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EDITORIAL

Dear Readers,

We are excited to announce the launch of International Journal of Contemporary Issues in Integrated Science Education (IJCIISE). This Association Integrated Science Educators' Association of Nigeria (ISEAN) play a vital role in promoting scientific advancement, supporting science education, informing science policy, recognizing science excellence and fostering community engagement. The desire to float this journal was borne out of the passion to organize a yearly conference of Integrated Science by the Integrated Science Educators' Association of Nigeria, of which selected scholarly articles will be published after a thorough review. The journal dedicated to advancing knowledge and fostering dialogue within. Our mission is to publish high-quality research, innovative ideas, and critical analyses that contribute to the understanding and development of Integrated Science. At IJCIISE, we believe in the power of interdisciplinary collaboration and inclusivity. We welcome contributions from scholars, practitioners, and thought leaders worldwide, providing a space for diverse perspectives and groundbreaking work. As we embark on this journey, we invite you to submit your research, engage with our content, and join us in creating a vibrant academic community. Together, we can push the boundaries of knowledge and inspire future generations. Thank you for your support as we launch this exciting new endeavour.

This edition moves around issues that border on **"Enhancing Quality Assurance in Integrated Science in Nigeria."** It is believed that diverse contributions from scholars and researchers expressed in this edition will provoke the understanding of issues that could foster education for societal transformations on a global scale
We look forward to your contributions!

For further information on future conference activities, visit **http://ijciise.org/index.php/ijciise**

Warm regards,
Professor O. S. Agboola
President, Integrated Science Educators' Association of Nigeria (ISEAN)

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A STUDY OF PERCEIVED DIFFICULT TOPICS IN BASIC SCIENCE CURRICULUM FOR JUNIOR SECONDARY SCHOOL STUDENTS IN IFE CENTRAL LOCAL GOVERNMENT, OSUN STATE

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Abstract
This study investigated perceived difficult topics in Basic Science curriculum in junior secondary schools. The study adopted descriptive survey research design. The sample constituted 100 junior secondary school Basic Science students. One local government was selected from the state using random sampling techniques. From the local government, five secondary schools were selected using simple random sampling technique and one intact class of the junior secondary school two was selected using simple random sampling technique. The research instrument used for data collection was Student's Questionnaire on Basic Science (SQBS). Data collected were analysed using descriptive statistics of frequency and percentage. The result showed that forces and motion, soil pollution, air pollution, simple machines, changes in non-living things and crude oil and petrochemicals were identified to be difficult with the frequency and percentage of 62.0%, 72.0%, 68.0%, 65.0%, 57.0% and 68.0% respectively. Also, the result showed that 48.18% of maleand 51.82% female students identified Basic Science concepts as being difficult. Finally, the result showed that 51.8% of the respondents were affirmative about the challenges students' face in understanding the difficult concepts in Basic Science while 48.2% of the respondents had contrary opinion on challenges students' face in understanding the difficult concepts in Basic Science. It is recommended that both teachers and

students should pay more attention to the teaching and learning of these difficult concepts in Basic Science in order to improve the performance of the students.
Keywords: Difficult concepts, Basic Science, Curriculum, Performance, Challenges

Introduction

Education is a broad and multifaceted concept that involves the process of acquiring knowledge, skills, values, and attitudes through various forms of learning. According to the Duoblienė, Kaire, and Vaitekaitis, (2023)education is defined as the key to personal development and the future of societies. Education has been recognized as a fundamental human right, and its importance has been emphasized in various international treaties and declarations, such as the Universal Declaration of Human Rights, 1948 and the Sustainable Development Goals, 2015(Collins, 2018). It is also viewed as a means of promoting social and economic development. According to the World Bank, education is a powerful driver of development and one of the strongest instruments for reducing poverty and improving health, gender equality, peace, and stability (Mahon, 2019). Furthermore, education is not limited to formal schooling but also encompasses informal and non-formal learning experiences. These can include self-directed learning, experiential learning, and community-based learning, among others (Murray& Brennan, 2023). In conclusion, education is a complex and essential concept that involves the acquisition of knowledge, skills, values, and attitudes through various forms of learning. It is viewed as a fundamental human right and a powerful driver of social and economic development.

