

Strategies for Bridging the Gap Between Theory and Practical Skill Acquisition by Metalwork Students in Technical Colleges in Rivers State

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Abstract

The study sought to determine the appropriate strategies for bridging the gap between theory and practical skill acquisition by metalwork students in technical colleges in Rivers State. Two research questions were posed to guide the study and one hypothesis. The study adopted descriptive survey research design and was carried out in Rivers State. The population of the study consists of 23 respondents which comprises of 12 metalwork teachers and 10 metalwork instructors in four government technical colleges in Rivers State. The instrument for data collection was a 21 structured item questionnaire developed by the researcher on five point Likert rating scale. The instrument was validated by three experts and the internal consistency of the instrument was established using Cronbach alpha reliability method which gave a reliability index of 0.82. The research questions were analyzed using mean and standard deviation and t-test statistic was used to test the hypothesis of no significant difference at 0.05 level of significance. Following the analysis, it was revealed that all the ten (10) items on instructional strategies and eleven (11) items on tools/equipment and facilities are all required in order to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State. Based on the result of the study, the following recommendations were made; that government should provide state of the art tools/equipment and facilities to technical colleges (metalwork production unit) in Nigeria as this will help in bridging the gap between theory and practice in skill acquisition and the technical teachers should be constantly retained and motivated with various incentives to encourage them to be the best in discharging their duties.

Paper Identification



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The development of adequate skill is an important characteristic of Technical Vocational Education and Training (TVET) programmes at any levels of Nigerian educational system. In support to the above assertion, the Federal Republic of Nigeria (2013) outlined that the goals of TVET as to provide trained manpower in the applied science, technology and business particularly at craft, advance craft and technical level,, provide technical knowledge and vocational skills necessary for agricultural, commercial and economic development; and give training and impart the necessary skill acquisition to individual for self-reliance economically (p.16). To achieve these goals; it was further stated that TVET shall cover the following areas; Vocational Enterprise Institutions (VEIs), National Vocational Qualifications Framework (NVQF) and Technical Colleges.

Technical Colleges are the principal technical institutions established to equip students with relevant practical skills as craftsmen in variety of occupation (Ayodele & Stephen, 2015). The curriculum of National Technical Certificate (NTC) in technical colleges is designed to include a multi-dimensional and multi-disciplinary curriculum, which contains various units in which students acquire various practical skills (Amadi, Orlu & Obed, 2015). One of such units is metalwork.

Metalwork is one of the various units offered in Technical Colleges in Nigeria and Rivers State inclusive. Metalwork is designed to produce metalwork craftsmen who will be enterprising and have an intelligent understanding of physical properties of metals, applications of ferrous and non-ferrous metals and manufacturing processes. Metalwork encompasses practical activities that leads to the production of goods and services by the use of tools, equipment and metalwork materials (NBTE, 2001). The teaching of Metalwork in Technical College should therefore focus mostly on practical skills rather than theories in order to appropriately prepare students to meet the demands in the labour market.

Skill can be described as competency and capacity acquired through deliberate, systematic and sustained effort to smoothly and adaptively carryout complex activities or job functions involving ideas [cognitive skills], things [technical skills], and people [interpersonal skills] (Anaele & Njoku, 2016). Skill from the above can be deduced as therefore, a specific competency acquired as a result of long-term training. While skill acquisition in the context of this research work is referred to as a process of learning skill in which individuals are gradually introduced to the use of tools, equipment and the materials of the occupation, using them safely under a more experienced individual.

Hence, skill acquisition in metalwork is aimed at producing competent and skilful metalwork craftsmen and technicians who are able to produce all types of machine components and modern equipment for transportation, communication, power, agriculture, construction and other industries (Okwelle & Orlu, 2020). Ehimen, (2018) opined that, skill acquisition in other word is one of the surest ways through which individuals are exposed to occupational rudiments thereby increasing their expertise in specific career.

The curriculum and syllabus of metalwork at Technical Colleges is usually framed on the basis of 60% practical skills and 40% theoretical knowledge (UNESCO-UNEVOC [2012](#)). It is education for doing rather than for knowing things. By so doing avoid gap development between theory and practice in the teaching and learning of metalwork while in school. This is aimed at producing adequate graduates that are competent in both theory and practice to meet the demands in the 21st century world of work.

