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Capacity Building Needs of Electronic Technology Lecturers for Integration of Mobile Phone Hardware Repairs into the Electronic Curriculum

Nnenna Ibezim,*, Ifeanyi Ohanu, Olufemi Shodeinde
Department of Vocational Teacher Education, University of Nigeria, Nsukka
* nnenna.ibezim@unn.edu.ng

Abstract
The study was carried out to determine the capacity building needs of electronic technology lecturers for integration of mobile phone hardware repairs into the electronic curriculum. In carrying out the research, five research questions and five null hypotheses were formulated for the study. The population for the study was 39 electronic technology lecturers. Questionnaire was the instrument used for data collection. Data collected were analyzed using mean while Analysis of Variance (ANOVA) was used to test the five null hypotheses at 0.05 level of significance. The study revealed the skill needs of electronic technology lecturers for integration of mobile phone hardware repairs into the electronic curriculum on mobile phone components identification, mobile phone hardware repair tools identification, disassembling and assembling of mobile phones, identification of mobile phone hardware faults, and remedying of mobile phones hardware faults. It was therefore recommended that in-service trainings should be given to the electronic lecturers in these skill need areas to ensure effective integration of mobile phone hardware repairs into the electronic curriculum.
Keywords: Electronic Technology, Mobile Phone Repairs, Curriculum, Capacity Building

1. Introduction

The level of technological advancement in the field of communication has lead to the development and production of different models and kinds of mobile phones. Mobile phones are communication devices that aid transfer of information from one place or person(s) to another at any convenient time. According to Acevedo (2013), mobile phones are a ubiquitous part of our global communications structure with more than 4.6 billion worldwide subscriptions. This ever-present communication medium offers business opportunities, including sales, repair, cell phone services and marketing. Mobile phones come with different models and new technologies. The level of technology involved in production of present day mobile phones presents mobile phone users and repairers with a lot of challenges which include ways of operating them and how to maintain or repair them when they develop faults. Repairing mobile phones involves identification of its functional components, parts, and various sections. The functional parts of a mobile phone include: mouth piece, speaker, screen, among others. Sankari (2007) identified some of the parts of mobile phone to include: antenna, battery, battery pin, battery cover, battery buckle, camera cover, master hinge, electronic board, keypad, LCD screen, hinge-cap, pen, screw, screw-cover, side-keys, sim card, and sim card lock.

These parts of a mobile phone can develop one fault or the other at any time. UNLOX(2004) identified some mobile phone faults as follows: Speaker / Sound Faults as when ringtones and/or music cannot be heard, ringtones and/or music is distorted or difficult to understand, ringtones and/or music is too quiet. Earpiece / Hearing Faults as when the caller cannot be heard, the callers voice is distorted or difficult to understand, the callers voice is too quiet.

The faults developed by mobile phones can be remedied using the right tools, equipment and materials with the help of a competent mobile phone repairer. Such tools used for mobile phone repairs include: precision screw drivers, testers, rework station, soldering lead, among others. CS-Tele(2006) stated that the tools for mobile phone repairs include: bga kit, bga boards, blow brush, bga ic adhesive removing liquid, soldering iron, paste, wick, tweezer, plier, iron head, power supply, lens, knife, muliti meter, screw driver set, screw driver with lens and tweezer, c35 opening tools, among others. Some of these tools can be used for assembling and disassembling of mobile phones. Assembling mobile phones involves putting the parts of the mobile phones together for it to function. Disassembling mobile phones involves removing the parts of the mobile phones for purpose of identifying and remedying faults. The use of these tools in repairing mobile phones depends on the capacity of the mobile phone repairer in using tools. A repairer who regularly builds his capacity on the use of tools for mobile phone repairs can effectively tackle the dynamic nature of mobile phone hardware faults.

