

Innovations

Process and Key Considerations in Developing a New Basic Science Curriculum Framework for Disabled Learners in Junior Secondary Schools in Ekiti State, Nigeria

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Abstract: *This study explores the process and key considerations involved in developing a new basic science curriculum framework for disabled learners in junior secondary schools in Ekiti State, Nigeria. In recognition of the unique cognitive and processing challenges faced by these learners, the framework emphasizes pedagogical approaches that promote accessibility, engagement, and deep understanding of scientific concepts. The study adopted a descriptive research design of survey type. The sample for the study comprised 120 students in senior secondary schools in Ekiti. Data were collected with instruments titled “Disabled Students Experiences and Perspectives in learning (DSEPL), Teachers’ Teaching Styles for Effective Learning (TTSEL), Student Attitudinal Scale (SAS) and Basic Science Performance Test (BSPT). The reliability of the instruments was determined through Cronbach-Alpha, which yielded a correlation coefficient of 0.75, 0.82 and 0.79, respectively, at the 0.05 level of significance. Frequency counts and percentages were used to analyze the data. Findings revealed that developing a new Basic Science curriculum framework, creating inclusive environment and the integration of adaptive learning influence the experience and perspective of the disabled students' learning.*

Keywords: *Basic Science Education, Learning disability, Curriculum development, Disabled learners, Junior Secondary School Students*

Introduction

Curriculum is a set of plans of activities conducted as a guide, covering several dimensions of learning, such as learning objectives, learning materials, teaching methods, and assessment, to achieve specific educational goals. In line with this, Olivia (2012) describes curriculum as a construct or concept of an extremely complex idea or set of ideas which is planned to educate students under the guidance of the school. Curriculum is a social item which is configured

according to elements of a cultural heritage worthy of being transmitted or communicated to the generation of learners. It is an essentially practical activity to improve the quality of teaching and learning through the use of systematic planning, development, and review practices in all aspects of any program. Richards (2001) noted that the curriculum provides many practical solutions to scientific programs for the development and renewal of elements such as planning goals and objectives, testing and analysis, materials development, language teaching, and evaluation.

Curriculum development is a vital issue that comprises a series of activities that contribute to the growth of teaching and learning in schools. Curriculum activities provide a framework that helps teachers accomplish the aim of teaching and learning activities. It helps in developing teachers to understand how the essential elements and component instructions interact in particular teaching situations. In fact, curriculum development guides in implementing the learning process in many areas, such as direction for student adaptation, integrative guidance for individual differences, and preparation for study, among others. Curriculum is a systematically planned document which plays a very important role in education. It is supposed to cater for every learner's knowledge, either abled or disabled.

Education for children, irrespective of ability, is a right. Unfortunately, some children with disabilities in Nigeria have not been satisfied with this; it is only a few lucky ones who get this opportunity. A learning disability is a neurological condition that affects how a person acquires, processes or uses information. It is a disorder that affects the ability to acquire and use academic skills such as reading, writing and calculating, among others. Eunice Kennedy Shriver National Institute of Child Health and Human Development (2018) noted that learning disability affect how someone learns to read, write, speak, and do mathematics. This researcher emphasizes that having disability is not associate with intelligence. This indicates that someone's brain is working differently from others. Therefore, many people with learning disabilities may be of average or above-average intelligence. Students with learning disabilities are facing several challenges in school, such as struggling with specific areas such as reading, writing, mathematics, organization and memory. This seems to hinder their learning experience. One of the significant issues is reading comprehension. Basic Science texts often contain complex, intricate concepts that can be difficult for these students to grasp. This can lead to misunderstandings of key ideas in biology, chemistry and physics aspects of the subject.

Likewise, Visual aids, such as diagrams and charts, which are crucial, can pose a challenge for students with visual processing difficulties. For example, they may not be able to interpret essential visuals such as symbols or formulas in chemistry and physics, photosynthesis or cellular respiration to the level of understanding.

