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Overloaded Curriculum Content: Factor Responsible for Students' Under Achievement in Basic Science and Technology in Junior Secondary Schools in Plateau State, Nigeria

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Abstract. The study was conducted to find out if overloaded curriculum content is one of the factors responsible for JSS 2 students' underachievement in Basic Science and Technology. The survey design was used in carrying out the study in the three senatorial zones of Plateau State. The population consisted of 395 Basic Science and Technology teachers and 26, 098 of junior secondary 2 students. Out of these populations, a sample of 60 teachers and 720 students were sampled in 5 schools from each of the senatorial zones using the proportionate to size stratified random sampling techniques for unequal sizes. Three research questions guided the study. Teachers' questionnaire, students' questionnaire and JS 2 basic science and technology curriculum content constituted the instrument for data collection. The findings revealed that the percentage of untreated topics were high with 72%. Both teachers and students strongly agreed that overloaded curriculum content is one of the major factors responsible for students' underachievement in basic science and technology. It was recommended that the curriculum content should be reduced to manageable size that teachers can treat within a given school academic calendar. It was also recommended that more time should be spent on practical activities and topics in the curriculum content should be properly taught at each level before moving to the next.

Keywords: Basic Science and Technology, Overload Curriculum Content and Underachievement.

1. Introduction

Science and technology is the bedrock on which every country anchors the foundation of its development. This is based on the fact that science and technology provide the avenue for effective harnessing and utilization of the resources of any country for national development. Fatokun and Jimoh (2018) viewed scientific literacy as the development of scientific and technological attitudes, approaches and skills which are necessary to cope with a rapidly changing environment and society. Science and technology play an essential role in shaping an individual's attitudes, skills and abilities that are necessary for effective living in the society. It provides the tools and knowledge for individuals to understand their society and its structures in other to influence their environment positively. Basic science and technology constitutes the training of persons in the social norms and values of the immediate society so as not to become a misfit of that society but rather useful citizens that can make positive contributions to the society.

Curriculum is the experience a school system provides for its students. Curriculum can be viewed as all the experiences/activities (co-curriculum activities) provided under the auspices of school to bring about a change in the learner in the desired direction. Science curriculum can therefore be viewed as all the experiences in science provided by the school for the achievement of goals of science education in the learner. Curriculum development in science education is an aspect of curriculum study that comes at the generation and improvement of curriculum for promoting teaching and learning of basic science and technology as well as enhancing man's lot as a civilized being (Lawrence & Abraham, 2016). It tries to blend theory with practice for possible achievement of the objectives of basic science and technology. It involves adjusting the content or any aspect of the curriculum to meet

changing needs (Maduatum, 2018). Curriculum content in basic science and technology refers to series of themes, sub-themes, units, topics in basic science and technology which students are made to study. It involves the knowledge, concepts, principles, generalizations, beliefs, theories, techniques, skills, and so on in basic science and technology that the students are expected to learn in order that the stated objectives of the subject could be achieved (Kola, 2018).

An overloaded curriculum is seen as having too many topics to be covered in basic science and technology that cannot be adequately taught within the span of an academic calendar year while underachievement is the process by which the curriculum objectives are not acquired by the learners by way of poor achievement or other demonstration of lack of skills acquisition after a period of instruction. For any form of education to be relevant to the need of a nation, it has to appropriately address those needs. There is a paradigm shift from theory laden curriculum to that which emphasizes the development of skills and conceptual understanding that are necessary for the development of innovative minds. There is need to pursue the views of scholars on science curriculum contents taught in schools and the underachievement of students in basic science and technology (Clauss, 2019). The problem of underachievement has consistently been a worrisome situation affecting basic science and technology in Nigeria over the years as seen in the table below:

Table 1: Achievement in JSSCE in Basic Science and Technology 2011-2020 in Plateau State