Capacity building according to UNDP(2009), refers to a process that supports the initial stages of building or creating capacities and is based on an assumption that there are no existing capacities to start from. The three levels of capacity are the enabling environment, organizational level and the individual level. Enabling environment is the broader system within which individuals and organizations function and one that facilitates or hampers their existence and performance. The individual level on the other hand, are the skills, experience and

knowledge that are vested in people. Each person is endowed with a mix of capacities that allows them to perform, whether at home, at work or in society at large. Some of these are acquired through formal training and education, others through learning by doing and experience. Lastly, the organizational level are the internal policies, arrangements, procedures and frameworks that allow an organization to operate and deliver on its mandate, and that enable the coming together of individual capacities to work together and achieve goals. Such policies under organizational level include the curriculum through which learning objectives are derived (UNDP, 2009).

The curriculum is the experiences and activities which learners are exposed to for the purpose of acquiring the desired knowledge and skills. Offorma (2002) defined curriculum as the sum total of the schools' planned programme of education designed to bring about desirable changes of behavior. The author further described curriculum as a deliberately and systematically planned attempt to change the behavior of the young and inexperienced student to enable them acquire competency they could use to build a better society. The Curriculum should reflect the societal aims, meaning and values. The mobile phone today plays a major and vital role in our society, and as such has become in a way, people's way of life. The study of the aspects, uses and applications of the mobile should therefore be integrated into the school curriculum to empower individuals on issues regarding the use of mobile phones, since the technology has really come to stay. According to Saylor (2012), mobile phones are wireless electronic devices used for telephone and multimedia communications, and consequently, learning activities involving mobile phones should best be part of the electronic technology curriculum in schools.

Electronic technology curriculum involves the process of applying scientific knowledge in the design, selection of materials, construction, operation and maintenance of electronics (Theraja, 2007). The Electronics Technology program trains students in those basic electronics skills necessary for immediate employment and provides the foundation for more advanced studies. Electronics is an industrial area of growth and opportunity. Constantly up-graded new technologies have created a strong demand for employees who are well trained as electronics technicians. Employment opportunities also exist in many related fields, such as computing, communications, industrial controls, aerospace, biomedical electronics, semi-conductor fabrication, and instrumentation. Employee assignments ordinarily involve product testing, troubleshooting of circuits and systems, or field maintenance and repair. Therefore, in order to provide our society with professionals that can offer services in the electronic field, the curriculum of electronic technology in schools should include learning experiences involving building of the capacity of students in the right use and management of universally used electronic devices such as the mobile phone. However, for an effective integration of the mobile phone hardware repair into the electronic technology curriculum, the teachers or lectures in the case of a university system, of electronic technology should be properly equipped for effective knowledge transfer. This is because, as opined by Ukonze (2011), teachers are agents of knowledge transfer to students for positive change in behavior. It is against this background that this study has its major purpose as to determine the capacity building needs of electronic technology lecturers for integration of mobile phone hardware repairs into the electronic curriculum. Specifically, the study will identify capacity building needs of the lecturers in:

- Mobile phone components identification,
- Mobile phone hardware repair tools identification,
- Disassembling and assembling of mobile phones,
- Identification of mobile phone hardware faults,
- Remedying of Mobile Phones Hardware Faults.

2. Research Questions

- What are the capacity building needs of electronic technology lecturers in mobile phone components identification?
- What are the capacity building needs of electronic technology lecturers in mobile phone hardware repair tools identification?
- What are the capacity building needs of electronic technology lecturers in disassembling and assembling of mobile phones?
- What are the capacity building needs of electronic technology lecturers in identification of mobile phone hardware faults?
- What are the capacity building needs of electronic technology lecturers in remedying of mobile phones hardware faults?

3. Hypotheses

The following hypotheses that guided the study were tested at 0.05 levels of significance:

Ho_1: There is no significant difference among the mean responses of electronic technology lecturers in

Universities, Polytechnics and Colleges of Education on their capacity building needs in mobile phone components identification.

Ho_2: There is no significant difference among the mean responses of electronic technology lecturers in Universities, Polytechnics and Colleges of Education on their capacity building needs in mobile phone hardware repair tools identification.

