SKILLS NEEDED BY FOUNDRY CRAFT STUDENTS OF TECHNICAL COLLEGES FOR SELF-EMPLOYMENT IN ENUGU STATE

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Abstract
The study was a survey research conducted to determine the skills needed by foundry craft students of technical colleges for self-employment in Enugu State. Three research questions and two null hypotheses tested at .05 significance level guided the study. A 40 items questionnaire was constructed, validated and its reliability of 0.77 was determined using Crondach Alpha formula and was used to generate data from 25 respondents made up of 21 students and 4 teachers of foundry craft. Findings of the study showed that 20 items identified on theoretical and entrepreneurship skills are needed by foundry craft students for self-employment and 24 out of 30 items identified on practical skills are needed. Testing of the two hypotheses reveled that there was no significance difference between the foundry craft students and teachers on the skills they needed for self-employment. The study concluded that skill acquisition in foundry is the most effective skills that can help to accelerate economic growth and job creation among foundry craft students. It was recommended among others, that foundry craft teachers and students should be encouraged for job creation.

Key words: *skills, foundry, technical college, self-employment*

Introduction
The development of any nation is built on sound practical skill acquisition in technology. Skills in foundry are very important among other practical skills, for national development. Khan (2014) stated that foundry is an aspect of metal work technology that deals with casting of metals. Foundry 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 Jain (2012), a foundry is a commercial establishment for producing cast metals by pouring molten metal into a mould and allowing it to solidify. Jain (2012) stated that foundry works involves many processes especially in the making of patterns, cores and moulds for producing intricate shapes. The melting of metal depends on the capacity of the foundry workshop and its skilled personnel. It is important that metal is at highest temperature before pouring and this is checked in the crucible by means of a high temperature thermometer.

According to khan (2014) foundry has recorded interesting rapid and progressive development over the years. The foundry technology which started

with simple sand casting, configured casting, precision casting and sand mould casting has turned into sophisticated programmable control system. Computerized modern day equipment has change the operation of equipment in foundry technology which necessitates acquisition of needed skills to enable foundry craft students to meet up with the knowledge of operation of modern day equipment.

Skills are proficiency that are acquired or developed through training (Houghton, 2012). The ability to do something well arising from talent, training or practice. It is a special competence in performance (Collins, 2014). Osinem (2008) defined skill as an individual capacity and feeling within a specific context and task domain. It is expertise practical ability dexterity and tact. It is an organized sequence of action, proficiency executed and usually displaying flexile habit of acting, thinking and behaving in such a way that the process becomes natural to the individual through repetition and practice which leads to mastery. (Okorie, 2009)

According to Okorie (2009), skills are acquired when procedural instructions are matched with performance activities. For skills to be acquired and developed there must be opportunity for participation and practice of such skills under real life condition. For skills to be acquired and developed, three factors are involved namely: imitation, repetition and participation (Okorie & Ezeji, 1988).Khan (2014) stated that to cater for the challenges of national development, there is need to impart good foundry skills to our technical college students so as to support economic growth and job creation on their graduation.

Skills promote creativity, innovation and self-employment. New skills help students to think creatively and to be effective in problem solving. Necessary skills if acquired will equip the students' ideas, managerial abilities and capabilities and mind set for self-employment rather than being employed for pay (Osuala, 2009).

Foundry skills will enable the recipients to stand on their own and be able to be creative in order to be self-employed. When students of technical colleges are equipped with the current and relevant skills, they will be able to work for themselves and also employ others. Current skills contribute to national building through its ability to provide the needed training that will help to develop and prepare students for self-employment. Foundry skills development in technical colleges is an urgent mechanism to youth unemployment.

Theoretical knowledge in foundry craft helps the students to understand why one technique works where another fails. It teaches the students through the experience of others. Both practical and theoretical experiences go hand in hand. Theory is the foundation for the practical. Practical skills are vital for self-employment. Practice is the doing of something often as an application of knowledge [Collins,2014] Self-employment among technical college students on graduation can help to reduce societal problem such as burglaries, prostitutions, frustration, armed robbery, drug addiction and insecurity. The society needs competent foundry craftmen who can produce things like machine parts. Therefore there is need to identify skills needed by foundry craft students of technical colleges for self-employment in Enugu State.

