Addressing the issue of ICT use in education/training, Tinio, (2002) submits that the realization of the potential benefits of ICTs in education is not automatic because the process of integrating ICTs into the educational system is complex and multifaceted; it involves not just technology but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing among others. Tinio, (2002) provided evidence that ICTs are potentially powerful tools for extending educational/training opportunities, for facilitating the acquisition and absorption of knowledge, improving policy formulation, execution and widening the range of opportunities because of its ability to transcend time and space when the two major determinants of Technology Acceptance Models (TAM) are put into consideration.

Technology Acceptance Model (TAM) specifies the causal relationships between system design features, perceived usefulness, perceived ease of use, attitude toward using, and actual user behavior. Overall, the TAM provides an informative representation of the mechanisms by which design choices influence user acceptance, and should, therefore, be helpful in applied contexts for forecasting and evaluating user acceptance of Information and Communication Technology in training. Again, TAM suggests that attitude would be a direct predictor of the intention to use technology, which in turn would predict the

actual usage of the technology. However, Venkatesh, (2000) suggested that attitude would not play a significant role but rather that perceived ease of use (an expectation that a technology requires minimum effort) and perceived usefulness (a perception that the use of a technology can enhance the performance of a task at hand) would determine the intention to use a technology. Venkatesh, (2000) added that TAM is a good model but that it does not help understand and explain the acceptance of a technology in a way that promotes the development of a strategy having a real impact on the usability and acceptance of the technology. He, therefore, proposed a modified model.

Four personal anchoring factors were added to the determinants of perceived ease of use; (computer self-efficacy, perception of external control, anxiety towards computers and computer playfulness) and two adjustment-based factors which develop with experience; (perceived enjoyment and objective usefulness). These anchors represent general beliefs about computers and their uses which are applicable to trainees and instructors in training institutions/organizations. In a critical review of the TAM, Legris, Ingham, and Collette, (2003) retained 22 studies that tested the model in its integrity with a well-defined methodology. TAM has also been used to test the acceptance of online games, internet utilization behavior, online shopping and technology in New Zealand dairy farming, online learning and internet banking (King and He, 2006). The results of these studies confirm that the model can be used in a wide variety of contexts like training and that the impact of ease of use on the intent to use is mainly brought about by perceived usefulness (King and He, 2006).

This model is applicable to trainees and instructors in training institutions and organizations as regards the influence of computer self-efficacy, perception of external control, anxiety towards computers, computer playfulness and two adjustment-based factors that develop with experience (perceived enjoyment and objective usefulness) for the use of ICT by trainees and instructors in training.

III. IMPACT OF TECHNOLOGY ACCEPTANCE MODEL ON THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN TRAINING

The present information age has made the whole world a global village through the interconnectivity of the world wide web. This development has affected every human endeavor as information/knowledge sharing is now at the speed of light made accessible through Information and Communication Technology. Therefore the need to use ICT in training in all disciplines cannot be overemphasized which will no doubt enhance training outcomes and consequently optimal productivity. However, to reap optimal benefit in the use of ICT in training, the perceptions of the trainees, instructors and the institution/organization in the use of ICT for training are key determinants. Thus, the impact of the Technology Acceptance Model on the use of Information and

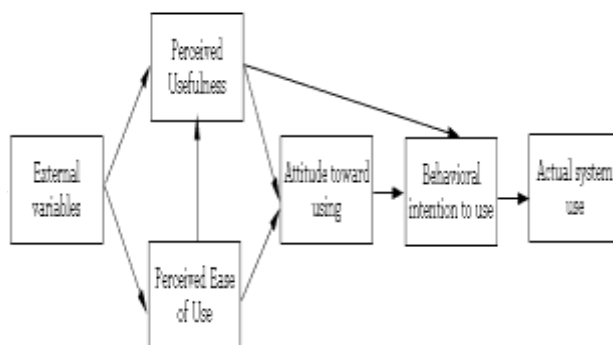
Communication Technology in training is of paramount importance.

Based on the theory of Reasoned Action, Davis, (1989) developed the Technology Acceptance Model which deals more specifically with the prediction of the acceptability of an information system. The purpose of this model is to predict the acceptability of a tool and to identify the modifications which must be brought to the system in order to make it acceptable to users. This model suggests that the acceptability of an information system is determined by two main factors: perceived usefulness and perceived ease of use.

