

CRITERIA FOR SELECTING BUILDING TECHNOLOGY STUDENTS FOR CREATIVE THINKING SKILL ACQUISITION IN NIGERIA TECHNICAL COLLEGES

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Abstract

Creativity is not only central to the development of technical and vocational education programme, it is also a tool to national technological growth and development. Inculcation of creative thinking skill into the technical college curriculum therefore will equip the students, especially the building technology students with thinking and

innovative abilities. This study therefore focused on the criteria to put into consideration before selecting students for creative thinking skill development in Nigeria technical colleges. The study considered both the personal factors and social environmental factors. The design of the study was quantitative research which made use of questionnaire for data collection. The sample of the study consisted of 30 building technology teachers who were randomly selected. Two research questions were answered while two hypotheses were tested at 0.05 level of significance. The result of the study showed that the personal factors to be considered include students' perception about creativity; their thinking style and personal interest among others. Also, the social environmental factors among others include availability of material resources for creativity as well as availability of creative teachers. The null hypotheses were significant only on the responses of male and female teachers on consideration for past academic experience and home support on creativity development.

Key words: creative thinking; building technology; technical college; personal factors; environmental factors

1.1 INTRODUCTION

Creativity has been described by different authors in different ways. Fautley and Savage (2007) described creativity as all possible outcomes which involves doing something new and worthwhile. The author also emphasized that creativity is universal and therefore, it is not restricted to some special people but rather, can be carried out by everybody/

Harris et al (2011) saw creativity as capability to imagine and event something new. In this case, a creative individual has the potential power to visualize or think abstractly and then produce an object. Thus creativity is usually preceded by an imagination or a thought called creative thinking skill. Harris et al (2011) expressed that “creativity builds up an individual in a way to accept change as well as empowers him or her with willingness to

play with ideas". Which means a creative person will not only be flexible, he will also look for every possibility of improving on new ideas. This shows that creativity involves a process with a number of components which include: imagination, originality, productivity, problem solving, and ability to produce a worthy and valuable outcome(Sharp, 2004)

Since production of a new idea is germane to technical colleges, hence, Nwakwo ,Onyali and Obikese (2011) emphasized the need to integrate creativity into the curriculum of technical colleges. Furthermore, Nwakwo et al (2011) who also recommended acquisition of creative thinking and innovative skills in Nigeria Technical colleges believed that the integration will engrave creativity and innovation in the memory of the students who will apply them later

Loyd (2011) viewed curriculum as diffused oriented and well planned events which take place in educational institutions in order of achieving certain goals, and objectives. It is also meant to provide learners with knowledge and skills required to lead successful lives(Williamson and Futurelab,2009). It is therefore the duty of teachers to collaborate across the discipline in order to help students attain the skills necessary to function as productive citizens (Fautley, 2007S). Grier (2005) agreed to this by suggesting the curriculum development process that will provide satisfaction to both the students and the society.

Consequently, Brand (2003) recommended a TVE curriculum which would be organized around major industries and broad career opportunities and consist of a rich cluster of academic and technical courses. The basis for the recommendation is to

enable courses to be offered to go beyond the traditional vocational education programmes and include integration of models, designs and innovations. Therefore, a building technology course can go beyond the traditional carpentry, masonry, plumbing and electricity to include the knowledge of urban planning, construction engineering, interior design and environmental protection.

Block laying and concreting in Nigeria is categorized by NBTE(2012, 2014) as a course under Building and Wood work trades. The National Vocational Certificate in Block-laying and Concreting is aimed at producing skilled and self-reliant craftsmen that can execute and coordinate Block-laying and Concreting work in a construction project. The objective of the programme According to NBTE (2007; 2012; 2013) is to produce the trainee who after graduation should be able to among others read and interpret building construction drawings and demonstrate basic principles of site organization.\

Notwithstanding, Usoro and Ogbuanya (2009) in a study found that there was absence of creative thinking skill in the technical colleges curriculum, Also a subsequent study carried out by Usoro and Essien (2012) study also revealed that the Building technology teachers in Nigeria technical colleges agreed that before creative thinking skill could be fostered, there is need for: the teachers themselves to be creative; cultivates the habits of providing advice to students about how to become creative; learn to make decision on issues that need fresh thinking and help the students to develop and improve creatively.