Ho_3: There is no significant difference among the mean responses of electronic technology lecturers in Universities, Polytechnics and Colleges of Education on their capacity building needs in disassembling and assembling of mobile phones.

Ho_4: There is no significant difference among the mean responses of electronic technology lecturers in Universities, Polytechnics and Colleges of Education on their capacity building needs in identification of mobile phone hardware faults.

Ho_5: There is no significant difference among the mean responses of electronic technology lecturers in Universities, Polytechnics and Colleges of Education on their capacity building needs in remedying hardware faults.

3. Method

The survey research design was adopted for the study. The study was carried out in Government owned Universities, Polytechnic and Colleges of Education in Enugu state, Nigeria. The population for the study was 39 electronic technology lecturers comprising of 23 university lecturers (17 from university of Nigeria, Nsukka and 6 from Enugu State University of Science and Technology), 9 Polytechnic lecturers (Institute of Management and Technology, Enugu), and 7 College of education lecturers (Enugu State College of Education). All the lecturers were used for the study. A structured questionnaire was developed from literature to obtain data for the study. The scaling statements used for answering the questions were Highly Needed (HN), Needed (N), Slightly Needed (SN), and Not Needed (NN). The questionnaire was face validated by three experts and Cronbach alpha technique was used to determine the internal consistency of the questionnaire items, and a coefficient of 0.83 was obtained. 39 copies of the questionnaire were administered to the 39 lecturers in Enugu state and 36 copies were retrieved and analyzed. The weighted mean was used to answer the research questions, and the standard deviation was used to determine the closeness or otherwise of the opinions of the respondents from the mean. Real limits of numbers were used to determine the capacity building needs of electronic technology teachers for integration of mobile phone hardware repairs into the electronic curriculum. Analysis of Variance (ANOVA) was used the test the hypotheses at 0.05 level of significance.

4. Results

4.1 Table 1: Mean ratings, Standard deviation, and Analysis of Variance of responses of electronic technology lecturers on their capacity building needs in mobile phone components identification.

S/N	Skills Needs in Mobile Phone Components Identification	University $n_1 = 23$		Polytechnic $n_2 = 9$		COE $n_3 = 7$		F	Sig	Decision
		$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD_3			
1.	Mobile phone LED	3.40	0.70	3.20	1.03	3.10	1.10	0.25	0.78	NS
2.	Mobile phone mouthpiece	2.80	1.03	3.20	1.03	2.70	1.34	0.54	0.59	NS
3.	Mobile phone IC chips	2.90	0.74	3.20	1.03	2.90	1.10	0.32	0.73	NS
4.	Mobile phone Joystick	2.90	0.88	3.40	0.84	3.10	0.99	0.77	0.47	NS
5.	Mobile phone Connectors	3.30	0.95	3.20	1.03	2.70	1.34	0.83	0.45	NS
6.	Mobile phone Keypad modules	3.40	0.97	3.40	0.97	3.20	0.92	0.15	0.86	NS
7.	Mobile phone Speaker and buzzer	3.30	0.95	3.60	0.97	3.40	0.70	0.30	0.74	NS
8.	Mobile phone Vibrators	3.50	0.53	3.50	0.71	3.70	0.48	0.40	0.68	NS
9.	Mobile phone Antenna	3.50	0.71	3.40	0.97	2.80	1.23	1.46	0.25	NS
10	Mobile phone Resistor	3.50	0.53	3.70	0.67	3.10	0.88	1.87	0.17	NS
11	Mobile phone Capacitor	3.30	0.67	3.60	0.70	3.70	0.48	1.10	0.35	NS
12	Mobile phone Diode	3.50	0.71	3.50	0.97	2.80	1.23	1.66	0.21	NS
13	Mobile phone Transistor	3.30	0.67	3.30	1.06	3.10	0.88	0.17	0.84	NS
14	Mobile phone Fuse	3.70	0.48	3.10	1.10	3.00	1.05	1.68	0.21	NS
15	Mobile phone Inductor	3.60	0.52	3.20	1.03	2.90	1.20	1.34	0.28	NS
16	Mobile phone Oscillator	3.60	0.52	3.20	1.03	3.00	1.05	1.15	0.33	NS
17	Mobile phone RF & IF Amplifier and Filter	3.70	0.48	3.10	1.10	3.10	0.99	1.48	0.25	NS