Perceived usefulness is defined as being the degree to which a person believes that the use of a system will improve his performance. Perceived ease of use refers to the degree to which a person believes that the use of a system will be effortless. Several factorial analyses demonstrated that perceived usefulness and perceived ease of use can be considered as two different dimensions (Hauser et Shugan, 1980; Larcker et Lessig, 1980).

As demonstrated in the theory of Reasoned Action, the Technology Acceptance Model postulates that the use of an information system is determined by the behavioral intention, but on the other hand, that the behavioral intention is determined by the person's attitude towards the use of the system and also by his perception of its utility. According to Davis, (1989), the attitude of an individual is not the only factor that determines his use of a system but is also based on the impact which it may have on his performance. Therefore, even if an employee does not welcome an information system, the probability that he will use it is high if he perceives that the system will improve his performance at work. Besides, the Technology Acceptance Model hypothesizes a direct link between perceived usefulness and perceived ease of use. When the two systems offer the same features, a user will find more useful the one that he finds easier to use (Dillon and Morris, 1996).

Figure 1. Technology Acceptance Model from Davis, Bagozzi et Warshaw (1989)



Source: http://edutechwiki.unige.ch/en/Technology_acceptance_model

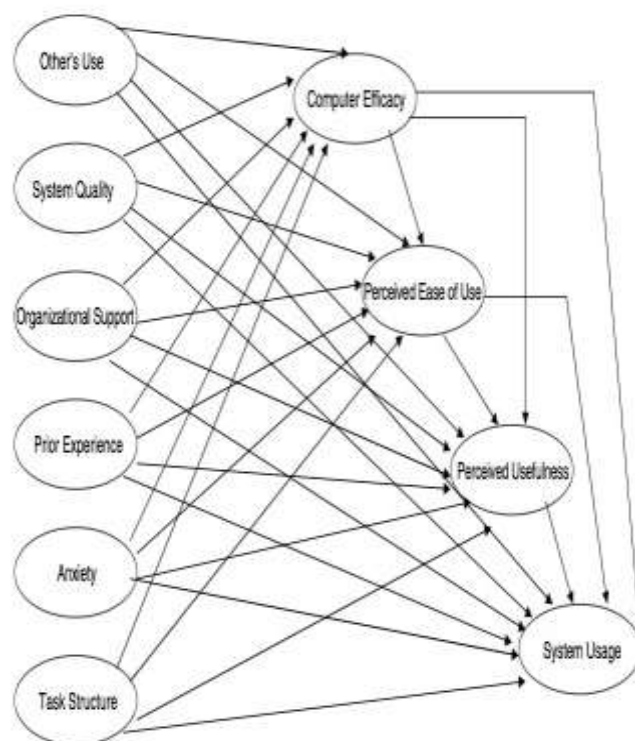
According to Davis (1989) perceived ease of use also influences in a significant way the attitude of an individual through two main mechanisms: self-efficacy and instrumentality. Self-efficacy is a concept developed by Bandura, (1982) which explains that the more a system is easy to use, the greater should be the user's sense of efficacy. Moreover, a tool that is easy to use will make the user feel that he has control over what he is doing (Lepper, 1982). Efficacy is one of the main factors underlying intrinsic motivation (Bandura, 1982; Lepper, 1982). Therefore it illustrates the direct link between perceived ease of use and attitude. Perceived ease of use can also contribute in an instrumental way to improving a person's performance. Due to the fact that the user will have to deploy fewer efforts with a tool that is easy to use, he will be able to spare efforts to accomplish other tasks.

It is however interesting to note that the research presented by Davis, (1989) to validate his model, demonstrates that the link between the intention to use an information system and perceived usefulness is stronger than perceived ease of use. According to this model, we can, therefore, expect that the factor which influences the user most is the perceived usefulness of a tool.