Theory is a set of principles or a system of ideas intending to explain something on which the practice of an activity is based. It involves the use of hands, the head and the heart to produce concrete products. Theory help's one's understanding of practice in any field (Evetts, [2003](#)). Meanwhile, Cardin & Mcneese-Smith ([2005](#)) stated that theory is the foundation for practical implementation that will be translated into real situations. However, Oviawe, Uwameiye & Uddin, ([2017](#)) have argued that there is gap that exist between theory and practice in almost all the technological courses in the technical Colleges in Nigeria. According to Scully ([2011](#)) the gap between theory and practice in skill acquisition is the difference between the theoretical knowledge learned in the classroom with practical implementation in real situations. These gaps occur when there is no proper integration in the implementation of the curriculum in training institutions. Most importantly, Hatlevik ([2012](#)) stated that there is a relationship between theory and practice which is key in reducing the gap between the two and further enhance the effectiveness of the curriculum implementation. That means; neither of the two should overshadow the other. Theory in the classroom and practice in the workshop using the appropriate tools/equipment.

Workshop tools and equipment are very useful for bridging the gap between theory and practice in skill acquisition in technical colleges in Nigeria. Akpan & Udoh, ([2014](#)) affirmed that the poor performance of technical college graduates are as a result of inadequate and non-functional training facilities. Barky ([2005](#)) reiterated that the availability of instructional resources has a major influence on the selection of teaching methods and materials. Without functional workshop tools and equipment, the technical teacher is handicapped and cannot go far in the use of demonstration method, project-based learning approach in his teaching. TVET has theory limit, if the teaching and learning exceed that limit, skill acquisition is hampered and TVET will become “theoretical education” (Audu, Aede, Yusri & Muhammad, ([2013](#))). They further argued that skills cannot be acquired in a vacuum but rather in a well-established and functional workshop with the right tools, equipment and machines for effective implementation of TVET program. Therefore, high and quality skill acquisition requires qualified instructors, appropriate tools/equipment and proper instructional strategies.

Instructional strategies are the relevant procedures and actions applied in the classroom by a teacher for guiding students to realize a set objective. In the view of Adediran, Orukotan & Adeyanju, ([2015](#)) instructional strategies are all the things the teacher uses to aid the learners in acquiring skills in learning process and they are the means used to bring about effective teaching and learning. Scholars such as Okwelle & Allagoa ([2014](#)) have argued that in order to carry out an effective instructional strategies, attention must be paid to a few tactics to improve proficiency in choosing, creating, and utilizing tools/equipment for effective delivery, as well as focusing on positivity, reflection of learner's individual differences, learning objectives, and content. Putting all of these in the right perspectives are part of the strategies that enable the teacher to prepare and deliver an inclusive lesson where

no learner is deprived. The usefulness of instructional strategies varied as course contents varied. The strategies used to achieve a particular task may not necessarily be used to accomplish another. Some objectives require high skill and knowledge by the teacher to deliver, while some require less skill. Therefore, choice of strategy determines the level at which skill acquisition is acquired. This suggests that the instructional strategies for teaching skill acquisition should be user friendly and suitable to attain the target task. It is against this background that the present study sought to determine the appropriate strategies for bridging the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State.

Statement of Problem

The FRN, (2013) outlined the goals of TVET as to provide trained manpower in the applied science, technology and business particularly at craft, advance craft and technical levels, provide technical knowledge and vocational skills necessary for agricultural, commercial and economic development and give training and impart the necessary skill acquisition to individual for self-reliance economically (p.16). In order to fully realize the above goals; it was further stated that teaching shall be practical, activity-based, experiential for maximum skill acquisition, self-development and fulfilment in the labour market.

Regrettably, due to some challenges as outline by some scholars such as Okoye & Maxwell, (2016); Muoghalu, (2018) & Ayonmike, (2014). it has been observed that metalwork technical college graduates are not very competent in practical skills compared with the demands of the labour market and technological advancement (Ede & Ariyo, 2014; Akpan & Udoh, 2014). This explains why most employers of labour in this nation and abroad believe that the products of technical colleges are half-baked and unusable without further training, some even prefer to use technicians and craftsmen from neighbouring West African (Udo, 2015). The worst is that these graduates are unable to establish their entrepreneurial skills ventures because they would not be able to put into practice what they studied in Technical College since such skills were poorly acquired. It is against this background that the present study is sought to determine the appropriate strategies for bridging the gap between theory and practice if the problem of lack of practical skill acquisition among metalwork students in technical colleges in Rivers State should be solved.