Year	Enrolment	A	%	C	%	P	%	F	%
2011	19617	474	2.42	4011	20.44	13257	67.58	1875	9.56
2012	26401	960	3.90	12926	52.54	9413	38.26	1302	5.30
2013	28018	732	2.61	5170	18.45	14696	52.45	7421	26.49
2014	32794	297	0.91	4192	12.78	20171	61.51	8134	24.8
2015	43470	683	1.57	9672	22.25	25266	58.12	7849	18.06
2016	45250	750	1.66	9313	20.58	29131	64.38	6059	13.38
2017	52232	557	1.07	8955	17.14	31992	61.25	4263	8.16
2018	25960	533	2.05	6475	24.94	17856	68.78	783	3.02
2019	24189	2688	11.11	15348	63.45	5368	22.19	378	1.56
2020	25017	2559	10.23	9098	36.37	11980	47.89	689	2.75

Source: *Department of Statistics and Planning ERC, Plateau State Ministry of Education, Jos 2014*

The results showed that those with pass and fail have the highest percentages from 2011 to 2020. A number of factors have been identified by researchers to be responsible for student underachievement in basic science and technology and such factors include: Defective instructional methodology by teachers (Ajaja & Eravwoke, 2014); Presentation of concept out of context and abstract nature of science (Ogunniyi, 2015); Students poor attitude to science (Agu, 2016); inadequate instructional materials (Agu, 2016); Poor teacher student classroom interaction pattern (Achor & Orji, 2011); Lack of workshop opportunities for teachers (Daramola & Odigiri, 2016); Poor funding of research in science and technology (Audu, 2016); Disconnect between school science, industry and society needs (Daramola & Odigiri, 2016); Irregular supply of elcctricity to keep science and technology equipment functional; Lack of hands on science activities in classrooms (Ajayi & Ogbeba, 2017).

With suggestions profound as a result of the identified factors by these researchers and others that were not listed, students' underachievement in basic science and technology is still a thing of concern. Would overloaded curiculum content be a major cause of underachievement in basic science and technology? It is against this backdrop that this study aimed at finding out whether overloaded curriculum content is the major cause of students' underachievement in Basic Science and Technology in Plateau State.

2. Aim and Objectives of the Study

The aim of the study was to find out if overloaded curriculum content is one of the factors responsible for underachievement of students in basic science and technology. The study has the following objectives:

- find out the number and percentage of topics in the curriculum content that were treated and those that were not treated from 2015/2016 – 2019/2020 school calendar?.
- find out the views of teachers and students on number of topics on the curriculum content to be taught in basic science and technology?
- find out if overloaded curriculum content is the major cause of students' underachievement in basic science and technology.

3. Research Questions

- What percentages of topics in the curriculum content of Basic Science and Technology were treated from 2015/2016 – 2019/2020 in the school academic calendar?
- What are the opinions of teachers and students in the number of topics in the curriculum content taught in basic science and technology?
- To what extent does overloaded curriculum content contribute to students' underachievement in basic science and technology?

4. Methodology

The population of the study consisted of Junior Secondary two basic science and technology teachers and students from 391 schools in Plateau State. A total of 395 teachers (145 males and 250 females) and 26,098 students (14,950 males and 11,148 females) constituted the population from public junior secondary two students in the state.

The sample of the study was made up of 60 basic science and technology teachers (26 males and 34 females), and 720 JSS two students (376 males and 344 females) selected through the use of proportionate stratified random sampling technique to obtain samples from 5 schools each in the three senatorial zones of Plateau State. The instruments for collecting the data were direct assessment of topics treated and those not treated by the teachers from the scheme and record of work for JS 2 in the schools by the researchers. Result entry sheet was used to fill in the information. Also basic science and technology curriculum content assessment (BSTCCA) questionnaire was developed by the researchers and was used to determine the responses of teachers and students on the number of topics in the curriculum content meant to be taught and also to seek their opinions on the loads of the topics in the curriculum content. The researchers in collaboration with experienced basic science and technology teachers and test and measurement experts developed the instruments for the students and teachers to respond to. The instrument for teachers and students had two sections: A and B. Section A is personal data and Section B contained all the contents in basic science and technology curriculum recommended to be taught to JSS two students. The teachers and students were asked to express their opinions by ticking the ones appropriate to them. Since the schools were not or equal sizes, the proportionate stratified random sampling technique was used to select the respondents (Awotunde & Ugodulunwa, 2004).