According to McFarland and Hamilton, (2006), although the initial TAM model was empirically validated, it explained only a fraction of the variance of the outcome variable, that IT usage was from 4% to 45%. Therefore, many authors have refined the initial model, trying to find the latent factors underlying perceived ease of use and perceived usefulness. In TAM2, Venkatesh and Davis, (2000) showed that social influence processes (subjective norm, voluntary, image) and cognitive instrumental processes (job relevance, output quality, result demonstrability) affected perceived usefulness and intention to use. A notable refinement of the TAM model is proposed by (Mc Farland and Hamilton, 2006). Their model assumes that 6 contextual variables (prior experience, other's use, computer anxiety, system quality, task structure, and organizational support) affect the dependant variable system usage through 3 mediating variables (computer efficacy, perceived ease of use and perceived usefulness). The model also postulates a direct relationship between the external variables and system usage and not only mediation through perceived ease of use and perceived usefulness affect the actual use of a technology. The results corroborated the research model, showing that system usage was directly and significantly affected by task structure, prior experience, other's use, organizational support, anxiety, and system quality. The mediation effect was also seen as predicted. Thus, the 6 contextual variables (prior experience, other's use, computer anxiety, system quality, task structure, and organizational support) affect the dependant variable system usage through 3 mediating variables (computer efficacy, perceived ease of use and perceived usefulness) in the use of ICT for training in an organization. Furthermore, on the use of ICTs for training, TAM also postulates a direct relationship between the external variables and system usage and not only

mediation through perceived ease of use and perceived usefulness are essential.

Figure 2. Adding Contextual Specificity to the Technology Acceptance Model from McFarland and Hamilton, (2006)



Source: http://edutechwiki.unige.ch/en/Technology_acceptance_model

In a nutshell, the initial model or its extension does not completely account for the observed variance in system usage. However, the models all agree that computer efficacy affects perceived ease of use, which in turn is strongly related to perceived usefulness which are applicable in the attitude of trainees and instructors in the use of ICT in training. A meta-analysis conducted by Scherer, Siddiq, and Tondeur, (2019) showed that TAM models remains a good choice for explaining teachers' adoption of digital technology in education. There are various related empirical studies that buttressed the fact that the 6 contextual variables and the 3 mediating variables postulates of TAM are not negotiable in developing positive attitudinal behavior in the use of ICTs in training. Below are a few of such empirical studies.

IV. REVIEW OF RELATED EMPIRICAL STUDIES

There are many proponents on related empirical studies on the use of ICT for instruction/ training as it relates to the two major determinants in the Technology Acceptance Model (TAM). In this section, a number of such studies would be discussed. The empirical study carried out by Usluel, Askar and Bas (2008) was titled: A Structural Equation Model for ICT Usage in Higher Education. The study focused on Information and Communication Technologies (ICTs) usage,

which is the indicator of diffusion of ICT innovation. A model composed of the variables which can explain ICT usage in Turkish higher education was established and tested within the study. The two dimensions of ICT usage were considered: instructional and managerial. The data collected from 814 faculty members in Turkey were used to test the model by using LISREL 8.72; it explained 61% of the faculty members use ICT, with a good model fit. The model supposes that the perceived attributes of ICT and ICT facilities in the universities predict the ICT use. The faculty members made use of ICT mostly as a means of communication and for searching for information about the course through the internet; for publishing their lecture notes and the announcements concerning the course assignments. The study was carried with a questionnaire administered on faculty members. The study was able to identify the ICT diffusion rate in universities on the basis of faculty members ICT usage. The result shows that 65.3% of faculty members in the study group have computers in their offices and 55.9% have access to the internet in offices. Also, the availability of computers and internet facilities in the laboratories were 38.7% and 28.2% respectively.

Furthermore, majority of the respondents have personal access to the computer and internet facilities. Respondents who own personal computers were 89.1% and 70.6% of them have internet connections. In summary, the study identified that the percentage of faculty members who have their own computers and access to internet is quite high (82.5% for computers and 81.2% for internet) and the remaining 17.5% of faculty members who do not have personal computers stated that they easily have access to it in the department. The finding of the study shows that ICT usage is getting more widespread in higher education. This study has investigated the underlying relationship between ICT facilities, perceived attributes, and ICT usage for higher education. Also, it further provides evidence that the availability of ICT facilities (system quality, task structure, and organizational support variables) have a strong positive effect on ICT usage than a positive effect on perceived attributes.

