

## Professionalism and Management of Steam Education in Nigeria

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**Abstract.** This study investigated professionalism and management of STEAM education in Nigeria. The purpose of this study is to examine the relationship between teacher commitment to students, parents, community and effective management of STEAM education in Nigeria. To achieve the purpose of this study, three hypotheses were formulated and tested. Quantitative research design was used for the study. A self-designed questionnaire titled “Professionalism and Management of Steam Education Questionnaire” (PMSEQ) was used to collect data for the study. The population of this study comprised all 310 principals in public senior secondary schools in Kwara State. Sample of 175 principals were selected with the use of Research Advisor (2006) table of determine sample size of a known population. Thus, stratified random sampling technique was used to select principals from the sample schools. This was to ensure that all categories of principals were given equal chance of being selected for the study. The data collected were analyzed using Pearson product moment correlation coefficient statistics. All hypotheses were tested at 0.05 level of significance. The result revealed that there was a positive and significant relationship between teacher commitment to students, parents, community and effective management of STEAM education in Nigeria. It was recommended that teacher should continue to improve their commitment to students by dealing justly and impartiality with students, avoidance of damaging comments with the learners as well as planning the lesson by taking into account specific interest of the learners. Teachers should also ensure effective commitment to parents by establishing friendly

and cooperative relationship with home of students, provide parents with information that will improve the performance of students positively, as well as keeping parents informed about the progress of their children in school. Lastly, teacher should continue their commitment to community so as to strengthening the community moral and intellectual life, keep the community informed of the educational teacher programme which is being provided, and help the school to adhere to reasonable pattern of behaviour accepted by the community in order to achieve effective management of STEAM education in Nigeria.

**Keywords:** professionalism, management, STEAM education, Nigeria

### 1. Introduction

Professional activity is learned and based on great knowledge carries with good personal responsibility. Professionalism is seen as a strategy for controlling an occupation in which colleagues set up a system of government (Kim, 2015). It is a known fact that no nation can rise above the quality of its teachers. Teaching today in Nigeria has been professionalized with the setting up of Teachers Registration Council (TRC) to regulate the policies of the teaching profession. The heart of Nigeria education system is the teachers. Teacher accountability goes beyond responsibility of defining student performance level but includes the obligation to improve professionally and support the goals of the institution served, through effective commitment to student, parent and community under circumstances.

The society makes a lot of expectations from teacher to impact knowledge to the students, instill discipline and sound moral values, initiate ideas and actions towards community development, to help people become literate and adopt innovative techniques of teaching, while the government expect them to help students imbibe positive attitudes towards national unity (Mkpa, 2006). The primary obligation of the teaching profession in Nigeria is commitment to students by guiding children, youth and adults in the pursuit of knowledge and skill to develop attitudes that enable them live in harmony with other Nigerians, and help them become useful and responsible member of the society.

The integration of Science, Technology, Engineering, Arts and Mathematics known as STEAM education aim at shifting teaching practices from traditional lecture-based teaching into those that are inquiry, project-based and problem-based learning and design thinking as a means to present meaningful learning experiences. STEAM education is a teaching philosophy that fosters creativity and innovative thinking which designed to develop students' creative, analytical, team work, communication and problem solving skill in providing solution to real world problems.

The goal of STEAM education is to foster the true innovation that comes with combining the mind of a scientist or technologist with that of an artist or designer. STEAM education empower teachers to employ project-based learning that comprises all five disciplines (science, technology, engineering, arts and mathematics) and bring about inclusive learning environment where students are able to exercise both sides of modeling techniques and scientific thinking) of their brain at once. Therefore, for effective management of STEAM education, there is need for teacher to fulfill the obligation of commitment to students, parents as well as commitment to the community.

In committing to students, teacher share with parents the task of shaping each students behaviour towards achieving socially acceptable behaviour. Parent teacher partnership need to be strong to guarantee the holistic and effective education of students. The manner in which

teachers communicate and interact with parents affect the extent and quality of parent' home involvement with their children's learning. An effective teacher needs to be committed to students by putting students' learning and interests above anything else. Teacher commitment to the patents help parents in getting ideas from school on how to help and support their children and learn more about the school's academic program and how it works.

The teaching profession in Nigeria occupies a position of public trust involving not only the individual teacher's personal conduct, but also the interaction of school and the community. Teacher commitment to community entails flow of ideas between the teacher and the community to ensure mutual understanding and effective team work for the realization of effective steam education towards achieving educational goals and objectives.

