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Twenty-First Century Skills Retraining Needs of Mechanical Engineering Craft Practice Teachers in Technical Vocational Institutions in the North West Zone of Nigeria

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Abstract:
This study aims to determine the twenty-first-century skills retraining needs of mechanical engineering craft practice teachers in technical vocational institutions in the North West zone of Nigeria. The specific objectives were to determine the technical skills possessed and needed by MECP teachers in technical schools in the North West zone of Nigeria. A descriptive research design was adopted to reach out to a population of 78 MECP teachers in the technical colleges in the North West geo-political zone. The instrument for data collection used was a four-category response Mechanical Engineering Craft Practice Teachers Skill Possessed Instrument (MECPSPI), while the second is the Mechanical Engineering Craft Practice Skill Need Instrument (MECPSNI). The instrument was subjected to both validation and reliability with a reliability coefficient of 0.87. The data was analyzed using the mean statistic and the hypotheses using ANOVA at 95% confidence level. Results show that the technical skills possessed by MECP teachers in Technical Schools in North West zone of Nigeria were not digital skills in terms of drawing skills, machining skills, engineering material skills, hand tools skills and forming operation skills. The 21st century skills needed by MECP teachers were mostly digital skills. The results of the hypotheses show that MECP teachers in technical schools did not differ significantly based on their years of teaching experiences as it relates to the technical skills possessed and needed in North West zone of Nigeria. It was recommended, among others, that the Federal Government, in collaboration with relevant stakeholders, design a comprehensive road map for up-skilling of MECP teachers periodically. Standing orders for the supply of modern digital machines and equipment should be made every five years to ensure meeting the world's best practice of acquiring new technological skills.

Keywords: *Twenty-first-century skills, retraining needs, mechanical engineering craft practice*

1. Introduction

Technical skills continue to be a major challenge in Nigeria despite having one of the largest populations in the world. Skilled manpower is fundamental to economic development and growth, yet Nigeria lags behind in the training of its workforce (Okebukola, 2002). Technical skill, in particular, is needed for providing critical services in society. Investigations have shown that national investment in technical education has a great contribution to the overall economic development of a nation (Asadullah, 2018; Mourtzis, 2018). Many experts have warned about the risk of neglecting the training of technical personnel in Nigeria, particularly in mechanical engineering trades, and have highlighted the risk of the current level of low skills in a smooth school-to-work transition (Olaopa, 2019). The situation of skill gap is very evident in the low quality of technical teachers, especially in mechanical engineering trades (Rufai, 2014). This presents a serious impediment to achieving the national goal of an industrialized nation.

Mechanical engineering trades are used to define trades that are related to the cutting, forming or joining of metals (Sharma, 2014). Skills in metal manufacturing have broad applications in virtually every aspect of modern society. Hence, it is the backbone of many occupations. Some occupations that depend on mechanical trades include agriculture, transport, commerce, building, equipment and appliances in business communication, electrical/electronics. The training for occupations in mechanical engineering trades in the Nigerian TVET is called Mechanical Engineering Craft Practice

(MECP) (UNESCO/NBTE 2002). It aims to ensure that students gain the appropriate skills in shaping metals for use in appliances, tools and machinery. Virtually any functional industry depends on the quality of mechanical trade personnel. Hence, there is a need for experts such as machinists, die makers, fitters and other allied skills. Quality instruction in skill learning only happens with teachers who are very competent in practical skills.

The demand for quality in mechanical craft skills calls for the retraining of MECP teachers to meet international standards for the world of work. Teachers are the major factor in any educational endeavor, and are therefore very critical in achieving training standards in MECP. Teachers play a significant role in the teaching and learning process in technical colleges. The importance of teachers in technical colleges suggests that they should be in tune with developments in the work environment because of the dynamic nature of technology. With regard to this, some experts have called for improving the number and quality of technical teachers in Nigerian education. (Oni, 2000; Okebukola, 2002)

