Appropriate Contents in Android Phone Maintenance for Training of Youths at Skill Acquisition Centers

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Abstract
The study was carried out to determine appropriate contents in android phone maintenance for training of youths at skill acquisition centres in Lagos State. Three research questions guided the study and three null hypotheses formulated were tested at 0.05 level of significance. A survey research design was adopted for the study. The population for the study was 122 which comprised of all the 35 lecturers of electrical/electronic engineering technology in polytechnics, 22 lecturers of electrical/electronic technology in colleges of education and 67 road side cell phone technicians in Lagos State. The sample for the study was 122 respondents. These were purposively sampled 67 literate road side cell phone technicians, and all the 55 lecturers of electrical/electronic technology in the polytechnics and colleges of education in the study area. A structured questionnaire was used for data collection. The instrument was validated by three experts. Cronbach alpha reliability method was adopted to determine the internal consistency of the questionnaire item and 0.84 was obtained. One hundred and twenty two copies of the questionnaire were administered. One hundred and twenty copies of the questionnaire were collected back and analyzed using factor analysis while analysis of variance was used to test the hypotheses of no significant difference at 0.05 level of significance. The study found out that the competencies identified in android phone maintenance are appropriate for the training of youths at skill acquisition centres in Lagos State. It was recommended that all the competencies identified should be used to organize training for youths at skill acquisition centres in Lagos State.
Keywords: Appropriate content, android phones, Maintenance, Training, Youths, competence

Introduction

Android phone is a powerful, high-tech handset that runs on Google's android operating system. Android phones come in different shapes, colours and sizes. Some have super fast processors, powerful cameras and a few have hardware QWERTY keyboards. All current android phones feature a touch screen, the size of which varies, but in most cases it measures at least 3-inches diagonally, although some devices use much larger displays. Reardon (2010) described android phones as modern mobile phones typically support additional services such as e-mail and internet access; short-range wireless communications, as well as business and gaming applications, and photography. Bakare (2014) explained that android phones are capable of sending and receiving emails, editing documents and storing files. Every handset maker makes android phones. Samsung, Sony, Acer, Alcatel, Asus, Huawei, LG, Motorola and ZTE have all made android phones. They have a number of features in common, but manufacturers also try to differentiate their own products by implementing additional functions to make them more attractive to consumers. Android phones are sophisticated and complex in nature but found very useful in all aspect of

human life. Bakare (2014) stated that there is no aspect of human life where cell phones have not made impacts. Android phones are found useful education, security, health, transportation business among others. Android phones are prone to faults such as open and short circuit faults, broken of screen, casing, ports and motherboard most especially when handle carelessly or misuse. In order to bring faulty android phones back to normal operable stage, maintenance activities must be carried out.

Maintenance is the activities carry out to restore back a mal functional or faulty object. Maintenance according to Olaitan in Ihediwah (2007) is a set of measure or steps taken to ensure that a given piece of equipment or infrastructure is kept in good operational order until it attain its maximum possible life span. In the Report of Microsoft Corporation (2009) maintenance is described as the work done regularly to keep a machine, building, or piece of equipment in good condition and working order. Two major types of maintenance can be carried out on android phones. They are preventive and corrective maintenance. Preventive maintenance is systematic inspection, detection, correction and prevention of incipient failures, before they become actual or major failures. Bakare (2014) described corrective maintenance as the activity undertaken to detect, isolate and rectify a fault so that the failed equipment, machine or system can be restored to its normal operable state. Training of youths using appropriate contents will help in maintaining android phones for the users.

Appropriate contents promote effective training in android phone maintenance. No training shall hold and successful without appropriate contents. Content is the totality of the subject matter delivered to the students through appropriate process in order to achieve a clearly stated objective. Content according to Urevbu (1994) refers to what is taught in school, it is the subject matter or topics consisting facts, concepts, ideas, skills, knowledge within a particular subject and how they will bring about change in the individual and to the society. Kapoma and Namusokwe (2011) described content as a list of subjects, topics, skills, competencies, themes, concepts or works to be covered by teacher and his students. Gay (1999) explained that appropriate contents should therefore meet the needs of society in which it is being implemented. Bakare (2014) stated that a content is appropriate when meets the need of the immediate society.

