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Full Length Research Paper

Factors Preventing Learning in Science, Technology and Mathematics Education (STME) in Selected Secondary Schools of Three Senatorial Zones in Niger State, Nigeria

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The bed rock of any developed country lay on Science, Technology and Mathematics Education (STME), as effective factors for economic growth of a country. The paper discussed factors preventing learning of STME in selected secondary schools of three senatorial zones in Niger state of Nigeria. A simple random sampling (SRS) were used to select a total of 500 teachers and 1,000 students for the study, using the Four point Likert Scale method of responses i.e. Strongly Agree (SA), Agree (A), Disagree (D), Strongly and Disagree (SD) which weighted as 4, 3, 2 and 1 respectively in the questionnaires. The study was guided four (4) research questions and two (2) hypotheses. Average Mean Score and standard deviation were used to analyze responses from the research questions, while Regression Analysis was used to test the hypotheses at 0.05 level of significance. The dependent variable correlated significantly positive with the independent variable for both hypotheses. F-statistics of 42.825 had a p-value of 0.000 (<0.05) and F-statistics of 4.461 had a p-value of 0.000 (<0.05) respectively. Recommendations were made based on these findings.

Keywords: *Learning, Science, Technology, Mathematics, Schools.*

INTRODUCTION

In order to be able to compete in the global economic system in the 21st century, a country must establish education where students get an understanding of Science, Technology, Engineering and Mathematics (STEM) education, and effective use of technology (Engineering) and problem solving skills (Mathematics) in building the basis of STEM education produce by using the necessary skills in the field (Akgunduz, 2016). Furthermore, he also said that the education of Science and Technology recently is a constructivism and investigations aimed at integration with other disciplines

such as the effective use of technology (Engineering) and problem solving skills (Mathematics) in building the basis of STEM education.

The purpose of teaching and learning Science, Technology and Mathematics Education (STME) is specifically to produce three kinds of intellectual capital: Scientists and engineers who will continue the research and development that is central to the economic growth of our country; technological proficient workers who are capable of dealing with the demands of a science-based high technology workforce and scientifically literate citizens who make intelligent decisions about public policy and who understand the world around them (Adaramola et al, 2011). Accordingly, effective Science, Technology and Mathematics (STM) education is critical to enable students to acquire: (1) Deeper intrinsic value

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of STM education to shape and define our common life history and culture among others. (2) Appropriate skills; abilities and competences that will enable them contribute meaningfully to the development of the society.

There is also the need for basic standard of achievement in preparing students for occupations in a highly scientific and technological environment (Encarta, 2005). Moreover, the world summit for sustainable development (WSSD) recommended that people should be empowered through education to achieve the 3 goals of – employment generation, poverty eradication and value – orientation (Ajeyelemi, 2006).

Statement of the Problem / Justification

The report of Shelter Right Initiative clearly stated that Nigeria trailed behind other West African countries for nine consecutive years in STM academic performance. Students do not only perform poorly at the cognitive level, they also perform badly at the affective and psychomotor domains respectively. And to the extent that it is difficult to have a good number of candidates with enough credits to secure admission at higher levels of STM disciplines (Adaramola et al, 2011).

Sulaiman (2010) argued that science, technology and mathematics education in Nigeria are grossly characterized by inadequacy of content and ineffective methodology by teachers, paucity of facilities, equipment and materials in our laboratories, as well as dominated socio-cultural lapses. These lapses have to be properly tackled for our STM education to produce individuals with sufficient skills capable for self-reliant life activities. The present trend of mass unemployment in Nigeria shows that the STM being taught in schools do not prepare Nigerian graduates to function well in the nation undergoing transition from rural economy to modern economy (Nwachukwu, 2009). The courses which should be taught as hands-on and minds-on practical courses are basically taught theoretically; this makes learners not to benefit maximally from their education. Hence, development of useful factors necessary for learning is inadequate. To this there is the need to investigate the factors preventing learning in science, technology and mathematics education (STME) in selected secondary schools of three senatorial zones in Niger state, Nigeria.

Objective of the Study

The following objectives are set to guide the study:

1. Assess the standards of the STME teachers in Niger state secondary schools.
2. Determine the attitudes of secondary school teachers in the teaching of STME-related subjects in Niger state.

