

# IMPACT OF MOBILE DIGITAL DEVICES ON VOCATIONAL AND TECHNICAL SKILLS ACQUIRED BY A SELECTED GROUP OF TERTIARY INSTITUTION STUDENTS IN NIGERIA

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**Abstract:** *The impact of mobile digital devices on the vocational and technical skills acquired by a carefully selected group of tertiary institution students in Osun State, Nigeria was examined in this study. A sample of Three hundred and fifty students carefully selected from tertiary institutions in Osun State, Nigeria was employed for this study. A Self developed questionnaire which was validated through pilot testing was administered to the sample for the collection of data. The researcher personally visited respondents to ensure an accurate collection of data. The collected data were tabulated and analyzed using percentage, frequency count and t-test analysis. The major findings of the study were: that there is significant difference in the vocational and technical skills acquired by a carefully selected group of tertiary students in Osun State, Nigeria through the use of mobile digital devices; mobile digital devices have impact on the vocational and technical skills acquired by a carefully selected group of male students than that of their female counterparts. It was also concluded that there is significant difference in the impact of mobile digital devices on the vocational and technical skills acquired by a carefully selected group of students in Osun State, Nigeria based on specialization. Based on the findings of the study, major recommendations were enumerated as: government and parents should provide mobile digital devices that will be useful for students to learn within their cultures so as to make learning more relevant to the local needs of the people, educators should be sponsored to attend workshops, seminars, and conferences both locally and internationally, educational programmes should be restructured to make it utility oriented and among others.*

**Keywords:** *Vocational and Technical skills; Tertiary institutions; Information and Communication Technology; Mobile digital devices; Software.*

## 1. Introduction

Information and Communication Technology (ICT) is a process of creating, processing, storing, retrieving and disseminating information and data using computers and telecommunications. ICT is being increasingly used for the purpose of meeting the challenges facing humans all over the world. ICT has become one of the fundamental building blocks of education. Globalization has shifted global development agenda, thus many countries now regard the mastering of basic skills and concepts of ICT as an inevitable part of the core of education, which has resulted in the Nigerian government introducing some reforms in our educational system with a view to repositioning it in line with the mission of Information and Communication Technology (ICT). ICTs are computer-based tools used to meet with the Information and Communication needs of individuals and organizations. Oliver (2009) envisioned ICT as the science that investigates the properties and behaviour of information, the force governing the flow of information and the means of processing information for

optimum accessibility and usability. The process includes the origination, collection, storage, retrieval, interpretation, dissemination and use of information. ICT involves the use of hardware, software, networks and media for the collection, storage, processing, transmission and presentation of information (voice, data, text, images) as well as related services (World Bank, 2007). Therefore, ICT can be defined as an electronic device (which includes mobile digital devices) for managing and processing information with the use of soft and hard wares to convert, store, manipulate, protect, transmit, manage, control and retrieve information for the enhancement and productivity of personal and organizational activities.

Ubogu (2011) stated that ICTs comprise computer hardware and software, network and several other mobile and non-mobile digital devices (video, audio, photography, camera and many others) that convert information, images, sound, motion, among others into common digital form. Information and Communication Technology (ICT) are tools employed by students and teachers alike. ICT has the potential of being used to meet the learning needs of individual students. The pervasive influence of ICT has brought about a rapid technological, social, political and economic transformation, which has paved way to network society, organized around ICT.

The field of education has not been unaffected by the penetrating influence of information and communication technology. ICT enhances teaching and learning through its dynamic interactive and engaging content and provides real opportunities for individualization of instruction. Information and communication technology has the potential to accelerate, enrich and deepen skills, motivate and engage students learning, helps to relate school experience to work practice, helps to create economic viability for tomorrow's workers; contributes to the total development of the institution; strengthens teaching and learning and provides opportunities for connection between the institution and the world (Davis, 2009).

Kirschner and Weperies (2013) realized that information and communication technology can make the school more efficient and productive, by organizing a variety of tools (which includes mobile digital devices) to enhance and facilitate teachers' professional activities. Yusuf and Onasanya (2004) opined that ICT provides opportunities for tertiary institution to communicate with one another through e-mail, mailing list, chat room and other facilities. It provides quicker and easier access to more extensive and current information. ICT can also be used to do complex tasks as it provides researchers with a steady avenue for the dissemination of research reports and findings.