Purpose of the Study

The purpose of the study is to determine the strategies for bridging the gap between theory and practical skill acquisition by metalwork students in technical colleges in Rivers State. Specifically, the study sought to determine:

1. The instructional strategies that can be used to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State.
2. The tools/equipment and facilities required in order to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State.

Research questions

1. What are instructional strategies that can be used to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State?
2. What tool/equipment and facilities that are required in order to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State?

Hypothesis

one null hypothesis (Ho) was formulated and tested at 0.05 level of significance.

1. There is no significant difference in the mean responses of metalwork teachers and metalwork instructors on the strategies for bridging the gap between theory and practical skill acquisition by metalwork students in technical colleges in Rivers State.

Methodology

Descriptive survey research design was adopted for this study. Nworgu (2015) described the descriptive survey research design as one aimed at collecting data through questionnaire or interview and describing the data in a systematic manner that interpret the characteristics, features, and facts about a given population. The descriptive survey research design was therefore considered suitable for this study since it tends to elicit data/information from metalwork teachers and metalwork instructors on strategies for bridging the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State.

The study was carried out in Rivers State Nigeria. The population of the study consist of 23 respondents which comprises of 12 metalwork teachers and 10 metalwork instructors in four government technical colleges in Rivers State. There was no sampling as the entire population was studied. This is in consonance with Nwosu & Mbaezue, (2016) who stated that the entire population could be studied when the size is considered small and manageable. The instrument for data collection was a structure questionnaire made up of 21 items developed by the researcher on five point Likert type rating scale of Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D) and Strongly Disagree (SD) with corresponding numerical values of 5, 4,3,2 and 1 respectively. Three experts from Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, validated the instrument. The internal consistency of the instrument was established using Cronbach Alpha reliability method which gave a high coefficient of 0.82. Twenty-three (23) copies of the questionnaire were administered to the respondents by the researcher. Out of the Twenty-three (23) copies of the questionnaire administered, Twenty-two (22) copies were retrieved by the researcher and used for analysis representing 99% retrieval rate. Data collected from the respondents were analysed using statistical Mean and Standard Deviation to answer the research questions while t-test statistics was used to test the null hypothesis at 0.05 level of significance. For the research questions, it was decided that any item with mean real limit equal and above 3.50 was regarded as 'Agreed' while on the other hand, any item with mean real limit less than 3.50 was regarded as 'disagreed'. Standard deviation values close or wide apart were used to determine the

homogeneity in opinion among the respondents. The decision for hypothesis was that if the calculated value of t (t -cal) is less than the critical value of t (t -crit), the hypothesis is not rejected but if (t -cal) is greater than (t -crit), the hypothesis is rejected.

Results

Research Question 1: What are instructional strategies that can be used to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State?

Table 1: Respondents' mean ratings of instructional strategies that can be used to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State.

S/N	INSTRUCTIONAL STRATEGIES	Mean	SD	Remarks
1.	Frequently taking students to field trips (welding/metalwork workshop not far from the school)	3.59	<u>0.93</u>	Agreed
2.	The use of demonstration method for teaching both practical and theory	3.85	<u>1.01</u>	Agreed
3.	Add apprenticeship training in the school time-table at least twice a week	4.76	0.97	Agreed
4.	Assign more time for practical demonstrations than theory.	4.06	0.89	Agreed
5.	Use questioning method as a techniques in teaching to create critical thinking in students.	3.51	2.03	Agreed
6.	Give individualise and group projects to monitor students' performance.	4.59	1.81	Agreed
7.	Use experts from craft workshop or industries occasionally to teach practical's.	3.52	0.99	Agreed
8.	Allow students to use school workshop during their free-time.	3.55	1.03	Agreed
9.	Use discussion method to teach both practical and theory to check students understanding.	3.74	1.72	Agreed
10.	Reward best performance in both practical and theory.	4.33	0.92	Agreed

	Mean of means	3.95		
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The data in Table 1 revealed that all the ten (10) items had their mean values ranged from 3.51 to 4.76 which were above the cut-off point of 3.50. This indicated that the respondents agreed that all the ten (10) items are instructional strategies that can be used to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State. Further-more, Table 1 revealed that the standard deviation (SD) of all the ten (10) items ranged from 0.89 to 2.03 which showed that the respondents were homogeneous or close in their opinion.