Several studies have being carried out on STEM or STEAM education. El-Deghaidy (2015) carried out science teachers' perceptions of STEM education: Possibilities and challenges. Hunkoog, Oksu and Jinwoong (2016) conducted an analysis of STEAM teacher education in Korea with a case study of two schools from a community of practice perspective. The study aim to investigate STEAM teacher education and to examine the successful conditions for its implementation. Hui-Hui and Younkyeong (2015) conducted exploring the impact of a STEM integration teacher professional development program on secondary science and mathematics teachers' perceptions of engineering and their attitude toward engineering integrated teaching. A total of sixty eight teachers from ten schools participated in the study. The study utilized both qualitative and quantitative research methods. The result shows that both science and mathematics teachers thought that integrating engineering into teaching provided valuable outcomes.

Danielle and Cassie (2017) investigated exploring teachers' perception of STEAM teaching through professional development: implications for teacher educators. There are several areas on STEAM education that are yet

to be carried out by these scholars. This area includes professionalism and management of STEAM education, especially in Nigeria. This study on professionalism and management of STEAM education in Nigeria therefore endeavor to fill these gaps yet to cover. The following objectives have been formulated to achieve the aim of this study to:

- determine the relationship between teacher commitment to students and effective management of STEAM education in Kwara State.
- examine the relationship between teacher commitment to parents and effective management of STEAM education in Kwara State.
- identify the relationship between teacher commitment to community and effective management of STEAM education in Kwara State.

## 2. Theoretical Framework

The framework of this study is developed to determine the relationship between professionalism and management of STEAM education in Nigeria. It is developed based on integrating Vroom's Expectancy theory of motivation as cited in Durosaro (2010). Vroom theory posits that people will be motivated to do things to achieve some goal to the extent that they expect that certain actions on their part will help them to achieve the goal. Vroom's expectancy theory of motivation is simply summed up as follows: Motivation = Valence multiply by Expectancy. This means motivation is equal to the sum total of valence multiplied by expectancy. Valence is the strength of an individual's performance for an outcome. Expectancy is the probability that a particular action will lead to a desired outcome. Expectancy is what is expected to be achieved in an organization. Therefore, high level of expectation can lead to a particular future outcome and success of STEAM education.

This theory can also be applicable in the education setting in that teachers will perform better, if they see a high probability that their efforts in (committing to students, parents and community) will lead to high performance and

effective management of STEAM education. Thus, teacher's motivation may be a result of the actual or perceived rewards available to him/her for accomplishing some goals. This study anchored on Vroom Expectancy theory so as to understand the usefulness of teacher-parents relationship. Notably, parents believe that STEAM topics are important for their children's future, then their children will be more likely to develop high expectation for success in STEAM education.

## 3. Research Questions

The following research questions were raised in addressing the problem of this study:

- Does teacher commitment to students enhance effective management of STEAM education in Kwara State?
- Do teacher commitment to parents bring about effective management of STEAM education in Kwara State?
- Does teacher commitment to community improve effective management of STEAM education in Kwara State?

## 4. Research Hypotheses

The following hypotheses were formulated to guide the conduct of this study:

- There is no significant relationship between teacher commitment to students and effective management of STEAM education in Kwara State.
- There is no significant relationship between teacher commitment to parents and effective management of STEAM education in Kwara State.
- There is no significant relationship between teacher commitment and effective management of STEAM education in Kwara State.

## 5. Methodology

### 5.1 Research Design

The research method of this study was quantitative which allowed the researcher to

collect data through a set of survey questionnaire. This involves the process of questionnaire selection, data collection and data analysis. Descriptive statistical analysis was used to explain responses of the respondents on the variables used in this study. Inferential statistical analysis of Pearson product moment correlation analysis was utilized to test the hypotheses.

### 5.2 Population and Sampling

The population of this study comprised 310 principals in public senior secondary schools in Kwara State as at 2017. Sample of 175 principals were selected with the use of Research Advisor (2006) table of determine sample size of a known population. Stratified random sampling technique was used to select principals from the sample schools. This was to ensure that all categories of teachers were given equal chance of being selected.