5. Results

Research Question 1: What percentage of topics in the curriculum content of basic science and technology were treated from 2016-2020?

Table 2: Percentage of Topics Treated in Curriculum Content of Basic Science and Technology.

School calendar Year	No. of themes	No. of sub-themes	No. of Topics	No. Of Topics Treated	Percentage	No. of Topic not treated	Percentages
2015/2016	4	25	88	73	68	15	32
2016/2017	4	25	88	69	78	19	22
2017/2018	4	25	88	58	66	20	34
2018/2019	4	25	88	62	70	26	30
2019/2020	4	25	88	25	28	63	72

The results in table 2 showed that the topics meant to be treated from 2015/2016 to 2019/2020 in the school academic calendar were not fully covered. It also indicated that the highest percentage of topics covered were in 2016/2017 school academic calendar which was 78% while the highest percentage of topics not treated was 72% in 2020.

Research Question 2: What are the views of teachers and students in the number of topics on the curriculum content taught in basic science and technology?

Table 3: Teachers' Opinions on Topics of the Curriculum Content

S/N	Item	SA	A	D	SD	Total
1	The number of topics in the curriculum contents are too many to be taught	26(44%)	20(32%)	8(14%)	6(10%)	60(100%)
2	Overloaded curriculum contents is the major cause of students'	46(76%)	10(16%)	2(4%)	2(4%)	60(100%)

	underachievement					
3	The number of topics in the curriculum content should be reduced	30(50%)	15(25%)	8(13%)	7(12%)	60(100%)
4	Time allocation to treat the topics is sufficient	6(10%)	8(14%)	20(32%)	26(44%)	60(100%)

Table 3 revealed that 44% of the teachers strongly agreed that topics in the curriculum content are too many, 76% strongly agree that overloaded curriculum content is the major cause of students underachievement, 50% strongly agreed that the number of topics in the curriculum content should be reduced, while 44% strongly disagree that time allocated to treat the topics were sufficient.

Table 4: Students' Opinions on Topics of the Curriculum Content

S/N	Item	SA	A	D	SD	Total
1	Teachers are capable of treating all the topics	95(13%)	77(33%)	232(33%)	316(44%)	720(100%)
2	Teachers are not detailed in treating the topics	316(44%)	231(33%)	77(10%)	95(13%)	720(100%)
3	Teachers always leave some topics untreated	332(33%)	393(54%)	95(13%)	0(0%)	720(100%)
4	Teachers treat many topics at the same time	95(13%)	77(11%)	232(32%)	316(44%)	720(100%)
5	Teachers always create time for practical work	77(11%)	95(13%)	232(33%)	316(44%)	720(100%)

Table 4 showed that 44% of the students strongly disagreed that teachers are capable of treating all the topics in the curriculum content, 44% strongly agreed that teachers are not detailed in treating the topics, 54% agreed that teachers always leave some topics untreated, 44% strongly disagreed that teachers always leave such topics untreated, 44% strongly disagreed that teachers treat many topics at the same time, and also 44% strongly disagreed that teachers always create time for practical work.

Research Question 3: To what extent does overloaded curriculum content contribute to students' underachievement in basic science and technology?

Table 5: Extent of How Overloaded Curriculum Content Contribute to Students' Underachievement in Basic Science and Technology.

