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Development and Validation of E-Portfolio for Enhancing Employability Skills of Students in Electrical and Electronic Programme in Colleges of Education in North East Nigeria

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ABSTRACT
The purpose of this study is to develop and validate an e-portfolio package for enhancing employability skills of students in Electrical/Electronic Technology in colleges of education in North East Nigeria. The study was guided by two research questions. The study adopted mixed method using instrumentation, and survey research design. The population of the study was 149 respondents made up of 99 of NCE III students of 2019/2020 academic session 42 lecturers and 8 workshop Technicians of the Electrical/Electronic Programme in all the Colleges of Education in North East Nigeria. The entire population of used for the study, hence there was no sampling for the study since the population was small and manageable. The instrument titled "Format on the content "required for the Development and Validation of an E-portfolio (FCRDTE)" for Enhancing Employability Skills of Students in Electrical and Electronics Programme in North East Nigeria was produced by the researcher using the NCCE Minimum Standards for NCE Electrical and Electronics programme and relevant literature reviewed. The findings of the study revealed that: Employability skill content areas for e-portfolio development of Electrical/Electronic Technology in Colleges of Education were found to be valid and E-portfolio employability skill content areas for Electrical/Electronic Technology in Colleges of Education were found reliable. Based on the on the findings of the study, recommended among others that the National Commission for Colleges of Education should integrate e-portfolio into their minimum standard for the assessment of students' performance. The teachers of Electrical/Electronic in Colleges of Education should be encouraged to use e-portfolio while assessing NCE students.
Keywords: Development, Validation, E-Portfolio and Employability Skills

INTRODUCTION

In the 21st century, world events have turned to information and communication technologies (ICTs). Quite a good number of developed and developing countries around the globe believe that ICTs will continue to be a critical facilitator of effective teaching, student learning process and evaluation (Mohammed and Abubakar, 2017). Changes occurring due to the introduction of ICT in education affect the skills required in the workplace for employees to be competent in any working environment. The Federal Government of Nigeria has made significant investments in Information and Communication Technologies (ICTs) to support the teaching and learning process (Webb, 2007). Considering the importance of ICTs in teaching and learning, the Federal Republic of Nigeria (FRN, 2013) stated in the National Policy on Education that, all teachers in educational institutions including Colleges of Education shall be professionally trained in Information and Communication Technology (ICT) for the effective

performance of their duties. According to Cuban, Kirkpatrick, and Peck (2001), teachers are to be better trained to face the evolving challenges in the teaching profession.

In Nigeria today, many teachers are unable to find effective ways to use technology or any other means of teaching/learning and evaluation, the possible explanation for this lack of success by teachers is that the use of technology in the classroom has not been encouraging and teachers are not well trained (Ololube, 2006). According to Aliyu (2020), teachers need effective techniques that can help them search for an assessment strategy for skills-related courses. Teachers need to learn how to integrate ICTs effectively into their classroom activities, these necessitate a clarion call for innovation and transformation among educators (Ololube, Ubogu, and Egbezor, 2007). As such, ICTs have come to stay as a means of assisting instructional delivery in education and in particular, technical education. This calls for several changes in every aspect of the teaching and learning process. Technical Vocational Education and Training (TVET) programs need ICTs because the present world of work is rapidly changing its requirement for workers (Bappa, 2012). The recent developments and demands of present society have deeply affected the education sector considering theories such as constructivism and new social trends such as changing labour market, these necessitated a radical change in traditional approaches of teaching and learning approach.

Teaching involves a process of imparting appropriate knowledge and skills to learners to enable them to function effectively towards meeting the demands of the dynamic society. The central purpose of teaching is to effect desirable changes in a learner's behaviour (Richards and Rodgers, 2014). Thus, the established academic institutions struggle to keep up with the new changes in every aspect of the teaching and learning process. However, Nigerian TVET institutions are not an exception to such struggles as they are responsible for the production of technologies and technicians who can apply their technical knowledge and vocational skills to solve the industrial problems of their nation. Malgwi and Mbah (2012), reiterated that Technical Vocational Education and Training could be described as the factory for the production of needed technologists, craftsmen, and skilled artisans who are required to turn the nation's economy around. One of the objectives of vocational-technical education in Nigeria is the production of skilled, self-reliant, and enterprising craftsmen and technicians who can apply their technical knowledge and acquire vocational skills necessary for solvir 1 ustrial, agricultural, and economic problems of the nation (FRN, 2013).

