Stakeholders' Perception of ICT Impact on Higher Education in Rivers State, Nigeria

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ABSTRACT--- ***Most studies on ICT impact on tertiary education focused on students and lecturers and their academic works. This study took a wider perspective as an attempt to examine the perception of students, lecturers, administrative staff and employers of university graduates on a more holistic impact of ICT on Higher Education in Rivers State, Nigeria. Four research questions and one null hypothesis guided the study. A total sample of 300 respondents drawn from the target population of students, lecturers, administrative staff and employers of graduate were used. Instrumentation was through four different questionnaires, one for each group of stakeholders. Data analysis was through mean on item by item basis, and One-way analysis of variance. The findings indicated that ICT enhance academic and social activities on campus though can be a source of distraction, extra cost and social vices which mare goals of tertiary education. Administrative staff also found ICT useful but feared the possible negative impact of poor mobility and total loss of crucial information in case of loss or crash of a system. Employers of labor acknowledged more positive than negative impact of ICT on recent graduates. ICT was therefore recommended for use in tertiary institutions but with caution to guard against possible negative impacts.***

Keywords--- ICT, Higher Education, Perception, Quality-Manpower, Nigeria

1. INTRODUCTION

Education in Nigeria is seen as instrument par excellence; a tool for producing quality, quantity manpower for every facet of the labor market (FRN, 2004). With prevalence and rapid development of ICT, job expectancies are getting higher and more sophisticated. In response to these challenges, educators, in the recent years, are emphasizing integration of ICT hoping on its potentials at all levels of education.

Among the three tiers of education, tertiary institutions serve as repositories of valuable human capitals, and are intended to make optimum contribution to national development by:

a. intensifying and diversifying its programmes for the development of high level manpower within the context of the needs of the nation
b. making professional course contents to reflect our national requirements,
c. making all students, as part of a general programme of all-round improvement in university education, to offer general study courses such as history of ideal, philosophy of knowledge and nationalism (FRN, 2004).

Information and Communication Technology (ICT) is a 21st century driving force for educational reforms and an integrative part of national education policies and plans in Nigerian tertiary institutions (Achimugu, Oluwagbemi, and Oluwaranti, 2010). As opined by Desai (2010), ICT is a cluster of associated technologies defined by their functional usage in information access and communication of which one embodiment is the internet. It is an umbrella name for any communication device or application, encompassing radio, television, cellular phones, power-point, slides, computer net works, hardware, software, and electronic mail, facsimile, satellite systems, as well as the various services and applications associated with them (Adomi & Kpangban, 2010). Countries such as Singapore, United States, Canada, Japan and most European nations that have adopted and applied ICT to their operations have witnessed dramatic improvement in their development efforts; it has become a strong tool for sustainable development and improving governance, widening democratic space, increasing productivity, administrative effectiveness and cost savings (Adamali, Coffey and Safdar, 2006). Driven by globalization, accelerating shift to high-technology and information technology economies, and pressures to teach and train knowledgeable, skilled and competitive professionals, tertiary education face a huge challenge to an increased accessibility, effectiveness and efficiency.

2. ICT IN TERTIARY INSTITUTIONS

It is widely acknowledged that ICT can be used to improve the quality of teaching and learning in tertiary institutions. This explains why it is gaining prominence, becoming one of the most important elements defining the basic

competencies of students in this 21st century (Adeyomo, 2010; Nwabueze & Ozioko (2011). Melamed and Salant (2010) identified five major skills enhanced by ICT as follows:

- *information skills* (literacy) which relate to ability to gather, edit, analyze, process and connect information
- *higher order thinking skills* in particular problem-solving, critical thinking, creative and entrepreneurial thinking
- *communication and cooperation skills* which is ability to work in team and to belong to various communities
- *skill to use technology tools*
- *learning skills*, in particular, the development of autonomous learning, self-directed learning skills.