Therefore, based on this need arising from the

aforementioned problem, Usoro and Ogbuaya (2009; 2012) in their recommendations advocated for reconfiguration of the present technical and technology curriculum and suggested a creativity curriculum that will help the graduate of technical college generate employability skill as enshrined in the National Policy on Education .

However, before creative thinking skill can be effectively developed in schools, there is need to understand the creative functions and ability of the technical or engineering students. Thus the first thing to be done while selecting students for creative thinking skill is to consider the background of the students (Hsiao, Liang and Lin, 2004). Some of the backgrounds which must be identified for proper consideration according to Hsiao et al (2004) include: the students' perception or knowledge about creativity; their thinking style and their willingness to explore, think creatively and discover new things.

It has been noted that students who have dominant flair for creativity tends to run away from subjects that require practical skills and logical reasoning like Technical and engineering (Hsiao et al, 2004). Therefore, educators are not supposed to chide away from considering the interest, ability, skills and creative thinking potential of students before admitting them and even as they progress on their course of study. Kim (2011) supported this idea by suggesting a due consideration for creative thinking skill potentials at the early state of vocational training of students. The reason given by Kim (2011) is that children's ability to produce ideas (fluency) increases up to Third Grade (JSS Level in Nigeria educational system) and remains static between 4th and 6th Grade (SSS or Levels 1 to 3 in Nigeria Technical College).This shows that

the students at the JSS Level in Nigeria situation, can become alert to issues like accuracy and appropriateness in generating ideas before gaining admission into the Technical colleges. Students at this stage have the increased potential and motivation for creativity up till the high school level but with decrease in elaboration after graduation

Apart from positive perception of students on creativity, some other factors found to influence creative performance among others include: gender difference, socioeconomic status, academic achievement, availability of human and material resources, the use of effective creative process, social environment , ethnicity and cultural difference (Stephes, et al 2001; Runco, 2004; Chamorro-Premuzic, 2006; & Wang, 2011

As a matter of fact, Lee (2005) also stressed that social – cultural context is an important factor to be considered while defining creativity and when carrying out creativity studies. The implication of this is that culture cannot be separated from creativity. Based on the recommendation of Lee (2005), it implies that the cultural differences among Nigerians and even those within the same Geo-Political Zone must definitely have different impacts on the level of creative thinking skill and creativity of the people.

Under the school system, Ambile(1983; 2012) identified the classroom environments as the major factors which can influence creativity. The classroom environmental factors identified include the teachers' characteristics and behaviors, the influence of the peers, and the physical classroom environment itself. The peer can influence each other if they are well grouped in a heterogeneous way so they can mutually work together. The

teachers who possess the intrinsic motivation trait will be able to encourage students too as they are granted autonomy and self-directed work. Also, a conducive classroom or workshop environment will help the students to exhibit their creativity (Bedell and Muford, 2007).

1.2 STATEMENT OF THE PROBLEM

Various factors which influenced the selection of students into creative thinking skill have been identified and categorized by different authors. Bowkett (2007) provided a checklist of the factors which can be summarized as external and internal factors.. In addition, Rowe (2003) and Amabile (2012) identified the major factors which can influence creativity to include social or organizational context (environment in which one works); tradition; personality (inner drive); managers or teachers attitude and intrinsic motivation (Rowe 2003). Amabile (2012) emphasized that a conducive environment will enable a child to explore his or her potentials to think very well. Environment in the school setting according to (Rowe?) include the classrooms, learning materials, social facilities, and the method of teaching and so on. Rowe (2003) further stated that a non-receptive environment will cause a great impediment to creativity. The reason is that the managers, administrators and teachers in the non-receptive environment are usually passive to change. They rather stick to protocols, traditions or the old methods of doing things. It is usually done without giving consideration for change.