### 5.3 Instrumentation

A self-designed questionnaire title “Professionalism and Management of Steam Education Questionnaire” (PMSEQ) was the instrument used for data collection. Altogether, there were 15 items, in which the questionnaire was divided into two sections namely section A and section B. section A of the questionnaire centres on personal information of the participants. Section B with 15 items focus on professionalism and STEAM education. This questionnaire was tested before it was finally distributed to the participants. The principals responded to the items in a 4-point Likert scale of Strongly Agree (4), Agree (3), Disagree (2)

and Strongly Agree (1). The criterion mean is given thus:  $4 + 3 + 2 + 1 / 4 = 2.50$ . The criterion mean value of 2.50 is agreed while the one below the criterion mean value is disagreed by the participants.

### 5.4 Validity and Reliability

To ensure content validity of the instrument, draft copies of the questionnaires were given to two experts in educational management and two experts in measurement and evaluation to look into the content of the instrument. Relevant corrections and adjustment were made based on their suggestions and recommendations. Also 20 corrected copies were further administered to principals who are part of the sampled to examine their understanding of the items wordings, instructions and understandability of the questions and scales in order to detect if there is any difficulties that may arise in filling the questionnaire. Therefore, some suggestion made were effected appropriately before sending out final copies.

Instrument reliability was ensured by using Cronbach’s Alpha; the instrument reliability index was .82. The reliability test revealed a high level of consistency for all variables. According to Sekaran and Bougie (2010) the Cronbach’s Alpha value which are within 0.8-.0.95 are considered as having a very good reliability. Therefore, the value for Cronbach’s Alpha for this study indicated an acceptable internal consistency of the items in each scale. Hence, the instrument was reliable for the study. The result is presented in Table 1:

Table 1: Reliability Statistics for each of the Variables

Variables	Number of items	Crobach’s Alpha	Decision
Commitment to students	5	.814	All items reliable
Commitment to parents	5	.816	All items reliable
Commitment to community	5	.822	All items reliable

### 5.5 Data Collection Process

A total of 175 questionnaires were distributed to 175 principals in senior secondary schools in Kwara State. The researcher with the help of three research assistants personally administered the instruments to the principals of the sample

senior secondary schools upon obtaining permission from the heads of the sample schools by sending a copy of letter for their permission. The participants were briefed on the objectives of the study. The introduction, explanation, distribution, completion and collection of questionnaires ranged from 10-20 minutes per

school. However, in some schools the researcher and research assistants had to collect the questionnaires in few days' time because of several circumstances such as time or unavailability of school principal. The instruments were retrieved and scored. In the guideline provided by Stanley and Wise (2010), this study emphasized the ethical issues in assuring anonymity and confidentiality of their responses.

### 5.6 Data Analysis

The data collected were analyzed using the Statistical Package of the social Sciences (SPSS Version 21). The data were analyzed using both descriptive analysis (Mean and Standard deviation) and inferential statistical analysis (Pearson Product Moment Correlation) to achieve the aim and objectives of this study. For the interpretation of 4 Likert point scale, the composite mean for each items was merged into two levels, namely agreed and disagreed, whereby below 2.50 is interpreted as (disagreed) and above 2.50 is (agreed). The data were screened before analysis. Missing data was not

an issue in this study because researcher with the help of research assistants distributed the questionnaire to the participants. All hypotheses were tested at significance level of (0.5) to determine the acceptance and rejection of the hypotheses.

## 6. Findings

This section discusses the result of the findings. This section discusses the result of the findings.

### 6.1 Teacher commitment to students

This section consists of items that elicit feedback from participants about their perception on teacher commitment to students. Table 2 describes the mean and standard deviation for the item on teacher commitment to students. The overall mean of teacher commitment to students is high with the mean score of 2.92 and standard deviation 0.973. This indicates that most of the principals agreed that teacher commitment to students Enhance effective management of STEAM education.

Table 2: Mean and Standard Deviation for Teacher Commitment to Students

Items	Mean	SD	Decision
Teacher deal justly and impartially with students regardless of their physical and emotional, racial or religion characteristics help in the management of STEAM education	2.897	.998	Agreed
Recognizing and respect of the students differences and seek to meet their education needs help in the effective management of STEAM education.	2.98	.925	Agreed
Teacher avoidance of damaging comments upon a student help in the management of STEAM education.	2.96	.973	Agreed
Teacher commitment in planning the lesson and taking into account students specific interest, disposition and difficulties help in effective management of STEAM education.	2.87	1.028	Agreed
Choosing materials that meet the learners need and appropriate for the group of learners help in achieving effective management of STEAM education.	2.94	.942	Agreed
Overall Mean	2.92	0.973	

(Mean  $\geq$  2.50 Agree, Mean  $<$  2.50 Disagree)

### 6.2 Teacher commitment to parents

This section consists of items that gives feedback from the participants about the perception on teacher commitment to parents. Table 3 describes the mean and standard deviation for all items in the teacher commitment to parents.

