

## STRATEGIES FOR EFFECTIVE TEACHING AND LEARNING OF FOUNDRY CRAFT IN TECHNICAL COLLEGES

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### Abstract

*The study was a survey research conducted to investigate the strategies for Effective Teaching and Learning of foundry craft in technical Colleges in Enugu State. Two research questions and two null hypotheses tested at .05 significant levels guided the study. A 45 items questionnaire was constructed and validated and its reliability of 0.78 was used to generate data for 25 respondents made up of 21 students and 4 teachers of foundry craft. The findings of the study showed that the 45 items identified are needed for effective teaching and learning of foundry craft in technical colleges. The study concluded among other things that the provision of good classroom, laboratory and workshop should be encouraged for effective teaching and learning of foundry craft in technical colleges.*

**Keywords:** *Strategies, effective, teaching, learning, foundry*

### Introduction

Foundry is a factory that produces metal castings. It is a commercial establishment for producing cast metals by pouring molten metal into a mold and allowing it to solidify. Metals are cast into shapes by melting them into a liquid, pouring the metal into a mold and removing the mold material after the metal has solidified as it cools (Campbell, 2013). Foundry craft works involves many processes especially in the making of patterns, cores and moulds for producing intricate shapes (Jain, 2012). Foundry craft technology is the most efficient and effective means of producing parts of machines and other parts that are difficult to produce on the lathe machine with respect to grinding, milling and shaping. According to Clegg (2014) foundry is an aspect of metal work technology that deals with casting of metals.

Nigeria is a country that is rich in iron ore which are not being utilized due to lack of competent foundry craft men and technologists. Highly skilled craft men and technologists are needed to conserve and develop the nation's resources for the benefit of man (Loffler, 2010). Foundry craft and technology has promoted technological and national greatness in some countries across the globe through innovation. Germany and Japan became super powers because of their focus in foundry craft. The image of the country in the comity of nations can be enhanced by foundry skills if effective teaching and learning of foundry craft in our technical colleges are encouraged.

Campbell (2013) stated that some developing nations including Nigeria have not developed appreciable skills in foundry. This is as a result of lack of the strategies for effective teaching and learning of foundry craft in our technical colleges. Effective teaching and learning

of foundry craft in our technical colleges comprises both the teaching of theory and practice of foundry craft.

The transformation power of an effective teacher can do wonders in foundry craft lessons. It can inspired students to play with ideas, think deeply about a subject matter, take on more challenging work and even pursue a higher career in foundry. Effective teaching and learning is more than just the successful transference of knowledge and skills about a particular topic. It ensure that the surface approach to learning is replaced by deeper students driven approaches to learning that analyze, develop, create and demonstrate understanding. Students need to initiate learning and maintain engagement during teaching and learning in their development as lifelong learners (Kim, 2017)

In the course of teaching, teachers too can learn from students just as students learn from their teachers. When teaching and learning becomes shared experience, it becomes evident that it is a two way process (Mendonca, 2017). Holistic education enables the teachers and students to find dedicated time to grow in their relationship in the teaching-learning process and therefore make teaching and learning effective and enjoyable.

The concern of this study is that there seems to lack of strategies for effective teaching and learning of foundry craft in our technical colleges. The problem of this study, therefore is what the strategies for effective teaching and learning of foundry craft in technical colleges

The purpose of this study is to determine the strategies for effective teaching and learning of foundry craft in technical colleges. Specifically, the study seeks to determined:

1. the extent of strategies for effective teaching of foundry craft in technical colleges.
2. the extent of strategies for effective learning of foundry craft in technical colleges.

### **Research Questions**

The following research questions were posed to guide the study.

1. What are the strategies for effective teaching of foundry craft in technical colleges?
2. What are the strategies for effective learning of foundry craft in technical colleges?

### **Null Hypotheses**

The following null hypotheses were tested at 0.05 level of significance.

1. There is no significant difference between the mean responses of students of technical college and their teachers on the strategies for effective teaching of foundry craft in technical colleges.
2. A significant difference does not exist between the mean responses of students of technical college and their teachers on the strategies for effective learning of foundry craft in technical colleges.

### **Method**

The design adopted in this study was survey. The area of the study was technical colleges in Enugu State. Enugu State is made up of 17 local government areas and 26 technical colleges (STVSMB,2015).The population for the study was 25 respondents (comprised of four teachers and 21 students) of foundry craft at G.T.C, Enugu ( the only technical college that offer foundry

craft in Enugu State). The population for the study was manageable. There was no sampling. The instrument for data collection was a structured questionnaire developed by the researcher using a four point responses scale of strongly agree (4), agree (3), disagree (2) and strongly disagree (1). The instrument was validated by three experts and its reliability ( $r=78$ ) coefficient was established using Cronbach alpha measure of internal consistency.

The instrument was administered by hand with the aid of a research assistant. The return rate was 96%. Mean and standard deviation was used to answer the research questions while t-test statistic was used to test the null hypotheses at 0.05 level of significance.