Hence, Science is a systematic and evidence-based approach to understanding the natural world (Elliott & Resnik, 2019). It involves the use of observation, experimentation, and logical reasoning to develop theories and models that can explain phenomena and make predictions about future observations (Zou & Xu, 2023). Science has a long history, dating back to the ancient Greeks who made significant contributions to mathematics, physics, and astronomy. Since science has continued to evolve and expand, leading to countless discoveries and technological advancements (Ullah, et al, 2024). The scope of science is vast, encompassing a wide range of disciplines and fields of study, including physics, chemistry, biology, mathematics, astronomy, geology, and many others. Each of these disciplines has its own unique set of methods, theories, and areas of investigation, but they are all united by a common goal: to use evidence-based reasoning to better understand the natural world. Science plays a critical role in national development, providing the knowledge and tools necessary to drive economic growth, improve health outcomes, and address social and environmental challenges.

Science and technology are key drivers of economic growth, enabling the development of new products, services, and industries (Ghannouchi, 2023). Scientific research can lead to breakthroughs in fields such as medicine, agriculture, and energy, creating new opportunities for economic development and job creation

(Burke, Okrent, Hale & Gough, 2022). In addition, investment in science and technology education can help to develop a highly skilled workforce that is equipped to meet the demands of the modern economy (Blimpo & Owusu, 2019). Scientific research has played a critical role in improving health outcomes, from the development of life-saving drugs and vaccines to the discovery of new treatments for diseases (Collins, et al 2023). Advances in medical science have helped to reduce mortality rates and increase life expectancy, while research in public health has contributed to the prevention and control of infectious diseases (Dye, 2014). In addition, scientific research can help to identify and address environmental and social factors that contribute to poor health outcomes (Trapani, 2021). Science is also critical to addressing environmental challenges, such as climate change, pollution, and resource depletion (Uralovich, et al, 2023).

Scientific research can provide the knowledge and tools necessary to develop sustainable technologies, conserve natural resources, and mitigate the impact of human activities on the environment (Sullivan, et al, 2021). In addition, science education can help to raise awareness of environmental issues and encourage individuals to take action to address them (Oe, Yamaoka &Ochiai, 2022). Science education therefore, is the process of imparting knowledge, skills, and attitudes related to science and scientific inquiry. It plays a critical role in preparing students to participate in a society that is increasingly reliant on science and technology. Science education has continued to emphasize the importance of developing students' understanding of scientific concepts and processes, as well as their ability to apply scientific knowledge to real-world problems (Hofstein, Eilks & Bybee, 2011). Furthermore, there has been an increased focus on promoting equity and diversity in science education, with a recognition that access to high-quality science education is essential for all students, regardless of their background (Lee & Luykx, 2013; Lee, Russo Tait, 2023). The science education curriculum typically covers topics such as biology, chemistry, physics, and earth science. It is designed to provide students with a broad understanding of scientific concepts and principles, as well as hands-on experience with scientific inquiry (Crawford, 2014). The curriculum may also include topics such as science and technology in society, the history of science, and the scientific method.

Therefore, Basic Science as a subject under science education curriculum is a broad term that encompasses many fields of study. Hence, Hjørland, (2022) defined Basic Science research as systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. The Oh, (2024) defined Basic Science as research that is aimed at understanding the fundamental principles that govern the behavior of natural phenomena, without regard to practical applications. In addition, the Kragh, (2024) defined Basic Science as the study of natural phenomena and their underlying principles, guided by curiosity and aimed at advancing our understanding of the natural world. Overall, these definitions highlight the focus on acquiring new knowledge and understanding of the underlying

principles and foundations of natural phenomena in Basic Science. Basic Science education in Nigeria has undergone significant changes since the country's independence in 1960. Prior to independence, Basic Science education in Nigeria was mainly informal and was taught by traditional rulers, parents, and older members of the community (Jokodola, 2021). According to Godpower-Echie, and Owo, (2019), Nigerian students' performance in Basic Science has remained low over the years. The study revealed that Nigerian students scored significantly below the international average in both science and mathematics at the fourth and eighth-grade levels.

Similarly, the National Examination Council (NECO) in Nigeria released statistics in 2020 indicating that less than 30% of candidates who sat for the 2020 Basic Education Certificate Examination (BECE) achieved five credits, including Mathematics and Basic Science (NECO, 2020).Several factors have been identified as contributing to the poor performance of Nigerian students in Basic Science, such as inadequate teaching facilities, poorly trained teachers, and outdated curriculum (Badmus &Omosewo, 2018; Jacob, 2020). Difficult concepts have been identified as one of the reasons why students fail Basic Science. Several studies have shown that students perceive some topics in Basic Science to be difficult and challenging, which can negatively affect their performance and interest in the subject (Babayemi & Uko, 2014; Asu, &Ude, 2024). Byukusenge, et al, (2023)conducted a study on students' views of difficult concepts in biology and found that students identified complex topics such as genetics and molecular biology as difficult to understand. Similarly, Erinosho, (2013) and Uzezi, Ezekiel, and Auwal, (2017) investigated the perception of science as a difficult subject among secondary school students in Nigeria and found that abstract concepts in physicsand chemistrywere perceived to be difficult.