Skills and knowledge can be viewed as the proficiency in performing an activity; the ability of using tools and technical equipment for the teaching, distributing and transferring knowledge (Selvi, 2006). Autonomous learning is a product of self-directed learning skills which enables students prioritize what they need to learn, make choices about the resources they will consult, work collaboratively with colleagues, and organize their efforts to address learning issues in sufficient depth (Achuonye, 2012). Yusuf (2005), David (2005), and Bransford (1999) have all shown that the appropriate use of ICT can catalyze the paradigmatic shift in both content and pedagogy that is at the heart of education reform in the 21st century and promotes:

- *Active learning:* Learners learn as they do and, whenever appropriate, work on real-life problems in-depth, making learning less abstract and more relevant to the learner's life situation; students become more aware about how to learn,

- *Collaborative learning:* positive relationship, interaction and cooperation, better communication and access to information. among students, lecturers, and experts regardless of where they are,

- *Creative Learning:* manipulation of existing information and the creation of real-world products rather than the regurgitation of received information, enhanced students' curiosity and motivation that in turn force lecturers to seek more knowledge; such competences learnt by using ICT prepare undergraduates better for further education and in future work.

- *Integrative learning*: a thematic, integrative approach to teaching and learning, eliminating the artificial separation between different disciplines and between theory and practice that characterizes the traditional classroom approach,

- *Evaluative learning*: student-directed and diagnostic, devoid of static, text- or print-based educational technologies, allowing learners to explore and discover rather than merely listen and remember.

Tinio (2002) indicated that ICT is a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies scattered, and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus. Thus, ICT, despite some pitfalls, provides education anytime, anywhere, transcends time and space through online course materials, accessed at all times. Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries and available in limited quantities for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at any time of the day and by an unlimited number of people. This is particularly significant for many schools in developing countries, and even some in developed countries, that have limited and outdated library resources. ICT also facilitate access to resource persons- mentors, experts, researchers, professionals, business leaders, and peers all over the world.

ICT can enhance the quality of education in several ways by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training (Haddad & Jurich, 2002). ICT such as videos, television and multimedia computer software that combine text, sound, and colorful, moving images can be used to provide challenging and authentic content that will engage the students in the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and become involved in the lessons being delivered. More so than any other type of ICT, net-worked computers with Internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICT appliances with the opportunity to connect with real people and to participate in real world events. ICT has also been used to improve access to and the quality of teacher training. For example, Carnoy, et al (2002) indicated that in China, large-scale radio- and television-based teacher education has for many years been conducted by

the China Central Radio and TV University, the Shanghai Radio and TV University and many other RTVUs in the country.

ICT has so impacted on higher education, that both present and future academic global community will utilize ICT making it imperative that undergraduates not only need to use it, but they need to become comfortable with using them. Therefore, this article, based on Nigerian situation, is set to investigate the impact of ICT on higher education, not just academics and students but also on non-teaching staff and employers of graduates in the larger society.

3. STATEMENT OF THE PROBLEM

Most studies and initiatives on ICT in Tertiary Education tend to focus on foreign standards and utilization of ICT for instructional purposes only (The Commonwealth of Learning, 2006; Becta, 2004; Akale, 2003). This emphasis on instructional use of ICT in education has an antecedent as educational interest in technology has always centered on the instructional application of such technology to improve classroom instruction. As in the case of computer, educators have long before the emergence of ICT emphasized Computer-Assisted Instruction (CAI), and Computer-Managed Instruction (CMI).

This may explain the emphasis of ICT on instruction, particularly as it concerns students and lecturers. However, campus activity is not just about teaching and learning, rather it includes other facets such as social, political, and economic activities. These aspects of human life are in continuous interactions with and affecting each other. These activities involve all and sundry, students, lecturers and non-teaching members of the university which are aspects of the system, such that lapses in any part hinder the overall goal of the institution. Furthermore, educational institution is a microcosm of the larger community, and the graduates serve as major inputs to the existing workforce. This implies that whatever ICT impact on the graduates should be felt in their activities at workplaces. Therefore, studies on ICT impact on higher education based on teaching-learning only is viewed as partial.