Culp, Honey and Mandinach (2003) viewed ICT as a tool for addressing challenges in teaching and learning situation; a change agent; and central force in economic competitiveness. As a tool for addressing challenges in teaching and learning, technology has the capabilities for delivery, management and support of effective teaching and learning. As a change agent, it is capable of changing the content, methods and overall quality and quantity of teaching and learning, thereby reducing teachers' workload and ensuring constructivist inquiry-oriented classroom, part of which can be achieved through the use of which includes mobile digital devices. Moreover, ICT is a central force in economic and social shifts that has technology skill critical to future employment of today's students.

Thierer (2010) pointed out that the role of technology in vocational and technical skills is rapidly becoming one of the most important and widely discussed

issues in contemporary education policy. Experts in the fields of education have agreed that, if ICT is properly used, it holds great promise to improve vocational and technical skill to shaping work-force opportunities.

Mooij (2007) mention that differentiated ICT based education can be expected to provide greater reliability, validity, and efficiency of data collection and greater ease of analysis, evaluation, and interpretation at any educational level. While the world is moving rapidly towards digital media, the role of ICT in vocational and technical education has become increasingly important. It has transformed the way knowledge is disseminated today in terms of how teachers interact and communicate with the students and vice-versa, one of the ways by which this has become meaningfully achievable is through the use of mobile digital devices. ICT has tremendously broadened the opportunities for people to acquire information, interact, network, address issues of common concern, generate income and participate in society.

However, information technology revolution associated with the internet has brought about two edge functions: that is on one hand, it has contributed positive values to the world. While on the other hand, it has produced so many maladies that threaten the order of the society and also producing a new wave of crime to the world. The internet online business services, which ordinarily suppose to be a blessing as it exposes one to a lot of opportunities in various field of life is fast becoming a source of discomfort and worry due to the atrocity being perpetrated through it (Foster, 2009). Apart from the ICT improvement on the vocational and technical skills, it also enhanced falsehood, dissemination of harmful information as well as fraudulent activities in the educational system such as internet fraud and examination malpractice (Ramey, 2008).

The term mobile digital device can be used to describe a physical unit of equipment that contains a computer or microcontroller. Mobile digital devices comprise a variety of devices that can be carried along to perform numerous tasks such as cellular phones, IPod, Ipad, Personal Digital Assistance (PDA), laptops, and smart phones. Most mobile devices used nowadays are digital devices. Some of such include smartphone, tablet, smartwatch, micro and minicomputers, ancillary equipment, software, firmware and similar equipment. It is worth mentioning that most technologies used for cellular communication in contemporary world are digital. Mobile digital devices came into being as new instruments for which a wide variety of development is not generally placed in doubt. There is a link between mobile digital devices and development and a positive association exists between both variables. Therefore, investment in mobile digital devices is considered as an important investment (UNESCO 2002).

The use of mobile digital devices affords teachers and students the opportunity to utilize computing power without the barrier of space and time, while the wireless internet technologies inbuilt such devices enable mobile digital devices to interconnect with other numerous computing devices seamlessly, thus providing tertiary institution students with the opportunity to utilize it for learning. Mobile digital devices have impact at different levels of the society especially toward enhancing learning. But the usage of mobile digital devices in schools is grossly abused, without exceptions to tertiary institutions in Nigeria. In most Nigeria tertiary institutions, various form of fraud is being witnessed through the emergence of ICT ranging from examination malpractices, falsification of admission and internet fraud. A critical look into most of

the ICT tools through which these atrocious acts are being perpetrated reveals that mobile digital devices are mostly employed in perpetrating most of the acts mentioned. Thus, this study set out to critically appraise the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state Nigeria, who are mainly from the Polytechnics.

## **2. Purpose of the Study**

The specific purposes of the study were:

1. To examine the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria.
2. To find out if there would be any difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria based on gender.
3. To determine if there is any significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria based on specialization.

## **3. Hypotheses**

The following hypotheses were raised in the course of this study:

1. There will be no significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria.
2. There will be no significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria based on gender.
3. There will be no significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria based on specialization.

## **4. Methodology**

This is a survey research design. The population for this study comprises of all Polytechnic students in Osun State Polytechnic Ire and Osun State College of Technology Esa-Oke Polytechnic.