The poor quality of technical teachers has been a cause of concern for a long time (Uwaifo, 2010). Teacher quality can have an effect on the quality of trainees, and perhaps that could be a reason for the low level of trainees in Nigeria's technical schools. While hitherto, technical teachers in Nigeria were mostly drawn from industry, with rich experience, the current crop of technical teachers are mostly coming from polytechnics and universities where exposure to such skills is limited. Therefore, given the poor or lack of practical exposure of graduate teachers from the universities and polytechnics to new skills, there is a strong need for retraining these teachers to meet modern standards of mechanical craft practice towards solving the problem of technical teacher quality in Nigeria, The Master Plan for Technical Vocational Education and Training (NMPTVET, 2002), and the National Policy on Education (NPE, 2014), recommend for a mandatory professional development of technical teachers. Indeed, the professional development of technical teachers is noted to have a positive effect on trainees Feng, (2012). Therefore, a skill retraining program for MECP teachers becomes imperative.

The need for the retraining of MECP teachers is premised on the increasingly competitive world of manufacturing. Emerging technologies are being deployed for increased productivity and efficiency. New skills in the methods of making metal parts are therefore in great demand. Machine tools skills are needed to bridge the gap between current practice in the world of the manufacturing industry and what students learn in school. There is little doubt that Nigeria needs a large number of competent mechanical trade practitioners who possess the right skills to meet the demands of an economically vibrant economy. Besides this, the demand for higher-quality engineering products calls for high-quality experts to train machinists, die makers and fitters. As noted by Olurenfewa & Ashaolu, (2008), the problem of poor technical teachers is driven by the poor practical skill of teachers, many of whom have very little practical experience; hence training in MECP could be out of tune with what obtains in the industry.

Therefore, Technical Vocational Education and Training (TVET) will become a powerful tool for national development only when TVET teachers are equipped with not just skills in manipulating tools and machines, demonstrating concepts, and directing students learning but also 21st-century digital skills to meet the fast-changing technological world of work. Digital skill is the basic understanding of how to interact with a computer, how to interact with applications on that computer, and how to make it do what you want in real-time. Digital skill can be defined as the ability to locate, organize, understand, evaluate, and create information using digital technology (www.e-safetysupport.com). According to Usoro and Calab (2014), digital learning encompasses many different facets, tools and applications to support and empower teachers and students, including online courses, blended or hybrid learning, or digital content and resources. Digital literacy is the ability to understand and use digital technologies effectively for everyday tasks. In education, TVET, in particular, extends to all aspects of teaching and learning, and the usage extends into citizenship, industrial and e-safety. Currently, it seems inevitable that the usage and reliance on digital technologies will continue to grow unprecedentedly. While reading books and paper resources and manual writing remain fundamentally important, this current period in time may well represent a pivotal point in the march towards digital domination (www.e-safetysupport.com). Therefore, it is expedient to provide TVET students today with the necessary tools, understanding and practice in using digital technologies to ensure they are not disenfranchised from what is a probable, if not highly likely, shift towards technology-based literacy. TVET students need to be taught which tools are effective and how to use them responsibly. TVET teachers need to teach concepts and techniques to allow students to work with any digital device and adapt to new technology quickly using the skills and concepts they have been taught. Digital technology has changed the world for the better, but the innovation that helps some developed nations rise also threatens to leave developing nations behind. As technology transforms the economy at a blinding pace, more and more people are being locked out of a job market increasingly dominated by the demand for digital or computer skills (http://www.bizjournals.com/louisville/print-dedition/2011/04/29/study-shows-economicimpact-of.html). According to UNESCO (2011) a number of issues may hinder schools and teachers in their effort to fully benefit from these windows of opportunities such as not being able to afford the equipment, lack of access to internet, or suitable materials might not be available in simple language. However, a fundamental issue is whether teachers know how to use digital skills effectively in their teaching (UNESCO, 2011). This is because of the digital skill gaps existing between the teachers and the students, especially in instructional delivery and assessment in TVET in Nigeria. The digital skills gap is the divide between the technological skills a job requires and the skills a worker possesses. In other words, digital skills gaps, like educational gaps, impose on a nation the economic equivalent of a permanent national recession (Mckinsey and Company, 2011). According to the Guardian (2015), urgent action is required to support teachers who are currently not equipped to deliver the new computing curriculum, and insists that no child should leave school without basic digital skills. The teaching of digital skills in schools should be regarded as equally important as lessons in numeracy and literacy.