ICT has come a long way in various human institutions, including education that it deserves a more concerted study extended to other stake holders in and outside the campus. It is in the light of these, that the present study is birthed from a holistic angle seeking perception of ICT- impacts on general campus activities, academic, job and social life, whether positive and negative, from four interest groups: students, lecturers, and non-teaching members of the university community, and employers of university graduates.

4. PURPOSE OF THE STUDY

This study was conducted to ascertain the various ways ICT is:

- affecting the activities of students at tertiary level
- influencing lecturers in higher institutions
- influencing non-teaching staff of higher institutions
- perceived in the graduates at workplaces by their employers.

5. RESEARCH QUESTIONS

Three research questions were formulated to guide the study.

a. How is ICT influencing students' activities in tertiary institutions?
b. In what areas is ICT affecting academic staff of higher institutions?
c. In what areas is ICT impacting the non-academic staff of higher institutions?
d. Which qualities of recent graduates do employers of labor attribute to ICT impact?

6. HYPOTHESIS

There is no significant difference in the perception of students, lecturers, non-academic staff, and employers of labor on the overall value of ICT

7. METHODOLOGY

The study adopted a descriptive survey designed to ascertain both the positive and negative impact of ICT higher education in Rivers State, Nigeria. The population of the study comprised of all students, teaching and non-teaching staff

of tertiary institutions and the employers of graduates. Through random selection, a sample population of 330 was drawn from three tertiary institutions summed up as follows: 200 students, 50 lecturers, 50 non-teaching staff, and 30 employers of labor.

Research Instrument consisted of four different questionnaires targeting the four stakeholders named as follows:

a. Questionnaire on Students' Perceived ICT-Impact (QSPI)
b. Questionnaire on Lecturers' Perceived ICT-Impact (QLPI)
c. Questionnaire on Non-academic Staff's Perceived ICT-Impact (QNAPI)
d. Questionnaire on Employers' Perceived ICT-Impact (QEPI)

Each questionnaire has two parts. Section 'A' requested information on the personal data such as name of and length of time in the institution/establishment, knowledge, possession and usage of ICT tools. While part 'B' comprised of 10 items using four parts Likert scale format of Strongly Agree (SA) (4points), Agree (A) (3points), Disagree (D) (2points), and Strongly Disagree (SD) (1point). The section B of QSPI (25 items), QLPI (19 items) and QNAPI (17 items), sought to find out the perception of respondents on ICT-impact on their activities on campus, but the second part of QEPI (14 items) sought the employers' perception of ICT-impact on university graduates workplace. The respondents were required to rate the items on the questionnaire and provide answers accordingly.

The questionnaires were face-validated by three senior colleagues in the field of Educational Technology. Their criticisms contributed to the final version used for data collection. The reliability of the instrument was ascertained using Cronbach Alpha; and reliability coefficients of 0.81, 0.78, 0.83, and 0. 82 were obtained. The instrument was administered through personal contacts by the researcher with three colleagues in the higher institutions used to ensure a hundred percent completion and return of the questionnaires.

Data analysis was through mean for research questions 1, 2, and 3; and one-way analysis of variance for research question 4. Mean was calculated item by item, and interpretations were based on the limit of the real numbers: 3.50-4.49 (SA), 2.50-3.49 (A), 1.50-2.49 (D), 0.59-1.49 (SD).

8. RESULTS

The results were presented based on the research questions raised for this study.