Foundry technology is very important for sustainable human development. The application of science and technology in foundry has brought both good improvement in product quality, rate of

production, reduce in human labour and errors in delivery and rate of turnover (Linda, 2010). Today foundry work can be done using specially designed computerized pattern making machine.

The concern of this study is that foundry craft students of technical colleges might not have the skills to be self-employed. Many of them after graduation stayed unemployed for many years. It seems that they lack skills necessary for self-employment which are in terms of adequate theoretical knowledge, practical skills and entrepreneurship skills. The problem of this study, therefore is; what are the skills needed by foundry craft students of technical colleges for self-employment in Enugu State.

The purpose of the study is to determine the skills needed by foundry craft students of technical colleges for self-employment in Enugu state. Specifically, the study seeks to determine:

1. the extent of theoretical skills needed by foundry craft students of technical colleges for self-employment in Enugu State.
2. the extent of practical skills needed by foundry craft students of technical colleges for self-employment in Enugu State.
3. the entrepreneurship skills needed by foundry craft students of technical colleges for self-employment in Enugu State.

Research Questions

The following research questions where posed to guide the study.

1. What are the theoretical skills needed by foundry craft students of technical colleges for self-employment in Enugu State?
2. What are the practical skills needed by foundry craft students of technical colleges for self-employment in Enugu State?
3. What are the entrepreneurship skills needed by foundry craft students of technical colleges for self-employment in Enugu State?

Hypotheses

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

Ho_1: There is no significant difference between the mean responses of students of technical colleges and their teachers on the practical skill they needed for self-employment in Enugu State.

Ho_2: A significant difference does not exist between the mean responses of students of technical colleges and their teachers on the entrepreneurship skills they needed for self-employment in Enugu State.

Method

The design for the study is a survey research design. The study was carried out in Enugu state of Nigeria. Enugu state is made up of 17 Local Government Area 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 Government Technical College, Enugu (the only technical college that offers foundry craft in Enugu State). The population for the study was not too large, therefore there was no sampling.

The instrument for data collection was a structured questionnaire. The questionnaire has two sections. Section one deals with the information relating to the Bio-data of the respondents. Section two was divided into three: A, B and C. A deals with the theoretical skills, B deals with practical skills, while C deals with entrepreneurship skills. It is made up of 40 questionnaire items.

The respondents were asked to rate the items on four (4) point rating scale as shown below:

Very Great Extent	(VGE)	4 points
Great Extent	(VE)	3 points
Low Extent	(LE)	2 points
Very Low Extent	(VLE)	1 point

The instrument was validated by three experts. Two experts from the Department of Technology and Vocational Education, one from Department of Science and Computer Education, Enugu State University of Science and Technology .

The validated instrument was pilot tested. Cronbach Alpha method was used to test for reliability. The reliability coefficient of 0.77 was obtained for the instrument.

The questionnaire was administered on the respondents by the researcher and with the help of a research assistant. Twenty-five questionnaire items were distributed and collected after two days. The return rate was 96%.

Results

Data for the study were presented and analyzed based on the research questions and hypotheses that guided the study. The details are contained in tables 1 – 5.

Research Question 1

What are the theoretical skills needed by foundry craft students of technical colleges for self-employment in Enugu State?

Mean ratings of theoretical skills needed by foundry craft students of technical colleges for self-employment in Enugu State.

S/N	Item statements	VGE	GE	LE	VLE	X	SD	Decision
1.	Communicate effectively in written English	21	3	1	–	3.80	0.50	Agree
2.	Communicates very well in spoken English	14	10	1	–	3.52	0.58	Agree
3.	Understand foundry craft workshop Management	20	4	1	–	3.76	0.53	Agree
4.	Understanding the use of equipment	15	8	1	1	3.44	0.58	Agree
5.	Good knowledge of physical properties of metal	20	5	–	–	3.80	0.41	Agree
6.	Good knowledge of mechanical properties of metal	21	4	–	–	3.84	0.37	Agree
7.	Good knowledge of chemical properties of metal	4	10	2	2	2.80	0.77	Agree
8.	Safety awareness in foundry workshop	18	6	1	–	3.68	0.56	Agree
9.	Ability to read measuring instrument	19	6	–	–	3.76	0.43	Agree
10.	Good knowledge of maintenance practice in foundry workshop	15	5	3	1	3.28	0.87	Agree
	Grand mean					**3.57**	**0.56**	**Agree**