Improvement in technical teacher manpower is recognized by the International Development Research Council (IDRC). IDRC recommends a review of technical teacher training and for massive upgrading of technical training programs

to include in their training an integration of soft skills such as computing in TVET programs to meet the standard of modern-day manufacturing practices (IDRC, 2019). Retraining teachers in engineering craft skills is very important because, for a long time, metal shaping has been dominated by manipulative dexterity. However, new machines require, in addition to manual dexterity, more cognitive abilities such as computer programming and design skills. Today, there is virtually no modern machine tool that is not computerized and automated (Sharma, 2013). The introduction of computers in several machine tools and equipment means that students must adapt to these new methods of working on metals. Therefore, learning these skills is very necessary for MECP teachers.

1.1. Statement of the Problem/Justification

Poor technical teacher quality continues to be a serious cause for concern in Nigeria. Poor quality of teachers is always reflected in student's performances. This situation is a cause for concern, particularly the lack of relevant skills possessed by MECP teachers. The world of manufacturing has massively changed in methods of production in the 21st century. Machine tools and equipment are now digitalized. Different kinds of skills are therefore needed to function well in a computer-dominated world of mechanical production.

Literature shows that instruction in technical subjects in the Nigerian technical school system is dominated by theory, as most teachers lack practical skills (Odu, 2011). This situation is a serious impediment to developing effective technical manpower. The lack of skills by teachers in production technology equally limits trainee's employment opportunities. The challenge for MECP teachers, therefore, is for them to be properly equipped with skills that can assist them to function effectively in delivering instruction to the learners. The inability to train students in the appropriate skills in mechanical production is a major drawback for Nigeria's quest for economic advancement. For MECP teachers to be effective, there is the need to identify their current level of skill possessed and that which they need to enable remedial planning for retraining. Competent technical teachers are assets to the nation and mechanical production teachers must be properly trained where certain deficiencies are found. The problem of this study, therefore, is posed by the question: What are the 21st century skill retraining needs of MECP teachers in TVET in the North West zone of Nigeria?

1.2. Objective of the Study

The main purpose of this study is to find out the 21st century skill retraining needs of MECP teachers in TVET in the North West zone of Nigeria.

Specifically, the study sought to find out:

- The technical skills possessed by MECP teachers in technical schools in the North West zone of Nigeria
- The technical skills needed by MECP teachers in technical schools in the North West zone of Nigeria

1.3. Research Questions

The research questions that guided the study are:

- What are the technical skills possessed by MECP teachers in technical schools in the North West zone of Nigeria?
- What are the technical skills needed by MECP teachers in technical schools in the North West zone of Nigeria?

1.4. Hypotheses

- Ho1: There is no significant difference in the response of MECP teachers regarding technical skills possessed and technical skills needed.
- Ho2: There is no significant difference in the mean responses of the experience categories of MECP teachers regarding skills needs in technical schools in North West zone, Nigeria.

2. Review of Related Literature

Production technology is an aspect of mechanical engineering that deals with the conversion of raw materials, mostly metals, plastics, and ceramics, into finished products (Sharma, 2013). This conversion process can be carried out through cutting and forming processes like sawing, turning, drilling, milling, grinding, forging, casting and non-traditional machining like electric discharge machining (EDM), water jet cutting, laser cutting, etc. Lindbeck (1994) identified some manufacturing to include joining processes like welding, brazing or soldering and riveting. The guiding principle of this trade is to work to design specifications. Skills in production technology are key to promoting manufacturing activity, and it is expected that more skilled machinists, foundry workers, and die makers will be required in the sustainable development of the main sectors like construction, agriculture and energy (Afolayan, 2014). National economic development is an outcome that depends heavily on industrial production (Mouritzis, 2018). Therefore, for Nigeria to move into the world of industrialization, it must produce thousands of skilled machinists and other metalwork jobs. This is the only method of making machines, engines, technical equipment and even ICT devices.

