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Enhancement of qualified mathematics and basic science teachers at senior secondary school level through admission into first degree programmes at polytechnics in Bauchi State, Nigeria

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Abstract
The article was based on descriptive and expo-factor research design study, was aimed at the enhancement of qualified mathematics and science teachers at senior secondary school level through admission into first degree programmes at Abubaakar Tatari Ali Polytechnic in affiliation with the Nigerian Universities specifically the Abubakar Tafawa Balewa University, Bauchi, Nigeria. The instruments used for the study were in two categories, included were; Lecturers/Students Inventory questionnaires (LSIQ) as well Lecturers Basic Science Laboratory Questionnaire (LBSLQ). Descriptive statistics were used and data were coded and analysed using Statistical Package for Social Sciences (SPSS). Findings on position levels among lecturers revealed 33.3% out of 15 in mathematics and 30.0% out 20 in computer science at the rank of Lecturer three (LIII). Findings further revealed 26.5% out of 22 in chemistry at the same rank. At the rank of Lecture one (LI), findings revealed 25% out of 20 lecturers in computer science and 29% out 17 in biology respectively. Findings on percentages of lecturers in mathematics and basic science subjects revealed 60% out 20 specialist in Computer Science, with first degree and forty per cent (40%) with second degree. Findings also revealed 50% out 15 in Mathematics with second degree, while 30% with first degree, and a PhD holder. In chemistry result from the study revealed that 28% out of 22 have first degree and 58% with second degree while 13.2 % had third degree. Findings also revealed that in 2016/2017session, 244 candidates were already admitted into various 1st degree programs in ATAP in affiliation with ATBU, Bauchi with the high per cent (37.3%) admitted into B. Tech Business Education. Findings further revealed 300 candidate admitted in 2017/2018 session with the high per cent (34.3%) admitted into B. Tech. Computer Science Education. Findings on availability of laboratory learning facilities revealed that ou of 86 mathematics and basic science lecturers 60% agreed that there were enough laboratory learning facilities in the Polytechnic (ATAP). This a clear indication that the admission of more brains into mathematics and basic science teacher education at the first degree programs in Polytechnics Nigeria and Bauchi Sate in particular is a step toward the enhancement of qualified mathematics and science teachers at senior secondary level.

Keywords: Enhancement, qualified, science teachers, admission, degree programs

Introduction
In recent years, biased ferrite material for micro strip antenna structures has attracted noticeable attention. Ferrite is one of the important magnetic materials which are used as in both types single and polycrystalline. Some novel characteristics of polycrystalline ferrite over normal dielectric material make it very useful in microwave antenna applications. Different types of polycrystalline ferrites have their specific advantages Qualified mathematics and science teachers at the secondary school determine to a large extent how successful students learn, understand and perform in mathematics and basic sciences. This is true if mathematics and science teachers are qualified and sufficient enough to teach in our public secondary schools.

The National Council of Teachers of Mathematics (NCTM, 2012) [9] recommended that students at secondary level of education need to learn mathematics and basic sciences to excel at higher levels of generalization of models and solve complex problems. This can provide the opportunity for many countries of the world to remain competitive in terms of economy that is needed for scientific and technological development, which is one of the major goals of establishing tertiary institutions (Agwu, 2015) [2]. However with the establishment of more of public schools and the increase in populations globally, there is a shortage supply of mathematics and science teachers resulting into students' poor performance.

In England, an overall shortage of mathematics and science teachers was observed in the 2012/13 academic year and severe shortages in the 2016/17 academic year (Sims, 2017) [12]. Indeed, a recent government report identified mathematics as having among the worst shortages of any subject (MAC, 2016). Study indicated that some civil servant who had mathematics and science basis are recruited to teach the said subject and as a result encounter difficulties (TES Global, 2016). Shortages appear to be concentrated in particular schools rather than particular regions (Sims, 2017; Allen & Sims, 2018) [12].