Research Question 1: *How is ICT influencing students' activities in tertiary institutions?*

Table 1: Mean Ratings of Students' Perception on the impact of ICT

Item Statement	Mean	Decision
ICT helps university students to:		
1. Understand and complete projects/assignments easily	3.68	SA
2. Access relevant literature/information for projects/assignments & further reading	3.83	SA
Understand lectures and develop interest to learn more & study ahead of the class	3.80	SA
Take more active participation in class, ask and answer questions	3.61	SA
Record lectures on phones/laptops and use other software for private studies	3.42	A
Register courses and pay school fees online with little or no stress	4.30	SA
Access their exam-results online with ease and error-free	3.63	SA
Disseminate relevant information easily and accurately to friends and colleagues	4.42	SA
Make friends and maintain relationships	3.54	SA
Take active participation in social activities	3.51	SA
Furthermore: ICT discourages the development and use of handwriting, making it difficult for students to legibly and coherently write down their ideas	3.50	SA
Use of phones encourages examination malpractice, and other social vices	3.76	SA
Use of ICT tools reduces sense of direct social/welfare and care for colleagues	2.2	D
ICT tools are relatively too expensive to purchase and manage (e.g. regular subscriptions, anti-virus, updates, etc.)	2.40	A
Phone calls, ring-tones & chatting in classrooms/exam halls are major distractions	4.35	SA
Software and internet facilities on virtually every topic are making students lazy hindering the development of their thinking capabilities & creativity	3.73	SA
Phone calls and text messages on the road are major distractions leading to devastating accidents	3.87	SA
There is poor concentration in students' academic/social life due to memory overload from phone calls , internet facilities, 24/7 numerous channels on TV, etc	2.86	A
ICT generally reduces personal ideas, efforts, and contributions towards work	2.23	D
Wrong exam-results uploaded to the web are more difficult to correct	2.34	D
Use of ICT is major time usurper of our era	3.63	SA
ICT gadgets are generally fragile and heavy to carry about, therefore fail to meet mobile needs e.g. laptops & multimedia projector for PowerPoint presentations	1.78	D
Internet fraud/crime is learnt and perpetrated on campuses	3.21	A
Pornography, cultism and kidnapping thrive more as result of ICT impact	1.30	SD

Table 1 shows that students perceive positive impact of ICT on their academics, particularly in their assignments, literature review, interest to learn more and study ahead and participate actively in class; and their social life such as making and maintaining friendship and dissemination of relevant information among themselves. Nevertheless, they also

admitted some of the negative influence of ICT such as deteriorating handwriting, examination malpractice, agent of distractions, poor concentrations in classes and to studies, time usurping and source of crimes.

Research Question 2: *In what areas is ICT affecting academic staff of higher institutions?*

Table 2: Mean Rating of ICT Impact on Lecturers

Item Statement	*Mean*	*Decision*
1. ICT boosts research work through rich and up-to-date literature review	4.63	SA
2. ICT gadgets are generally fragile and heavy to carry about, therefore fail to meet mobile needs e.g. laptops & multimedia projector for PowerPoint presentations	3.52	SA
3. ICT triggers international contacts for journal subscription and publication	4.62	SA
4. ICT readily provides gadgets & software, making teaching and practical demonstrations easy	4.33	SA
5. ICT widens professional horizon through regular updates: methods, resources, and contents	4.36	SA
6. Software and internet facilities on virtually every topic are making lecturers lazy hindering the development of their thinking capabilities & creativity	3.32	A
7. ICT enhances professional linkage and collaboration beyond the local boundaries	4.34	SA
8. ICT enhances teacher-learner relationship through steady communication	3.61	SA
9. ICT promotes both local and international relationships among colleagues	4.23	SA
10. Phone calls are major sources of distractions during lectures/examination sessions	3.89	SA
11. Phone calls and text messages on the road are major distractions leading to devastating accidents	3.87	SA
12. With progress in ICT, teachers' job is highly threatened, because computers are successfully doing most of teachers' jobs	2.30	D
13. Use of ICTs is reducing people's sense of direct social/welfare and care for colleagues	2.25	D
14. ICT generally reduces personal ideas, efforts, and contributions towards work	2.41	D
15. Progress in ICT is posing major challenge to face-to-face contacts	3.32	A
16. Plagiarism thrives more in this era of ICT	3.43	A
17. ICT gives room for students to challenge teacher's authority in class	2.86	A
18. ICT tools are relatively too expensive to purchase and manage (e.g. regular subscriptions, anti-virus, updates, etc.)	3.12	A