S/N	Item	SA	A	D	SD	Total
1	Overloaded curriculum content has led to poor achievement of students in examination.	45(75%)	12(20%)	3(5%)	0(0%)	60(100%)
2	Overloaded curriculum stresses teachers during instruction.	50(83%)	10(17%)	0(0%)	0(0%)	60(100%)
3	Overloaded curriculum content makes teachers rush to cover the content at the expenses of understanding by student	54(90%)	6(10%)	0(0%)	0(0%)	60(100%)
4	Overloaded curriculum content has led to inadequate generation of items during examinations leading to poor performance.	53(88%)	7(12%)	0(0%)	0(0%)	60(100%)

Table 5 shows that 75%, 83%, 90% and 88% of teachers strongly agreed that overloaded curriculum content contribute to students under achievement, stress up teachers during instruction, rush the content at the expense of understanding, and leads to poor items generation during examinations respectively.

6. Discussion

Answers to research question 1 revealed that most teachers do not treat all the topics meant to be taught in basic science and technology curriculum content. The findings from 2015/2016 to 2019/2020 school calendar year showed that 68%, 75% 66%, 70% and 74% were treated in 2015/2016, while 32%, 22%, 34%, 30% and 26% of the topics were left untreated. These untreated topics from the curriculum content will have negative effects on not promote the teaching and learning of basic science and technology as noted by Lawrence and Abraham (2016).

Research question 2 revealed that majority of the teachers expressed that topics in the curriculum content are overloaded, and of the opinions that the

curriculum content should be reduced and the time allocated to teach the topics should be increased while from the students perspectives, the teachers do not treat all the topics, they do not treat the topics in detail and do not create enough time for practical works during instruction contrary to the assertion made by Maduabum (2017) who said that science teachers should blend theory with practice for possible achievement of the objectives of basic science and technology. Maduabum is of the opinion that certain aspect of the curriculum content should be adjusted to meet changing needs, which is similar to the opinions of the teachers in reducing the topics of the content of the curriculum.

Findings from research question 3 revealed that overloaded curriculum content in basic science and technology has led to poor performance by students' underachievement with a very high percentage of 75% strongly agreed with 20% agreed and only 5% disagreed and nonstrongly disagreed. Thus an overwhelming majority of the teachers are of the view that they are usually stressed up during instructions and they rush to cover the curriculum content from the syllabus at the expense of the students' understanding what is being taught. Furthermore, they were of the opinion that overloaded curriculum content has led to inadequate generations of items during examination as some teachers might set questions from content areas they might have not taught which obviously lead to under achievement (Okwu, 2017).

From the findings, it is certain that most of the teachers did not cover all the topics at each level. This could result to underachievement of students in Junior Secondary School Certificate Examinations (JSSCE) in basic science and technology. Teachers tried to cover the topics in the curriculum content thereby not giving much attention to details, whereas some paid attention to details at the expense of covering the topics in the curriculum content. Whenever this happens, items sampled as questions by examiners might not have been exposed to students during the course of instruction, thereby leading to underachievement. This agreed with the finding of Oludipe and Awokoye (2018) who found out that overloaded biology syllabus is a major contributor to students' under achievements. Research findings by Sheron (2015), Pethuses (2016) and Okwu (2019) revealed that the curriculum contents of biology and mathematic are full of topics that would not be covered or taught. The implication of this study is that the curriculum content need to be reviewed and topics to be taught should be those that the teachers could possibly cover within a specified academic calendar year.

7. Conclusion

Concluding from the discussion above, the researchers found out that overloaded curriculum content of basic science and technology led to underachievement of students in Basic Science and Technology, this makes teachers to rush to cover the syllabus. It was the teachers' opinions that topics in the curriculum contents should be reduced to manageable sizes that will enable the teachers finish treating them within a school calendar year.