Part of the government efforts towards achieving this objective is the establishment of Colleges of Education Technical among others, such Colleges aim to train technical and vocational teachers with intellectual and professional backgrounds adequate for imparting necessary skills to young Nigerians. Technical Education has a multi-dimensional and multi-disciplinary curriculum, which contains various subjects where learners acquire several technical and professional skills; one of such areas in Electrical/Electronic Technology. As stipulated in the National Commission for Colleges of Education (NCCE) Minimum Standards for Nigerian Certificate in Education (NCE), the Electrical/Electronic Technology consists of seven major courses which include: Electrical Machines and Power, Maintenance and Repairs of Electrical/Electronic Equipment, Telecommunication, Electrical Measuring Instruments, Digital Electronics Electrical Circuits, School workshop Management and Drawing (NCCE, 2012). These seven courses have a total of eight credit units of theory and twenty eight units of practical. The main purpose of practical lessons in every subject requiring manipulative skills is to impact or develop learners' practical skills. This purpose is often achieved by assigning students to perform practicals in the workshop (Baird, 2000). Skills in Electrical/Electronic involves various tasks such as, winding of machines, wiring, soldering, validation and measuring among others. Such acquired skills are referred to as employability skills whether paid employment or self-employment.

Employability skills are not only to gain employment but also to progress within an enterprise Department of Education Science and Training, (DEST, 2002). Employability skills include technical or discipline-specific skills, knowledge, capabilities, and personal attributes. This is consistent with the European Commission's (2011) definition that employability skills are the combination of factors that enable individuals to progress towards employment and to progress during their careers. Employability skills are acknowledged as skills that enable employees to perform effectively in the workplace and apply

technical or discipline-specific skills. In an effort toward equipping young Nigerians with employability skills, the entire traditional approaches of teaching and learning require a radical change as labor market requires changes (Bappa, 2012). When the teaching and learning process is changed, it also affects assessment procedures and approaches (Fourie and Van Niekerk, 2001). Australian Employability Skills Framework (AESF, 2012) noted that failure to recognize the context-dependent nature of employability skills, lack of explicit focus on employability skills in education, measurement, and assessment difficulties are responsible for poor development of employability skills in graduates. In line with globalization, the colleges of education have been concerned with the development of persons with the requisite knowledge, attributes, and skills that are necessary for employment after graduation. It further aims to inspire and enable individuals to develop their capabilities to the highest potential so that they can, contribute effectively to the development of society, achieve personal fulfilment, and are well-equipped for work. It becomes crucial now for colleges of educations (COEs) to respond to the unpredictable labor market and make parallel adjustments to fulfil their mission and vision (Abas and Imam, 2016). Considering the main goals of earlier academic education that enable students to learn a certain domain, learning of basic knowledge is important, the behaviourist approach generally uses traditional instruction.

In using the traditional instructional approach, knowledge is merely abstracted, drill and practice play an important role in this process. Assessment practice is mainly based on validation basic knowledge because the proof of learning generally is seen as changing the behaviors and increasing the right answer in test and changing between pre-test and end-test in this approach (Birgin and Baki, 2007). The traditional assessment approach mostly promotes students to memorize algorithms or rules rather than conceptual understanding, and focus on small, discrete components of the domain (Dochy, 2001). In this new environment, students' learning cannot be assessed within a shorter time using multiple choices tests (Mumme and Cameron, 2019). This suggests an alternative method of assessment for measuring individual students 'or group performance in the learning process, thus, one of the alternative assessment techniques to be used in education is the portfolio, this has been emphasized by many researchers (Mumme and Cameron, 2019, Birgin, 2003; Gussie, 1998, Norman, 1998, Micklo, 1997, De Fina and 1992). According to these researchers, an e-portfolio gives more reliable and dynamic data about students.