Hence it is necessary to find out what personal and environmental factors will be considered necessary before selecting students for creative thinking skill in Nigeria Technical Colleges

1.3 PURPOSE OF THE STUDY

The aim of the study was to determine the background and

the social environmental information required to to be consider in selection of students for creative thinking skill. Specifically, the study will seek to determine

1. The personal or background information required to select students for creative thinking skill
2. The social environmental factors required to select students for creative thinking skill

1.3 RESEARCH QUESTIONS

The study sought to answer the following research question

1. What are the background information necessary for consideration before selecting students for creative thinking skill?
2. What are the environmental factors required for selecting students for creative thinking skill?

2.0 METHODOLOGY

2.1 RESEARCH DESIGN

The study is basically a pilot study which utilized a quantitative method of collecting data from the participants.

2.2 SAMPLE AND SAMPLING TECHNIQUES

The pilot study randomly sampled 30 participants who are mainly technical teachers. The teachers specialize on building technology. The sample is made up of 19 male teachers and 11 female teachers.

2.3 INSTRUMENT FOR DATA COLLECTION

The instrument for data collection was a structured questionnaire with five point-Likert scale. The questionnaire

consisted of two sections and a total of 23 items. The first section which measured personal factors consisted of 14 items with options such as: Not Strongly required (NSR), Not Required (NR), Undecided (U) Required (R) and Strongly Required (SR).

The second section which measured environmental factors consisted of 9 items ranged from Not very necessary (NVN) to Very necessary (VN)

2.4 VALIDITY AND RELIABILITY OF INSTRUMENT

The instrument was validated by five experts who are in the field of technical education, educational Psychology and educational evaluation. The instrument was subjected to face, content and construct validity. It was later pilot tested on 30 participants. Cronbach alpha was used to obtain its reliability. Section A had $r = 0.83$, while Section B had $r = 0.89$.

3.0 ANALYSIS OF RESULT

3.1 RESEARCH QUESTION 1

.What are the background information necessary for consideration before selecting students for creative thinking skill?

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Table I : personal factors /background information necessary for consideration before selecting students for creative thinking skill

SN	Personal Factors	Mean	SD	Decision
1.	Perception about creativity	3.97	1.35	R
2.	Thinking style	3.77	1.04	R
3.	Personality traits of the students	3.53	1.16	R
4.	Personal interest of the students	4.37	1.09	R

5.	Willingness to discover new things	4.27	0.94	R
6.	Ability to elaborate on ideas	3.93	0.90	R
7.	present level of technical/ construction related skill	3.70	1.28	R
8.	Creative thinking potentials	3.83	1.14	R
9.	Gender difference	2.67	1.49	NR
10.	Social economic background	2.40	1.30	NR
11.	Ethnic groups of the students	2.23	1.14	NR
12.	Cultural background of the students	2.23	1.04	NR
13.	Career experience of the students	3.67	1.32	R

Note: NR =Not Required; R= Required

From table L above, it was found that Gender difference, social economic background, Ethnicity and students cultural background are not required to be used in selecting building technology students for creative thinking skill in Nigeria Technical colleges. While all other items on personal background are required.

Table II T.test tables on level of significance on the responses of male and female teachers on personal factors or background information to be considered in selecting students for creative thinking skill development

Item	X1 (M)	SD1	X2 (F)	SD2	T test	df	P val	Sig
1	3.52	1.42	4.00	.894	-1.40		0.19	NS
2	3.63	1.21	3.45	.820	0.17		0.48	NS
3	3.57	1.12	3.36	.924	0.19		0.47	NS
4	3.78	1.13	4.09	.136	-0.83		0.61	NS
5	3.84	1.25	4.09	.943	-1.17	14	0.74	NS
6	3.84	1.30	3.81	.603	0.00		0.75	NS
7	3.89	1.28	3.36	.674	0.66		3.13	NS
8	3.78	1.43	3.81	.250	0.14		0.52	NS
9	3.00	1.37	2.72	1.250	0.95		0.30	NS
10	3.10	1.28	2.36	.1200	0.71		0.29	NS
11	3.31	1.45	3.00	1.000	0.00		0.03	NS
12	2.89	1.48	2.45	1.213	0.74		0.28	NS
13	2.94	1.31	2.81	.981	0.51		0.72	NS
14	4.05	1.02	3.36	1.206	1.16		0.21	NS

Note X1= Mean for male teachers; X2 = Mean for female teachers; NS Not significant ; S= Significant ; N1= 19 and N2 = 11

$P < 0.03$ for item14 , hence the null hypothesis was rejected only for this item.