3. Determine the attitudes of secondary school students in the learning of STME-related subjects in Niger state.

4. Identify the extent to which home-based factors contribute to students' inhibiting learning in STME-related subjects in Niger state secondary schools.

Research Questions

The following research questions were raised to guide the study:

1. To what extent do the STME teachers in Niger state secondary schools qualified and adequate?
2. What are the attitudes of secondary school teachers in the teaching of STME-related subjects in Niger state?
3. What are the attitudes of secondary school students in the learning of STME-related subjects in Niger state?
4. To what extent do home-based factors contribute to students' inhibiting learning in STME-related subjects in Niger state secondary schools?

Research Hypotheses

To answer the research questions, the following hypotheses were formulated:

1. There is no significant relationship between the standards of the STME teachers and their attitudes to work in Niger state secondary schools.
2. There is no significant relationship between the standards of the STME teachers and the attitudes of secondary school students towards the learning of STME subjects in Niger state secondary schools.

LITERATURE REVIEW

Science, Technology and Mathematics Education (STME) have been called a meta discipline, the creation of a discipline based on the integration of other disciplinary knowledge into a new whole. This interdisciplinary knowledge bridging among discrete disciplines is now treated as an entity known as STM Education (Sulaiman, 2010). Thus, STM Education offers students one of the best opportunities to make sense of the world holistically, rather than in bits and pieces. It should be noted, however, that STM Education is an interdisciplinary approach to learning; where rigorous academic concepts are coupled with real world lessons as students apply STME in the context that make connections between schools, community, work and the global enterprises enabling the development of STME

Table 1: Socio-demographic Information of Respondents

| Socio-demographic Information | | Frequencies | Percentages (%) |
|-----------------------------------------------------|--|-------------|-----------------|
| Sex (Teachers, n = 500) | | | |
| Female | | 237 | 47.40 |
| Male | | 263 | 52.60 |
| Sex (Students, n = 1000) | | | |
| Female | | 413 | 41.30 |
| Male | | 587 | 58.70 |
| Age (Teachers, n = 500) | | | |
| 0 – 18 years | | 64 | 12.80 |
| 19 – 25 years | | 154 | 30.80 |
| 26 – 32 years | | 112 | 22.40 |
| 33 – 39 years | | 117 | 23.40 |
| 40 years & above | | 53 | 10.60 |
| Age (Students, n = 1000) | | | |
| 0 – 18 years | | 935 | 93.50 |
| 19 – 25 years | | 63 | 6.30 |
| 26 – 32 years | | 2 | 22.40 |
| 33 – 39 years | | 0 | 0.00 |
| 40 years & above | | 0 | 0.00 |
| Working Experience (Teacher, n = 500) | | | |
| 1 – 5 years | | 128 | 25.60 |
| 6 – 10 years | | 213 | 42.60 |
| 11 – 20 years | | 111 | 22.20 |
| 21 years & above | | 48 | 9.60 |
| Nature of School (n = 120) | | | |
| Private | | 76 | 63.33 |
| Public | | 44 | 36.67 |
| Nature of Subject (Teacher, n = 500) | | | |
| Science | | 126 | 25.20 |
| Technology | | 254 | 50.80 |
| Mathematics | | 120 | 24.00 |
| Educational Qualification (Teacher, n = 500) | | | |
| Grade II | | 65 | 13.00 |
| NCE | | 254 | 50.80 |
| BSc./B.Ed | | 143 | 28.60 |
| MSc./M.Ed | | 32 | 6.40 |
| Ph.D | | 6 | 1.20 |

literacy and self reliance skills, and with it, the ability to compete in the new economy (Tsupro et al, 2009).

The pattern of STME approach is not emphasizes on the principles of practice, where in each student's learning is always facilitated to practice so that students get the learning experience not to be forgotten as research (Naila et al, 2017) concluded that STME must emphasize on the learning experience of students in

schools, the concept of eye an integrated lessons, connections between subjects, the student's ability to solve problems, methods of thinking in depth, the ability to manage projects types of tasks, understanding and skills regarding the design engineering, as well as the use of information and technology.