Table 3: Mean and Standard Deviation of Items on the Teacher Commitment to Parents

Items	Mean	SD	Decision
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Establishing friendly and cooperative relationship with the home of students help in achieving Effective Management of STEAM education	2.84	.933	Agreed
Teacher commitment to parents help increasing the student confidence in his/her home.	2.92	.943	Agreed
Teacher commitment help in providing parents with information that will serve the will and improve the performance of their child positively.	2.90	.995	Agreed
Commitment of teacher help in keeping parents informed about the progress of their children in school.	2.83	1.014	Agreed
Teacher commitment to parents help in sharing the responsibility of improving effective management of STEAM education	2.92	.943	Agreed
overall Mean	2.88	0.966	

(Mean > 2.50 agree, Mean < 2.50Disagree). Researcher field work

Table 3 shows that the overall mean of teacher commitment to parents is high with the mean score of 2.88 and standard deviation 0.966. This indicates that participants agreed that teacher commitment to parents bring about effective management of STEAM education.

#### Teacher commitment to the community

This section consists of items that give feedback from the participants about teacher commitment to community. Table 4 describes the mean and standard deviation for all items on teacher commitment to community.

Table 4: *Mean and Standard Deviation of Items on Teacher Commitment to the community*

Items	Mean	SD	Decison
Teacher commitment to the community help in strengthening the community moral and intellectual life.	2.91	.966	Agreed
Teacher commitment to respect the community in which he/she is employed help in the effective management of STEAM education.	2.89	.985	Agreed
Teacher commitment in keeping the community informed of the educational programme which is being provided help in the management of STEAM education.	3.04	.937	Agreed
Teacher commitment to community help the school adhere to reasonable pattern of behaviour accepted by the community.	2.95	.996.	Agreed
Teacher commitment to the community have significant impact on the provision of discipline and academic achievement.	2.89	.985	Agreed
Overall Mean	2.94	0.974	

(Mean > 2.50 Agree, Mean < 2.50 Disagree) Researcher field work

Table 4 shows the overall mean of teacher commitment to community is high with mean score of 2.94 and standard deviation of 0.974. This indicates that principals perceived the teacher commitment to community as a way of improving effective management of STEAM education. Therefore, principals agreed with the view that teachers' commitment to community improves effective management of STEAM education.

#### *Hypotheses Testing*

The analysis method applied in this study was the use of Pearson product moment correlation statistical analysis to test the set hypotheses.

$H_{01}$ : There is no significant relationship between teacher commitment to students and Management of STEAM education in Kwara State.

Table 5: *Teacher Commitment to Students and Management of STEAM Education*

Variable	N	$\bar{x}$	SD	Df	Cal-r	p-value	Decision
Teacher commitment to students	175	11.90	4.233	349	0.91	0.00	Rejected
Management of STEAM education	175	2.92	0.973				

Table 5 indicates that calculated r-value = .91 and p-value notation is .000 level of significance. This shows that there is positive and significant relation between teacher commitment to students and effective management of STEAM education. Therefore, the hypothesis which states that there is no significant relationship between teacher commitment to students and management of STEAM education is rejected.

$H_{02}$ : there is no significant relationship between teacher commitment to parents and management of STEAM education in Kwara State..

Table 6: *Teacher Commitment to Parents and Management of STEAM Education*

Variable	N	$\bar{x}$	SD	Df	Cal-r	p-value	Decision
Teacher commitment to parents	175	11.63	4.394	349	0.93	0.00	Rejected
Management of STEAM education	175	2.88	0.966				

Table 6 indicates that calculated r-value = .93 and p-value notation is .000 level of significance. This shows that there is a positive and significant relationship between teacher commitment to parents and effective management of STEAM education. Therefore, the hypothesis which states that there is no significant relationship between teacher commitment to parents and Management of STEAM education is rejected.