Key:NS = Not Significant, S = Significant, df = Degree of freedom, f = Calculated value of ANOVA using

SPSS, $S.D_1$ = Standard Deviation for University lecturers, $S.D_2$ = Standard Deviation for Polytechnic lecturers, $S.D_3$ = Standard Deviation for College of Education lecturers, $\bar{X}_1$= Mean for University electronic lecturers, $\bar{X}_2$ = Mean for Polytechnic electronic lecturers, $\bar{X}_3$ = Mean for College of Education Electronic lecturers, n_1 = number of University lecturers, n_2 = number of Polytechnic lecturers, n_3 = Number of College of Education lecturers, Level of Significance = 0.05.

Data presented in Table 1 shows that all the items had their mean ranging from 2.70 to 3.70 which falls within the response categories of highly needed and needed. This indicates that all the items are the capacity building needs of the electronic technology lecturers in mobile phone components identification. The standard deviation for the items ranges from 0.48 to 1.34. This implies that the electronic technology lecturers are homogenous in their responses on the capacity building needs in mobile phone components identification. The result also revealed that there was no significance difference in the mean responses of electronic lecturers on all the items 1-17, since their significance values range from 0.17 to 0.86, which are more than 0.05 level of significance. Therefore, the hypothesis of no significance difference was not rejected at 0.05 level of significance for those items.

4.2 Table 2: Mean ratings, Standard deviation, and Analysis of Variance of responses of electronic technology lecturers on their capacity building needs in mobile phone hardware repair tools identification

S/N	Skills Needed in Mobile Phone Hardware Repair Tools Identification	University $n_1 = 23$		Polytechnic $n_2 = 9$		COE $n_3 = 7$		F	Sig	Decision
		$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD_3			
18.	Screwdriver set	3.30	0.95	3.10	0.99	2.70	1.25	0.81	0.46	NS
19.	Cutting pliers	3.30	0.95	3.10	0.99	2.40	1.35	1.81	0.18	NS
20.	Precision knife	3.30	0.95	2.60	1.26	2.70	1.34	1.00	0.38	NS
21.	Tweezer	3.50	0.71	3.10	0.99	2.90	1.20	0.96	0.40	NS
22.	Soldering lead	3.30	0.95	2.80	1.14	2.80	1.14	0.72	0.50	NS
23.	Multimeter	3.30	0.95	3.50	0.71	3.40	0.70	0.16	0.85	NS
24.	DC power supply	3.40	0.97	3.30	1.06	3.20	1.03	0.10	0.91	NS
25.	Rework station	3.30	0.67	3.70	0.48	3.60	0.52	1.36	0.27	NS
26.	Soldering pump	3.20	0.92	3.20	0.79	2.80	0.92	0.69	0.51	NS
27.	Heating station	3.50	0.71	3.50	0.71	3.70	0.48	0.32	0.73	NS
28.	Conductive brush	3.40	0.70	3.30	1.06	3.20	1.03	0.11	0.89	NS
29.	Anti static gloves	3.30	0.95	3.70	0.48	3.60	0.52	0.93	0.41	NS
30.	Cleaning brush	3.30	0.95	3.20	0.79	2.80	0.92	0.89	0.42	NS
31	Soldering iron tip cleaner	3.20	1.03	3.50	0.71	3.70	0.48	1.06	0.36	NS

Key:NS = Not Significant, S = Significant, df = Degree of freedom, f = Calculated value of ANOVA using SPSS, $S.D_1$ = Standard Deviation for University lecturers, $S.D_2$ = Standard Deviation for Polytechnic lecturers, $S.D_3$ = Standard Deviation for College of Education lecturers, $\bar{X}_1$= Mean for University electronic lecturers, $\bar{X}_2$ = Mean for Polytechnic electronic lecturers, $\bar{X}_3$ = Mean for College of Education Electronic lecturers, n_1 = number of University lecturers, n_2 = number of Polytechnic lecturers, n_3 = Number of College of Education lecturers, Level of Significance = 0.05.