8. Recommendations

The following suggestions are made to improve on the achievement of students in basic science and technology:

- The curriculum planners should look at possible ways that the curriculum contents could be reduced to manageable sizes.
- There is the need to expunge the topics that are not appropriate in the basic science and technology curriculum content.
- Teachers should be encouraged to spend quality time on practical activities in basic science and technology classes.
- The topics in the curriculum content of each class are to be properly taught to the students at that level before proceeding to the next class.
- Teachers should be trained and retrained through workshops and seminars on how to emulate practical activities in the schemes of work that will motivate students' interest their lessons.

References

Achor, E.E. & Orji, A.C. (2011). Levels of Students' Motivation in Classroom Interactions in Integrated Science. *Journal of Research in Curriculum and Teaching*. 4(1), 294-303.

Agu, P.A. (2016). Policies Practices and Challenges of Science and Technology Education in Nigeria. In E.U.U. Akpan, F.O. Agbo & Mang, L.G. (eds), Policies Practices and Challenges of Science and Technology Education in Nigeria. A Book of Reading in Honour of Prof. C.T.O. Akinmade. Jos: Fab Anieh Publishers.

Ajaja, O. & Eravwoke, O.U. (2010). Effects of Cooperative Learning Strategy on Junior Secondary School Students Achievement in Integrated Science.

Electronic Journal of Science, South Western University. Retrieved from http//ejese.southwestern.edu.

Audu T.A. (2016). Reinventing Science Education in Nigeria for National Development: In E.U.U. Akpan, F.0. Agbo & L.G. Mang (eds), Policies Practices and Challenges of Science and Technology Education in Nigeria. A Book of Reading in Honour of Prot. CTO Akinmade. Jos: Fab Anieh Publishers.

Awotunde, P.O. & Ugodulunwa, C.A. (2004). Research Methods in Education. Jos: Fab Anieh (Nig.) Ltd.

Clauss, P.C. (2012), Education in Nigeria: Historical Perspectives. Onitsha: Adson Educational Publishers

Daramola, I. S. & Odigii, M. (2016). Challenges in technical skills acquisition and development in enhancing manpower development in nigeria. In E.U.U. Akpan, F.O. Agbo & L.G. Mang (eds), Policies practices and challenges of science and technology education in Wigeria. A Book of Reading in Honour of Prof. CTO Akinmade. Jos: Fab Anieh Publishers.

Fatokun, K.V.F. & Jimoh, S.B. (2018). Empowering Rural Female Secondary School Students through Functional Chemistry Education for Health Creation and Social Integration. 59th Annual Conference Proceedings of Science Teachers Association of Nigeria (STAN), 3-10, Abuja: STAN PLACE Ltd.

Kola, A.J. (2013). Importance of Science Education to National Development and

Problems Militating against its Development. American Journal of Educational Research, 1(7), 275-229.

Lawrence, E. & Abraham, A.C. (2016). The Challenge of Effective Teaching of Chemistry; A Case Study, Retrieved from iejp.academicdirect.org on 10" October, 2018.

Maduabum, A.L. (2017). The Place of Education in Scientific, Technological and Economic Development. Journal of Studies in Education, 6(2), 12- 18.

Okwu, B. O. (2019). Self confidence in learning and academic achievement. Journal of Science Education, 8(12), 636-643.

Oludipe, O. Y. and Awokoye U.V. (2010). Alternative Strategies for Education and Curriculum Implementation. *Journal of Science Education*, 62(24), 568-596.

Pethuses G.M. (2014). Assessing the Curriculum Content of Biology Education. *Journal of School of Science Education and Research*, 78(54) 162- 174.

Sheron A.S. (2012). Factors affecting the implementation of Science Education Curriculum. *Review of Research in Science Teaching*, 22(8), 54-69.

Suwaid, F.K. (2018). New views for the learner: Implication for instruction and curriculum. *International Education Journal*, 42(68), 896- 112.

Udoh, A.O. & Akpan, O.E. (2014). Functional education: Rising vocational skills requirement in a global economy. *International Journal of Research in Humanities, Art and Literature*, 2, (6), 2347-4564.