Furthermore, studies have shown that students who perceive Basic Science topics to be difficult are more likely to have negative attitudes towards the subject and are less likely to pursue science-related careers (Tytler & Osborne, 2012; Uitto, 2014.). Therefore, it is important for science teachers to identify difficult concepts and develop effective teaching strategies to help students understand and master these concepts. This can help to improve students' performance and interest in Basic Science.Thus, this study is set out to assess the perceived difficult topics in Basic Science curriculum in Ife Central Local Government Area. Although a lot of research has been carried out on the perceived difficult topics in Basic Science, none of the studies has investigated on this geographical location; Ife Central Local Government Area. Hence the gap left out by the previous literatures would be filled by this research.

Objectives of the Study

Therefore, the specific objectives of the study are to;

i) identify the perceived difficult topics in Basic Science curriculum in Junior Secondary Schools in Ife Central Local Government Area;

ii) assess the differences in the topics identified as difficult by male and female students in the study area; and
iii) examine the challenges students' face in understanding the perceived difficult concepts in Basic Science curriculum in the study area.

Research Questions

The following research questions were used to guide the study;

i) What are the identified perceived difficult topics in Basic Science Curriculum?
ii) What are the differences in the topics identified as difficult by male and female students in Basic Science curriculum?
iii) What are the challenges students' face in understanding the perceived difficult concepts in Basic Science curriculum in the study area?

Methodology

The study adopted a survey research design. The target population for this research is all Basic Science students in junior secondary schools in Ife central local government area of Osun State. The sample constituted 100 junior secondary schools Basic Science students that were selected using simple random sampling techniques. One local government was selected from the state using random sampling techniques. From the local government, five secondary schools were selected using random sampling techniques and one intact class of junior secondary school two was selected using simple random sampling techniques. The research instrument used for data collection was the Student's Questionnaire on Basic Science (SQBS). The questionnaire was divided into three main sections; Section A was to generate information of the respondents demographic data; Section B consisted of 28 Basic Science topics arranged in a rating scale; Section C address the challenges students face in difficult concept in Basic Science. The questionnaire used was a four point Likert rating scale of Very Difficult (VD), Difficult (D), Moderately Difficult (MD), and Not Difficult (ND). In order to determine the face and content validity of the instrument. The instrument was presented to some expert in test and measurement for review. The observations and suggestions were used for the final preparation of the instrument. The reliability of the instrument was determined by administering the questionnaire on some selected Basic Science students in Junior Secondary School Students who were not within the scope of the study. The reliability coefficient was found to be 088. Hence, it was concluded that the questionnaire was reliable. Data collected were analyzed using descriptive statistics of frequency, percentage and mean. The research question 1, was analyzed using frequency and percentage, research question 2 and 3 were analyzed using mean.

Results

Research Question One: what are the identified perceived difficult topics in Basic Science Curriculum in Ife central local government area?

Table 1 presented the descriptive analysis of identified perceived difficult topics in Basic Science Curriculum in the study area.

Table 1: Descriptive analysis of identified perceived difficult topics in Basic Science Curriculum

S/N	Topics	Difficult f (%)	Not Difficult f(%)
1.	Change in Matter	40(40.0)	60(60.0)
2.	Family Health	32(32.0)	68(68.0)
3.	Forces and Motion	62(62.0)	38(38.0)
4.	Environmental Pollution	40(40.0)	60(60.0)
5.	Parts of the Body	38(38.0)	62(62.0)
6.	Soil Pollution	72(72.0)	28(28.0)
7.	Air Pollution	68(68.0)	32(32.0)
8.	Drug Abuse	40(40.0)	60(60.0)
9.	Habitats	24(24.0)	76(76.0)
10.	Uniqueness of Man	50(50.0)	50(50.0)
11.	Simple Machines	65(65.0)	35(35.0)
12.	Energy It's Forms	40(40.0)	60(60.0)
13.	Changes in Living Things	50(50.0)	50(50.0)
14.	Safety and First Aid	23(23.0)	87(87.0)
15.	Electricity and Magnesium	50(50.0)	50(50.0)
16.	The Digestive System	44(44.0)	56(56.0)
17.	Changes in Non-Living Things	57(57.0)	43(43.0)
18.	Crude Oil and Petrochemicals	68(68.0)	32(32.0)
19.	Human Reproductive System	47(47.0)	53(53.0)
20.	Nutrition and Digestion	33(33.0)	67(67.0)
21.	Human Nervous System	33(33.0)	67(67.0)
22.	Information and Communication Technology	27(27.0)	73(73.0)