Nwachuku (2009) enumerated some of the problems confronting STM Education in Nigeria to include, lack of

funds to purchase equipment/materials, lack of adequate textbooks, overcrowded classrooms/laboratories, poor time table, lack of cooperation from administrator, the pressure of external certificate examinations, etc. Other challenges, include, lack of proper monitoring and feedback mechanisms, poor preparations of teachers who teach the new programs, lack of motivation among teachers, the rapid rate in which teachers are transferred from one school to another or out of the profession, the use of archaic/traditional teaching methods which ultimately hinders internalization of learned materials. Other problems facing STM Education in Nigeria includes the absence of efforts to bring about meaningful self-reliance programs and projects to the communities. There are lack of planning in different sectors of Nigerian economy; including, poor policy implementation procedures, shortage of qualified STME teachers/educators, over whelming number of activities demanded by the new curricula, lack of clear-cut goals, scarcity of resources and non-usage of research reports on the learning of the programs (evaluation). These are clear challenges facing Niger too in term STM Education, and unless these challenges are tackled, the dying in learning of STM Education in Niger State cannot be resuscitated.

METHODOLOGY

The research adopted the cross-sectional descriptive survey research design and the population for the study comprised of all senior secondary school STM teachers and learners in the three senatorial zones of Niger state. The research scope included overall Niger state with all the 25 local government altogether. Hence the multistage sampling technique was used to select sample for the study. In the first stage, the population was divided into smaller sampling units, that is, three senatorial zones (Zone A, Zone B and Zone C) and simple random sampling (SRS) employing simple balloting was used to select 5 local government areas from each zone. The second stage involved a SRS employing simple balloting to select eight (8) secondary schools from each local government area in the selected local governments. The third stage involved using SRS employing simple balloting in selecting teachers and students from each selected school. After stratifying the sample into teachers and students, a total of 500 teachers and 1000 students were used as sample for the study.

The instrument for data collection for this study was a semi-structured self-designed and self-administered questionnaire. The Four point Likert Scale method of response with Strongly Agree (SA), Agree (A), Disagree (D), Strongly and Disagree (SD) was used to collect responses where necessary and the responses weighted as 4, 3, 2 and 1 respectively. The instrument was

designed with each section seeking answers to each research question. To ensure face and content validity of the instrument, it was given to three experts in educational measurement and statistics who are computer literate for vetting. Some items in the instrument were modified and re-constructed to reflect the nature of the work. A pilot study was carried out in two secondary schools outside the population of study but with similar characteristics. The Pearson's Product Moment Correlation was carried out and a coefficient of 0.89 shows a very strong reliability for the instrument. The data for the study was collected by the researchers by administering the instruments to the respondents personally with the assistance of three (3) other research assistants. This was to ensure the confidence of the respondents in the confidentiality of the responses. The questionnaires were collected immediately. The response rate in the course of the study was 100% since the questionnaires were collected immediately. Hence any respondent not willing to respond was be replaced by another respondent. All data analyses were done using Statistical Package for Social Sciences (SPSS) version 20.0 for Windows. Average Mean Score and standard deviation were used to analyze responses from the research questions while Regression Analysis was used to test the hypotheses at 0.05 level of significance.

RESULTS AND DISCUSSION

Socio-demographic Information of Respondents

Table 1 above displayed socio-demographic information of the respondents interviewed for this study. It was discovered that about average 263 (52.6%) of the teachers are male while the remaining 47.4% are females. Also a little above average 587 (58.7%) of the students are male while the remaining 41.3% are females. This indicates that both male students and teachers interviewed outnumbered their female counterparts. In addition, very few 64 (12.8%) of the teachers interviewed are between the ages of 0 – 18 years and 53 (10.6%) of them are 40 years and above while the remaining 76.6% of the teachers are between the ages of 19 and 39 years. Also, more than three-quarter 935 (93.5%) of the students are between the ages of 0 – 18 years while the remaining few 28.7% are between the ages of 19 and 32 years. It was also discovered from Table 1 that about a quarter 128 (25.6%) of the teachers interviewed have up to 1 – 5 years working experience while about a half 213 (42.6%) of them have up to 6 – 10 years working experience and the remaining 31.8% have at least 11 years working experience. Table 1 also revealed that about three-quarter 76 (63.33%) of the schools where the research was conducted are private schools while the remaining