Purposive sampling technique was applied to select 200 students in Osun State Polytechnic Ire and 150 students in Osun State College of Technology Esa-Oke Polytechnic Ijebu-Ijesa. Therefore three hundred and fifty (350) respondents constituted the sample size of this study.

The research instrument for this study is a self constructed questionnaire. The questionnaire consisted of two (2) sections- (A and B). Section "A" elicited respondents bio-data information; while section "B" contained items measured on a four point Likert scale, ranging from (Excellently to Poor). Efforts were made during the construction of the instrument to ensure that it measure the desired objectives. Therefore, the items were carefully composed and submitted to experts in tests and measurement evaluation as well as an ICT expert for necessary correction and modification. Also, other experts in the related field were consulted for their input on the instrument.

Comments and corrections were attended to in order to establish the face and content validity of the instruments.

The reliability of the instrument was established through a test re-test method. This involved administering the instrument on twenty (20) students in Osun State Polytechnic Ire. This was done twice within an interval of two weeks and the participants were not included in the main study's sample. Cronbach's alpha reliability test was used to establish the reliability coefficient of the instrument. The researcher visited each institution to administer the instrument to the respondents. 350 copies of questionnaire was administered and collected back by the researcher with the help of research assistants.

The responses from the participants were carefully keyed in the computer grid using Statistical Package for Social Science (SPSS) software, version 23.0. Thereafter, the data screened to remove any unwanted errors and outliers using descriptive statistics approach on the SPSS. Descriptive statistics via percentage analysis, frequency count and T-test were employed in analyzing data for the research questions.

## 5. Results

This section presents the results of impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria.

This section focuses on the analysis of the research question using descriptive statistics such as simple frequency counts, percentage, mean, standard deviation, t-test and analysis of variance (ANOVA).

**Table 1: Distribution of Selected Institutions**

Variable	Frequency	Percentage
Osun State College of Technology, Esa-Oke	100	28.6
Interlink Polytechnic, Ijebu-Ijesa	100	28.6
Federal Polytechnic, Ede	150	42.8
<b>Total</b>	<b>350</b>	<b>100.0</b>

Source: Field research data

Table 1 shows that out of 350 respondents that participated, 28.6% of the respondents were selected from Osun State College of Technology, Esa-Oke and interlink Polytechnic, Ijebu-Ijesa respectively while 42.8% were selected from Federal Polytechnic, Ede. Respondents were selected from State, Federal and Private Polytechnic in Osun State.

**Table 2: Gender of Respondents**

Variable	Frequency	Percentage
Male	203	58.0
Female	147	42.0
<b>Total</b>	<b>350</b>	<b>100.0</b>

Source: Field research data

Table 2 shows that out of 350 respondents that participated, 58.0% of them are male and 42.0% are female which shows that both sexes are well represented.

**Table 3: Course of Specialization of the Respondents**

Variable	Frequency	Percentage
Computer	119	34.0
Engineering	98	28.0
Management	133	38.0
<b>Total</b>	<b>350</b>	<b>100.0</b>

Source: Field research data

Table 3 shows that 34% of the respondents were specialized in computer based, 28% were specialized in engineering courses while 38% were management courses.

**Table 4: Age Distribution of the Respondents**

Variable	Frequency	Percentage
15-20 years	119	34.0
20-25 years	210	60.0
>25 years	21	6.0
<b>Total</b>	<b>350</b>	<b>100.0</b>

Source: Field research data

Table 4 shows that 34% of the respondents were between age 15 and 20 years, 60% were between age 20 and 25 years while 6% were more than age of 25 years.

**Research Hypothesis 1:** The first hypothesis addresses the significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria. Therefore, Table 5 present the significant difference in the impact of mobile digital devices on vocational and technical skills acquired by students of tertiary institutions (Polytechnics) in Osun State.

**Table 5: Summary of t-test Analysis on the significant difference in the impact of ICT on vocational and technical skills acquired by students of Polytechnics in Osun State.**

Variable	N	X	SD	DF	T	Sig.	Remark
<b>ICT</b>	350	3.580	1.495	349	6.515*	0.004	Significant
<b>Vocational and Technical skills</b>	350	3.460	1.692				

Source: Field research data

\*Denote significance at P<0.05

Table 5 shows the result of significant difference in the impact of mobile digital devices on vocational and technical skills acquired by students of Polytechnics in Osun State. The mean and standard deviation of Mobile Digital Devices (M = 3.580, SD = 1.495) and vocational and technical skills (M =3.460, SD = 1.692) with (t=6.515, df = 349, p<0.05). This shows that there is significant difference in the impact of mobile digital devices on vocational and technical skills acquired by students of tertiary institutions (Polytechnics) in Osun State. It shows polytechnic students' orientation about mobile digital devices has positive impact on their vocational and technical skills acquired. Therefore, the null hypothesis is rejected.