From Table 1, it should be noted that in the scoring of students' responses the four-Likert scale response format was collapsed into two categories; Very Difficult (VD) and Difficult (D) were categorized into Difficult (D), while Moderately Difficult (MD) and Not Difficult (ND) were categorized into Not Difficult (ND). Therefore, from the table, majority of the topics were not identified as being difficult by the students. However, Forces and Motion, Soil Pollution, Air Pollution, Simple Machines, Changes in Non-Living Things and Crude Oil and Petrochemicals were identified to be difficult through rating and ranking by the students with the frequency and percentage of 62(62.0), 72(72.0), 68(68.0), 65(65.0), 57(57.0) and 68(68.0).

Research Question Two: What are the differences in the topics identified as difficult by male and female students in Basic Science curriculum?

Table 2 presented the percentage scores differences of gender identification of perceived difficult concepts in Basic Science Curriculum in the study area.

Table 2: Percentage scores differences of gender identification of difficult concepts in Basic Science

S/N	Concepts	Male f(%)	Female f(%)
1.	Change in Matter	20(50.0)	20(50.0)
2.	Family Health	12(38.0)	20(62.0)
3.	Forces and Motion	42(68.0)	20(32.0)
4.	Environmental Pollution	20(50.0)	20(50.0)
5.	Parts of the Body	18(47.0)	20(53.0)
6.	Soil Pollution	32(44.0)	40(56.0)
7.	Air Pollution	28(41.0)	40(59.0)
8.	Drug Abuse	19(48.0)	21(52.0)
9.	Habitats	12(50.0)	12(50.0)
10.	Uniqueness of Man	25(50.0)	25(50.0)
11.	Simple Machines	35(54.0)	30(46.0)
12.	Energy It's Forms	20(50.0)	20(50.0)
13.	Changes in Living Things	30(60.0)	20(40.0)
14.	Safety and First Aid	12(52.0)	11(48.0)
15.	Electricity and Magnesium	26(52.0)	24(48.0)
16.	The Digestive System	22(50.0)	22(50.0)
17.	Changes in Non-Living Things	37(65.0)	20(35.0)
18.	Crude Oil and Petrochemicals	28(41.0)	40(59.0)
19.	Human Reproductive System	27(58.0)	20(42.0)
20.	Nutrition and Digestion	11(33.0)	22(67.0)
21.	Human Nervous System	11(33.0)	22(67.0)
22.	Information and Communication Technology	7(26.0)	20(74.0)
	Ground Mean	**(48.18)**	**(51.82)**

Table 2, showed that the mean average percent of 48.18% of the respondents represent males that identified the Basic Science concepts as being difficult while 51.82% of the respondents represent females that identified the Basic Science concepts as being difficult. It can be stated that female students identified more topics than male as difficult in Basic Science curriculum.

Research Question Three: What are the challenges students' face in understanding the perceived difficult concepts in Basic Science curriculum?

Table 3 presented the descriptive analysis of the challenges students' face in understanding the difficult concepts in Basic Science curriculum in the study area.

Table 3: Descriptive analysis of the challenges students' face in understanding the difficult concepts in Basic Science

S/N	Challenges	True f(%)	False f(%)
1.	Complex Concepts	45(45.0)	55(55.0)
2.	Lack of Clear Explanations	22(22.0)	78(78.0)
3.	Insufficient Practice Opportunities	62(62.0)	38(38.0)
4.	Inadequate Teacher Support	51(51.0)	49(49.0)
5.	Connecting Theory to Real-life Applications	70(70.0)	30(30.0)
6.	Time Constraints and Heavy Workload	72(72.0)	28(28.0)
7.	Lack of Interest or Motivation	58(58.0)	42(42.0)
8.	Fear or Dislike for the Basic Science Teacher	46(46.0)	54(54.0)
9.	The Teaching Methods are not Effective	54(54.0)	46(46.0)
10.	Shortage of Learning Resources	38(38.0)	62(62.0)
	Ground Mean	**51.8(51.8)**	**48.2(48.2)**

Table 3 showed the descriptive analysis of the challenges students' face in understanding the difficult concepts in Basic Science. Based on complex concepts 45(45.0%) of the respondents affirmed with the statement while 55(55.0%) of the respondents disagreed. Lack of clear explanations 22(22.0%) of the respondents agreed with the statement while 78(78.0%) of the respondents disagreed. Insufficient practice opportunities 62(62.0%) of the respondents agreed with the statement while 38(38.0%) of the respondents disagreed with the statement. Inadequate teacher support 51(51.0%) of the respondents agreed with the statement while 49(49.0) of the respondents disagreed with the statement. Connecting theory to real-life applications 70(70.0%) of the respondents agreed with the statement while 30(30.0%) of the respondents disagreed. Time constraints and heavy workload 72(72.0%) of the respondents agreed with the statement while 28(28.0%) of the respondents disagreed with the statement.