Again, Kiptalam and Rodrigues, (2010) studied accessibility and utilization of ICTs among secondary school teachers in Kenya. This work investigated the level of access and the extent of use of ICT among teachers in selected Kenyan secondary schools. The study provided evidence to support the fact that the use of ICT in education has the potential to enhance the quality of teaching and learning, the research productivity of teachers, students, management and effectiveness of institutions. The study, which is a cross-sectional descriptive survey, used quantitative technique, using the questionnaire method for data collection and analysis. The sample for the survey was drawn from 11 secondary schools with internet access. The findings show that the use of ICTs and its integration in the teaching and learning in secondary education is getting more widespread and its use more pervasive among teachers as a means of communication and information searching due to their

perceived usefulness in the teaching and learning process. Access rates for teachers were observed to be much higher in educational institutions that have made effective ICT investments in education, translating into better use of ICT related technologies with assumed positive impacts.

However, the study further reveals that the majority of the teachers did not receive ICT training at the teachers' training colleges or universities where they trained, with 55% getting into the teaching profession with no experience of computers and its related technologies. The lack of experience in ICT training resulted in anxiety towards computers, computer playfulness and the two adjustment-based factors that develop with experience (perceived enjoyment and objective usefulness) for the use of ICT in training institutions by trainees and instructors/teachers. Nevertheless, it is reassuring to note that there seems to be a reversal of trends with 51% of them indicating that they have undergone ICT training in the past three years, with some schools supporting the training programs.

Also in a more recent survey by GIT, in 2005 – 2006 on ICT utilization in training using Networked Readiness Index (NRI), Nigeria was ranked 90th out of the 115 countries surveyed. United States of America topped the list, followed by Singapore, Denmark, Iceland, Finland, Canada, Taiwan, Sweden, Switzerland, and the United Kingdom, (Global Information Technology, 2006). This shows a decline in Nigeria's preparedness to participate in the use of ICT in education and training development due to the negative perception of ease of use as buttressed by the Technology Acceptance Model determinants.

Dankaro, Jude, Inibehe, and Terumbur, (2012) did an empirical study on ICT Resources Utilization, Availability and Accessibility by Teacher Educators for Instructional Development in College of Education, (CoE) Katsina-Ala, Benue State Nigeria, the purpose of the study was to examine the availability and accessibility of ICT resources for teacher educators in College of Education (CoE). A total of forty (40) College of Education Katsina-Ala teacher educators from five schools randomly selected formed the sample size from a population of 287. The researchers adopted the Ex post-Facto research design and formulated two research questions to guide in the study. The researcher made an instrument tagged Information and Communication Technology Research Questionnaire (ICTRQ) which was used for data collection. The reliability coefficient of the instrument was 0.7.

The data was analyzed and the findings reveal that ICT resources were not available and for that reason, teacher educators could not access them for instructional development purposes. ICT resources were not available in CoE Katsina-Ala for teacher educators' instructional development as the institution did not supply computers/laptops to its teacher educators; there was a lack of organizational support in which is imperative in acceptance of innovative technology like ICT in training. Many of them owned personal laptops/computers

which were not connected to the internet and as such could not access internet services in their offices (lack of organizational support) for instructional development purposes. They mostly relied on personal mobile devices to access the internet. This finding corroborates the findings of Ezeoba, 2007 and Fakeye, 2010, who also found that ICT resources were not available in primary and secondary schools. This is also attributed to the failure of teacher training institutions whose products go through the program without the training to interact with such technology in the classroom and as a result, are not ICT compliant; that is they lack the know-how to teach these programs in the primary and secondary schools where they are trained to teach. The lack of ICT resources in teacher training institutions created ignorance on the perceived usefulness and self-efficacy of ICT in the teachers. Hence, there is an absence of ICT resources in primary and secondary schools as well as personal to use them. The level of accessibility of ICT resources depends on their availability. The poor availability level of ICT resources in CoE Katsina-Ala also means accessibility will be hindered for instructional development purposes probably due to negative perceived ease of use by the training institution and the lack of organizational support.