The twenty-first-century skills, being referred to as Digital skill, is the basic understanding of how to interact with a computer, how to interact with applications on that computer, and how to make it do what you want in real-time. Digital skill can be defined as the ability to locate, organize, understand, evaluate, and create information using digital technology (www.e-safetysupport.com). According to Usoro and Calab (2014), digital learning encompasses many different facets, tools and applications to support and empower teachers and students, including online courses, blended or hybrid learning, or digital content and resources. Digital literacy is the ability to understand and use digital technologies effectively for everyday tasks. In education, the work of Atsumbe, Okoro & Ogwo (2012) shows that the practical content of engineering craft practice in technical colleges is inadequate. This ranges from the inability of students to read blueprints to the actual tasks in the trade, like machine tool process metal fabrication. The authors recommend that the

curriculum should be broadened to meet emerging innovations in production technology. Another factor that could strengthen teaching and learning in production technology is ensuring that teachers are equally equipped to provide the needed skills.

Technical education has traditionally been craft-oriented and the method of instruction depended on the discretion of the teacher. However, a lot of changes have been introduced in technology and the way technology is being taught (Feng, 2009). Students now require critical thinking and design skills, and teachers may need to take the lead in delivering instruction than previously required. In order to meet this standard, there is a suggestion for professional retraining of technical teachers and, specifically, the need to focus on newer technology to improve student's skills in these new technologies (Feng, 2012).

Other experts like Odu (2011) suggested the professional development of technology teachers to meet industry standards. Specifically, the author asserted that professional technical teacher development is vital for the successful implementation of teaching and learning in technical colleges. Ngijima (2014) also noted that retraining is associated with on-going activities after completion of initial training, hence the need for technical teachers to undergo retraining. Ngijima further explained retraining as a process of subjecting the teacher to further training towards improving the teaching-learning process. A prerequisite for retraining, according to the author, is to conduct a need assessment of the skills required for retraining, which is the gathering of data to determine what training needs exist.

3. Methodology

3.1. Research Design

This work adopted the descriptive survey research design. The survey was used to obtain data from teachers of mechanical engineering craft practice in technical colleges within the study area. The survey research design was used because the opinion of respondents was sought.

3.2. Study Area

The area of study is the North West geo-political zone of Nigeria comprising Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara states. The researchers have already familiarized themselves with the study area. However, a preliminary study was undertaken to ascertain the number of MECP teachers in Technical Colleges offering the course. The study revealed that there are 78 technical teachers.

3.3. Population of the Study

The total population of the study is 78 MECP teachers in the technical colleges in the North West geo-political zone.

3.4. Sample and Sampling Technique

The whole population was used since the size of the population is manageable. Therefore, there was no sampling.

3.5. Instrument for Data Collection

Two instruments were used for data collection. The first is a four-category response, Mechanical Engineering Craft Practice Teachers Skill Possessed Instrument (MECPSPI), while the second is the Mechanical Engineering Craft Practice Skill Need Instrument (MECPSNI).

3.6. Validation of the Instrument

The Instrument was subjected to face and content validation by three experts in TVET institutions and National Board for Technical Education, respectively.

3.7. Reliability of the Instrument

The pilot study was conducted in North Central zone, Nigeria. The test-retest method and Pearson Product Moment Correlation Coefficient formula were used to establish the reliability index of 0.87.

3.8. Method of Data Collection

The instruments for the study were administered with the help of trained six research assistants. Each of the states within the zone was covered by one research assistant.

3.9. Method of Data Analysis

The analysis of data involved the use of mean Statistics. The hypothesis 1 was tested using a t-test and hypothesis 2 was tested using a chi-square at 0.05 level of confidence.

4. Results

4.1. Research Questions Presentations

- Research Question One: What are the technical skills possessed by MECP teachers in Technical Schools in North West zone of Nigeria?