In the US, studies found that there is unequal supply of teachers as a result of shortage particularly in mathematics and science subjects. Given the current national concern over the relatively low achievement test scores of U.S. students in comparison with students in other nations, the data on levels of out-of-field teaching in science achievement for 12th-grade level was 41% of public school students. This was observed by the classes taught by teachers who were not having a minor

or a major in chemistry, physics, or mathematics. Lack of subject background by teachers to sustained the students' interest in the subject may affect their performance in standardized examinations.

Dudu (2013), Makgato & Mji (2006) have shown concern on the problem of lack of qualified mathematics and science teachers in South African schools. South Africa is significantly underperforming in mathematics teaching and learning. Mathematics teaching is often of poor quality, with teachers not able to answer questions in the curriculum they are teaching, one indicator of the challenge. Simkins (2013), further revealed that only 23 per cent of South African Grade 6 mathematics teachers could answer [such a Grade 6] question – with the proportion answering correctly ranging from 13 per cent for quintile one teachers to 46 per cent for quintile five teachers. Obviously it is almost impossible to teach that which you do not know. The accumulated learning deficits seem to reach a decisive point after Grade 9, when there are high drop-out rates from South African schools.

In Kenya, the shortage of qualified science and mathematics teachers is the cause of poor performance in national examinations (KCE, 2013). Most teachers do not have the expertise in their subjects. Recent visits to schools by personnel from Ministry of Education Science and Technology in Kenya revealed that most teachers do not have the expertise in their subjects. One of the consequences of this is that students failed examinations and fewer of them pursue mathematics courses at tertiary level leading to an even greater shortage of Mathematics teachers. Also major shortages were in science subjects including Chemistry, Physics and Biology while there were surplus teachers in other subjects especially in social sciences including Geography and History (Wamukuru, 2016) [15].

In Nigeria, despite the establishment of Federal and State Universities as well as Colleges of Education, the level of supply of qualified mathematics and science teachers is still very low (EDOREN, 2015) [17]. The evidence is a result of the increase number of public schools and student enrolment in our secondary schools (BEP, 2010) [3]. This has become one of the biggest challenge in the area of supply of qualified mathematics and basic science teachers in Nigerian Secondary schools. No wonder performance of students in the Mathematics and basic science subjects continuo to remain very low.

In a study on Basic Education Profile in the North East, Nigeria, statistics revealed that, at the Secondary School level, Bauchi State has the highest number of secondary schools 411 with the highest gross enrolments of 34,592. Only 47% of teachers are qualified across all teaching subjects. The same report revealed that Bauchi State in the same zone has 53% unqualified teachers with the least in Taraba state (34%) but with the highest number (66%) of qualified teachers (BEP, 2010) [3].

NEI (2016) on a study on Senior Secondary School Indicator in Nigeria found that, the total number of public secondary schools in Bauchi was 510 with a total enrolment of 122, 546 The same study revealed that the number of qualified teacher was found to be 4156. Even though there was no clear record on ground concerning qualified teachers based on subject specialist. By implication this findings revealed the need for more qualified teachers in all subjects particularly in mathematics and basic science subjects in Bauchi State, Nigeria.

In this study, therefore we consider qualified teachers as only those who had a degree in mathematics, in one of the sciences, or in a related field, such as Mathematics education. We did not count as qualified those who had passed a subject-area test, held a teaching certificate, or had taught mathematics or science, having a degree.

In view of the above therefore the need for manpower requirement approach has great relevance to the demand for qualified teachers in schools. This approach is based on the fact that any nation with plans or aspirations for economic development must consider the preparations of its human aspects of development. To achieve this noble task, polytechnics in Nigeria and particularly in Bauchi state should participate in the production and supply of mathematics and science education teachers. The Bauchi state polytechnic (Abubakar Tatari Ali Polytechnic) as earlier mentioned is never left behind in admission of candidates into teacher education programme over the years.

The effort if implemented by the Abubakar Tatari Ali Polytechnic would support and complement the effort of Universities in the admission of candidates into mathematics and basic science education programs. This is attempt for the enhancement of more qualified mathematics and basic Science secondary school teachers in Bauchi State Nigeria.