**Research Hypothesis 2:** The second hypothesis addresses the significant difference in the impact of mobile digital devices on vocational and technical skills

acquired by a selected group of tertiary institution students in Osun state, Nigeria based on gender. Therefore, Table 6 present the significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a group of tertiary Institution (Polytechnics) students in Osun State based on gender.

**Table 6: Summary of t-test Analysis on the significant difference in the impact of ICT on vocational and technical skills acquired by students of Polytechnics in Osun State based on gender.**

GENDER	N	X	SD	DF	T	Sig.	Remark
Male	203	3.003	1.499	349	19.706*	0.001	Significant
Female	147	2.420	1.494				

Source: Field research data

\*Denote significance at  $P < 0.05$

Table 6 shows that there was a significant difference in the impact of mobile digital devices on vocational and technical skills acquired by tertiary institution (Polytechnic) students in Osun State based on gender. The mean and standard deviation of male ( $M = 3.003$ ,  $SD = 1.499$ ) and female ( $M = 2.420$ ,  $SD = 1.494$ ) with ( $t = 19.706$ ,  $df = 349$ ,  $p < 0.05$ ) reveals significant difference. This shows that mobile digital devices have impact on vocational and technical skills acquired by male students than that of female counterpart. Therefore, the null hypothesis is rejected.

**Hypothesis 3:** The third hypothesis addresses the significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria based on specialization. Therefore, Table 7 presents the significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun state, Nigeria based on specialization.

**Table 7: Summary of Analysis of Variance (ANOVA) on the impact of ICT on vocational and technical skills acquired by students of Polytechnics in Osun State based on specialization.**

Source:	Sum of Squares	Df	Mean Square	F	Sig.	Remark
Between Groups	19.982	2	9.991	7.238	0.001	Significant
Within Groups	479.978	347	1.380			
<b>Total</b>	<b>498.960</b>	<b>349</b>				

Source: Field research data

\*Denote significance at  $P < 0.05$

Table 7 shows the Analysis of Variance (ANOVA) of the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution (Polytechnics) students in Osun state, Nigeria based on specialization, and revealed significant ( $F_{(2,349)} = 7.238$ ,  $p < 0.05$ ). There is significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution (Polytechnics) students in Osun state, Nigeria based on specialization. Therefore, null hypothesis is rejected.

## 6. Discussion of the Findings

The result of this study is well documented on the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution (Polytechnics) students in Osun state, Nigeria. Based on the findings, the results show significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution (Polytechnics) students in Osun state, Nigeria. The mean and standard deviation of mobile digital devices ( $M = 3.580$ ,  $SD = 1.495$ ) and vocational and technical skills ( $M = 3.460$ ,  $SD = 1.692$ ) with ( $t=6.515$ ,  $df = 349$ ,  $p<0.05$ ). This shows that there is significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution students in Osun State. It shows polytechnic students' ICT orientation which was expressed through mobile digital devices has positive impact on their vocational and technical skills acquired.

The finding corroborates Adu and Tella (2013) which revealed that ICT provide a positive impact on learning and students performance when it becomes an integrated element in the classroom and teaching. The authors stated that ICT when applied as a tool for teaching the curriculum areas (achievable through the use of mobile digital devices) enables students to become competent, creative, discriminating, and productive users of ICT. Learners are better able to achieve skills and develop the capacity to select and use ICT to enquire, develop new understanding, and also create and communicate with others in order to participate effectively in society.