S/No	The Drawing Skills Possessed Items	M	SD	Remark
1	Ability to read blueprints	3.05	.534	Possessed
2	Ability to use drawing instruments	3.07	.482	Possessed
3	Ability to communicate graphically to students	3.12	.691	Possessed
4	Ability to design functional jobs	2.48	.833	Not Possessed
5	Ability to use Computer Aided Drawing (CAD)	2.40	.588	Not Possessed
6	Ability to draw engineering conventions	2.28	.761	Not Possessed
7	Ability to design jogs and fixtures	2.77	.927	Possessed
8	Ability to draw gears, shafts, keyways	2.82	.504	Possessed
	The Machining skills possessed			
9	Ability to prepare an operation sequence	3.02	.624	Possessed
10	Ability to secure work for machining	2.83	1.092	Possessed
11	Ability to observe safety rules on machine tools	3.07	.899	Possessed
12	Ability to select speeds and feeds on machine tools	3.27	.660	Possessed
13	Ability to apply measuring instruments in machining	3.22	.940	Possessed
14	Ability to work to a given tolerance	3.10	.858	Possessed
15	Ability to select the right cutting tools	3.03	.920	Possessed
16	Ability to program for CNC machining	2.70	1.225	Possessed
17	Ability to use CNC machine tools	2.48	.948	Not Possessed
18	Ability to use CAM machine tools	2.78	.739	Possessed
19	Ability to work to a good finish	3.05	.769	Possessed
20	Ability to use non-conventional machine tools	2.68	.833	Possessed
21	Ability to sharpen cutting tools	2.38	.783	Possessed
22	Ability to identify cutting chips	1.85	1.039	Not Possessed
23	Ability to identify different sounds in machining	2.48	1.157	Not Possessed
24	Ability to identify Industrial training skills	2.32	.833	Not Possessed
25	Ability to name parts of machine tools	2.33	1.130	Not Possessed
26	Ability to use Computer software to make products	2.10	.969	Not Possessed
	The Engineering Material skills possessed			
27	Ability to identify types of metals	2.22	.885	Not Possessed
28	Ability to select suitable metals for work	2.42	.889	Not Possessed
29	Ability to differentiate ferrous and non-ferrous metals	3.18	.930	Possessed
30	Ability to differentiate different types of steel	3.20	.755	Possessed
31	Ability to apply heat treatment to steel	2.82	1.049	Possessed
32	Ability to work on non-metallic materials	2.35	1.363	Possessed
	The Hands Tools skills possessed			
33	Ability to name types of hand tools	3.33	.986	Possessed
34	Ability to use hand tools appropriately	3.20	.819	Possessed
35	Ability to carry out workbench activities	2.73	1.118	Possessed
36	Ability to demonstrate proper care with hand tools	2.57	1.170	Possessed
37	Ability to observe safety rules in using hand tools	2.62	.958	Possessed
	The Forming Operations skills possessed			
38	Ability to prepare foundry pattern	2.53	.999	Possessed
39	Ability to cast simple components	2.55	.999	Possessed
40	Ability to cast complex components	2.32	.469	Not Possessed
41	Ability to prepare foundry sand	2.23	.533	Not Possessed
42	Ability to use foundry tools	2.13	.947	Not Possessed
43	Ability to conduct a forging operation	2.25	.508	Not Possessed
44	Ability to set up work for bending	2.53	.724	Possessed
45	Ability to carry out bending operations	2.77	1.047	Possessed
	The Measuring Instruments skills possessed			
46	Ability to name-measuring	2.80	1.022	Possessed
47	Ability to use drawing instruments appropriately	2.97	.901	Possessed
48	Ability to take care of drawing instruments	2.58	1.225	Possessed
49	Ability to use limits and fits	3.05	.891	Possessed
50	Ability to mark out jobs appropriately	3.08	.907	Possessed
51	Ability to use limit gauges	3.07	1.006	Possessed
	Grand Mean	2.709	0.393	Possessed

Table 1: Mean Responses on the Technical Skills Possessed by MECP Teachers in Technical Schools in North West Zone of Nigeria

The empirical data results presented in table 1 revealed that the grand mean of 2.709 (SD=0.393) is greater than the cut-off mean point of 2.50, revealing that the items have been accepted by the respondent as it relates to the technical skills possessed by MECP teachers in technical schools in North West zone of Nigeria. Item-by-item analysis reveals that all the items except 16 items, namely: Nos 4, 5, 6, 22, 23, 24, 25, 26, 27, 28, 29, 32, 40, 41, 42, and 43, each had a mean score higher than the accepted mean score of 2.50, indicating possession of technical skills by the teachers while 16 items analysis revealed non-possession of the technical skills out of the 51 items for this construct. In conclusion, this implies that the MECP teachers in technical schools in North West zone of Nigeria are in possession of technical skills.