Research Question 2: What tools/equipment and facilities that are required in order to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State?

Table 2: Respondents' mean ratings of tool/equipment and facilities that are required in order to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State.

S/N	TOOLS/EQUIPMENT AND FACILITIES	Mean	SD	Remarks
1.	Portable power tools	4.43	<u>1.03</u>	Agreed
2.	Vice	4.77	<u>1.01</u>	Agreed
3.	Lathe machines	3.82	0.83	Agreed
4.	Drilling machines (hand and electric drilling machines)	3.73	0.83	Agreed
5.	Cutting tools	3.69	1.05	Agreed
6.	Boring tools	4.56	1.01	Agreed
	Facilities			
7.	Space and well ventilated workshop	3.78	0.96	Agreed
8.	Well prepared classrooms (with projectors and instructional materials)	4.43	0.97	Agreed
9.	Drawing studio and drawing sets	3.87	0.95	Agreed
10.	Comfortable writing chairs	3.71	0.89	Agreed
11	Electricity supply/standby generator	3.99	1.04	Agreed
	Mean of means	4.07		

The data in Table 2 revealed that all the eleven (11) items had their mean values ranged from 3.69 to 4.77 which were above the cut-off point of 3.50. This indicated that the respondents agreed that all the eleven (11) items are tool/equipment and facilities that are required in order to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State. Further-more, Table 2 revealed that the standard deviation (SD) of all the eleven (11) items ranged from 0.89 to 1.05 which showed that the respondents were homogeneous or close in their opinion.

Table 3: T-test responses of metalwork teachers and metalwork instructors on the strategies for bridging the gap between theory and practical in skill acquisition by metalwork students in technical colleges in Rivers State.

Respondents	X	SD	N	Df	t-cal	t-cri	Decision
Metalwork Teachers	3.01	1.17	12	20	0.03	1.96	Accepted
Metalwork Instructors	1.93	1.11	10				

Table 3 revealed that t-cal (0.03) is less than t-crit (1.96). This indicates that the null hypothesis is accepted. Therefore, there is no significant difference between the mean responses of metalwork teachers and metalwork instructors on the strategies for bridging the gap between theory and practical in skill acquisition by metalwork students in technical colleges in Rivers State.

Discussion

Research question one sought to determine the instructional strategies that can be used to bridge the gap between theory and practice in skill acquisition. The result of this study revealed that all the ten (10) items are the instructional strategies that can be used to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State. This is in agreement with the view of Adediran, Orukotan & Adeyanju, (2015) who stated that instructional strategies are all the things the teacher uses to aid the learners in acquiring skills in learning process and they are the means used to bring about effective teaching and learning. The result is also in consonant with the Okwelle & Allagoa (2014) who argued that in order to carry out an effective instructional strategies, attention must be paid to a few tactics to improve proficiency in choosing, creating, and utilizing tools/equipment for effective delivery, as well as focusing on positivity, reflection on the learner's individual differences, learning objectives and content inclusiveness where no learner is deprived.

Research question two sought to determine tools/equipment and facilities required in order to bridge the gap between theory and practice in skill acquisition. The result of this study revealed that all the eleven (11) items are tools/equipment and facilities required in order to bridge the gap between theory and practice in skill acquisition by metalwork students in technical colleges in Rivers State. This result is in agreement with Audu, Aede, Yusri & Muhammad (2013) who argued that skills cannot be acquired in a vacuum but rather in a well-established and

functional workshop with the right tools, equipment and machines for effective implementation of TVET program. They further stated that the provision of workshop tools and equipment are necessity for TVET graduates skills acquisition that will enable them to be gainfully employed. The result is also in consonant with the words of Barky (2005) who reiterated that the availability of tools/equipment has a major influence on the selection of teaching methods.

Conclusion

Based on findings of the study, it was concluded that instructional strategies, tools/equipment and facilities are required in order to bridge the gap between theory and practice in skill acquisition in Rivers State. The technical teacher must also be vast in using various instructional strategies, tools/equipment and facilities as this will helping students acquire relevant skills.

Recommendations

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

1. Government should provide the state of the art tools/equipment and facilities to technical colleges (metalwork production unit) in Nigeria as this will help in bridging the gap between theory and practice in skill acquisition.
2. The technical teachers should be constantly retained and motivated with various incentives to encourage them to be the best in discharging their duties.

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