Statement of the Problem

The shortage of specialist of mathematics and basic science teachers as a result of the limited number of candidates graduating from universities in Nigeria has many implications for Mathematics and Basic Science teaching and learning. More specifically, there are serious implications for students' attainment and performance. This is attributing to the fact of unqualified number of teachers in our secondary school. In Nigeria, many unqualified teachers are still in the employment of some States teaching Service Boards. Until government makes this training mandatory and pursues the policy vigorously, teaching will continue to be open to anyone and this situation holds the potentials of further eroding professionalism in teaching profession (Osokoya, 2012).

The usual shortage of applicants seeking admission into programs that would prepare them as mathematics and basic science teachers in universities and colleges of education in Nigeria is a pointer to why admission and placement in education programs is not as rigorous as it is in other programs. This arose to the inability of most Universities to meet the requirement in the production and supply of teachers in mathematics and basic science subjects in Nigeria and Bauchi State in particular. This has led to shortage of supply of mathematics and science teachers in our schools.

Evidence has also shown that there is surplus supply of teachers in subject such as social studies, economic and government in secondary schools in Bauchi State, Nigeria is at the expense of mathematics, physic, chemistry and biology (Adeyemi, 2011 & Dogo, 2017) [1, 6]. A chronic shortage of teachers in Mathematics and Basic Sciences in Bauchi State constitutes a critical level of unbalance on staffing and curriculum. It is therefore a real institutional difficulty that

requires much attention among the stakeholders. The participation of polytechnics specifically the Abubakar Tatari Polytechnic in the area of admitting candidates into first degree programs was effective for the enhancement of qualified mathematics and basic science secondary school teachers

Objectives of the study

The study was guided by the following specific objectives;

1. To establish frequency count of position levels among lecturers of mathematics and basic science subjects in Abubakar Tataari Ali Polytechnic (ATAP), Bauchi
2. To find out frequency count of qualified mathematics and basic science lecturers in Abubakar Tataari Ali Polytechnic (ATAP), Bauchi
3. To find out frequency count of candidates admitted into various degree programs in Abubakar Tataari Ali Polytechnic in affiliation with Abubakar Tafawa Balewa Universities over a period of time.
4. To establish the level of availability of laboratory facilities for mathematics and basic science subjects in Abubakar Tataari Ali Polytechnic (ATAP), Bauchi.
5. To find out the types and frequency count of laboratory facilities for science subjects in Abubakar Tataari Ali Polytechnic (ATAP)

Research Question

1. What are the position levels among lecturers of Mathematics and Basic Science Subjects in ATAP?
2. What is the frequency count of lecturers in Mathematics and Basic Science subjects based on qualification in ATAP?
3. What is the frequency count of candidates admitted into various first degree programs in ATAP in affiliation with Abubakar Tafawa Balewa University over a period of time?
4. What is the availability level of laboratory facilities for teaching of Mathematics and Basic Science Subjects in ATAP
5. What are the types and number of laboratory for Basic Science education programme in ATAP?

Purpose of the Study

The purpose of the study was to assessed and established the possibilities of introducing more first degree programs in Mathematics and Basic Science subjects. It is for the purpose of enhancement of qualify of mathematics and basic science teachers in Bauchi State, Nigeria

Methodology

This study adopted expo-facto and descriptive research design. It was an expo- facto research as it was an after fact or after event studies (Cohen & Morrison, (2011) [5]. The data are already in place in the study institution. They do not involve any manipulation of variables. It was descriptive in the sense that it was a form of planned collection of data from a target population for the purpose of analyzing the relationships between variables (Kotari, 2004). In this regard, the targeted study population comprised all the 281 lecturers in Abubakar Tatari Ali Polytechnic, in Bauchi State, Nigeria by year 2016-2018. The sample was chosen through the use of purposeful sampling technique. The sample was the exact number of all lecturers (86) who specialized in Mathematics and Basic Science Subjects.