Thus, it can be deduced from this study that, integrating ICT in the teacher training program in Colleges of Education will go a long way in raising the fallen standard of education, making learning real and no longer abstract when organizational support is put in place. This would also motivate learners, who deserve an improved approach to their daily educational growth. As all stakeholders clamor for improved quality of education through the integration of ICT in learning the need to equip teacher training institutions and their faculty with adequate ICT infrastructure and skills becomes imperative. Based on these, it was recommended that the college authority should avail teacher educators in the institution with ICT resources and sponsor them for training and retraining programs to produce ICT compliant teachers.

Alazzam, Bakar, Hamzah and Asimiran (2012), also conducted a study to examine ICT readiness and the effects of demographic characteristics, educational background, and support factors on the ICT readiness of technical and vocational teachers in Malaysia. The study was conducted using a questionnaire administered on technical and vocational teachers who are teaching engineering subjects in Malaysian technical and vocational schools. The questionnaire consisted of items related to ICT knowledge, ICT skills, and attitudes toward ICT. The findings in this study indicated that the teachers' ICT knowledge was above average, the teachers' ICT skills were at a moderate level, and their attitudes toward ICT were positive.

A total of 329 teachers participated in this study. Almost 63% of them were male teachers and the other 37% were female teachers. They were between 27 and 57 years old and more than one-third (37.1%) were between the age of 42 to 49 years old. With regard to teaching experience, about 32% have been

in the teaching profession for less than 10 years, approximately 31% were between 11 and 18 years and about 11% had been in the teaching profession between 27 and 34 years. The respondents were asked if they attended any ICT related courses. Forty-one percent (41%) of them indicated that they have attended ICT basic course. A little bit more than 39% attended courses related to world-wide-web design, multimedia, and programming. Ten percent of the respondents attended courses related to ICT integration in teaching and learning and 9.7% of the respondents never attended any ICT related training.

The success of ICT integration in teaching and learning process is very much dependent on the administrative (organizational) support and the availability of the ICT facilities as well as the prior knowledge and experience through training on the use of ICT. The majority (75%) of the respondents indicated that they have the support from the administration in the integration of ICT in teaching. With regard to the ICT facilities, 62.9% of the respondents felt that there were highly adequate ICT facilities in their schools, 27.7% thought that the ICT facilities in their schools were adequate and 9.4% thought that ICT facilities in their schools were inadequate.

The findings of this study also indicated that there was no significant effect related to age and years of teaching experiences on teachers' on ICT readiness. However, there was a significant effect of teachers' gender on their readiness, specifically teachers' ICT skills due to negative perceived ease of use by the female respondents.

Also, Tella, (2012) investigated the level of availability and use of ICT in some South-Western Nigeria Colleges of Education. The data for the study were gathered through a two-page questionnaire administered to 200 respondents who were accessible in all the Colleges of Education in the South-Western part of Nigeria. In total, 180 questionnaires were retrieved which represents a 90% return rate. The data were analyzed quantitatively using Statistical Package for Social Scientists (SPSS).

The study revealed a low level of usage of ICT gadgets and the non-availability of some ICT equipment in the Colleges. Colleges use computers for research/educational purposes as well as administrative purposes. Those for administrative purposes are usually found in the Provost, Registrar, Deputy-Provost offices. Not a single one could be found in any of the Heads of Department's offices except the offices of the Departmental heads of Mathematics/Computers. The results of the survey on College of Education staff on the level of availability, use, and perception of the impact (perceived usefulness) of ICT on teacher education in Nigeria reveals a low level of usage of ICT gadgets due to non-availability of ICT equipment and that the respondents were disgruntled with the sluggish use and integration of ICT.

Moswetsi, Renken and Neethling, (2006) carried out a research to investigate the attitudes of the Students/Trainees in the South Africa (SA) Military Academy towards ICT. It was believed that a realistic perception of the worth of ICT/Computers, needs to be established among officers and students/ trainees at the SA Military Academy for the Academy, students/trainees, and instructors to benefit maximally from the widespread use of ICT. The objective was to determine whether there exists any difference in the attitudes of students/ trainees towards ICT utilization based on gender, prior experience with computers, rank, arm of service (Navy, Army, Air-force and others) and academic year. The result indicated that there is no significant difference in perception towards ICT usage based on gender, prior knowledge of computer and arm of service.