## **Result**

Data for the study were presented and analyzed based on the research questions and hypotheses that guided the study. The details are contained in the tables 1-4.

### **Research question 1**

What are the strategies for effective teaching of foundry Craft in Technical Colleges in Enugu State?

#### **Tale 1**

#### **Mean and standard deviation of responses on the strategies for effective teaching of foundry craft in technical colleges in Enugu State**

S/N	Item statement	Teachers		Students		Overall		Decision
		X1	SD1	X2	SD2	X3	SD3	
1	Recruitment of : efficient teachers	3,50	1.00	3.38	0.84	3.44	0.92	Agree
2	highly resourceful teachers	3,50	0.57	3.60	0.49	3.55	0.53	Agree
3	creative teachers	3,50	0.57	3.38	0.76	3.44	0.67	Agree
4	only conscientious teachers	3,25	0.76	2.90	0.48	3,10	0.62	Agree
5	technically qualified teachers	3,50	0.57	2.80	0.49	3,15	0.53	Agree
6	Improve teachers classroom organization	3,50	0.57	2.90	0.97	3,20	0.77	Agree
7	Improve teachers classroom management	3,50	0.57	2.90	0.97	3,20	0.77	Agree
8	Ensure that teachers employ improved teaching method	3,25	0.50	3.20	0.75	3,22	0.63	Agree
9	Training and re-training of teachers(in service training)	3,50	0.57	3.70	0.75	3,60	0.66	Agree
10	Providing adequate instructional material	3,50	0.57	3.60	0.57	3,55	0.57	Agree
11	Providing adequate machinery and equipment	3,50	0.57	2.65	0.97	3,10	0.77	Agree
12	Motivating teachers through incentives	3,50	0.57	3.85	0.36	3.67	0.47	Agree
13	Providing adequate library service for teachers	3,50	0.57	3,80	0.73	3,65	0.65	Agree
14	Providing adequate consumable for effective teaching	3,25	1.60	3.60	0.73	3.43	1.16	Agree
15	Effective instructional supervision	3,75	0.50	3.57	0.36	3.66	0.43	Agree
16	Increment of teachers salary and wages	3,50	0.57	3.38	0.50	3.44	0.53	Agree
17	Provision of health care services for teachers	3,50	0.57	3.60	0.50	3.55	0.53	Agree
18	Provision of good staff office	3,50	0.50	3,70	0.56	3.60	0.53	Agree
19	Regular sponsoring of teachers to professional conference	3,50	0.57	3.00	0.97	3.25	0.77	Agree
20	Regular sponsoring of teachers to seminar	3,50	0.57	3.38	0.70	3.44	0.64	Agree
21	Regular sponsoring of teachers to workshop	3,50	0.50	3.60	0.70	3.55	0.60	Agree
22	Encouraging teachers through teachers welfare services	3,50	0.57	3.10	0.70	3.20	0.64	Agree
23	Regular payment of teachers salary	3,50	0.57	3.80	0.36	3.65	0.47	Agree
24	Regular promotion of teachers as and when due	3,50	0.50	3.80	0.36	3.65	0.43	Agree
25	Genuine care for students	3,75	0.50	2.71	0.97	3.23	0.74	Agree
<b>Grand Mean</b>		<b>3,49</b>	<b>0.62</b>	<b>3.06</b>	<b>0.78</b>	<b>3.42</b>	<b>0.70</b>	<b>Agree</b>

Data in table 1 showed that the respondents agreed that all the items indentified are the strategies for effective teaching of foundry Craft in Technical Colleges in Enugu State. The mean values were above the benchmark of 2.50 and the grand mean for the two groups of the respondents were also above 2.50.

### Research question 2

What are the strategies for effective learning of foundry Craft in Technical Colleges in Enugu State?

**Table 2**

**Mean and standard deviation of responses on the strategies for effective learning of foundry craft in technical Colleges in Enugu State**