Data presented in Table 2 shows that all the items had their mean ranging from 2.40 to 3.70 which falls within the response categories of Highly Needed, Needed and Slightly Needed. This indicates that all the items are the capacity building needs of the electronic technology lecturers on mobile phone hardware repair tools identification. The standard deviation for the items ranges from 0.48 to 1.35. This implies that the electronic lecturers are homogenous in their responses on the capacity building needs in mobile phone hardware repair tools identification. The result also revealed that there was no significance difference in the mean responses of electronic technology lecturers on items 18-31, since the significance values of the items ranges from 0.18 to 0.89 which are more than 0.05 level of significance. Therefore, the hypothesis of no significance difference was not rejected at 0.05 level of significance for those items.

4.3 Table 3: Mean ratings, standard deviation, and Analysis of Variance of responses of electronic technology lecturers on their capacity building needs in disassembly and assembly of Mobile Phones

S/N	Skills Needs in Disassembly and Assembly of Mobile Phones	University $n_1 = 23$		Polytechnic $n_2 = 9$		COE $n_3 = 7$		F	Sig	Decision
		$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD_3			
32	Remove the battery cover	3.00	0.91	2.63	1.41	3.00	1.32	0.29	0.75	NS
33	Remove the battery	2.85	1.07	2.50	1.41	2.56	1.51	0.22	0.80	NS
34	Remove the SIM card	2.46	1.20	2.88	1.36	2.89	1.17	0.43	0.66	NS
35	Remove the Memory card	3.00	0.91	2.88	1.36	3.22	0.97	0.24	0.79	NS
36	Visible screws	2.77	1.01	2.75	1.28	2.22	1.48	0.60	0.56	NS
37	Detect and remove hidden screws	3.54	0.66	3.38	0.74	2.67	1.12	3.01	0.07	NS
38	Run the opening tool along the edge of the joint on the casing to unclip it	3.38	0.96	3.13	1.13	3.00	1.00	0.41	0.67	NS
39	Unplug the screen and other parts are attached to the circuit board by a ribbon flex	3.69	0.48	3.63	0.52	3.44	1.01	0.35	0.71	NS
40	Secure the screws	3.00	0.82	2.88	0.99	2.67	1.41	0.26	0.77	NS
41	Reverse the disassembly process to reassemble	3.46	0.66	3.75	0.46	3.00	1.00	2.26	0.12	NS

Key: NS = Not Significant, S = Significant, df = Degree of freedom, f = Calculated value of ANOVA using SPSS, $S.D_1$ = Standard Deviation for University lecturers, $S.D_2$ = Standard Deviation for Polytechnic lecturers, $S.D_3$ = Standard Deviation for College of Education lecturers, $\bar{X}_1$= Mean for University electronic lecturers, $\bar{X}_2$ = Mean for Polytechnic electronic lecturers, $\bar{X}_3$ = Mean for College of Education Electronic lecturers, n_1 = number of University lecturers, n_2 = number of Polytechnic lecturers, n_3 = Number of College of Education lecturers, Level of Significance = 0.05.

Data presented in Table 3 shows that all the items had their mean ranging from 2.22 to 3.75 which falls within the response categories of Highly Needed, Needed and Slightly Needed. This indicates that all the items are the capacity building needs of electronic technology lecturers in disassembly and assembly of mobile phones. The standard deviation for the items ranges from 0.46 to 1.51. This implies that the lecturers are homogenous in their responses on the capacity building needs in disassembly and assembly of mobile phones. The result also revealed that there was no significance difference in the mean responses of electronic lecturers on items 32-41, since the significance values of the items ranged from 0.12 to 0.80 which are more than 0.05 level of significance. Therefore, the hypothesis of no significance difference was not rejected at 0.05 level of significance for those items.