E-portfolios are valid way to document students' progress, encourage greater students' involvement in the learning process, showcase work samples, and provide a method of learning outcomes assessment and curriculum evaluation. Similarly, Milman (2007) described the portfolio as a purposeful compilation and reflection of one's work, efforts, and progress. As technology becomes increasingly available, students' e-portfolios are moving from paper formats to Electronics formats. The concept of an e-portfolio goes beyond text and still images only, but one can incorporate multimedia to demonstrate knowledge and skills. The realm of e-portfolio is extending as new tools and technologies are being developed. Therefore, e-portfolio development is not only about the "collection" of artefacts as evidence of learning and "reflection" on the process and product of learning but is also about the "interactions" of learning. Most of the present-day e-portfolio platforms provide the option for the inclusion of peer review, feedback, and discussion. An e-portfolio is an organized compilation that demonstrates knowledge, skills, values, and/or achievements and that includes reflections or exegesis which articulate the relevance, credibility, and meaning of the artefacts presented (Cooper and Love, 2006). These goals can be achieved through sharing ideas, experiences, receiving feedback from peers and teachers. e-portfolio development is not only about the "collection" of artefacts as evidence of learning and "reflection" on the process and product of learning but it is also about "interactions" of learning. Most of the present-day e-portfolio platforms provide the option for the inclusion of peer review, feedback, discussion, and reflections.

The development of e-portfolios could provide students with an opportunity to engage in an authentic learning experience (Reese and Levy 2009), this form of learning typically focuses on real-world, complex problems, and their solutions, with students carrying out tasks that match the real-world tasks of professionals in practice (Lombardi, 2008). In situations where students are expected to possess high-quality employability skills proficiency especially in Electrical/Electronic Technology, methods that will

be employed for assessing and evaluating students should be comprehensive and systematic, and students should be allowed to choose work samples for their learning. Assessment criterion using e-portfolio allows students to recognize, and select work that is considered high quality (Birgin and Baki, 2007), and that assessment through e-portfolio takes care of skill areas that are difficult to assess using mere paper and pencil techniques, also students' progress, and achievement over a while will be clearly shown. Such aforementioned call for the development of e-portfolio as an alternative assessment technique in Colleges of Education for enhancing employability skills acquisition. Through such a process, the students will be engaged in the processes of deciding which artefacts to include, how to organize their content, and what design choices will best contribute to their achievement.

Purpose of the Study

The main purpose of the study was to Develop and Test e-portfolios for Enhancing Employability Skills of Students in the Electrical/Electronic Technology in Colleges of Education in North East Nigeria. Specifically, the study seeks to:

1. Determine major content area required for the development of e-portfolio towards enhancing employability skills of students in Electrical/Electronic Technology in Colleges of Education in North East Nigeria.
2. Determine the mean performance score of students assess using an e-portfolio in Electrical/Electronic Technology.in Colleges of Education in North East Nigeria.

Research Questions

The following research questions were formulated to guide the study.

1. What are the major content area required for the development of an e-portfolio toward enhancing employability skills of students in Electrical/Electronic Technology in Colleges of Education in North East Nigeria?
2. What is the performance score of students' assessment using an e-portfolio in Electrical/Electronic Technology in Colleges of Education in North East Nigeria?

METHODOLOGY

The study employed mixed method using instrumentation and survey research design for the study. Instrumentation involves the selection and development of an assessment technique and the condition under which the technique is administered (Frankael and Wallen 2000). While survey research design according to Gall and Borg (2007) is a study which uses sample of an investigation to document, describe and explain what is in existence or non-existence on the present status of phenomena being investigated.

The geographical area of the study is North East Nigeria which consist of six states namely Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe States. North East Nigeria

The population of the study consist of 149, 99 of the population are NCE III students of 2019/2020 academic session, 42 lecturers and 8 Workshop Technicians from the department of Electrical/Electronic Technology in Colleges of Education in North East Nigeria. The choice of NCE III students is based on the fact that the National Commission for Colleges of Education (NCCE, 2012) minimum standard, Electrical/Electronic Technology courses main for the study are been taught in the third year second semester in the colleges of education.

The entire population of 149 were used for the study. There was no sampling for the study since the population was small and manageable,. This is in line with the assertion by of Creswell (2002) that, where the number of the targeted population is small, it is preferable to utilize all the subjects in order to ensure representativeness.

