PROBLEMS FACED IN TEACHING AND LEARNING BIOLOGY PRACTICAL TOPICS IN SENIOR SECONDARY SCHOOLS IN OFFA LGA, KWARA STATE

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Abstract
The study investigated the problems faced in teaching and learning biology practical topics in senior secondary schools in Offa LGA, Kwara State. Three research questions were answered and two hypotheses were tested. The population comprised 184 respondents randomly selected in senior secondary schools in Offa local government area. Data was collected through a validated researcher-designed questionnaire with a reliability value of 0.92 from 60 Biology teachers and 124 students in Offa Local Government Areas, Kwara State, Nigeria. The data collected were analyzed using mean, standard deviation, and t-test. The findings showed that biology students and teachers encounter problem with biological concepts to real life, incorporating real-life application to Biology in teaching and learning biology among others. The results revealed that there was no significant difference in teachers' and students in perceived problems encounter with biological concepts to real life, communication of complex biological concepts clearly and understandably and video animations. Based on the findings it was recommended that Biology teachers should explore innovative teaching methods to improve student engagement and comprehension remains essential, irrespective of perceived differences in instructional strategies.

Keyword: Problems Faced, Teaching and Learning, Biology Practical Topics, Senior Secondary Schools

Introduction

Science is defined as a body of knowledge, a way or method of investigating, and a way of thinking to understand nature (Abimbola, 2013). Science is the bedrock on which modern-day technological breakthrough is hinged. Also, a systematic, precise, and satisfying enterprise requires creativity, skill, and insight. Science can also be defined as rationally structured knowledge about nature that embraces a systematic method of positive attitudes for acquisition, teaching, learning, and application

(Mberekpe, 2012). Science is a body of knowledge, a way or methods of investigation, and a way of thinking in the pursuit of understanding nature (Abimbola, 2016).

Biology as a branch of science deals mainly with the study of living. It is the branch of science that involves the study of the life of plants, animals, humans, and any other types of living organisms (Abidoye, 2021). Ackon, (2014), investigated the challenges contributing to the minimum use of practical work in biology identified include time, the attitude of the learner, resources, and material as contributing to the minimum use of practical work in biology. Chala (2019), observed the practice and challenges facing practical work implementation in Natural Science Subjects at Secondary Schools. The result shows that practical work is either totally not done or poorly implemented in secondary schools in these countries. The minimum use of this practical work in teaching biology might be due to the challenges teachers face in implementation. Daba, and Anbesaw (2016), observed the factors affecting implementation of practical activities in Science Education in Some Selected Secondary and Preparatory Schools. The result found out that the key challenges to biology practical work were: the absence of separate biology laboratories, teachers not embracing improvisation, and the local government's lack of paying attention to school challenges.

Teachers are essential in the entire educational system of any nation and are pivots on which education wheels revolve. Ashimole (2011), investigated on the developing teaching manpower through emerging myths and realities in Nigerian institutions. The result shows that teaching and learning depend largely on teachers and that it is on teachers' number, quality, and devotion that test the effectiveness of all educational arrangements, development, and growth. Akinsolu (2010) observed teachers and students' academic performance in Nigerian secondary schools. The result found out that teachers are vital prerequisites for students' attainment of educational goals and objectives. Furthermore, if students are not happy with the way that Biology is taught, they may show disinterest in and negative attitudes towards biology and its teaching. Without interest or motivation in the subject being studied, it is hard for the learner to keep learning. Ololube, (2005), observed the benchmarking motivational competencies of academically and professionally qualified teachers in Nigerian Secondary Schools and the result indicated significant difference in the study. Russell (2017), observed the tackling the outdated nature of secondary biology textbooks in the USA and reported that the constant evolution of biological knowledge can lead to outdated content in instructional materials. Also, inaccuracies and misinformation, underscoring the need for continuous updates to ensure instructional accuracy.

Sweller, Merriėnboer, and Paas, (2011), observed the cognitive architecture and instructional design. The result shows that educators must consider the cognitive demands of strategies to ensure that students can effectively process and understand the presented information while instructional strategies hold promise, an excessive focus on specific strategies can lead to overlooking broader educational principles. This research investigated on the problems faced in teaching and learning biology practical topics in senior secondary schools in Offa LGA.

Research Hypotheses

The following null hypotheses were tested in this study:

$H_0$1: There is no significant difference in teachers' and students' perception of professionalism problems in teaching and learning Biology topics in senior secondary schools.