4.4 Table 4: Mean ratings, Standard deviation, and Analysis of Variance of responses of electronic technology lecturers on their capacity building needs in identification of Mobile Phones Hardware Faults

S/N	Identification of Mobile Phones Hardware Faults	University $n_1 = 23$		Polytechnic $n_2 = 9$		COE $n_3 = 7$		F	Sig	Decision
		$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD_3			
42	Identify a faulty vibrator	3.30	1.06	3.30	1.06	3.30	1.06	0.00	1.00	NS
43	Detect charging faults	3.30	1.06	3.40	0.97	3.30	0.95	0.03	0.97	NS
44	Troubleshoot a dead phone	3.50	0.97	3.30	0.95	3.50	0.97	0.14	0.87	NS
45	Detect keypad faults	3.40	0.97	3.40	0.97	3.50	0.97	0.04	0.97	NS
46	Detect LCD faults	3.40	0.97	3.30	0.95	3.30	1.06	0.03	0.97	NS
47	Detect battery faults	3.40	0.97	3.50	0.97	3.40	0.97	0.04	0.97	NS
48	Detect panel faults	3.50	0.97	3.30	0.95	3.10	1.20	0.37	0.70	NS
49	Detect audio faults	3.30	0.95	3.30	1.06	3.40	0.97	0.03	0.97	NS
50	Detect phone hanging fault	3.40	0.97	3.10	1.20	3.00	1.25	0.33	0.72	NS
51	Detect camera faults	3.30	1.06	3.00	1.25	2.60	1.43	0.78	0.47	NS
52	Detect memory card faults	3.30	0.95	3.40	0.97	3.20	1.23	0.09	0.91	NS
53	Detect SIM card faults	3.40	0.97	3.00	1.25	3.10	1.20	0.33	0.72	NS
54	Troubleshoot overheating problem	3.50	0.97	3.30	1.06	3.40	0.97	0.10	0.91	NS
55	Detect flex faults	3.20	1.03	3.00	1.25	2.80	1.40	0.26	0.77	NS
56	Detect network faults	3.30	1.06	3.00	1.25	2.90	1.37	0.29	0.75	NS
57	Locate jumper lines	3.30	1.06	3.00	1.25	2.70	1.25	0.64	0.54	NS

Key:NS = Not Significant, S = Significant, df = Degree of freedom, f = Calculated value of ANOVA using SPSS, $S.D_1$ = Standard Deviation for University lecturers, $S.D_2$ = Standard Deviation for Polytechnic lecturers, $S.D_3$ = Standard Deviation for College of Education lecturers, $\bar{X}_1$= Mean for University electronic lecturers, $\bar{X}_2$ = Mean for Polytechnic electronic lecturers, $\bar{X}_3$ = Mean for College of Education Electronic lecturers, n_1 =

number of University lecturers, n_2 = number of Polytechnic lecturers, n_3 = Number of College of Education lecturers, Level of Significance = 0.05.

Data presented in Table 4 shows that all the items had their mean ranging from 2.60 to 3.50 which falls within the response categories of Highly Needed and Needed. This indicates that all the items are the capacity building needs of the electronic lecturers in identification of mobile phones hardware faults. The standard deviation for the items ranges from 0.97 to 1.40. This implies that the lecturers are homogenous in their responses on the skills needs in identification of mobile phones hardware faults. The table further revealed that there was no significance difference in the mean responses of electronic lecturers on items 42-57, since their significance values ranged from 0.47 to 1.00 which are more than 0.05 level of significance. Therefore, the hypothesis of no significance difference was not rejected at 0.05 level of significance for those items.