The making of appropriate contents in android phone maintenance therefore is the list of skills and competencies in trouble shooting, repairing, flashing, configuring, maintaining and upgrading of malfunctional phones. James (2011) explained that android phones help in selling and buying of goods and services with ease but has created some management problems to the users in the areas of maintenance. Most of the users could not easily locate efficient technicians who can repair and service faulty android phones thereby making users whose phones are bad to abandon them for the purchase of new ones. Providing competent personnel to maintain faulty android phones will reduce continuous spending of money and electronic wastage which can cause health problems such as cancer to people especially where they are exposed carelessly. Moreover the people maintaining android phones in Lagos State are not formally trained and therefore use trial by error approach during maintenance and cause more problems to cell phones contracted to them. Making use of appropriate contents in android phones maintenance to train youths at skills acquisition centres will also reduce unemployment in the society.

Youths are young energetic people whose their ages range from 16 to 35 years. The National Youth Development Policy (2001) defined youths as people aged 18-35. Youths according to United Nation General Assembly report (1995) are young people of 15-24 years bracket. Abu (2014) stated that this age range may go up to 30 years in developing countries like Nigeria. The youth population according to the 2006 census is almost a hundred million. This means that they constitute more than two thirds of the country's population of 140 million. They are the backbone of the development of the country. Indeed if Nigeria is to be sustained as a viable entity, there must be a very good plan to

tap the energy and resourcefulness of the youth population to fast track economic development and this could be done through training in android phone maintenance.

Training is the learning activities carried out to modify the behavior of someone or group of learners. Training according to Gordon (1992) is a planned and systematic modification of behavior through learning event, activities and programme which results in the participant achieving the level of knowledge, skills and abilities to carry out their work effectively. Onuka (2008) viewed training as a skill acquisition process through which youths are taught new knowledge and skills and how to apply them. The author stated further that the objectives of training youths in occupations is to assist them in acquiring relevant competencies in all aspect of any production activities so as to increase their production capacity. Training therefore is the acquisition of relevant knowledge and skills in android phone maintenance by the youths through practical teaching to enhance their entry into android phone maintenance

Making of appropriate contents in android phone maintenance for training of youths will not only help providing information on the knowledge, skills and attitude required for effective cell phone maintenance but if also well implemented will enhance technological development and provide employment to the youths (Ogbuanya and Bakare, 2014). Jorge, Saba and Arbache (2011) in their own view stated that unemployed and underemployed youths are more exposed to conflicts and illegal activities, many of them fall prey to armed and rebel conflicts. The major purpose of the study was to the make appropriate contents in android phone maintenance for training of youths in Lagos State. Specifically the study sought to identify:

1. Competencies required for servicing and repairing of faulty android phones
2. Competencies required for configuring and flashing of malfunctional android phones
3. Competencies required for upgrading of android phones

Research Questions

The following research questions guided the study:

1. What are the competencies required for servicing and repairing of faulty android phones?
2. What are the competencies required for configuring and flashing mal-functional android phones?
3. What are the competencies required for upgrading android phones?

Hypotheses

The following hypotheses were tested at .05 level of significance:

$H0_1$:   There is no significant difference in the mean responses of lecturers of electrical/electronic engineering technology in polytechnics, lecturers of electrical/electronic technology in colleges of education and road side cell phone technicians on the competencies required for servicing and repairing of faulty android phones

$H0_2$:   There is no significant difference in the mean responses of lecturers of electrical/electronic engineering technology in polytechnics, lecturers of electrical/electronic technology in colleges of education and road side cell phone technicians on the competencies required for configuring and flashing of mal-functional android phones

$H0_3$:   There is no significant difference in the mean responses of lecturers of electrical/electronic engineering technology in polytechnics, lecturers of electrical/electronic technology in colleges of education and road side cell phone technicians on the competencies required for upgrading android phones

Method

The study adopted survey research design. Survey research design in the opinion of

Osuala (2005) is a design that studies characteristics and focuses on people, the vital facts of people and their beliefs, opinions, attitude, motivation and behaviors. The survey research design is appropriate for this study because it aimed at the making appropriate contents in android maintenance for training of youths.

The study was conducted in Lagos State of Nigeria. The population for the study was 122 which comprised of all the 35 lecturers of electrical/electronic engineering technology from Department of Electrical/Electronics Technology, Yaba College of Technology, Lagos State Polytechnic Ikorodu and Lagos City Polytechnic Ikeja and 20 Lecturers of Electrical/Electronic Technology from Federal College of Education (Technical) Akoka and Adeniran Ogunsanya College of Education Otto Ijanikin and 67 road side cell phone technicians in Lagos State. The sample for the study was 122 respondents. These were purposively sampled 67 literate road side cell phone technicians, all the 55 lecturers in polytechnics and colleges of education in the study area.