Table 2: Standards of the STME Teachers in Niger State Secondary Schools (n = 500)

| | Variables | \bar{x} | S.D | Remark |
|----|------------------------------------------------------------------------------------------------------------------------|-----------|-------|----------|
| 1 | The number of STME teachers in Niger State secondary schools is adequate. | 2.01 | 1.451 | Rejected |
| 2 | The available STME teachers in Niger State secondary schools are qualified to teach. | 2.43 | 0.137 | Rejected |
| 3 | There are refresher courses for STME teachers in Niger State secondary schools. | 1.09 | 0.783 | Rejected |
| 4 | STME teachers in Niger State secondary schools use improvised instructional materials to teach STME subjects. | 2.93 | 1.741 | Accepted |
| 5 | STME teachers in Niger State secondary schools usually attend seminars and workshops to improve their teaching skills. | 2.70 | 0.251 | Accepted |
| 6 | STME Teachers' degree of success in implementing the school's curriculum is high | 2.51 | 0.187 | Accepted |
| 7 | STME Teachers' expectations for student achievement is high | 3.04 | 1.009 | Accepted |
| 8 | STME Teachers are working together to improve student achievement | 2.82 | 2.143 | Accepted |
| 9 | STME Teachers' ability to inspire students is encouraging | 3.00 | 0.004 | Accepted |
| 10 | STME Teacher-student ratio in Niger State secondary schools is adequate | 1.03 | 1.087 | Rejected |

36.67% are public schools. In addition, about half 254 (50.80%) of the teachers interviewed are teaching technological subjects and 126 (25.20%) are science teachers while the remaining 120 (24%) are Mathematics teachers. Lastly, it was established that about a half 254 (50.8%) of the teachers interviewed are NCE teachers and 28.6% are degree holders while 7.6% of them have their postgraduate degrees and only 13% are Grade II teachers.

Analysis of Research Questions

Table 2 above displayed the standards of STME teachers in Niger State Secondary Schools. It was discovered that items 4 – 9 all have their means rating above the threshold of 2.50 with the least standard deviation of 0.004, indicating that the respondents agreed with the assertion that STME teachers in Niger State secondary schools use improvised instructional materials to teach STME subjects and that they usually attend seminars and workshops to improve their teaching skills. They also agreed that STME Teachers' degree of success in implementing the school's curriculum is high and that their expectations for student achievement are high. It was also agreed that STME Teachers are working together to improve student achievement and that their ability to inspire students is encouraging. However, items 1, 2, 3 and 10 have their means rating below the threshold of 2.50, pointing out that the respondents disagreed with the assertions that the number of STME

teachers in Niger State secondary schools is adequate and that the available STME teachers in Niger State secondary schools are qualified to teach. Lastly, they disagreed that there are refresher courses for STME teachers in Niger State secondary schools and that STME Teacher-student ratio in Niger State secondary schools is adequate.

Table 3 below displayed the attitudes of secondary school teachers towards the teaching of STME-related subjects in Niger state. It was discovered that items 1 – 12 have their means rating above the cut-off of 2.50 with the least standard deviation of 0.041. This indicates that the respondents are in agreement with the assertions that there are too many students in the classes, there are too much material to cover in classes, they have too many teaching hours and needed more time to prepare for classes and assist individual students. They also agreed that they feel too much pressure from parents, have difficulty keeping up with all of the changes to the curriculum and have too many administrative tasks. In addition, they agreed that majority of the students are not interested in STME-related subjects even though the teachers find their work full of meaning and purposeful. Lastly, they agreed that they are proud of their job as STME teachers and the schools have clear rules about student conduct. However, the respondents disagreed with the assertions in items 13 – 20 because their means ratings are below the cut-off with the least standard deviation of 0.035. This shows that the respondent disagreed with the assertions that students behave in orderly manners, respectful of the teachers and respect