Data in Table 1 indicated that the respondents agreed on all the items as the skills needed by foundry craft students for self-employment in Enugu State. This means that foundry craft students of technical colleges in Enugu State needed all the theoretical skills indicated in table 1 for self-employment.

Research Question 2

What are the practical skills needed by foundry craft students of technical colleges for self-employment in Enugu State?

Table 2

Mean ratings of practical skills needed by foundry craft students of technical colleges for self-employment in Enugu State.

S/N	Item statements	VGE	GE	LE	VLE	X	SD	Decision
11.	Ability to:							
	Use hand tool	20	5	-	-	3.80	1.15	Agree
12.	Keep equipment clean after use	10	11	3	1	3.20	0.81	Agree
13.	Use safety wears	18	7	-	-	3.70	0.46	Agree
14.	Finish casting work according to standard	9	12	3	2	3.20	0.84	Agree
15.	Use measuring instrument	17	5	2	-	3.48	0.82	Agree
16.	Production pattern	4	5	12	4	2.36	0.45	Disagree
17.	Use power machine tools	5	10	1	3	2.68	0.89	Agree
18.	Use computer in foundry craft workshop	–	3	6	16	1.48	1.07	Disagree
19.	Detect faults in metal casting	17	7	1	-	3.64	0.59	Agree
20.	Programmed induction furnace for melting of metal	–	2	8	15	1.48	0.95	Disagree
21.	Identify various foundry components	18	6	1	-	3.68	0.56	Agree
22.	Use maintenance schedules of various foundry workshop machineries	10	15	-	-	3.40	0.50	Agree
23.	Use beefing machine to shine the surface of metal cast	10	10	4	1	3.16	0.55	Agree
24.	Control blowholes in metal casting	12	13	-	-	3.48	0.57	Agree
25.	Feed information into computer for machining operation	2	9	12	2	2.44	0.76	Disagree
26.	Use computer to keep the furnace in a good condition	–	10	10	5	2.20	1.01	Disagree
27.	Use computerized heart furnace	1	9	12	3	2.32	0.75	Disagree
28.	Remove cast from mould	15	9	1	-	3.56	0.58	Agree
29.	Use rammer	19	6	-	-	3.76	0.44	Agree
30.	Cast metal object by pouring molten metal into the mould	18	7	-	-	3.76	0.76	Agree
	Grand mean					**3.04**	**0.74**	**Agree**

Data in Table 2 indicate that the respondents agreed on all the items except items 16, 18, 20, 25, 26 and 27 as the practical skills needed by foundry craft student of Technical Colleges for self-employment. This means that foundry craft students of Technical Colleges in Enugu State needed all the agree skills as indicated in Table 2 for self-employment.

Research Question 3

What are the entrepreneurship skills needed by foundry craft student of Technical College for self-employment in Enugu State?

Table 3

Mean ratings of entrepreneurship skills needed by foundry craft students of technical colleges for self-employment in Enugu State.

S/N	Item statements	VGE	GE	LE	VLE	X	SD	Decision
31.	Good display of innovation	17	8	–	–	3.68	0.48	Agree
32.	Drive for hard work	15	10	–	–	3.60	0.49	Agree
33.	Desire for to achieve set goals	12	10	2	–	3.32	0.91	Agree
34.	Effective record keeping	14	9	1	1	3.44	0.77	Agree
35.	Able to work with a team	16	7	2	–	3.56	0.65	Agree
36.	Accountability	17	6	2	–	3.60	0.65	Agree
37.	Effective human relation qualities	18	6	1	–	3.68	0.56	Agree
38.	Ability to be focus	15	9	1	–	3.56	0.58	Agree
39.	Drive for independence	18	6	–	–	3.60	0.46	Agree
40.	Ability to be initiative	10	14	1	–	3.36	0.6	Agree
	Grand mean					3.54	0.62	Agree

Data in table 3 indicate that the respondents agreed in all the items as the skills needed by foundry craft student of Technical Colleges for self-employment. This means that foundry craft student of technical colleges needed all the entrepreneurship skills indicated in table 3 for self-employment in Enugu State?