A structured questionnaire was used as instrument for data collection and was on 5-point Likert scale. The structured questionnaire had 56 competency items developed for collecting data in accordance with the research questions. The instrument was in four sections A-C. A centered on competencies required for servicing and repairing of faulty android phones,

B was on competencies required for configuring and flashing of malfunctional android phones, C dealt with the competencies required for upgrading android phones

The instrument was face validated by three experts. These were experts from Department of Vocational Teacher Education, University of Nigeria, Nsukka, Department of Science and Industrial Technology Education. The internal consistency reliability coefficient of 0.84 was obtained for questionnaire items using Cronbach alpha technique. Out of one hundred and twenty two copies of the questionnaire administered to the respondents with the help of three research assistants, only 120 copies were duly retrieved which represent 98.36 percent return rate.

The data collected from the study were analyzed using factor analysis for answering the research questions. For selecting the appropriate competencies in cell phone maintenance for youth empowerment, 0.50 as factor loading was utilized. Any competency with factor loading of 0.50 and above was required and any competency with factor loading less than 0.50 was not required. Analysis of variance (ANOVA) was employed for testing all the null hypotheses at 0.05 and relevant degrees of freedom. The null hypothesis of no significant difference was accepted for any item whose P-value was greater than the 0.05, but it was rejected for any item whose P-value was less than 0.05.

Results

The data answering research question and testing hypothesis one are presented in Table 1

Table 1: Summary of the Outcome of Factor Analysis for answering Research Question One and Analysis of Variance for Testing Hypothesis One

S/N	Competency items	Factor Loading at 0.50	P-values	Sig.	Remark, Ho	
A	**Competencies in Trouble Shooting android phones**				Required,	NS
1	Write down the history of the faults from the cell phone user	0.78	0.61	0.05	"	"
2	Identify the facilities for cell phone trouble shooting	0.61	0.38	"	"	"
3	Test the faulty cell phone in the present of the owner	0.57	0.57	"	"	"
4	Know the symptoms of all the possible faults	0.68	0.49	"	"	"
5	List all the possible causes of the problems	0.55	0.45	"	"	"

6	Check the list of possible causes against the list of the symptoms	0.70	0.54	"	"	"
7	Rank the remaining causes in order of likelihood	0.71	0.51	"	"	"
8	Tackle the likeliest causes in the order of the complexity, cost and /or time required to check them	0.77	0.38	"	"	"
9	Use tested okay unit to replace bad unit of the same capacity if fault is obvious	0.58	0.49	"	"	"
10	Record down the outcome of the trouble shooting	0.66	0.61	"	"	"
11	Reveal the result of the trouble shooting to the owner of the cell phone	0.67	0.67	"	"	"
B	**Competencies in servicing malfunctional android phones**	0.76	0.11	"	"	"
12	Dismantle cell phone before embarking on maintenance actions	0.52	0.45	"	"	"
13	Check the battery contacts for proper connection	0.66	0.51	"	"	"
14	Clean the battery by removing carbon from the contacts	0.67	0.21	"	"	"
15	Clean the motherboard of a phone using soft wool	0.78	0.32	"	"	"
16	Adjust the settings of the phone for functionality	0.58	0.33	"	"	"
17	Heat each ICs inside the phone for functionality	0.65	0.54	"	"	"
18	Dry clean the phone if drop inside the water	0.59	0.48	"	"	"
19	Check for proper contact of SIM card	0.71	0.55	"	"	"
20	Clean the whole of cell phone with appropriate agents	0.56	0.31	"	"	"
21	Check the speaker or mouth piece for proper operation	0.72	0.34	"	"	"
22	Check the charging point of a phone for functionality	0.66	0.45	"	"	"
23	Clean the screen of a cell phone	0.61	0.23	"	"	"
24	Check the flash light of a cell phone for proper operation	0.73	0.46	"	"	"
25	Check the flip flop IC for proper operation in case of sliding phone	0.67	0.42	"	"	"
26	Check the power ICs of a cell phone for functionality	0.67	0.43	"	"	"
27	Check all electrical installation operations as designed in schematic manual	0.51	0.30	"	"	"
28	Check for contact of keyboard for proper operation	0.67	0.34	"	"	"
29	Test the keyboard IC for effective operation	0.77		"	"	"
30	Check the active components in the charger for functionality	0.65	0.51	"	"	"
31	Check the passive components in the charger for functionality	0.76	0.38	"	"	"
32	Clean the screen of a cell phone with a very soft damped cotton cloth	0.55	0.52	"	"	"
33	Scratch the battery and SIM contacts with fine sharp paper or object	0.58	0.27	"	"	"
C	**Competencies in repairing faulty cell phones**		0.33			
34	Dismantle the cell phones	0.69	0.59	"	"	"
35	Split out the casing of the cell phone	0.60	0.51	"	"	"
36	Separate the key pad from the mechanism	0.56	0.62	"	"	"
37	Move the slider down	0.58	0.71	"	"	"
38	Lift the connector up to unplug the screen that is attached to the circuit ribbon	0.59	0.54	"	"	"