However, the study indicated a significant difference in perception based on rank and academic year. Officers/trainees of lower rank than a Lieutenant had a negative perception of the use of ICTs and officers in the first year were more afraid to use ICTs resources than others. The research also provided evidence that ICT utilization is dependent on computer experience, access to computers/ICTs through organizational support and the number of ICT related courses attended (prior knowledge) as enumerated in TAM. These results highlight the importance of influencing the perceptions of officers under training in order to optimize their preparedness for the operational environment. This research also emphasizes the importance of providing contextualized information systems training to military personnel in a purposeful way to help them have a positive attitude to the actual use of ICTs in training and operations.

Vichita, Vathanophas, Krittayaphogphun, and Klomsirir, (2008) carried out an empirical study to investigate the utilization of ICT (internet) by naval officers in the Naval Department for the e-government initiatives in Thailand. The study employed the Technology Acceptance Model to measure naval officers' perception of the internet and their ease of using the internet. The study revealed that factors influencing naval officers' perception of internet use were: prior experience, job relevance, commitment, trust, and autonomy. These factors aptly corroborated in the 6 additional variables in the modified Technology Acceptance Model by McFarland and Hamilton, (2006). Also, training and infrastructural problems were factors identified that hindered the effective utilization of ICTs.

V. CONCLUSION

In summary, salient themes relevant to the research topic have been explored. The concept of training generally reviewed and different definitions of ICT have been explained and in the context of this study, ICT could be seen as diverse electronic gadgets and resources such as computers, internet, broadcasting (radio and television) utilized by persons (trainees and instructors) to communicate, create and disseminate information to a single and multiple destinations

using wired and wireless media for optimal productivity and attainment of organizational goals. The review also highlighted the Technology Acceptance Model (TAM) that provided an adequate framework for the research. The Technology Acceptance Model (TAM) was specifically developed to identify the factors involved in acceptance and of utilization of computers in general and ICTs by extension in every discipline and facet of life especially impartation of knowledge (training). Findings from the empirical studies in this research succinctly bring to fore the great impact of that the two (2) determinants the six (6) contextual variables (prior experience, other's use, computer anxiety, system quality, task structure, and organizational support) affect the dependant variable system usage through three (3) mediating variables (computer efficacy, perceived ease of use and perceived usefulness) in the use of ICT for training in organizations. Therefore, from the modified Technology Acceptance Model, there is a direct relationship between the external variables and system usage. Consequently, it is not only mediation through perceived ease of use and perceived usefulness that impact on the use of Information and Communication Technology in training generally. Overall, the TAM provides an informative representation of the mechanisms by which design choices influence user acceptance, and could, therefore, be helpful in applied contexts for forecasting and evaluating user acceptance of information technology. Thus, the application of the Technology Acceptance Model in the use of ICT in training would impact positively on training outcomes which are effectiveness, efficiency and optimal productivity.

REFERENCES

- [1] Alazzam, A., Bakar, A., Hamzah, R., & Asimiran, S. (2012). Effect of Demographic Characteristics Educational Background and Support Factors on the ICT Readiness of Technical and Vocational Teachers in Malaysia. *International Educational Studies*. 5(6):229-243 Retrieved 18 March, 2020.
- [2] Adebayo, O.O., (2007). Availability and Utilization of Material Resources as Correlates of Students Learning Outcome in Secondary School History: A Case Study of Some Selected Secondary School in Oluyole Local Government Area of Oyo State. *Unpublished M.Ed. Project, University of Ibadan*. Retrieved 12 March, 2020.
- [3] Aldhmour, F. M. & Shannak, R. O. (2009). The Effective Utilization of Information and Communication Technology and its Impact on Competitive Advantage. *European Journal of Scientific Research* 29 (3): 302- 314. Retrieved 12 March, 2020.
- [4] Atinmo, M.I., (2000). Availability and Accessibility of Library Resources for the Visually Handicapped in Nigeria: The Way forward, *Journal of Association of Librarians for the Visually Handicapped* 1(1):15- 22. Retrieved 28 March, 2020
- [5] Bakar, A.R. and Mohammed, S. (2008). Teaching Using Information and Communication Technology: Do Trainee Teachers Have the Confidence? *International Journal of Education and Development Using ICT /online/, 4(1)* from <http://ijedict.dec.uwi.edu/viewarticle.php?id=374> Retrieved 27 March, 2020
- [6] Bandura, A. (1982). Self-efficacy Mechanism in Human Agency, *American Psychologist* 37 (2) 122-147. Retrieved 28 March, 2020