- Research Question Two: What are the technical skills needed by MECP teachers in Technical Schools in North West zone of Nigeria.?

S/No	The Technical Skills Needed by MECP	M	SD	Remark
52	Drafting skills (manual)	3.07	.841	Needed
53	Drafting skills (CAD)	2.72	1.059	Needed
54	Ability to interpret drawings/blueprints	2.03	.956	Not Needed
55	Draw involute spur and bevel gears	2.30	.809	Not Needed
56	Ability to use measuring instruments	2.75	.628	Needed
57	Ability to appropriately use hand tools	2.83	1.011	Needed
58	Ability to set up work for machining	2.72	.804	Needed
59	Ability to work to specification	2.27	1.071	Not Needed
60	Ability to use gauging instruments	3.15	.971	Needed
61	Ability to use CNC machine tools	2.88	.865	Needed
62	Ability to work to good finishes	2.58	.926	Needed
63	Ability to cut involute spur and bevel gears and keyways	2.65	1.300	Needed
64	Skills in carrying out precision works	3.02	.504	Needed
65	Skills in designing jugs and fixtures	2.72	.885	Needed
66	Skills in operating non-traditional machining	2.38	.940	Not Needed
67	Ability to conduct tool and die operations	2.80	1.190	Needed
68	Ability to make simple casting works	2.60	1.123	Needed
69	Ability to handle basic forging operation	2.40	1.224	Not Needed
70	Skills in handling basic forging operations	2.15	1.071	Not Needed
71	Skills in selecting cutting tools for machining	2.90	1.115	Needed
72	Writing basic programming for CNC machines	2.52	1.097	Needed
73	Prepare patterns for foundry works	3.07	.972	Needed
74	Obeying safety rules in the machine shop	2.47	1.081	Not Needed
75	Ability to operate computer-aided machines	2.47	.947	Not Needed
76	Knowledge of related digital skills	2.45	1.156	Not Needed
77	Ability to select related software	2.20	.935	Not Needed
78	Knowledge of related digital teaching methods	2.57	1.240	Needed
	Grand Mean	2.617	0.556	Needed

Table 2: Mean Responses on the Technical Skills Needed by MECP Teachers in Technical Schools in North West Zone of Nigeria

The results of data analysis collated and presented in table 2 show that the grand mean of 2.617 with a standard deviation of 0.556 is greater than the cut-off mean point of 2.50, revealing that the items have been accepted by the respondent as it relates to the technical skills needed by MECP teachers in Technical Schools in North West zone of Nigeria. Item-by-item analysis reveals that all the items except items Nos 54, 55, 59, 66, 69, 70, 75, 76 and 77 each had a mean score higher than the accepted mean score of 2.50, indicating the technical skills are needed while revealing that 9 items out of 27 items of this construct are not needed. In conclusion, this implies that the respondents (MECP Teachers) in Technical Schools in North West zone of Nigeria are in need of those specified technical skills.

4.2. Statement of Null Hypothesis

- HO1: The MECP teacher's technical skills possessed would not be influenced significantly by their years of teaching experience.

Age Bracket	N	Mean	Standard Deviation			
0 – 5 years	14	141.286	16.513			
6 – 10 years	25	138.560	20.33			
11 and Above years	21	136.667	22.33			
TOTAL	60	138.18	20.046			
ANOVA						
Source of Variation	**Sum of Square**	**df**	**Mean Squares**	**F**	**P**	**Remark**
Between Groups	271.300	2	135.650	.330	.720	NS
Within Groups	23437.684	57	411.187			
TOTAL	23708.983	59				

Table 3: Response on ANOVA on Years of Teaching Experiences of MECP Teachers' Influence on Technical Skills Possessed

The One-way ANOVA was conducted to explore the years of teaching experiences of MECP teachers' influence on technical skills possessed in North West zone of Nigeria. Participants were divided into three groups according to their years of teaching experience, namely: Group 1: 0-5yrs, Group 2: 6-10 yrs, Group 3: 11 yrs and above. The results presented in table 3 indicate non-statistically significant differences among the years of teaching experiences of MECP teachers as it relates to their technical skills possessed, F (2, 57) = .330, P =.720. Despite not reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size calculated using eta squared was 0.01. The conclusion is that MECP teachers in technical schools did not differ significantly based on their years of teaching experiences as it relates to the technical skills possessed in North West zone of Nigeria.