Furthermore, lack of interest or motivation 58(58.0%) of the respondents agreed with the statement while 42(42.0%) of the respondents disagreed with the statement. Fear or dislike for the Basic Science teacher 46(46.0%) of the respondents agreed with the statement while 54(54.0%) of the respondents disagreed with the statement. The teaching methods are not effective 54(54.0%) of the respondents agreed with the statement while 46(46.0%) of the respondents disagreed with the statement. Finally, considering the shortage of learning resources 38(38.0%) of the respondents agreed with the statement while 62(62.0%) of the respondents disagreed with the statement. The ground mean showed that 51.8(51.8%) of the respondents were affirmative about the challenges students' face in understanding the difficult

concepts in Basic Science while 48.2(48.2%) of the respondents had contrary opinion on challenges students' face in understanding the difficult concepts in Basic Science.

Discussion of Findings

The result showed that majority of the topics in Basic Science curriculum were not identified as being difficult by the students. The findings corroborated with Haruna (2021) that students usually have difficulties in some concepts in science subjects like nutrient cycling in nature, ecological management, and conservation of natural resources, pests and diseases of crops as well as reproductive system in plants. Likewise, Isma'il and Matazu, (2024) findings revealed that, in all the listed 30 biology topics, SS II students and their teachers identified Nutrition in animals, Respiratory system, and Pests and diseases of crops as difficult. More so, SS II students identified the topic Cell and its environment, Functioning ecosystems, and Nutrient cycle as difficult, while teachers considered them easier. Conversely, the findings is in variance with Calik and Ayas (2005)who revealed that JSS II students perceived some concepts as difficult in Basic Science and Technology and that some of those concepts were not taught to them. It was further revealed that there was no significant difference in mean performance between those who perceived the topics as not difficult and those who perceived them as difficult.

Additionally, the result showed that female students identified more topics than male as difficult in Basic Science curriculum. The findings is not in line with Bello, Opaleye and Olatunde, (2018) who revealed there was no significance difference in male and female students' perception of the difficult concepts in Physics curriculum. Likewise Filgona and Sakiyo, (2020) in their findings recorded that students' gender had no effect on their achievement when exposed to social studies using scaffolding and brainstorming instructional models. The result is not consistent with the conclusion made that male students outperform their female counterparts in computer graphics concepts using computer animation instructional strategies(Anih&Obadiaru, 2024).

Lastly, the result showed that students' face challenges in understanding some difficult concepts in Basic Science curriculum. The findings is line with Eze-Odurukwe (2014) who reported that lack of interest and lack of engagement in class on the part of both genders were all cited as reasons for the perceived difficulty in Chemistry. Furthermore, England, Brigati, Schussler and Chen, (2019) reported that an increase in perception of course difficulty and higher general class anxiety from the beginning to the end of the semester was significantly associated with lower final course grades particularly for females, non-Caucasians, and students who took fewer Advanced Placement (AP) courses. The outcomes of this study add credence to the work of Uzezi, Ezekiel and Auwal, (2017) who revealed that students in the third year of chemistry found out that the character of the school affected how students viewed challenging issues in the chemistry curriculum. Furthermore, Etobro and Fabinu, (2017) reported that teaching strategies, students' attitude, inadequate

learning resources and students' learning habits were the reasons adduced by students of the perceived difficult topics in biological science concepts.

Conclusion

The study concluded that students find some topics difficult in the Basic Science curriculum for junior secondary schools in Ife central local government area in Osun State. In addition, the study concluded that female students identified more topics than their male counterparts in the Basic Science curriculum and the result showed that students face challenges in understanding some difficult concepts in Basic Science curriculum.

Recommendations

Based on the conclusion of this study, it is hereby recommended that;

Both teachers and students should pay more attention to the teaching and learning of these difficult concepts so as to reduce the level of difficulty of these concepts and improve the performance of students in Basic Science subject.

Basic Science teachers should cultivate a positive attitude and commitment to the teaching of the subject so as to encourage students to study Basic Science with less difficulty.

Basic Science teachers should endeavor to make practical work a compulsory and integral part of the lessons so as to give the students opportunity to have independent hands-on experience of Basic Science concepts.

They should use familiar, local and relevant examples and analogies to bring down Basic Science concepts to the level of understanding of the students.

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