S/N	Item statement	Teachers		Students		Overall		Decision
		X1	SD1	X2	SD1	X3	SD3	
	Provision of:							
26	Good and modern classrooms	3.50	0.57	3.14	0.83	3.32	0.70	Agree
27	good foundry laboratory	3.50	0.57	3.14	0.83	3.18	0.70	Agree
28	good foundry workshop	3.50	0.57	3.00	0.84	3.23	0.79	Agree
29	good student foundry library	3.50	0.57	3.60	0.54	3,56	0.56	Agree
30	good students hostel accommodation	3.75	0.50	3.33	0.48	3.54	0,49	Agree
31	modern foundry equipment	3.50	0.57	3.05	0.79	3.16	0.68	Agree
32	Free education services	3.50	0.57	3.05	0.79	3.16	0.68	Agree
33	Improving teacher and student relationship	3.75	0.50	3.10	0.77	3.42	0.64	Agree
34	Admitting only qualified students	3.25	0.50	3.10	0.77	3.10	0.64	Agree
35	Industrial visit	3.50	0.57	2.70	0.69	3.08	0.63	Agree
36	Boosting students interest through interactive lesson delivery	3.50	0.57	3.10	0.77	3.37	0.67	Agree
37	Provision of effective instructional materials	3.50	0.57	3.10	0.77	3.25	0.67	Agree
38	Proper utilization of instructional materials	3.50	0.57	3.20	0.81	3.30	0.69	Agree
39	Encouraging students' group foundry class discussion	3.50	0.57	3.14	0.83	3.32	0.70	Agree
40	Encouraging students to participate in classroom delivery	3.50	0.57	3.14	0.83	3.37	0.70	Agree
41	Encouraging students to develop good reading habits	3.50	0.57	3.24	0.70	3.37	0.64	Agree
42	Motivating students through learning materials incentives	3.50	0.57	3.24	0.70	3.37	0.64	Agree
43	Hand on practical foundry class lessons	3.50	0.57	3.24	0.70	3.32	0.64	Agree
44	Success driven	3.50	0.57	3.14	0.83	3.37	0.70	Agree
45	Being focus	3.50	0.57	3.24	0.70	3.29	0.64	Agree
<b>Grand Mean</b>		<b>3.51</b>	<b>0.56</b>	<b>3.12</b>	<b>0.75</b>	<b>3.32</b>	<b>0.55</b>	<b>Agree</b>

Data in table 2 showed that the respondents agreed that all the items indentified are the strategies for effective learning of foundry Craft in Technical Colleges in Enugu State. The mean values were above the benchmark of 2.50 and the grand mean for the two groups of the respondents were also above 2.50.

### Hypotheses 1

There is no significant difference between the mean responses of students of technical colleges and their teachers on the strategies for effective teaching of foundry Craft in Technical Colleges.

**Table 3**

**t-test analysis of the mean responses of students of technical colleges and their teachers on the strategies for effective teaching of foundry Craft in Technical Colleges**

Respondents	N	X	SD	Df	t-cal	t-crit	Decision
Teachers	4	3.49	0.62	23	±1.21	±1.96	Do not
Students	21	3.06	0.78				Reject Ho <sub>1</sub>

The data presented in Table 3 indicated that at 0.05 level of significant, t-calculated of 1.21 is less than t-critical which is 1.96. This implies that there is no significant difference in the mean ratings of students of technical colleges and their teachers on the strategies for effective teaching of foundry Craft in Technical Colleges.

### Hypotheses 2

A significant difference does not exist between the mean responses of students of technical colleges and their teachers on the strategies for effective teaching of foundry Craft in Technical Colleges.

**Table 4**

**t-test analysis of the mean responses of students of technical colleges and their teachers on the strategies for effective learning of foundry Craft in Technical Colleges**

Respondents	N	X	SD	Df	t-cal	t-crit	Decision
Teachers	4	3.51	0.56	23	±0.99	±1.96	Do not
Students	21	3.12	0.75				Reject Ho <sub>2</sub>

The data presented in Table 4 indicated that at 0.05 level of significant, t-calculated of 0.99 is less than t-critical which is 1.96. This implies that there is no significant difference in the mean ratings of students of technical colleges and their teachers on the strategies for effective learning of foundry Craft in Technical Colleges.

## **Discussion of Findings**

Analysis of respondents to research questions one and two revealed that all the 45 items listed had mean ratings that qualify them as the strategies for effective teaching and learning of foundry craft in technical colleges. This was observed from overall mean( $\bar{x}$ ) values which range between 3.10 and 3.67 for research question one and between 3.16 and 3.56 for research question two, indicating agreed because the mean values were above the benchmark of 2.50.

The grand mean ( $\bar{x}$ ) for the two groups of the respondents respectively in the two research questions were above 2.50, showing that they agreed to the items as the strategies for effective teaching and learning of foundry craft in technical colleges. The closeness of the responses as shown by the entire standard deviation (SD) indicates homogeneity in their responses. Testing of the two hypotheses as shown in table 3 and 4 revealed that there is no significance difference on the mean responses of students of technical colleges and their teachers on the strategies for effective teaching and learning of foundry Craft in Technical Colleges.

## **Conclusion**

For teachers and students of foundry craft to be effective, they should be dedicated. They should grow in their relationship in the teaching –learning process. When there is good relationship, both teachers and students can learn from each other. The teachers should develop in them transformation power which will inspire the students to play with ideas and thereby learn very effectively. Effective teaching and learning ensure that the surface approaches to learning is replaced by deeper student driven approach to learning.

## **Recommendations**

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

1. Only technically qualified teachers should teach foundry craft in our technical colleges.
2. The government and technical education managers should provide good foundry laboratory and workshop with modern foundry equipment.
3. Students of foundry craft should be motivated through the provision of foundry craft material incentives.

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