Table 2 shows that admit the positive impact of ICT which includes boost on research and professional horizon, enhancement both local and international collaborations and publications, and teaching performance; general life on campus. Furthermore, they concurred to the negative impact of ICT in the areas of high cost of purchase and maintenance, regular disturbances from phone-calls, plagiarism,

Research Question 3: *In what areas is ICT impacting the non-academic staff of higher institutions?*

Table 3 indicates that positive impact of ICT is perceived by non-teaching staff in the areas of communication, record keeping and retrieval. They, however, agreed that ICT could be a source of distractions and delays, loss of vital information, and some health challenges.

Research Question 4: *Which qualities of recent graduates do employers of labor attribute to ICT-impact?*

Table 4: Mean Ratings on Employers' perception on ICT Impact

Item Statement	*Mean*	*Decision*
1. Their knowledge of the job is higher than before	3.62	SA
2. The flow in communication is smoother and more adequate	4.24	SA
3. Their sense of duty is higher as they are more punctual and regular to work	3.53	SA
4. They are more resourceful, innovative and initiative at work	3.61	SA
5. ICT gadgets are generally fragile and heavy to carry about, therefore fails to meet mobile needs e.g. laptops & multimedia projector for PowerPoint presentations	2.86	A
6. There is improved interpersonal relationships at work place	2.84	A
7. There is poor concentration to work due to distractions from phone calls , internet facilities, 24/7 numerous channels on TV	4.25	SA
8. There is reduced mobility which may result to some health problems, e.g. backache, arthritis, eye-defect, etc.	3.89	SA
9. They exhibit low sense of direct social/welfare and care for colleagues	3.76	SA
10. ICT generally reduces personal ideas, efforts, and contributions towards work	1.32	SD
11. Software and internet facilities on virtually every topic are making people lazy, hindering the development of their thinking capabilities & creativity	1.20	SD
12. ICT tools are relatively too expensive to purchase and manage (e.g. regular subscriptions, anti-virus, updates, full dependence on electricity, etc.)	3.84	SA
13. Phone calls and text messages on the road are major distractions leading to devastating accidents	3.92	SA

Table 4 reveals that employers of labor are aware of positive ICT impact on current graduates particularly in the areas of job knowledge and performance, communication flow and resourcefulness. Nevertheless, they agreed to some negative impacts such as distractions, high costs, and health challenges.

Hypothesis: *There is no significant difference in the perception of students, lecturers, non-academic staff, and employers of labor on the overall value of ICT*

Table 5: One-Way ANOVA of overall ICT Impact on Tertiary Education

	Sum of Squares	Df	Mean square	F	Sig.
Between groups	92123.461	3	30343.826	36.075	.000
Within groups	1167118.467	1367	867.373		
Total	1259241.928	1372			

Table 5 indicates that there is significant difference in the perception of ICT impact among the four stakeholders. This is because the significant value of F is .000 which is less than 0.05. Hence, the hypothesis is rejected. The post hoc test indicates that the difference is between the students and other stakeholders (lecturers, non-teaching staff and employers of labor). While students perceived ICT as only useful the other stakeholders saw it as very useful.