4.5 Table 5: Mean ratings, Standard deviation, and Analysis of Variance of responses of electronic technology lecturers on their capacity building needs in remedying of hardware faults

S/N	Skills Needs in Remedying of Hardware Faults	University $n_1 = 23$		Polytechnic $n_2 = 9$		COE $n_3 = 7$		F	Sig	Decision
		$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD_3			
58	Fix a faulty vibrator	3.40	0.70	3.40	0.70	3.40	0.97	0.00	1.00	NS
59	Fix charging faults	3.70	0.48	3.70	0.48	3.70	0.48	0.00	1.00	NS
60	Repair a dead phone	3.30	0.95	3.20	0.92	3.60	0.70	0.58	0.57	NS
61	Fix keypad faults	3.50	0.71	3.60	0.52	3.50	0.53	0.10	0.91	NS
62	Fix LCD faults	3.50	0.53	3.60	0.52	3.40	0.52	0.37	0.69	NS
63	Fix battery faults	3.70	0.48	3.90	0.32	3.70	0.48	0.71	0.50	NS
64	Fix panel faults	3.70	0.48	3.90	0.32	3.70	0.48	0.71	0.50	NS
65	Fix audio faults	3.60	0.52	3.60	0.52	3.50	0.53	0.12	0.89	NS
66	Fix phone hanging fault	3.50	0.71	3.60	0.52	3.60	0.52	0.10	0.91	NS
67	Fix camera faults	3.80	0.42	3.90	0.32	3.80	0.42	0.22	0.80	NS
68	Fix memory card faults	3.80	0.42	3.90	0.32	3.80	0.42	0.22	0.80	NS
69	Fix SIM card faults	3.70	0.48	3.60	0.52	3.60	0.52	0.13	0.88	NS
70	Fix overheating problem	3.70	0.48	3.80	0.42	3.70	0.48	0.16	0.86	NS
71	Fix flex faults	3.60	0.52	3.70	0.48	3.50	0.53	0.39	0.68	NS
72	Fix network faults	3.50	0.71	3.50	0.71	3.40	0.70	0.07	0.94	NS
73	Run jumper cables	3.50	0.71	3.70	0.48	3.50	0.71	0.32	0.73	NS

Key:NS = Not Significant, S = Significant, df = Degree of freedom, f = Calculated value of ANOVA using SPSS, $S.D_1$ = Standard Deviation for University lecturers, $S.D_2$ = Standard Deviation for Polytechnic lecturers, $S.D_3$ = Standard Deviation for College of Education lecturers, $\bar{X}_1$= Mean for University electronic lecturers, $\bar{X}_2$ = Mean for Polytechnic electronic lecturers, $\bar{X}_3$ = Mean for College of Education Electronic lecturers, n_1 = number of University lecturers, n_2 = number of Polytechnic lecturers, n_3 = Number of College of Education lecturers, Level of Significance = 0.05.

Data presented in Table 5 shows that all the items had their mean ranging from 3.30 to 3.90 which falls within the response categories of Highly Needed and Needed. This indicates that all the items are the capacity building needs of the electronic technology lecturers in remedying of hardware faults. The standard deviation for the items ranges from 0.32 to 0.97. This implies that the lecturers are homogenous in their responses on the skills needs in remedying of hardware faults. The result also revealed that there was no significance difference in the mean responses of electronic technology lecturers on items 58-73, since their significance values ranged from 0.50 to 1.00 which are more than 0.05 level of significance. Therefore, the hypothesis of no significance difference was not rejected at 0.05 level of significance for those items.

5. Discussion

The findings of the study revealed that the capacity building needs of the electronic technology lecturers in mobile phone components identification include skill in identifying: mobile phone LED, mobile phone mouthpiece, mobile phone IC chips, mobile phone joystick, mobile phone connectors, mobile phone Keypad modules, mobile phone speaker and buzzer, mobile phone, vibrators, mobile phone antenna, mobile phone resistor, mobile phone capacitor, mobile phone diode, mobile phone transistor, mobile phone fuse, mobile phone inductor, mobile phone oscillator, mobile phone RF & IF amplifier and filter. This finding is in line with Sankari(2007) who identified some of the parts of mobile phone to include: antenna, battery, battery pin, battery cover, battery buckle, camera cover, master hinge, electronic board, keypad, LCD screen, among others.