39	Move the slider up in case of slide phone	0.71	0.71	"	"	"
40	Run fingernail along the edge of the front cover to unclip it	0.65	0.43	"	"	"
41	Remove the front cover of the cell phone	0.58	0.21	"	"	"
42	Identify faulty area or components in a cell phone	0.67	0.43	"	"	"
43	Test the components with appropriate testing instruments	0.56	0.51	"	"	"
44	Remove the component(s) from the mother board using appropriate tools	0.78	0.34	"	"	"
45	Select components of correct specification	0.62	0.08	"	"	"
46	Verify the condition of the components before fixing it back to the mother board	0.59	0.54	"	"	"
47	Repair or change the faulty components if totally bad	0.72	0.21	"	"	"
48	Fixes back the components into mother board correctly	0.64	0.43	"	"	"
49	Applies soldering iron for only 3 seconds if needed	0.52	0.22	"	"	"
50	Applies sufficient flux to point(s) being soldered	0.63	0.43	"	"	"
51	Couple back the phone	0.57	0.19	"	"	"
52	Configure the phone	0.56	0.22	"	"	"

Data in Table 1 showed that all the competencies in trouble shooting, servicing and repairing faulty android phones had their factor loadings ranged from 0.51 to 0.78 which were either equal to or greater than 0.50 loading factor. This indicated that all the competencies in trouble shooting, maintaining and repairing faulty android phones are appropriate for training of youths in Lagos State. The table also indicated that all the items had their P-values greater than 0.05. This indicated that there was no significant difference in the mean responses of lecturers in polytechnics, lecturers in colleges of education and road side cell phone technicians on the competencies in trouble shooting, maintaining and repairing faulty android phones. Therefore, the null hypothesis of no significant difference was upheld for all the 52 competencies.

The data answering research question and testing hypothesis two are presented in Table 2

Table 2: Summary of the Outcome of Factor Analysis used for answering Research Question two and Analysis of Variance for Testing Hypothesis two

S/N	Competency items	Factor Loading at 0.50	P-values	Sig.	Remark,	Ho
D	**Competencies in configuring malfunctional android phones**			**0.05**	**Appropriate**	**NS**
1	Select or click on menu	0.66	0.53	"	"	"
2	Select settings	0.51	0.34	"		
3	Select configure setting correctly	0.52	0.09	"	"	"
4	Identify or generate personal configuration	0.49	0.54	"	"	"
5	Select add new in web	0.71	0.67	"	"	"
6	Create wap.mtnonlineplay.com	0.65	0.43	"	"	"
7	Select home page	0.58	0.21	"		
8	Click on bearing setting to have proxy server	0.67	0.43	"	"	"
9	Generate 8080 on port	0.56	0.81	"	"	"
10	Rewrite username and password two times	0.78	0.27	"	"	"

S/N	Item					
11	Click back up and choose options	0.62	0.58	"		
12	Activate as web	0.59	0.54	"	"	"
13	Click web for browsing to show bookmark	0.72	0.09	"	"	"
14	Complete the configuration correctly	0.64	0.08	"	"	"
E	**Competencies in flashing malfunctional android phones**					
15	Select appropriate facilities for flashing	0.66	0.56	"	"	"
16	Connect the laptop to the internet	0.53	0.88	"	"	"
17	Key in the website of the service provider	0.58	0.44	"	"	"
18	Unzip the downloaded flashing software	0.64	0.65	"	"	"
19	Download correct software from the website of the service provider	0.65	0.08	"		
20	Register with the CDMA or GSM carrier in the cell phone	0.67	0.54	"	"	"
21	Connect the cell phone to the computer with the help of appropriate USB cable	0.63	0.69	"	"	"
22	Install the downloaded software onto the phone	0.51	0.21	"	"	"
23	Complete the installation within 15-20 minutes	0.56	0.17	"		
24	Disconnect the phone from laptop	0.55	0.23	"	"	"
25	Test the cell phone for functionality	0.70	0.23	"	"	"

Data in Table 2 showed that all the competencies in configuring and flashing malfunctioned android phones had their factor loadings ranged from 0.51 to 0.78 which were either equal to or greater than 0.50 loading factor. This indicated that all the competencies in configuring and flashing malfunctioned android phones are appropriate for training of youths in Lagos State. The table also indicated that items had their P-values greater than 0.05. This indicated that there was no significant difference in the mean responses of lecturers in polytechnics, lecturers in colleges of education and road side cell phone technicians on the competencies in configuring and flashing malfunctioned android phones. Therefore, the null hypothesis of no significant difference was upheld for all the 25 competencies in configuring and flashing malfunctioned android phones.