The sample category of lecturers were choosing and counted as qualified for only those who had a first degree and above in mathematics, in one of the sciences, or in a related field, such as mathematics education. Ingersoll (2011) [11] maintained that this category of lecturers can play a significance role in the training, producing and supply of qualified mathematics and science teachers in our secondary schools.

Two instruments were used to collect data for the study. These were the Lecturers /Admitted Students Inventory and the Laboratory Learning Facility Questionnaire. The Lecturers/Admitted Students Inventory consisted of two parts. Part A contain demographic information. It elicited information on the number of lecturers with Mathematics and Basic Sciences specialist in the polytechnic and the number of students admitted into first degree programs over the years. Part B was in 2 sections. Section A required data on the lecturers position in the polytechnic. Section B elicited data on number of lecturers on subject basis in the schools. The Laboratory learning facilities questionnaires was also in two parts. Part A was demographic while Part B consisted of items that requested information on the level of the availability of the learning facilities.

The content validity of the instrument was determined by expert in Test and Measurement who matched each item of the instrument with the general research questions. This was to determine whether the instrument actually measured what it was supposed to measure. Their comments were used to effect necessary corrections to the instruments before they were administered to the respondents. Reliability was conducted for only the questionnaire. It was not conducted for the inventory because the data collected using the inventory was already in the schools. In conducting the reliability, the questionnaires were administered to 30 respondents outside the study area. After period of two weeks, the questionnaires were administered to the same respondents. The data collected from the two tests were analysed using the Pearson Product Moment Correlation. A correlation of 0.05 was determined which indicated that the instruments were reliable for the study. The instruments were administered by the researchers and research assistant. After a period of two weeks, the completed copies of the instruments were retrieved from the respondents. The data collected were analyzed using descriptive statistics such as frequency counts and percentages.

Results

Question 1: What is frequency count of position levels among lecturers of Mathematics and Basic Science subjects in Abubalar Tatari Ali Polytechnic (ATAP)?

The search question one was set in order to test the first objective of the study. Lecturers' position levels were established using inventory study questionnaires. Data were obtained from documented records that clearly define the frequency of position levels among lecturers. Table 1 p resent the result.

Table 1: Frequency count on positions levels among lectures of maths and basic sciences

Position levels	LIII	LII	LI	S.L	P.L	CL	Total
Subject	F %	F %	F %	F %	F %	F %	F %
Mathematics	5 (33.3)	2(13.3)	3(20.0)	2(13.3)	3(20.0)	0(0.0)	15(100)
Physics	3 (25.)	2(16.7)	3(25.0)	2 (16.7)	0(0.0)	0(0.0)	12(100)
Biology	3 (17.6)	4(23.6)	4(23.6)	4(23.6)	1(0.1)	0(0.0)	17(100)
Chemistry	4(18.2)	4(18.2)	5(22.7)	4(1821)	3(13.6)	3(13.6)	22(100)
Computer Science	6 (30.0)	6(30.0)	4(20.0)	4(20.0)	0(0.0)	0(0.0)	20(100)

LIII= Lecturer 3, LII = Lecturer 2, LI = Lecturer 2 S.L = Senior Lecturer, PL= Principal Lecturer, C.L. = Chief Lecture Table I shows that out of 15 lecturers in mathematics, 33.3% of them are at the rank of Lecturer (LIII) with none at the rank of Chief Lecturer (CL). This is similar to those specialist in Computer Science were out of 22 lecturers, 30% were at the rank of lecturer three (LIII) with none at rank of Chief Lecture (C.L.). Result further indicated high percentage (25%) of lecturers in chemistry and Computer science (25%) were at the rank of lecturer two (LII). Apart from the rank of chief lecturer number of lecturers were found in each position. By implication man power requirement to enhanced qualify maths and science lectures is adequate and applicable

Question 2: What is the frequency count of mathematics and Basic Science Subjects lecturers in ATAP based on qualifications?

The research question two was set in order to test the second objective of the study. Frequency count and percentages of lectures at their various degrees were obtained using inventory study questionnaires. Data were also obtained from documented record. Table 1 present the result.