From the study, it was also revealed that the capacity building needs of the electronic lecturers in mobile phone hardware repair tools identification include skill in identifying: screwdriver set, cutting pliers, precision knife,

tweezer, soldering lead, multimeter, DC power supply, rework station, soldering pump, heating station, conductive brush, anti static gloves, cleaning brush, soldering iron tip cleaner. This finding is in consonance with CS-Tele(2006) which recorded that the tools for mobile phone repairs include: bga kit, bga boards, blow brush, bga ic adhesive removing liquid, soldering iron, paste, wick, tweezer, plier, iron head, power supply, lens, knife, muliti meter, screw driver set, screw driver with lens and tweezer, c35 opening tools, among others.

The study also revealed that the capacity building needs of the electronic technology lecturers in the disassembly and assembly of hardware components of mobile phones skill in removing: the battery cover, the battery, the SIM card, the memory card, visible screws, and detecting hidden screws, as well as skill in: running the opening tool along the edge of the joint on the casing to unclip it, unplug the screen and other parts are attached to the circuit board by a ribbon flex, secure the screws, and reverse the disassembly process to reassemble. Pro/ENGINEER(Not Dated) had stated that the ear piece can be assembled by: select the front surface of the earpiece. the placement panel shows the earpiece surface as the component reference. Next, rotate the cover and select the shelf of the earpiece housing. It also stated that the lens can be assembled by: select the bottom surface of the lens, select the surface in the cutout on which the lens will sit, insert the lens.

From the study, it was also revealed that the capacity building needs of the electronic lecturers in identification of mobile phones hardware faults include skill in: identify a faulty vibrator, detect charging faults, troubleshoot a dead phone, detect keypad faults, detect LCD faults, detect battery faults, detect panel faults, detect audio faults, detect phone hanging fault, detect camera faults, detect memory card faults, detect SIM card faults, troubleshoot overheating problem, detect flex faults, detect network faults, and locate jumper lines. This result agrees with UNLOX(2004) which identified Speaker / Sound Faults as when ringtones and/or music cannot be heard, ringtones and/or music is distorted or difficult to understand, ringtones and/or music is too quiet. Earpiece / Hearing Faults as when the caller cannot be heard, the callers voice is distorted or difficult to understand, the callers voice is too quiet, among others.

The study also revealed that the skills needed in remedying hardware faults include skill in fixing: a faulty vibrator, charging faults, repair a dead phone, keypad faults, LCD faults, battery faults, panel faults, audio faults, phone hanging fault, camera faults, memory card faults, SIM card faults, overheating problem, flex faults, network faults, and jumper cables.

On the hypothesis, the study revealed that there were no significant differences in the mean ratings of the responses of the lecturers on all the items (1-73). The five null hypotheses were all accepted. The implication of this finding is that despite the differences in institution and training of the electronic technology lecturers, their opinions were not significantly influenced on their capacity building needs for integration of mobile phone hardware repairs into the electronic technology curriculum.

6. Conclusion

There is increase in the number of persons using mobile phones in the society on daily basis. There is also need for skilled technicians that can effectively fix mobile phone faults. One major way to address this is through training in our schools. However, the facilitators of education, teachers and lecturers, need to be well equipped in other to transfer relevant knowledge. This paper has identified the capacity building needs of electronic technology lecturers for integration of mobile phone hardware repairs into the electronic technology curriculum.

7. Recommendations

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

- The Ministry of Education should mandate all school administrations that run the electronic technology curriculum to organize capacity building trainings for the electronic technology lecturers on the identified skills needs.
- Curriculum planners should integrate the identified capacity building needs into the curriculum of higher institutions in order to produce teachers that can effectively transfer knowledge on mobile phone hardware repairs.

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