- [7] Betrand, M. and Bouchard, S. (2008). Applying the Technology Acceptance Model to VR with People Who are Favourable to its Use. *Journal of Cyber-Therapy & Rehabilitation*. 1(2): 200- 210. Retrieved 28 March, 2020
- [8] Dankaro, Jude, Inibehe, W. and Terumbur J. (2012) ICT Resources Utilization, Availability and Accessibility by Teacher Educators for Instructional Development in College of Education, (CoE) Katsina-Ala, Benue State Nigeria. *Academic Journal of New Media and Mass Communications* <http://connection.ebscohost.com/c/articles/82158773/3:1>. Retrieved 20 March, 2020.
- [9] Davis, F., Bagozzi, R., and Warshaw, R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, Volume 35, 1989, pp. 982-1003. Retrieved 18 March, 2020.
- [10] Davis, Bagozzi et Warshaw (1989). Technology Acceptance Model from http://edutechwiki.unige.ch/mediawiki/index.php?title=Technology_acceptance_model&oldid=72539 Retrieved 18 March, 2020.
- [11] Dillon, A., and Morris, M. G. (1996). User Acceptance of Information Technology: Theories and Models. *Annual Review of Information Science and Technology*, Vol. 31, 3-32. Retrieved 18 March, 2020.
- [12] Elwood, H. (2002). *Human Resource Development*. New York: Random House.
- [13] Ezeoba, K. O. (2007). Instructional Media. An Assessment of The Availability, Utilization, and Production by Nursery School Teachers. *Journal of Applied Literacy and Reading*. 3 (Special Edition) 33 – 38. Retrieved 22 March, 2020.
- [14] Fakeye, D. O. (2010). Assessment of English Language Teachers' Knowledge and Use of Information and Communication Technology (ICT) in Ibadan Southwest Local Government of Oyo State. *American Eurasian Journal of Scientific Research* 5(4) 56 – Retrieved 20 March, 2020.
- [15] Fuller M.A. (2005). "Internet" in Davis G.B. (Ed.). *Management Information Systems*, The Blackwell Encyclopedia of Management, 2nd Ed, Blackwell Publishing, Malden.
- [16] Global Information Technology Report (2005). The Networked Readiness Index Rankings 2005. www.weforum.org/pdf/global_competitiveness_reports/2006/rankings. Retrieved 29 March 2020.
- [17] Haag S., Cummings M., Philips A., (2007). *Management Information Systems for the Information Age* 6th Ed., McGraw- Hill/ Irwin, Boston.
- [18] Hauser, J. R. and Shugan, S.M. (1980), "Intensity Measures of Consumer Preference," *Operation Research*, Vol. 28, No.2, (March-April), 278-320. Retrieved 29 March 2020.
- [19] Ingham, John; Pierre Colletette, Why Do People Use Information Technology? A Critical Review of The Technology Acceptance Model, *Information & Management*, Volume 40, Issue 3, January 2003, Pages 191-204, ISSN 0378-7206, 10.1016/S0378-7206(01)001434. (<http://www.sciencedirect.com/science/article/pii/S0378720601001434>) Retrieved 29 March 2020.
- [20] Kaino, L (2004). Information and Communication Technology (ICT) Research, Dissemination and Utilization in Southern African Universities. from http://www.aau.org/aau_fr/sites/default/files/ict6.pdf 25/11/12. Retrieved 29 March 2020.
- [21] King, W.R., He, J. (2006). A Meta-Analysis of The Technology Acceptance Model. *Information & Management*. 43: 740-755 Retrieved 29 March 2020.
- [22] Kiptalam and Rodrigues (2010). Accessibility and Utilization of ICTs Among Secondary School Teachers in Kenya. *International Journal of Computing and ICT Research*. 4 (1): 39-44. Retrieved 20 March 2020.
- [23] Kiptalam, G.K.&Rodrigues, A. J. (2010). Internet Utilization: A Case of Connected Rural and Urban Secondary Schools in Kenya. *International Journal of Computing and ICT Research*. 4(1): 49-63. Retrieved 20 March 2020.