The instrument used for data collection was a format content required for the development of e-portfolio assessment method. The instrument titled "Format on the content Required for the Development of E-portfolio, the Instrument consist of 140 items developed after the review of NCE III Electrical/Electronic Technology curriculum based on the NCCE (2012) Minimum Standard. 5 point rating scale with the following response options: Employability Skills Highly Required (ESHR) 5 points, Employability Skills Moderately Required (ESMR) 4 points, Employability Skills Require (ESR) 3 points, Employability Skills Less Required (ESLR) 2 points and Employability Skills Not Required (ESNR) 1 point was used.

The instrument used for data collection was a Format Content Required for the Development of E-portfolio Assessment (FRDEA). The instrument titled "Format on the content Required for the development of e-portfolio" the Instrument consist of one hundred and forty items developed after review of NCE III Electrical/Electronic Technology curriculum based on the National Commission for Colleges of Education (NCCE, 2012) Minimum Standard. While 4 points likert scale was adopted by the researcher to determine the efficacy of the developed e-portfolio package. The result obtained was used for data analysis.

The Statistical Package for Social Sciences (SPSS Version 22) was employed for analyzing the data. Mean ($\bar{x}$) and standard deviation (SD) were used to answer research questions.

To draw the statistical inferences on the hypotheses of the study, if the z calculated obtained from the tested null hypotheses is greater than 0.05 level of significance, the null hypotheses was rejected, if otherwise, accepted.

In the decision rule, the researcher used 40% of the total means score of the performance test (40) as the mean cut-off points. Therefore any mean performance score that is below 40.0 was considered as below mean cut-off point 40, while any mean performance score that is equal to or above 40.0 was considered as above mean cut-off point of 40.

RESULTS AND ANALYSIS

Research Question 1: *What are the content areas required for the development of e-portfolio toward enhancing employability skills of students in Electrical/Electronic Technology in Colleges of Education in North East Nigeria?*

Table 1: Mean Responses and standard deviation of Lecturers and Workshop Technicians on content areas required for the Development **of** e-portfolio

S/N	Items	$\bar{x}_G$	σ_G	Remark
1	Types of power system generation	4.36	0.60	Required
2	Power transmission switch gears	2.24	1.14	Not Required
3	Sub-station equipment and maintenance	3.52	1.20	Required
4	Power and stabilization systems	3.06	1.32	Required
5	Installation of protective devices	4.36	0.72	Required
6	Validation of protective devices	4.46	0.65	Required
7	Types of electrical machines e.g AC and DC machines	4.30	0.89	Required
8	Diagrams of AC and DC machines	4.08	0.94	Required
9	Operation of AC machine	3.40	1.01	Required
10	Operation of DC machine	3.74	0.88	Required
11	Conduct an open circuit system of transformers	4.20	0.78	Required
12	Types of transformers	4.00	1.36	Required
13	Transformers test	3.86	1.01	Required
14	Components of the transformers	4.04	1.09	Required
15	Types of industrial wiring system	4.36	0.75	Required
16	Industrial and domestic wiring system	4.52	0.61	Required
17	Distribution system and the illumination of light	3.12	0.90	Required
18	Different types of light illumination	3.34	1.29	Required
19	Types of antenna	3.98	1.13	Required
20	Installation of antennas	4.26	0.75	Required
21	Types of telephone	3.64	1.16	Required
22	Types and operational system of as telephone	3.76	1.30	Required