Table 2: Percentage of Mathematics and Basic Science Lecturers with various degrees

Degrees	No of 1st Degree	No of 2'xi degree	No of 3rd	Degree Total
Field of Study0	**.0F%**	**F%**	**F%**	**F%**
Mathematics	5 (40.0)	9 (60.0)	1 (6.7)	15 (100)
Chemistry	6 (28.0)	10 (48.9)	6 (28.6)	22 (100)
Biology	3 (37.5)	5 (62.5)	0 (0.0)	17 (100)
Physics	6(50.0)	6 (50.0)	0(0.0)	12(100)
Computer Science	12 (60.0)	8 (40.0)	0(0.0)	20(100)
Total	12	20	5	86

***Source*:** Tetfund Sponsorship (2007-2017)

Table 1 shows that in Computer Science, out of 20 lecturers sixty per cent (60%) are having first degree and forty per cent (40%) with master's degree. Result also indicated specialist in Mathematics were sixty per cent (60%) of lecturers. are having second degree, forty per cent (40%) where having first degree with a PhD holder in the same area. This is also similar to Chemistry as an area of study where more lecturers (48.9%) are having second degree, with the highest percentage (28.6%) of PhD holders compare to Mathematics, Biology, Computer Science and Physics.

Similar findings were also found in Biology as an area of specialization where more lecturers (62.5%) have master's degree and those with first degree were less than forty per cent (37.5%) and non with a PhD degree. It's a clear indication that, there is enough man power in the polytechnic. By implication the availability of man power can lead to the commencement of degree programmes in mathematics and science education programs in Abubakar Tatari Ali Polytechnic Bauchi Sate, Nigeria.

Question 3: What is the frequency count of candidates admitted into various first degree programs other than mathematics and science education in ATAP over a period of time?

The research question three was set in order to test the third objective of the study. Frequency count and percentages of admitted candidates into various first degrees programs were obtained using inventory study questionnaires. Data were also obtained from documented record. Table 3 present the result.

Table 3: Frequency count of candidates admitted into various first degree programs

Programs	Tech. Educ.			Bus. Edu		Science Educ.		
	B. Tech	**B. Tech**	**B. Tech**	**B. Tech**	**B. Tech**	**B. Tech**	**B. Tech**	**Total**
	M. W	E.E	BLD	W/W	Auto	Bus.	Comp. Sc.	
Years	F%	F%	F%	F%	F%	F%	F%	F%
2016/2017	08(3.3)	35(14.3)	47(18.3)	14(5.3)	12(4.9)	91(37.3)	37(15.2)	244(100)
20/17/2018	12(4.0)	37(12.3)79	(26.3)	09 (3.0)	10(3.3)	50(16.7)	103(34.3)	300(100)

***Source*:** Admission list from Directorate (2018)

Table 3 revealed that in 2016/2017 session 37.3% of candidates were admitted into B. Tech. Business Education and was considered as the highest percentage compare to other candidates admitted into various 1st degree programs with 3.3% as the lowest admitted into B. Tech Metal Work (W.W). Further Findings revealed that in 2017/2018 session 34.3% of candidates were admitted into B. Tech Computer Science Education and also was considered the highest percentage with 3.0% as the least of candidate admitted into B. Tech. Wood Work. The implication here is that with the increase number of students admitted into various degree programmes in the Polytechnic would enhance the quality and qualification of teachers at secondary schools in those areas mentioned. This is a move to support and supplement the effort of universities in Nigeria especially in the production of Mathematics and Basic Science teachers.

Question 4: What is the level of the availability of laboratory facilities for teaching of Mathematics and Basic Science Subject in ATAP?

The research question four was set in order to test the fourth objective of the study. The information on the availability of laboratory learning facilities were obtained through the use of Likert scale four responses on six items. The responses were measured as follows: to A= highly adequate, B= Adequate, C= Not adequate and D = Undefined. Table 4 present the result.