Additionally, memory retention can be problematic in some aspects of Basic Science, such as biology, physics and chemistry, which require processes with strong recall skills. Critical attention and focus are needed for student-related disabilities. Difficulty in concentration during a lesson in the classroom can result in misinformation. Furthermore, students with fine motor skill difficulties may struggle with practical tasks, limiting their participation in hands-on laboratory work, which is a vital part of science education. Difficulty in organizational skills may form a hindrance to the management of their study materials and time effectively. Prisma (2025) found that disabled students often face social challenges, making it hard to identify the best course of action, which could allow them to reach their full potential. This researcher submitted that these students may lag behind their peers due to the way their brains process information. It is impossible to integrate students with learning disabilities in a class of more than fifty students, as it reduces teacher-student contact and makes the selection of suitable teaching methods impossible. Though children with disabilities are enrolled in secondary schools, very few complete the secondary cycle of education. This is attributed to the curriculum that does not serve the needs of the disabled and the school infrastructure, which is also not supportive. USDC (2003) noted that the curriculum examination system is not flexible and does not cater for students with learning disabilities, as the assessment has not been standardized. This researcher further submitted that students with disability are not taken into consideration in the planning of the curriculum.

Oyekefi and Nzewi (2012) noted that teaching should be activity-based and student-centred to promote student engagement in the teaching and learning process. For students with learning disabilities, developing a new curriculum framework should focus on guided discovery, hands-on laboratory techniques, field studies, and critical thinking skills. Agboola and Oloyede (2007) also emphasizes that for effective instruction, a science teacher must be able to use several science teaching methods and to implement them where they are applicable and most effective. Unfortunately, some school administrators seems currently being faced by huge challenges on the best way they can address the educational needs of special students. This arises owing to the fact that most teachers are not properly trained to handle any challenged learners (Verspoor, 2008). Corroborating this, Oyelekan, Igbokwe and Olorundare (2017) affirmed that science teachers barely utilized innovative teaching strategies in their lessons.

Purpose of the study

The purpose of this study is to examine the process and key considerations involved in developing a new Basic Science curriculum framework for disabled learners in Junior Secondary Schools. It is also to develop a specialized Basic Science curriculum framework that incorporates adaptive strategies, assistive technologies, and differentiated instruction to enhance learning outcomes for

students with learning disabilities. It is also to investigate the effectiveness of the new curriculum framework on the learning ability of disabled students in Basic Science.

Research Questions

The following research questions were raised for the study.

- i. Will the processes of developing a curriculum framework influence the perspective and experience of learning ability of disabled students in Basic Science?
- ii. Will the development of the curriculum framework influence the attitude of disabled students towards learning Basic Science?
- iii. Will developing a new Basic Science curriculum framework influence the performance of disabled students?

Research Hypothesis

The following research hypotheses were tested at the 0.05 level of significance.

1. The new curriculum framework will not significantly influence disabled students' learning ability in Basic Science.

Methodology

Research design

This study adopted a descriptive research design of the survey type to describe the exploration of the process and key considerations involved in developing a new Basic Science curriculum framework for disabled learners in junior secondary schools. The design is suitable because it enabled the researcher to gather relevant information from Basic Science disabled students, parents/guardians, and Basic Science teachers using a qualitative measure of survey.

Sample and sampling procedure

The sample for this study comprises 60 junior secondary students offering basic science, nine teachers teaching Basic Science and 12 parents of disabled students who were selected using a multistage procedure. The selection of samples involves the purposive selection of three local government areas in Ekiti State while the second stage involved the purposive selection of three special schools for the disabled situated in three local government areas in Ekiti States which comprised the (the special school for the blind in Ikere Ekiti, the special school for the deaf in Ikoru Ekiti and physically challenged and intellectual disability school in Ido Ekiti). The third stage involved the use of a simple random sampling technique to select twenty students from each school(making a total number of 60 disabled students). The fourth stage involved the purposive selection of three teachers in each of the schools (making a total of nine teachers). The last stage involved the purposive selection of four parents of disabled

students in each of the special schools in each local government area (making a total number of 12 parents). In all, the total sample of 60 disabled students, nine teachers and 12 parents were selected for the study.