23	Application system of a telephone	3.64	0.96	Required
24	Microphone	4.46	0.67	Required
25	Types of microphone	3.94	1.11	Required
26	Application of a microphone	4.08	0.95	Required
27	Operational system of a microphone	4.12	1.02	Required
28	Types of AM/FM Radio Transmitters	2.70	1.43	Not Required
29	Identification of AM/FM Radio Receivers	3.56	1.28	Required
30	Operational system of AM/FM Radio Receivers	3.58	1.40	Required
31	Modulation of AM/FM radio	2.18	1.34	Not Required
32	Diagram of AM/FM radio transmitters and receivers	3.84	1.27	Required
33	Principles of phase modulations	2.08	1.07	Not Required
34	Diagrams of phase modulations	2.64	1.03	Not Required
35	Television receivers and transmitters	2.72	1.65	Not Required
36	Checking how cathode ray oscilloscope (CRO) works through the observation of its functional parts	4.06	1.22	Required
37	Using a CRO to measure voltage, frequency, and phase	3.54	1.40	Required
38	Using CRO with a bridge rectifier to measure the voltage output of a transformer	3.56	1.16	Required
39	Using CRO to trace faults in electronics circuit	4.30	0.79	Required
40	Using CRO and pattern generator to detect and repair faults in electronics circuits	3.78	1.36	Required
41	Localizing defective stages in faulty Electronics system using pattern generator and oscilloscope	3.56	1.25	Required
42	Measuring peak to peak voltage waveforms using the CRO	3.89	1.11	Required
43	Measuring Direct Current (DC) voltage power supply using CRO	3.90	1.20	Required
44	Measuring Direct Current (DC) voltage power supply using an analog multimeters	4.06	0.87	Required
45	Measuring Alternating Current (AC) voltage supply using an analog multimeters	4.32	0.91	Required
46	Measuring Direct Current (DC) of the power supply using an analog multimeters	4.26	0.88	Required
47	Determining the resistance of the current flow in the power supply unit of an Electronics system using an analog multimeters	4.02	0.94	Required
48	Measuring direct current (DC) voltage of power supply using a digital multimeters	4.00	1.03	Required
49	Measuring Alternating Current (AC) voltage of the power supply using digital multi-meter	4.32	1.02	Required
50	Measuring Direct Current (DC) power supply using digital multi-meter.	4.32	0.84	Required
51	Measuring Alternating Current (AC) of the power supply using digital multi-meter in a megger ampere	4.08	1.12	Required
52	Determining the resistance of current flowing in power supply unit of an Electronics system using digital multi-meter	4.00	0.93	Required
53	Measuring diode with digital multi-meter	4.42	0.84	Required
54	Measuring transistor with digital multi-meter	4.28	0.88	Required
55	Measuring inductance of a coil with either analogue or digital multimeters	2.94	1.19	Not Required
56	Administering first aids	3.14	1.16	Required

57	Types of Safety rules and regulations	3.32	1.17	Required
58	Observe safety measures required in the wiring system	3.38	1.04	Required
59	Electrical maintenance	3.54	1.28	Required
60	Types of the wiring system	3.38	1.16	Required
61	Simple surface and conduit wiring installation	4.48	0.68	Required
62	Simple surface wiring Trunking installation	4.38	0.75	Required
63	Maintenance of tools used for surface wiring	4.00	1.03	Required
64	Observing safety measures required in the conduit system	3.82	0.98	Required
65	Types of the conduit system	4.28	0.99	Required
66	Simple conduit wiring installation	4.32	0.84	Required
67	Maintenance of tools used for conduit wiring	3.98	1.19	Required
68	Types of installation test	3.98	0.92	Required
69	Advantages of electrical maintenance	2.88	1.26	Not Required
70	Disadvantages of electrical maintenance	3.74	1.14	Required
71	Differences between advantages and disadvantages of electrical maintenance	3.74	1.29	Required
72	Components of Computer Hardware	4.52	0.61	Required
73	Maintenance and repair of Computer Hardware	4.42	0.67	Required
74	Numbering system	3.04	1.25	Required
75	Types of Numbering system	3.14	1.16	Required
76	Types of Logic gates	3.30	1.18	Required
77	Types of Computers	3.54	1.33	Required
78	Parts of Computers	3.92	1.03	Required
79	Decoders and Encoders	2.86	1.31	Not Required
80	Computer-aided design (CAD) software	3.76	1.30	Required
81	Computer hardware Operating system	4.04	0.93	Required
82	Computer hardware and computer hardware configuration	2.92	1.32	Not Required
83	Operational system of a computer	3.72	1.11	Required
84	Types of work done with a computer	3.72	1.25	Required
85	Comprehensive workshops	4.02	1.06	Required
86	Differences between comprehensive, general, and unit workshops	4.50	0.71	Required
87	Types of Comprehensive workshops	3.52	1.20	Required
88	Types of general workshops	4.50	0.68	Required
89	Types of unit workshops	4.46	0.61	Required
90	Drawing comprehensive workshops	4.28	0.88	Required
91	Drawing general workshops	4.06	0.91	Required
92	Drawing unit workshops	3.92	1.05	Required
93	Types of maintenance records	3.70	0.97	Required
94	Types of equipment and mode of supply	3.82	1.24	Required
95	Types of safety precautions in a workshop	3.08	1.21	Required
96	Types of safety equipment in workshop and their functions	3.16	1.15	Required
97	Types of laboratories personnel and their functions	3.26	0.85	Required
98	Types of equipment in School laboratory	3.28	1.21	Required
99	Types of equipment in School workshop	3.80	1.01	Required
100	Types of technical drawings based on the projection system	3.56	1.26	Required