Table 3: Attitudes of Secondary School Teachers towards the teaching of STME-related subjects in Niger state (n = 500)

| | Variables | \bar{x} | S.D | Remark |
|----|------------------------------------------------------------------------|-----------|-------|----------|
| 1 | There are too many students in the classes | 3.01 | 1.704 | Accepted |
| 2 | I have too much material to cover in classes | 2.76 | 0.204 | Accepted |
| 3 | I have too many teaching hours | 3.48 | 0.217 | Accepted |
| 4 | I need more time to prepare for class | 2.91 | 0.041 | Accepted |
| 5 | I need more time to assist individual students | 2.63 | 1.579 | Accepted |
| 6 | I feel too much pressure from parents | 2.80 | 0.654 | Accepted |
| 7 | I have difficulty keeping up with all of the changes to the curriculum | 2.53 | 1.479 | Accepted |
| 8 | I have too many administrative tasks | 3.10 | 1.414 | Accepted |
| 9 | Majority of the students are not interested in STME-related subjects | 2.99 | 0.165 | Accepted |
| 10 | I find my work as an STME teacher full of meaning and purpose | 2.64 | 0.387 | Accepted |
| 11 | I am proud of being an STME teacher | 2.50 | 0.465 | Accepted |
| 12 | This school has clear rules about student conduct | 2.51 | 1.563 | Accepted |
| 13 | Students are always disrupting lessons | 2.01 | 1.254 | Rejected |
| 14 | I am contented with my profession as an STME teacher | 1.03 | 0.250 | Rejected |
| 15 | I am going to continue teaching for as long as I can | 1.21 | 0.035 | Rejected |
| 16 | This school's security policies and practices are sufficient | 1.00 | 0.678 | Rejected |
| 17 | The students behave in an orderly manner | 2.01 | 1.302 | Rejected |
| 18 | The students are respectful of the teachers | 2.41 | 1.830 | Rejected |
| 19 | The students respect school property | 1.24 | 1.273 | Rejected |
| 20 | This school's rules are enforced in a fair and consistent manner | 2.37 | 0.605 | Rejected |

school properties; they are always disrupting lessons, although they are not disrupting lessons. They also disagreed that they will continue teaching for as long as they can because they are contented with their profession as STME teachers. Finally, they disagreed with the security practices and policies of the school and that the school rules are not enforced in fair and consistent manners

Table 4 below displayed the attitudes of secondary school students towards the learning of STME-related subjects in Niger state. It revealed that items 1 – 9 have their means rating above the threshold of 2.5 with the least standard deviation of 0.671. This means that the respondents agreed with that they want to develop their skills in the learning of STME-related subjects because they get a great deal of satisfaction out of attending STME-related lessons. They also agreed that STME-related subjects help develop the mind and teach a person to think and they believed that it is the teacher who can make STME-related subject learning easier. In addition, they agreed that a lot of unnecessary assignments are given in STME-related subjects which makes them feel extremely anxious and fearful, when examinations are mentioned and that the fear and anxiety

in STME subjects can be removed with a strong Mathematics background. Lastly, they agreed that gender interferes with their learning and performance in STME subjects. They also agreed that their parents and siblings encourage me to learn STME-related subjects and to perform well in them. Items 10 – 20 have their means rating below the threshold of 2.50 with the least standard deviation of 0.442. This means that the respondents disagreed with the assertions that their minds go blank and unable to think clearly during STME classes although they dislike their STME subject teachers. They self-confidence when it comes to STME-related subjects and are comfortable expressing their own ideas on how to look for solutions to a difficult problem in STME lessons. They also disagreed with the assertions that they are well provided with textbooks and other learning resources with regards to STME subjects and that they feel extremely anxious to attend STME-related classes. In addition, they also disagreed with the assertions that they do a lot of exercises on their own or with friends after STME classes and that they learn STME subjects well regardless of the gender of their teachers. They also disagreed that they are willing to take more than the required amount of STME subjects and that their grades (marks) are always