- HO2: The MECP teacher's technical skills needed would not be influenced significantly by their years of teaching experiences

Age Bracket	N	Mean	Standard Deviation			
0 – 5 years	14	73.571	11.250			
6 – 10 years	25	71.800	14.898			
11 and Above years	21	67.333	17.269			
TOTAL	60	70.660	15.026			
ANOVA						
Source of Variation	**Sum of Square**	**Df**	**Mean squares**	**F**	**P**	**Remark**
Between Groups	383.555	2	191.777	.845	.435	NS
Within Groups	12938.095	57	226.964			
TOTAL	13321.650	59				

Table 4: Response on ANOVA on Years of Teaching Experiences of MECP Teachers' Influence on Technical Skills Needed

The One-way ANOVA was conducted to explore the years of teaching experiences of MECP teachers' influence on technical skills needed in North West zone of Nigeria. Participants were divided into three groups according to their years of teaching experience (Group 1: 0-5yrs, Group 2: 6-10 yrs, Group 3: 11 yrs and above). The results of the analysis presented in table 4 indicate non-statistically significant differences among the years of teaching experiences of MECP teachers as it relates to their technical skills needed, F (2, 57) = .845, P =.435. Despite not reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size calculated using eta squared was 0.02. The conclusion is that MECP teachers in technical schools did not differ significantly based on their years of teaching experiences as it relates to their skills needed in North West zone of Nigeria.

5. Discussion of Findings

The technical skills possessed by MECP teachers in Technical Schools in North West zone of Nigeria show that most of the digital skills were not possessed by MECP teachers in terms of drawing skills, machining skills, engineering material skills, hand tools skills and forming operation skills. The 21st-century skills are needed by MECP teachers to be relevant to the present-day industries where most skills needed are digital. This is in line with Feng (2012), who asserted that to meet this standard, there is a suggestion for professional retraining of technical teachers and, specifically, the need to focus on newer technology to improve students' skills in these new technologies. Digital skill is the basic understanding of how to interact with a computer, how to interact with applications on that computer, and how to make it do what you want in real-time. Digital skill can be defined as the ability to locate, organize, understand, evaluate, and create information using digital technology (www.e-safetysupport.com). According to Usoro and Calab (2014), digital learning encompasses many different facets, tools and applications to support and empower teachers and students, including online courses, blended or hybrid learning, or digital content and resources. Digital literacy is the ability to understand and use digital technologies effectively for everyday tasks. That is why, from the data analysis, it is obvious that what the MECP teachers need are Digital skills. The results of the hypotheses show that the years of experience do not differ significantly in the possession of skills and also the skills needed. Therefore, there is a need for retraining MECP teachers, especially with digital and foundry skills.

6. Conclusion

The skills possessed by the MECP teachers in all six components of the instrument show that what most of the teachers lacked were the digital aspects of the components and the foundry operation skills. It is confirmed in the teacher's response to the skills needed that, indeed, the digital skills were needed to update them with the twenty-first-century skills for more efficient delivery of instruction to students.

7. Recommendations

Based on the findings and the discussion, it is recommended that:

- Federal Government, in collaboration with relevant stakeholders, designs a comprehensive road map for Up-skilling of MECP teachers periodically.
- Standing orders for the supply of modern digital machines and equipment should be made every five years to ensure meeting the world's best practice of acquiring new technological skills.
- Supply of modern foundry and specialized equipment should be given priority.
- Federal and state Governments and relevant agencies should invest heavily in regular training and retraining of MECP teachers to ensure the provision of 21st century skills among teachers.

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