- [24] Larcker, D.F., and LESSIG, V.P. (1980) Perceived Usefulness of Information: A Psychometric Examination. *Decision Sciences*, 11 (1). Retrieved 29 March 2020.
- [25] Legris, Paul, John Ingham, Pierre Colletette (2003). Why Do People Use Information Technology? A Critical Review of The Technology Acceptance Model, *Information & Management*, Volume 40, Issue 3, January 2003, Pages 191-204, ISSN 0378-7206, 10.1016/S03787206(01)001434. <http://www.sciencedirect.com/science/article/pii/S0378720601001434>) Retrieved 29 March 2020.
- [26] Lepper, M. R. (1982, August). Microcomputers in Education: Motivational and Social Issues. A Paper Presented at The Annual Meeting of The American Psychological Association, Washington, D.C. Retrieved 29 March 2020.
- [27] McFarland, D., & Hamilton, D. (2006). Adding Contextual Specificity to The Technology Acceptance Model. *Computers in Human Behaviour*, 22(3), 427-447. "http://edutechwiki.unige.ch/mediawiki/index.php?title=Technology_acceptance_model&oldid=72539" Retrieved 29 March 2020.
- [28] Moswetsi, W., Renken, J. & Neethling, A. (2006). Attitudes and Perceptions of South African Military Academy Students Towards Information and Communication Technology and Computers. *Scientia Militaria* 34(1):49-66. Retrieved 20 March 2020.
- [29] Obioha, J. (2005). The Role of ICT in Information Seeking and Use Amongst Research Officers in Research Institutes in Nigeria: The Nigerian Institute of Oceanography and Marine Research Institute Experience. *The International Information and Library Review*. 37(4): 303 – 314 Retrieved 20 March 2020.
- [30] Scherer, R., Siddiq, F., & Tondeur, J. (2019). The Technology Acceptance Model (TAM): A Meta-analytic Structural equation Modelling Approach to Explaining Teachers' Adoption of Digital Technology in Education. *Computers & Education*, 128, 13–35. from <https://doi.org/10.1016/J.COMPEDU.2018.09.009> Retrieved 29 March 2020.
- [31] Tella, A. (2011). Availability of ICT in South-Western Nigeria Colleges of Education. *African Research Review*, 5(5):315 - 331 Retrieved 19 March 2020.
- [32] Thomas, T.L. (2007). "IT Requirements for Police Keeping", US Foreign Military Studies Office Publication from <http://leavwww.army.mil/fmso/documents/ITPolicekeeping/itpolicekeeping.htm> Retrieved 19 March 2020.
- [33] Tinio, V. L. (2002). ICT in Education. *United Nations Development Programme. Bureau for Development Policy*. New York. From <http://www.eprimers.org> Retrieved 29 March 2020.
- [34] Usluel, Askar and Bas, (2008). A Structural Equation Model for ICT Usage in Higher Education. *Journal of Educational Technology & Society* 11(2), 262-273. from http://www.ifets.info/journals/11_2/19.pdf Retrieved 19 March 2020.
- [35] Venkatesh V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation and Emotion into the Technology Acceptance Model. New York: The Free Press.
- [36] Venkatesh, V. Davies, K. & Morris, T. (2003). *Social Influence on ICT utilization in Education*. New York: The Free press.
- [37] Venkatesh, V., Morris, M.G., Davis, G.B. & Davis, F.D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425. <https://doi.org/10.2307/30036540> Retrieved 19 March 2020.
- [38] Vichita Vathanophas, Nattapon Krittayaphongphun, and Chalalai Klomsiri, (2008) "Technology Acceptance Toward e-government Initiative in Royal Thai Navy", Transforming Government: People, Process and Policy, 2 (4): 256 – 282. Retrieved 12 March 2020.

[39] William & Sawyer, R. (2002). *Human resource management*. Enugu: Fulladu publishing.
[40] World Bank, (2002). World Bank Group, Information and Communication Technologies A

[41] World Bank Group Strategy(Washington, DC: The International Bank for Reconstruction and Development/The World Bank, 2002).