Research instruments

Four sets of instruments were used to collect data for the study. These are Disabled Students' Experiences and Perspectives in learning (DSEPL), Teachers' Teaching Styles for Effective Learning (TTSEL), Students' Attitudinal Scale (SAS) and Basic Science Performance Test (BSPT). The Basic Science Performance Test contained 30 items structured in respectively. The Basic Science Performance Test (BSPT) has two sections. Section A requested information about the school, sex of the student, nature of impairment and School location. Section B contained 30 objective questions, which were prepared by the researcher based on the contents of the topic taught by the teacher at the time of the study. The students were asked to pick the appropriate option on each item. These items were given to three experts in the field of Basic Science, two experts from the area of test, measurement and evaluation, and two experts in the area of psychology from the University for Face, Construct and Content validities, respectively. Chronbach's alpha was used to determine the reliability of the instruments from which yielded 0.78, 0.79 and 0.87 for DSEPL, TTSEL, SAS and BSPT, respectively. The Basic Science Performance Test contained 30 items structured respectively. Each of the items of BSPT was scored one mark. Thus, the total mark obtained by a subject is 30marks. The data collected were analyzed using frequency count, percentage, mean and standard deviation.

Results:

1: Will developing a new Basic Science curriculum framework influence the experience and perspective of the disabled students learning positively?

Table 1: Frequency counts and percentage of developing a new Basic Science curriculum framework to influence the experience and perspective of the disabled students learning

S/N	.The Experience And Perspective of Disabled Students Using a New Basic Science Curriculum Framework	Agree		Disagree	
		Freq	%	Freq	%
1	Teachers' teaching styles improve my learning of Basic Science	91	91.0	9	9.0
2.	I feel motivated to learn Basic Science despite my challenges	92	92.0	8	8.0
3.	I feel more engaged in learning Basic Science with the new curriculum framework.	94	94.0	6	6.0
4	My understanding of Basic Science concepts has improved through the new curriculum framework	81	81.0	19	19.0

Table 1 shows the frequency counts analysis of developing a new Basic Science framework for disabled learners' experience and perspective in learning Basic Science. The frequency count and percentage on the experience and perspective of disabled learners based on Basic Science curriculum frame work showed that 91(91%) agreed that they feel motivated to learn, 92(92%) of the respondents also agreed that their understanding of Basic Science concepts has improved, 94(94%) of the respondents agreed that they feel more engaged in Basic Science classes. While 81(81%) also agreed that the resources provided in the modified curriculum are helpful for their learning in Basic Science. From the table above, it could be concluded that developing a new Basic Science curriculum framework influences the experience and perspective of the disabled students' learning.

Research Question 2: Will the development of a new curriculum framework influence the attitudes of disabled students towards learning Basic Science?

Table 2: Frequency counts and percentage of developing of curriculum framework influence on the attitudes of disabled students towards learning Basic Science

S/N	Students' Attitudes towards Learning Basic Science	Agree		Disagree	
		Freq	%	Freq	%
1.	Developing of new curriculum frame work influences my attitude towards learning positively.	87	76.0	24	24.0
2.	Creating an inclusive environment encourages my learning of Basic Science positively	98	98.0	2	2.0
3.	I feel more comfortable with the incorporation of adaptive strategies introduced into the teaching of Basic Science	89	89.0	11	11.0
4.	I feel more confident in my abilities with the new curriculum framework integrated into the teaching of Basic Science.	76	76.0	14	14.0

Table 2 shows the difference in the influence on the attitudes of disabled students towards learning Basic Science. 87(87%) agreed that they believe that developing the new curriculum framework, the assessment criteria in indigenous methods are clearer and more understandable than those in the lecture method. Also, 98(98%) of the respondents agreed that creating an inclusive environment influences their attitude towards learning Basic Science positively. Also, 89(89%) agreed that they feel more comfortable with the incorporation of adaptive strategies introduced into the teaching of Basic Science, while 87(87%) of the respondents agreed that they feel more confident in their abilities with the new curriculum framework integrated into the teaching of Basic Science. From the table above, it could be concluded that creating an inclusive environment influences their attitude towards learning Basic Science positively.

Research Question 3: Will developing a new Basic Science curriculum framework influence the performance of disabled students?