Table 4: Attitudes of Secondary School Students towards the learning of STME-related subjects in Niger state (n = 1000)

| | Variables | \bar{x} | S.D | Remark |
|----|--------------------------------------------------------------------------------------------------------------|-----------|-------|----------|
| 1 | I want to develop my skills in the learning of STME-related subjects | 2.67 | 1.237 | Accepted |
| 2 | I get a great deal of satisfaction out of attending STME-related lessons | 2.53 | 1.322 | Accepted |
| 3 | STME-related subjects help develop the mind and teach a person to think. | 3.18 | 0.671 | Accepted |
| 4 | I think it is the teacher who can make STME-related subject learning easier | 3.17 | 1.501 | Accepted |
| 5 | I am given a lot of unnecessary assignments in STME-related subjects | 2.60 | 1.338 | Accepted |
| 6 | I feel extremely anxious and fearful, when examinations are mentioned or brought in STME subjects | 3.06 | 0.972 | Accepted |
| 7 | My parents and siblings encourage me to learn STME-related subjects and to perform well in them | 3.25 | 1.500 | Accepted |
| 8 | Being a girl or a boy interferes with my learning and my performance in STME subjects | 2.57 | 1.562 | Accepted |
| 9 | A strong Mathematics background could help me improve in STME subjects | 2.75 | 2.016 | Accepted |
| 10 | My mind goes blank and I am unable to think clearly during STME classes | 2.07 | 0.941 | Rejected |
| 11 | I have a lot of self-confidence when it comes to STME-related subjects | 1.86 | 1.385 | Rejected |
| 12 | I am comfortable expressing my own ideas on how to look for solutions to a difficult problem in STME lessons | 1.73 | 0.546 | Rejected |
| 13 | I am well provided with textbooks and other learning resources with regards to STME subjects | 1.01 | 0.442 | Rejected |
| 14 | I feel extremely anxious to attend STME-related classes | 2.14 | 1.398 | Rejected |
| 15 | I do a lot of exercises on my own or with a friend after STME classes | 2.10 | 1.702 | Rejected |
| 16 | Learning STME-related subject is just remembering what the teacher says and does while in class | 2.11 | 0.829 | Rejected |
| 17 | My grades (marks) are always low in STME subjects | 2.43 | 1.864 | Rejected |
| 18 | I like my STME subject teachers | 1.76 | 1.175 | Rejected |
| 19 | I learn STME subjects well regardless of the gender of my teacher | 2.20 | 1.691 | Rejected |
| 20 | I am willing to take more than the required amount of STME subjects | 1.04 | 0.616 | Rejected |

low in STME subjects. Finally, they disagreed with the assertion that learning STME-related subject is just remembering what the teacher says and does while in class.

Table 5 above displayed the extent to which home-based factors contribute to students' inhibiting learning in STME-related subjects in Niger state secondary schools. Items 1 – 10 have their means rating above the threshold of 2.50 with the least standard deviation of 0.069 which indicates that the respondents agreed with the assertions that school buildings need significant repair and that STME teachers do not have adequate workspace (e.g.,

for preparation, collaboration, or meeting with students). They also agreed that STME teachers do not have adequate instructional materials and supplies, school classrooms are not cleaned often enough and that school classrooms need maintenance work. In addition, they agreed that STME teachers do not have adequate technological resources and that the teachers do not have adequate support for using technology. Also, they agreed that the teachers are not adequately motivated and there are no adequate provisions of scholarships for STME students. Lastly, they agreed that epileptic power supply greatly affect the success of STME lessons.

Table 5: Extent to which Home-based factors contribute to Students' Inhibiting Learning in STME-related subjects in Niger State Secondary Schools (n = 1500)

| | Variables | \bar{x} | S.D | Remark |
|----|---------------------------------------------------------------------------------------------------------------|-----------|-------|----------|
| 1 | The school building needs significant repair | 3.52 | 0.069 | Accepted |
| 2 | STME teachers do not have adequate workspace (e.g., for preparation, collaboration, or meeting with students) | 2.71 | 1.439 | Accepted |
| 3 | STME teachers do not have adequate instructional materials and supplies | 3.28 | 1.027 | Accepted |
| 4 | The school classrooms are not cleaned often enough | 2.53 | 0.879 | Accepted |
| 5 | The school classrooms need maintenance work | 2.70 | 1.532 | Accepted |
| 6 | STME teachers do not have adequate technological resources | 2.62 | 1.344 | Accepted |
| 7 | STME teachers do not have adequate support for using technology | 3.11 | 1.756 | Accepted |
| 8 | STME teachers are not adequately motivated | 2.93 | 1.681 | Accepted |
| 9 | There are no adequate provisions for scholarships for STME students | 2.60 | 0.478 | Accepted |
| 10 | Epileptic power supply greatly affect the success of STME lessons | 3.01 | 1.307 | Accepted |