Table 4: Percentage of lecturers' responses on the availability of laboratory facilities

Items	Responses ABCDE				
	A	**B**	**C**	**D**	**E**
There are enough laboratory attendance for practical in all basic science subject	36	20	10	12	8
	41.9%	23.3%	11.6%	14.0%	0.1%
There is a special mathematical laboratory for science students	35	19	16	10	6
	40.7%	22.2%	18.8%	11.6%	0.1%
There are separate laboratories equipped with leaning facilities for each of Biology, Chemistry and Physics	40	26	10	0	10
	46.5%	30.2%	11.6%	0.0%	11.6%
My used of laboratory learning facilities makes my lesson clear and interesting.	30	6	20	19	11
	34.4%	0.1%	23.3%	22.2%	1.2%
There are no enough learning facilities in most of our science laboratories	50	21	20	0	5
	59.1%	24.4%	23.3%	0%	0.1%
As a mathematics, physics, biology and physics lectures I don't have enough laboratory learning facilities during lesson	0	6	15	20	45
	0%	0.1%	1.7%	23.3%	52.3%

Table 4 indicated that forty one per cent (41.9 %) of lecturers agreed that laboratory attendance are available and enough for practical in science class. Less than one per cent (0.1%) did not determined. Also forty per cent (40.7%) of the same lecturers agreed that there is a special mathematics laboratory. Further findings revealed that forty seven (46.5%) agreed that there are separate lab facilities for each of Biology, chemistry and physics.

Further findings revealed that majority (60%) of lecturers agreed that there enough learning facilities in the school laboratories where less than two per cent (1.01%) did not agree on the level of the availability of the materials. Majority of lecturers (52.3%) did not agreed that, there is no enough learning facilities in the polytechnic. The implication here is that the level of laboratory learning facilities are adequate. For this reason therefore there is an urgent need for the commencement of degree programmes in the Mathematics, Physics, Biology and Chemistry in Abubakar Tatari Ali Polytechnic., Bauchi Nigeria.

Question 5. What are the types and number of laboratories for mathematics and basic science programme, ATAP?

The research question 5 was set in order to test the fifth objective of the study. Frequency count and each type of laboratory facilities were obtained. Table 5 present the resulted

Table 5: Frequency count on types and number of laboratories available for mathematics and basic science subjects

Courses	Types of lab	Number of lab
Mathematics	Statistical Kids	1
	Math Lab	1
Computer	Computer Lab	1
Chemistry	Chemistry Lab	1
	Biochemistry Lab	l
Biology	Biology Lab	1
	Microbiology Lab	1
Physics	Physic/Electronic Lab.	1

***Source*:** Basic Science laboratory Inspection (2017)

Table 5 shows that in each of mathematics, chemistry and biology there exist a laboratory. Each occurring once indicating the availability of such laboratories. The implication here is that such laboratories would be use in courses that are upgraded to degree level by the polytechnic and as step in curtailing the shortage number of qualified teachers in Bauchi State and Nigeria. The existence or the establishment of such courses would also make the institution to contribute much better to the State and Nigeria in general.

Discussion

Findings on frequency count of position levels among

lecturers revealed that out of 15 lectures with specialist in +mathematics 33.3% were at the rank of Lecturer three (LIII). Similar findings revealed that out of 20 lecturers with specialist in computer science 30.0% were at the rank of Lecturer three (LIII). This was followed by 22 lectures with specialist in chemistry, where findings revealed 26.5% at the same rank. Findings also revealed that 17 lecturers with specialist in Biology where 29.4% at the rank of lecturer one (LI). Also findings revealed that out of 22 with specialist in chemistry, 4 (13.2%) Lecturers have attained the rank of chief lecture. This number was high compare to mathematics, physics, and biology and computer science. By implication the availability of man power in ATAP can create an opportunity for admission of candidates into mathematics and science education programs through its affiliation to any University in Nigeria.