RESEARCH QUESTION2

What are the Social/ environmental factors necessary for consideration before selecting students for creative thinking skill?

Table III: Social environmental factors necessary for creative thinking development among building technology students in Nigeria Technical colleges

Item	Statement	Mean	SD	Decision
15.	Availability of human resources	4.10	1.06	N
16.	Availability of material resources	4.17	1.43	N
17.	Good administrative support	4.10	1.09	N
18	Peer interaction	3.57	0.97	N
19.	Adequate space	3.87	1.07	N
20.	Freedom of show of creativity	3.77	1.17	N
21.	Adequate time	4.33	0.84	N
22.	Non restriction to create new ideas	3.70	1.29	N
23.	Home support	4.10	1.26	N

From Tale III above, it was found that all the item listed are necessary for consideration before selected for creative thinking skill in Nigeria technical colleges , all the items listed under environmental factors are to be considered

Table III: T-test table on level of significance on the responses of male and female teachers on Social environmental factors necessary for creative thinking development among building technology students in Nigeria Technical colleges

Item	X1 (M)	SD1	X2 (F)	SD2	T test	df	P val	Si g
15	4.00	1.41	4.09	1.64	-0.146		0.97	S
16	4.21	.917	4.63	.67	-.491		0.67	S
17	4.15	1.25	4.00	1.00	0.350		0.63	S
18	3.84	1.06	3.18	.98	1.456	9	0.68	S
19	3.94	1.47	4.18	.87	0.219		0.85	S

20	4.00	1.15	3.81	1.32	0.463	0.45	S
21	4.05	.91	4.18	.60	-0.265	0.48	S
22	3.84	1.01	3.81	1.25	0.329	0.16	S
23	3.68	1.37	4.54	.52	-1.715	0.02	N
							S

P < 0.02 for item 23, hence the null hypothesis was rejected only for this item.

4.0 DISCUSSION OF FINDINGS

The result of the study showed that personal factors which are necessary for consideration in selecting students for creative thinking skill in Nigeria Technical colleges include: students perception about creative thinking skill; thinking style; personality traits, students interest; willingness to discover new things and students/ career experience. The findings are in supports of earlier research carried out on creative thinking skill by Hsiao, Liang and Lin (2004).

Some of the backgrounds which must be identified for proper consideration according to Hsiao et al (2004) include: the students' perception or knowledge about creativity; their thinking style and their willingness to explore, think creatively and discover new things. Also Oke and Mustaal 2013 have also suggested in a study the need to consider the creative thinking skill potentials of students before admitting them into technical colleges.

However, the study negated the idea of scholars such as (Stephes, et al 2001; Runco, 2004; Chamorro-Premuzic, 2006; & Wang, 2011 who advocated gender difference, social economic factors, ethnicity and cultural background as major consideration for creative thinking skill. Though most researches carried out on gender difference in creativity have reported different results. While in some studies, no significant difference was found in creative performance of boys and girls (Chavez-Eakle, Lara, & Cruz-Fuentes, 2006; Szobiova, 2006), Kaufman, Baer and Gentile, 2009; Genifer, et al, 2011).

On the resources to be made available for creative thinking skill development, the study found that books on creativity, good workshop, construction plants and tool, computer, internet facilities drawing tools are needed. Also, the human resources needed include: creative teachers and attendants. The study further supported the findings of Usoro and Essien (2012) that Building technology teachers themselves must be assisted to be creative before they can help students to be creative.

Lastly, the hypotheses showed no significant difference in the responses of male and female teachers on the personal and environmental factors necessary for selecting students for creative thinking skill, except for issues bothering on students past career experience and home support

5.0 CONCLUSION/RECOMMENDATION

This pilot study has revealed the criteria to be considered for selecting students for creative thinking skill in Nigeria technical colleges. The findings of the study is recommended for implementation in technical colleges . The study is also recommended to be carried out on larger samples.

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