Table 6: Regression Analysis of the relationship between the standards of the STME teachers and their attitudes to work in Niger state secondary schools

| Model Summary | | | | | | |
|--------------------|-------------------|----------------|-------------------|----------------------------|--------|--------------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | | |
| 1 | .865 ^a | .748 | .594 | 7.68409 | | |
| ANOVA ^a | | | | | | |
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 60.025 | 3 | 20.008 | 42.825 | 0.000 ^b |
| | Residual | 157.594 | 38 | 4.147 | | |
| | Total | 217.619 | 41 | | | |

Test of Research Hypotheses

Table 6 shows the statistical relationship between the standards of the STME teachers and their attitudes to work in Niger state secondary schools. The table shows that the independent variable with a multiple correlation coefficient (R) of 0.865 and a multiple adjusted R Square of 0.594 accounted for 59.4% of the variance in the teachers attitudes. The dependent variable correlated significantly positive with the independent variable. With an F-statistics of 42.825 and a p-value of 0.000 (<0.05), the result shows a statistical significance between the independent and the dependent variable. Hence, there is significant relationship between the standards of the STME teachers and their attitudes to work in Niger state secondary schools.

Table 7 shows the statistical relationship between the standards of the STME teachers and the attitudes of secondary school students towards the learning of STME subjects in Niger state secondary schools. The table shows that the independent variable with a multiple correlation coefficient (R) of 0.813 and a multiple adjusted R Square of 0.417 accounted for 41.7% of the variance in the teachers attitudes. The dependent variable correlated significantly positive with the independent variable. With an F-statistics of 4.461 and a p-value of 0.000 (<0.05), the result shows a statistical significance between the independent and the dependent variable. Hence, there is significant relationship between the standards of the STME teachers and the attitudes of secondary school students towards the learning of STME subjects in Niger state secondary schools

Table 7: Regression Analysis of the relationship between the standards of the STME teachers and the attitudes of secondary school students towards the learning of STME subjects in Niger state secondary schools

| Model Summary | | | | | | |
|---------------|-------------------|----------|-------------------|----------------------------|--|--|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | | |
| 1 | .813 ^a | .605 | .417 | 6.15473 | | |

| ANOVA ^a | | | | | | |
|--------------------|------------|----------------|----|-------------|-------|--------------------|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 40.011 | 3 | 13.337 | 4.461 | 0.000 ^b |
| | Residual | 143.504 | 48 | 2.990 | | |
| | Total | 231.413 | 51 | | | |

CONCLUSION

From table 6, the dependent variable correlated significantly positive with the independent variable. With an F-statistics of 42.825 and a p-value of 0.000 (<0.05), the result shows a statistical significance between the independent and the dependent variable. Hence, there is significant relationship between the standards of the STME teachers and their attitudes to work in Niger state secondary schools. Also from table 7, the dependent variable correlated significantly positive with the independent variable. With an F-statistics of 4.461 and a p-value of 0.000 (<0.05), the result shows a statistical significance between the independent and the dependent variable. Hence, there is significant relationship between the standards of the STME teachers and the attitudes of secondary school students towards the learning of STME subjects in Niger state secondary schools.

RECOMMENDATIONS

1. There are need adequate provisions for scholarships for STME students as motivation
2. STME teachers should be provided with adequate support for using technology by Niger state Government
3. Government should provide STME teachers with adequate instructional materials and supplies through heavily investment.
4. Adequate power supply greatly influences the success of STME lessons.
5. Parent should encourage their children by providing them with textbooks and other learning resources with regards to STME subjects
6. Good well package (remunerations) should be given STME Teachers

7. Attending of seminars, conferences and short courses to improve on their pedagogical skills for STM teachers should be encourage.
8. Appointing qualified personnel to drive the delivery process to the benefit of the Niger society.

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