Table 3: Frequency counts and percentage of a new Basic Science curriculum framework influence the performance of disabled students

S/N	Student's Performance in Basic Science	Agree		Disagree	
		Freq	%	Freq	%
1	The integration of adaptive strategies into teaching advanced my performance in Basic Science.	92	92.0	8	8.0
2	The incorporation of assistive technologies into teaching makes Basic Science more relevant and encourages my performance	69	69.0	31	31.0
3	Using the collaborative method in teaching Basic Science enhances my understanding and performance in the subject	80	80.0	20	20.0
4	Creating an inclusive environment enhances my performance in Basic Science	75	75.0	25	25.0

Table 3 shows the opinion of the students on the integration of adaptive strategies into the teaching of Basic Science. This shows that 92(97%) of the respondents agreed that the integration of adaptive strategies used by the teachers influences students' learning of Basic Science. Also, 69(69%) agreed that integrating assistive technologies into teaching makes Basic Science more relevant in teaching the subject. 80(80%) of the respondents agreed that using a collaborative method in teaching Basic Science enhances their understanding of the subject. While 75(75%) agreed that creating an inclusive environment enhances my learning in Basic Science. From the table, it could be concluded that the integration of adaptive strategies used by the teachers influences the learning of Basic Science.

Hypothesis 1: The new curriculum frame work will not significantly influence students' learning ability.

The Mean and Standard deviation of teachers' teaching styles will not significantly influence disabled learning ability in Basic Science

Teaching Styles	N	Mean	S.D	Df	r_{cal}	r_{tab}
Indigenous	24	17.15	14.18	98	0.191	0.833
New teacher teaching styles (Multisensory instruction, assistive technology etc)	36	19.43	13.36			

$P > 0.05$ (Significant Result)

Table 7 shows that the r_{cal} (0.191) is greater than r_{tab} (0.833) at the 0.05 level of significance. The null hypothesis is accepted, which implies that there is significant difference in the performance of disabled students taught using the teacher's new teaching styles.

Discussion

The result showed that developing a new Basic Science curriculum framework influences the experience and perspective of the disabled students' learning. The study of Richards (2001) supported that curriculum provides many practical solutions to scientific program for development and renewal of elements such as planning, language teaching, and evaluation but on the contrast, the study of Eunice Kennedy Shriver National Institute of Child Health and Human Development (2018) stated that learning disability affect how someone learns either to read, write, speak, and do mathematics. The result also showed that creating an inclusive environment influences disabled students' attitudes towards learning Basic Science. This is in line with the study of Agboola and Oloyede (2007), who emphasized that for effective instruction, a science teacher must use several science teaching methods and implement them where they are applicable and most effective, especially, using methods that often prioritize collaborative learning and community involvement, which can create a supportive learning atmosphere. But the study of USDC (2003) noted that students with disability are not taken into consideration in the planning of the curriculum. The result also showed that the integration of adaptive strategies to teach disabled students influences their learning in Basic Science. This is in support of the result of Agboola and Oloyede (2007), who noted that a science teacher uses several science teaching methods for effective instruction. In contrast, the study of Oyelekan, Igbokwe and Olorundare (2017) affirmed that science teachers barely utilized innovative teaching strategies in their lessons. The study also revealed that there is a significant difference in the performance of disabled students with the use of new teaching styles. In line with this, Richards (2001) noted that the curriculum provides many practical solutions to scientific programs for development. In contrast, Prisma (2025) found that disabled students often face social challenges, making it hard to identify the best course of action, which could allow them to reach their full potential.

Conclusion`

In conclusion, developing a new curriculum framework for Basic Science specifically designed for the disabled would support the students' learning ability and foster an inclusive educational environment. This study also highlights the importance of adapting teaching styles such as hands-on activities, visual aids, and collaborative learning opportunities and materials to meet the diverse needs of these students by the teachers. This framework would also improve the performance, boosting the confidence and motivation of students with learning disabilities. The curriculum can empower these students to reach their full potential by recognizing and addressing their unique challenges.

Recommendations

Based on the findings, the following recommendations are suggested:

- i. Developing a new curriculum framework at intervals should be encouraged for disabled students.
- ii. Integration of adaptive strategies to teach disabled students, which would influence their learning in Basic Science, should be encouraged.
- iii. Establishing and creating an inclusive environment that would influence disabled students' attitudes towards learning Basic Science should be encouraged.

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