Another finding of the study revealed that there was a significant difference in the impact of mobile digital devices on vocational and technical skills acquired by some tertiary institution (Polytechnic) students in Osun State based on gender. The mean and standard deviation of male ( $M = 3.003$ ,  $SD = 1.499$ ) and female ( $M = 2.420$ ,  $SD = 1.494$ ) with ( $t=19.706$ ,  $df = 349$ ,  $p<0.05$ ) reveals significant difference. This shows that mobile digital devices have impact on vocational and technical skills acquired by male students than that of female counterparts. The finding is in disagreement with Mikre (2011) who submitted that ICT makes learning less abstract and more relevant to the life situations of all students irrespective of gender. The author also stated that in contrast to memorization-based or rote learning, that is the feature of traditional pedagogy; ICT-enhanced learning promotes increased learner engagement. Mikre stated that ICT-enhanced learning can also be 'just-intime' learning that the learners choose what to learn when they need not minding their gender.

Furthermore, the findings of the result shows the Analysis of Variance (ANOVA) of the impact of mobile digital devices on vocational and technical skills acquired by students of tertiary institutions (Polytechnics) in Osun State based on specialization and revealed significant difference ( $F_{(2,349)} = 7.238$ ,  $p<0.05$ ). There is significant difference in the impact of mobile digital devices on vocational and technical skills acquired by a selected group of tertiary institution (Polytechnics) students in Osun State based on specialization. This may be because of the inability and lack of wherewithal on the part of many of them to purchase modern and sophisticated mobile digital devices, or probably they are not very positively disposed to using such devices for the purpose of acquiring vocational and technical education skills when purchased.

## 7. Conclusions

It was concluded from this study that human capital is the key ingredient for achieving and maintaining competitiveness in world trade. There is also a widespread acceptance among nations that the workforce must be carefully prepared and that employees' skill sets maintained continuously. This need for lifelong learning requires a flexible system of education and training. ICTs provide the flexibility to meet diverse learners' needs anytime, anywhere. A wide variety of ICTs are now available for teaching and learning, ranging from simple printed materials to sophisticated Internet-based learning with the inclusion of mobile digital devices. The penetration of ICTs in education across UNESCO's Member States varies considerably and generally seems to be proportional to economic conditions.

The digital divide between the haves and have-nots is a major issue. In the context of ICT-mediated instruction, the emphasis is placed on self-directed learning rather than teaching, this can be achieved using mobile digital devices. Consequently, the ability to acquire, process, store, retrieve, and use information is becoming a critical element for successful learning, thereby making mobile digital devices more relevant. This condition is responsible for a cognitive divide, which is debilitating for people with limited cognitive skills. Educators have always been early adopters of innovations related to ICT tools, equipment, and system controls. The same is true regarding the use of ICTs for supporting the delivery of technical and vocational skills using mobile digital devices. There is a paucity of information on the extent to which ICT-mediated learning is being integrated in technical and vocational skills. There are many barriers that hinder the integration of ICTs into teaching and learning in Nigeria's tertiary institutions among which are polytechnics. The most significant are infrastructure, availability of suitable materials, job threat, appropriateness of the methods, and credibility of programme content. Although there are some anecdotal records of successful attempts regarding the use of ICTs for teaching affective and practical skills, there is no hard evidence in support of these claims. Particularly as it applies to the use of mobile digital devices.

Developmental testing must be an integral part of the development of all ICT-mediated instruction in order to ensure the efficiency and effectiveness of the product. Effectiveness can be viewed within a framework encapsulating three elements, namely achievement, study time, and attitude. Research attempting to assess the effectiveness of ICT-mediated learning is flawed and inconclusive. It is still very difficult, if not impossible, to establish the cost-effectiveness of ICT-mediated learning. The use of an information and communication technology tool like mobile digital devices may therefore prove a better and more viable alternative

## 8. Recommendations

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

- Educational programmes should be restructured to make it utility oriented, and work focused so that students and learners may be attracted and retrained.
- Educators should be sponsored to attend workshops, seminars, and conferences both locally and internationally. This will enable them to acquire skills needed in developing and implementing adequate curriculum for acquiring vocational and technical skills.

- The government should endeavour to do a serious reform in the power (electricity) sector to enable them to improve their services. This will go a long way in helping lecturers in polytechnics to make effective use of the gadgets available to them including mobile digital devices.
- Government, stakeholders, and engineers should develop softwares and applications that could be installed on mobile digital devices, that will be applicable to their indigenous cultures so as to make information and communication technology more relevant to the local needs of the people.
- Government and parents should provide mobile digital devices that will be useful for students to learn within their cultures so as to make learning more relevant to the local needs of the people.
- The high ups should make the compliance of ICT facilities including mobile digital devices more relevant to encourage skill acquisition and competence of the students.

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