9. DISCUSSION

The findings of this study show that both students, lecturers, non-teaching staff of tertiary institutions and the employers of labor perceive ICT as having both positive and negative impacts. From Table 1, it is seen that students acknowledged that ICT enhances their academic activities, motivation to learn, understanding and speedy completion of assignment/projects through readily available information for reviews and further reading, recording of class sessions and use of other software for individualized instruction and active participation in classes. This finding is widely concurred by several studies such as Adeyomo (2010), Nwabueze and Ozioko (2011), Melamed and Salant (2010), and Haddad and Jurich (2002). Also, ICT, through its on-line modalities, makes access to exam results easy and lifts off the burden of course registration and fees payment on long queues at offices and banks. Apart from the academic issues, table 1 also revealed the social dimensions of ICT impact on students such as making and keeping relationships, dissemination of relevant information among friends and colleagues, for active and prompt participation in social activities. However, in line with Yusuf (2005) and David (2005), some negative impacts displayed in the Table includes poor handwriting, use of phones for examination malpractice and other social vices (cyber crimes, pornography, etc.), regular and heavy expenses, distractive tendencies of calls and ring-tones, inability to concentrate and stay longer on studies due to chatting and games on phones, internet and 24/7 countless TV channels, and time usurping.

From Table 2, it is found that lecturers perceive ICT as a boost on their job through its information abundance and updated knowledge of content, literature reviews, skills and methodology. These finding gives a nod to some previous studies, Achimugu, Oluwagbemi, and Oluwaranti (2010). The table further revealed that both local and international publications and collaborations are enhanced among lecturers and their students (Selvi, 2006; Achuonye, 2012). The social aspect is not left out, as ICT boosts regular interactions among colleagues and students. They, however, admitted that ICT is a source of financial drain, distractions and plagiarism.

On the part of non-teaching staff of tertiary institutions, Table 3 revealed that ICT makes their jobs easier through numerous software and templates, facilitates communication, record keeping and retrieval of information. They, however, identified the high expenses, loss of vital information through damages, distractions and delays form phone calls and possible health hazards such as backaches and eye defects from regular stay on computers. Table 4 showed that employers of tertiary education graduates perceive ICT impact on the employees especially on their knowledge of the job, smoother flow of information, and resourcefulness. The employers also perceive some negative influences which include distractions, heavy expenditures, low sense of social welfare, and possible health hazards. Based on data shown on Table 5, all the stakeholders do not perceive the overall usefulness of ICT the same. Students think ICT is simply useful but not very useful as seen by other three groups. This difference may be as a result of the fact that students are yet to engage in money yielding ventures with ICT tools. However, it is presumed that further studies would unfold the reason(s).

10. CONCLUSION

This study was an attempt to extend studies on impact of ICT on tertiary education beyond lecturers and students. Previous studies on this issue hinged mostly on lecturers and students, but this study extended inquiries to non-teaching staff and employers of university graduates. This study therefore was a more holistic investigation on the impact of ICT on tertiary education. As shown in this study, ICT does not have only positive impacts, but also negative impacts on lecturers, students, administrative staff and the jobs done by school graduates. ICT was found to enhance academic work and social life in campus, but could also instigate piracy, examination malpractice and other social vices. On the non-

teaching staff, ICT made their work easier and faster, but could be a source of ill health and enormous administrative problems at the loss or break-down of computer. The study further showed that employers of labour perceived that recent school graduates are more organized and more productive than their other counterparts. The use of ICT was therefore recommended but with necessary precautions to minimize the negative influences on tertiary education.

11. RECOMMENDATION

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

a. Continued use of ICT is recommended as it was found useful to both lecturers, students and administrative staff of tertiary education,
b. To reduce the impact on examination malpractice, the use of phones should be restricted or bound in examination halls
c. High cost of purchase and maintenance were found as setbacks to effective use of ICT, therefore, Government and public-spirited groups or individuals are advised to provide free ICT facilities to students and staff of tertiary institutions
d. To minimize tendencies of viewing sites that impact negatively on students and lecturers, media enlightenment programmes should be organized and manufacturers and user of ICT tools should device a means of blocking some unwanted programmes/sites so that ICT-based anti-social vices could be check-mated.
e. There should be regular enlightenment campaign on the dangers of using mobile phones on road to avoid accidents,
f. To prevent health hazards speculated by some administrative workers, frequent enlightenment programme is suggested to enable them learn and regularly practice simple exercises in and out of office.

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