$H_{03}$ : there is no significant relationship between teacher commitment to community and management of STEAM education in Kwara State.

Table 7: *Teacher commitment to community and management of STEAM Education*

Variable	N	$\bar{x}$	SD	Df	Cal-r	p-value	Decision
Teacher commitment to community	175	12.11	4.392	349	0.91	0.00	Rejected
Management of STEAM education	175	2.94	0.974				

Table 7 indicates that calculated r-value = .91 and p-value notation is .000 level of significance. This shows that there is a positive and significant relationship between teacher commitment to community and management of STEAM education. Therefore, the hypothesis which states that there is no significant relationship between teacher commitment to community and management of STEAM education is rejected.

## 7. Discussions and Conclusion

The results of question one analysis and findings in Table 2 show that teacher

commitment to students is necessary for effective management of STEAM education. Teacher commitment to students enhance effective management of STEAM education by dealing justly and impartially with students regardless of their physical and emotional characteristics, recognizing and respecting the students differences, avoidance of damaging comments upon students, commitment in planning the lesson by taking into account learners specific interest as well as choosing materials that meet the learners need. Result from hypothesis one revealed that there is positive and significant relationship between teacher commitment to students and effective

management of STEAM education in Nigeria. This findings agreed with Glancy and Moore (2013) that for effective preparation of students to address the problems of society, it is necessary to provide students with opportunities to understand the problems through teacher commitment to their learning and welfare in other to engage them in provide powerful experiences that integrate the discipline of STEAM.

The findings in table 3 shows that teacher commitment parents improve effective management of STEAM education by establishing friendly and cooperative relationship with the home of students, providing parents with information that will serve the will and improve performance of children as well keeping parents informed about the progress of their children in school. Result from hypothesis two analysis revealed that there is positive and significant relationship between teacher commitment to parents and effective management of STEAM education in Nigeria. These findings conformed to Harackiewicz, Rozek, Hulleman and Hyde (2012) that the parent focused intervention is the efficacy to promote students utility value in STEAM education.

The result of question three analysis and findings in Table 4 shows that teacher commitment to community bring about effective management of STEAM education by helping in strengthening the community moral and intellectual life, keeping the community informed of the educational programme which is being provided towards effective management of STEAM education as well as helping the school adhere to reasonable pattern of behaviour accepted by the community. Result from hypothesis three analysis showed that there positive and significant relationship between teacher commitment to community and effective management of STEAM education in Nigeria. This findings agreed with Tata and Abdullahi (2014) school community relationship have significant impact on the provision and maintenance of school discipline, academic

achievement of student and overall success of the schools.

This paper focused on professionalism and management of STEAM education in Nigeria. As a way of doing fairness to the paper, it broadly discussed obligations of professionalism needed in achieving effective management of STEAM education in Nigeria. The findings of this study shows that teacher commitment to students, parents and community are the appropriate indices of professionalism for achieving effective management of STEAM education in Nigeria. Further researchers can expand the scope of this study by using other variables apart from teacher commitment to students, parents and community as an indicators of professionalism. This study can also be carry out in other level of education such as primary and junior secondary schools as well as in other countries.

## 8. Implications and Recommendations

The findings of this study would be useful to various stakeholders in education such as teachers, principals, parents and researchers among others. This study will be of benefit to teachers to be more effective in committed to discharge their duties to students, parents as well as community so as to ensure effective management of STEAM education. These findings will also be useful to principals to empower teachers to employ project-based learning in order to bring about inclusive learning environment where the students are able to exercise both sides of modeling techniques and scientific thinking. The findings will also be useful to parents in getting the necessary information needed to shaping their children behaviour towards achieving socially acceptable behaviour. Furthermore, this study will be of benefit to researcher as it will serve as reference guide for further research. To achieve effective management of STEAM education teachers should continue to improve their commitment on students by dealing justly and impartiality with students, avoidance of damaging comments with the learners as well as planning the lesson by taking into account



specific interest of the learners. Teachers should also ensure effective commitment to parents by establishing friendly and cooperative relationship with home of students, provide parents with information that will improve the performance of students positively, as well as keeping parents informed about the progress of their children in school. Lastly, teacher should continue their commitment to community so as to strengthening the community moral and intellectual life, keep the community informed of the educational teacher programme which is being provided, and help the school to adhere to reasonable pattern of behaviour accepted by the community in order to achieve effective management of STEAM education in Nigeria.

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