101	Construction of Line patterns used in technical drawing	3.52	1.09	Required
102	Construction of a standard drawing media and sheet sizes	2.86	1.31	Not Required
103	Lettering/Sketch of an object	3.82	1.22	Required
104	Drawing of Standard title block	3.88	1.22	Required
105	Construction of an isometric block	2.10	1.09	Not Required
106	Construction of an oblique block	2.70	1.11	Not Required
107	Construction of isometric and oblique block	3.10	1.33	Required
108	Construction of an orthographic projection	4.40	0.71	Required
109	Construction of first angle projection block	4.48	0.65	Required
110	Construction of third angle projection block	4.36	0.80	Required
111	Differences between first and third angle projection	4.04	0.95	Required
112	Construction of conics	3.98	1.02	Required
113	Construction of an ellipse	3.70	0.81	Required
114	Construct parabola and hyperbola by eccentricity method	4.20	0.78	Required
115	Construct of cycloid	4.04	1.32	Required
116	Construction of involutes of a square, pentagon, and circles	3.60	1.23	Required
117	Construction of raw tangents and normal to the above curves	3.82	1.24	Required
118	Construction of three dimensional objects and developing visualization skills through freehand sketching of multiple views	3.70	0.91	Required

Key: $\bar{x}_G$ *= Grand Mean,* σ_G *= Grand Standard deviation*

Table 1, shows the results of content areas required for the development and validation of e-portfolio. The respondents indicated that item 1, 3-28, 31, 33, 33-55, 57-69, 71-79, 81, 82, 84-104, 106 and 109- 118 were the content areas required as content necessary for inclusion into the e-portfolio toward enhancing employability skills of students in Electrical/Electronic Technology in Colleges of Education with mean ratings ranging from 3.08 to 4.52; and the standard deviation ranging from 0.60 to 1.33 respectively. The respondents further indicated that item 2, 29, 32, 34, 35, 36, 56, 70, 80, 105 and 107 and were not required as part of the content areas of e-portfolio toward enhancing employability skills of students in Electrical/Electronic Technology in Colleges of Education with mean ratings ranging from 2.10 to 2.86; and standard deviation which ranging from 1.03 to 1.34 respectively. Summarily, out of 118 items listed as content areas of the e-portfolio 107 items were required while 11 items were not required.

Research Question 2. *What is the performance score of student's assess using e-portfolio in Electrical/Electronic Technology.in Colleges of Education in North East Nigeria?*

Table 2: Mean Performance score of Students Assessed Using e-portfolio in Colleges of Education

S/N	Skills	$\bar{X}_Z$	$\bar{X}_H$	$\bar{X}_A$	$\bar{X}_G$	$\bar{X}_P$	$\bar{X}_{Gm}$	σ_G	Remark
1	Elect. Machine and power	72	72	70	77	70	72	5.22	Distinction
2	Telecommunication	74	76	72	78	72	74	7.13	Distinction
3	Elect. Circuit & mea. Inst.	72	82	70	76	70	72	8.70	Distinction
4	Main and repair of Elect.	74	78	66	78	68	72	8.58	Distinction
5	Drawings	82	74	72	78	74	76	8.43	Distinction
	Total						**74**		Distinction

Key: $\bar{X}_Z$ = Mean Zing, $\bar{X}_H$ = Mean Hong, $\bar{X}_A$ = Mean Azare, $\bar{X}_{Gm}$ = Mean Gombe, $\bar{X}_P$ = *Mean Potiskum,* $\bar{X}_G$ *= Grand Mean and* σ_G *= Grand Standard Deviation*

Result in Table 2 revealed that, the mean performance score of the students assessed using e-portfolio. The mean performance score of students assessed using e-portfolio ranges from 72 to 76. This mean

performance of the students indicates a grade rating of "A" grade. Hence the students' assessed using e-portfolio assessment performed at distinction grade. Also standard deviations of the mean performance scores of students assessed using e-portfolio assessment ranges from 5.22 to 8.70 this shows that students assessed using e-portfolio assessment were excellent in their performances as the standard deviation value were very close to each other.