The data answering research question and testing hypothesis three are presented in Table three

Table 3: Summary of the Outcome of Factor Analysis for answering Research Question two and Analysis of Variance for Testing Hypothesis two

S/N	Competency items	Factor Loading at 0.50	P-values	Sig.	Remark,	Ho
F	**Competencies in Upgrading android phones**			**0.05**	**Appropriate**	**NS**
1	Select the appropriate material for upgrading	0.63	0.06	"	"	"
2	Remove old or obsolete parts of the android phone	0.56	0.28	"	"	"
3	Unscrew the parts or unit to be upgraded	0.68	0.44		"	"
4	Replace the obsolete parts or unit of the android phone	0.53	0.65	"	"	"
5	Connect android phones to the computer using USB cord	0.65	0.08	"	"	"
6	Open the iTunes software	0.54	0.54	"	"	"
7	Select the android phone name to the iTunes source list on the left	0.62	0.59	"	"	"
8	Select the summary tab	0.59	0.21	"	"	"

9	Check for update button	0.68	0.11	"	"	"
10	Select install newest button	0.55	0.53	"	"	"
11	Close the window	0.68	0/45			
12	Disconnect the android phone from the computer	0.56	0.51	"	"	"

The data in Table 3 revealed that factor loading of the competencies in upgrading malfunctioned android phones ranged from 0.53 to 0.68. This means that all the 12 competencies in upgrading malfunctioned android phones are appropriate for training of youths in Lagos State. The table also indicated that each item had its P-value greater than 0.05. This showed that there was no significant difference in the mean response of lecturers in polytechnics, lecturers in colleges of education and road side cell phone technicians on the competencies in upgrading android phones. Therefore, the hypothesis of no significant difference was upheld for the 12 competencies.

Discussion of findings

The findings of this study revealed 52 appropriate competencies for trouble shooting, servicing, and repairing of faulty android phones, 25 competencies in configuring malfunctioned android phones, and 12 competencies in upgrading malfunctioned android phones. The findings of this study agreed with the findings of Ogbuanya, Bakare and Zakka (2009) who conducted a study on mechatronics skills required for integration into electrical/electronic engineering technology programme in polytechnics for sustainable employment of graduates in contemporary Nigeria. The findings revealed that 16 mechatronics contents and 40 mechatronics skills were required for integration into electrical/electronic engineering technology programme in polytechnics for sustainable employment of graduates

This finding was in agreement with the findings of Nwachukwu, Bakare and Jika (2010) who carried out a study to identify effective laboratory safety practice skills required by electrical and electronics students for effective functioning in the laboratory of technical colleges in Ekiti State. The authors found that 10 safety practice skills were required to use electrical hand tools, 25 safety practice skills in operating electrical and electronic power tools and machines and 10 safety practice skills for working in electrical/electronic workshop.

This finding is also in agreement with the study of Akinduro (2006) who carried out a study on electrical installation and maintenance work skills needed by technical college's graduates to enhance their employability in Ondo State. The author found out that the graduates of technical colleges need domestic installation skills, industrial installation skills, cable jointing skills, battery charging skills and winding skills in electrical machine for employment in Ondo state. The findings of the above researchers in their various research activities helped to support the justification of the results of this study on the development of appropriate competencies in smart phone maintenance for empowerment youths at skills acquisition centres.

Conclusion

Android phones are recent mobile technology used by people to make and receive calls. Android phones are handsets typically support additional services such as e-mail and internet access; short-range wireless communications, as well as business and gaming applications, and photography. These phones are useful by many people in Lagos state but most of the users could not easily locate competent technicians who can repair or service faulty android phones thereby making users whose phones are bad to abandon them for the purchase of new ones. It is in this direction that this study was carried out to make appropriate contents in android phone maintenance for training youths in Lagos State.

Recommendations

1. It is recommended that all the identified competencies in android phone maintenance should be used for training of youths at various skills acquisition centres in Lagos State.

2. The competencies identified in this study should be permanently integrated into the programmes of skills acquisition centres.

3. Relevant facilities and materials should be supplied by government and enabling individuals for training of youths at skills acquisition centres.

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