Hypotheses

H_{O1}: There is no significant difference between the mean responses of students of technical colleges and their teachers in the theoretical skills they needed for self-employment in Enugu State

Table 4

T-test of significant difference between the mean rating of students of technical college and their teachers on the practical skills they needed for self-employment in Enugu State.

Respondents	N	X	SD	Df	t-cal	t-crit	Decision
Teachers	4	3.50	0.51	23	1.93	±1.96	Do not
Students	21	2.92	0.68				Reject H_{O1}

The data presented in Table 4 indicated that at 0.05 level of significant, t-calculate of 1.93 is less that t-critical which is 1.96. This implies that there is no significant difference in the mean ratings of foundry craft students of technical colleges and their teacher in the practical skills they needed for self-employment in Enugu State.

Ho_2: There is no significant difference between the mean responses of foundry craft students of technical colleges and their teachers in the entrepreneurship skills they needed for self-employment in Enugu State.

Table 5
T-test of difference between the mean rating of foundry craft students of technical colleges and their teachers in the entrepreneurship skills they needed for self-employment in Enugu State.

Respondents	N	X	SD	Df	t-cal	t-crit	Decision
Teachers	4	3.75	0.50	23	1.66	±1.96	Do not
Students	21	3.51	0.61				Reject H_{O2}

The data presented in Table 5 indicated that at 0.05 level of significance, t-calculated of 1.66 is less than t –critical which is 1.96. This implies that there is no significant difference in the mean ratings of foundry craft students of technical colleges and their teachers on the entrepreneurship skills they needed for self-employment in Enugu State.

Discussion of Findings

The findings of this study were discussed according to the three research questions and two null hypotheses that guided the study. The result of the data analyzed with reference to research question one indicated that foundry craft student of technical colleges needed all the identified skills for self-employment. This could be seen from the ratings in Table 1.

Data pertaining to research question two as analyzed in Table 2 showed that out of the 20 skills identified, ability to produce patter, use computer in the workshop, programming furnace, feeding information on computer, use computer to keep the furnace in good condition and to use computerized heart furnace are not skills needed by foundry craft student to be self-employed. This implies that out of the 20 skills in Table 2, 14 of them are needed by foundry craft students for self-employment and 6 of them are not skills needed. This could be seen from the ratings in Table 2. The result of the data in Table 3 indicated that foundry craft students needed all the skills for self-employment.

The test of hypotheses shown in Tables 4 and 5 indicated the mean responses of foundry craft students and their teacher in their practical and entrepreneurship skills they needed for self-employment. Findings pertaining to these hypotheses showed that there is no significance difference on foundry craft students and their teachers in the practical and entrepreneurship skills they needed for self-employment. This finding is consistent with the proposition of Loffer [2010] that foundry students and teachers need some skills for self-employment in foundry business.

Conclusion

The development of any nation is built on sound practical skill acquisition. Skill acquisition in foundry is considered the most effective skill that can bring about a total change that would ensure accelerated economic growth and job creation. However the increasing importance of foundry for self-

employment and national development cannot be over emphasis. In this face of massive employment, the acquisition of skills in foundry will help to create jobs. The application of foundry is found in more than 95% of all human activities (Nwajagu, 1994). This implies that foundry can generate a lot of jobs if good attention is given to it.

Recommendations

Based on the findings of the study the following recommendations were proffered

1. Foundry craft should be introduced in all the technical colleges in Enugu State by the government and technical education administrations.
2. The government, school management, NGO and philanthropist should encourage practical foundry craft among students and teachers.
3. Seminars, conferences and workshops should be organized by the government and NGO to create awareness and sensitize the people on foundry craft skills and job creation.

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