Findings of the Study

The findings of the study revealed that:

1. Content areas necessary for inclusion into e-portfolio development include among others: Types of power system generation, protective devices, components of power system electric, Types of unit workshops, first angle projection block and orthographic projection, simple surface and conduit wiring installation, maintenance and repair of computer hardware.
2. Students' assessed using e-portfolio assessment package performed excellently with a distinction grade.

DISCUSSION OF FINDINGS

The discussions of findings were based on the research questions answered. The finding number one answered research question one on the contents required for the development and validation of e-portfolio towards enhancing employability skills of students in Electrical/Electronic Technology in Colleges of Education in North East Nigeria. The finding revealed that the content necessary for inclusion into the e-portfolio toward enhancing employability skills of students in Electrical/Electronic Technology in Colleges of Education include among others: Types of power system generation, test protective devices, enumerate components of power system electric, Types of unit workshops, draw first angle projection block and orthographic projection, carry out a simple surface and conduit wiring installation, maintain and repair computer hardware. This finding is related to the findings of Jimba (2001), Okwelle and Benchuks (2012), who in their separate studies reported that processed skills in machine work need to be identified and measurable using process-skills instrument in line with the specific course objectives. Okwelle and Okoye (2012) asserted that the fact that teachers were involved in identifying the curriculum items for the instrument to be developed for assessing students' skills, specific objective and the content areas must be determine in measurable terms. Buttressing the need for teacher's involvement in the selection of content area, Adamu (2019) suggested that teachers are conversant with the content areas of Minimum Standards for NCE Electrical/Electronic Technology, since they use it every day for teaching and learning and as such may provide the necessary guidance for the skills selection.

The findings related to research question two revealed that students' assessed using e-portfolio assessment package performed excellently with an excellent grade in Hong and Zing colleges of Education. This finding is supported by Barrett (2000) that e-portfolio provides the integration of a wide variety of new ICT means which expand the possibilities for increased participation, interaction, collaboration, and social networking. E-portfolio is a digital tool for reflection and assessment in teaching and learning. To further buttress the finding, Atkinson (2008) who conducted a study on perceptions of principals and teachers towards the implementation of Electronics portfolios as an assessment tool. Atkinson reported that student may pass a particular course or subject but due to the teacher mistake or oversight, the students result may be published wrongly and the student fail such a course which is one of the shortcomings of the traditional assessment method. Furthermore, Avraamidou and Zembal-Saul (2009) in making a case for web-based portfolios in support of e-learning and assessment of students asserted that work stress may affect teachers' efficiency and as such may not take note of certain requirement while assessing students' performance which will invariably affect the students' performance.

CONCLUSION

The major findings of this study serve as a basis for drawing conclusion that e-portfolio is a valid and reliable instrument for assessment that could be used in assessing NCE III students of Electrical/Electronic employability skills in Colleges of Education in North East Nigeria. E-portfolio will

also enhance the employability skills of students in Colleges of Education and effectively assess students' performance in NCE III Electrical/Electronic employability skills. In so doing, the developed e-portfolios will be able to show scores and grades that awarded. Furthermore, it is believed that students' employability skills performance in NCE III students of Electrical/Electronic will be improved if the e-portfolio is adopted for assessing employability skill in Colleges of Education.

RECOMMENDATIONS

Based on the findings from the study, the following recommendations are suggested:

1. The findings of this study should be made available to Management and Board of National Commission for Colleges of Education for inclusion of the contents of e-portfolio development toward enhancing employability skills of students in Electrical/Electronic Technology in Colleges of Education.
2. The teachers of Electrical/Electronic in Colleges of Education should be encouraged to use e-portfolio while assessing NCE students.

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