The findings of the study are steps toward curtailing the shortage of qualified mathematics and basic science teachers in our school. The findings is supported by Wmukuru (2016) in Kenya who found that the major shortages teachers were in science subjects including Chemistry, Physics and Mathematics while there was teacher surplus in other subjects especially in social sciences including geography, history. Also in support of findings was Dogo (2017) [6] who suggested that the need for more qualified teachers in all subjects particularly in mathematics and basic science subjects in Bauchi state, Nigeria is a step toward improving effective teaching delivery.

Findings on percentage of lecturers in mathematics and basic science subjects in ATAP revealed that in Computer Science, out of 20 lecturers sixty per cent (60.0%) are having first degree and forty per cent (40%) are having second degree. In Mathematics, out of 15 lecturers, sixty per cent (60%) are having second degree, forty per cent (40%) are having first degree with a PhD holder in the same area.

This is also similar to Chemistry, where out of 22 lecturers forty per cent (40%) are having second degree with the highest percentage (28.6%) of PhDs holders compared to Mathematics, Biology, Computer Science and Physics. In Biology also out of 17 lecturers, sixty two per cent (62.5%) are having master's degree and those with first degree were less than forty per cent (37.5%) and non with a PhD degree. It's a clear indication that, there are enough man power in the polytechnic (ATAP). By implication the commencement of degree programmes in mathematics and science education is a step toward enhancement of qualified science secondary school teachers in Bauchi State Nigeria.

The effort if implemented would reduce the use of unqualified teachers to teach basic science subjects as reported and support by TES (2016), Allen & Sim (2018) in England, that some civil servant who had mathematics and science bases are recruited to teach the said subjects and as a result encounter difficulties. To these effects therefore there is a need for admission of candidate into first degree mathematics and science education programs in Abubakar Tatari Ali Polytechnic in affiliation with any Nigerian Univeraity.

Findings on admitted candidates into various degree programs in the polytechnic (ATAP) revealed that more students (37.3%) were admitted in Business education in 2016/2017 session with least of candidates (3.0) admitted into B. Tech Woodwork in both 2016/2017and 2017/2018 session respectively. Further findings also revealed that more students (34.3%) were admitted in the year 2017/2018 session. To this effect therefore the admission candidates into first degree science education program would address the inability of most Universities to meet the requirement for the production and supply of teachers in mathematics and basic science subjects in Nigeria and Bauchi State in particular. It's one of the reasons why some polytechnics are affiliated to some universities in running such relevant degree programs.

Findings on availability of laboratory learning facilities in the polytechnic (ATAP) revealed that out of 86 mathematics and basic science lecturers sixty per cent (60%) agreed that there enough learning facilities in the school laboratory. Few number of lecturers (1.01%) did not agree on the level of the availability of the materials. Further findings also revealed that there exist a laboratory for each mathematics, physics, and chemistry and computer science education. For this reason there is an urgent need for the commencement of degree programmes in mathematics, chemistry, and biology and physics education at the Abubakar Tatari Ali Polytechnic Bauchi State Nigeria.

Conclusion

In conclusion, the results of this study proved that the shortage and unqualified mathematics and basic science teachers at senior secondary schools in Nigeria can be address effectively if polytechnic in Nigeria and specifically in Bauchi State would continue to admit candidates into 1st degree programs mathematics, chemistry, physics and biology as done in other programs including computer science education. This is a clear indication that the admission of more brains in the said fields of study remain a measure for the enhancement of qualified science teachers at senior secondary level in Nigeria and Bauchi State in particular

Implications of the study

The outcome of this study revealed that the admission of candidate into first degree programs in the Abubakar Tatari Ali Polytechnic would promote the supply and production of more science teachers in the state. Since the demand of mathematics and basic science teachers has become a matter of concern among the educational stake holders. Further research may also be conducted to investigate the effectiveness of admission of candidates into degree programs at polytechnics alongside Universities in Nigeria.

Recommendations

The following recommendations are made based on the findings

1. Admission of candidates into first degree programs in polytechnics should include mathematics, chemistry, and biology and physics education in the course list.
2. The Polytechnic admission stakeholders should have detail look on the findings and give equal opportunities for enhancement of qualified mathematics and basic science teachers in Bauchi State, Nigeria

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