$H_0$2: There is no significant difference in teachers' and students' perceptions of instructional strategies problems on teaching and learning Biology topics in senior secondary schools.

Methodology

The study is a descriptive of the survey type. This study adopted a survey method because the researcher intended to sample the opinion of a larger population through a sample size that is considered to be representative of the entire group and would give the report of the event as it occurs in actual reality.

The population for this study comprised all Biology teachers and students in Offa local government area. There are fifty (50) senior secondary schools in Offa L.G.A (Research and Statistics Department, Kwara State Teaching Service Commission). The target population was 130 secondary school biology students and 60 biology teachers randomly selected from 4 public and 6 private senior secondary schools in Offa L.G.A of 4830 biology students and 566 teachers, through the adoption a of ballot system to give every member an equal opportunity of being selected; whereby 6 biology teachers and 13 students were selected each from the sampled school. A total of 190 respondents were randomly selected from 10 secondary schools.

The researcher developed an instrument to elicit information from the respondents. The instrument was a close–ended structured questionnaire. The questionnaire was developed in line with the modified four-point Likert scale of Strongly Agreed (SA) Agreed (A) Disagreed (D) and Strongly Disagreed (SD) by the three research questions raised for the study. The questionnaire consists of two sections; section A contains brief information on the personal data of the respondents, while section B is made up of 15-item statements in which the respondents are expected to tick (“) as appropriate to them. The instrument was faced and validated by two (2) lecturers in Science Department, University of Ilorin, Ilorin, Nigeria. The researcher used Cronbach alpha reliability coefficient to determine the reliability of the instrument, alpha reliability coefficient of 0.812 was obtained.

The researcher visited all the schools and sought the consent of the school principals. The researcher personally administered the instruments to the teachers and students along with the informed consent form for the students, which seeks their rights to volunteer, and also states the purpose, procedure, risk, benefit, and confidentiality of the research.

These instruments were administered during the normal biology class hour to avoid disrupting classroom activities. After the completion of the questionnaires, 184 questionnaires were retrieved from the students and teachers. The instruments were treated with the utmost confidentiality and used for research purposes only.

Data collected were analysed with percentage, mean and t-test. All hypotheses were tested at .0.5 alpha level of significance.

Results

Research Question One: Are there practical problems in teaching and learning biology practical topics in senior secondary schools?

Table 1: *Participants' Response to practical problems in teaching and learning biology* practical *topics in senior secondary schools*

S/N	ITEMS	Mean	SD
1	The application of abstract biological concepts to real-life situations to help students to understand the relevance and importance of biology.	3.42	0.83
2	Real-life examples and case studies effectively to illustrate complex biological concepts to students.	3.06	0.89
3	Incorporating real-life applications of Biology in teaching to enhance students' problem-solving and critical-thinking skills.	2.57	0.93
4	Emphasising the practical applications of Biology to help students recognise potential career paths and future opportunities in related fields.	3.41	0.73
5	Real-life applications of Biology to increase student interest and engagement in Biology.	3.13	0.78
	Total	**3.44**	

Table 1 shows the practical problems in teaching and learning biology practical topics. Also the professionalism and instructional strategies. Items with mean values greater than 2.5 show the agreement of the respondents to the questionnaire items. The grand mean of 3.44, 3.47 and 3.49 respectively, which shows that there is a problem faced by Biology in teaching and learning biology practical topics.

Research Question Two: Are there professionalism problems in teaching and learning Biology practical topics in senior secondary schools?

Table 2: *Participants' Response on* professionalism problems in teaching and learning Biology topics in senior secondary schools.

S/N	ITEMS	MEAN	SD
6	I can effectively communicate complex biological concepts clearly and understandably.	3.15	0.92
7	I can provide timely and constructive feedback on assignments and assessments, facilitating student learning and improvement.	2.84	0.79
8	I effectively manage classroom behavior and create a respectful and inclusive learning environment for all students in Biology.	3.21	0.86
9	I can utilize a variety of instructional strategies and resources to cater to different learning styles and abilities in Biology.	3.31	0.72
10	I stay updated with current research and developments in the field of Biology, integrating relevant and cutting-edge information into instruction.	3.54	0.95
	Grand Mean	**3.47**	

Table 2 showed p- the value of 0.098 with a degree of freedom of 182 at 0.05 alpha level since p-value of 0.098 was higher than 0.05 which indicates that there is no significant difference in teacher and students' opinions towards the perceptions of problems in teaching and learning of biology practical topics in senior secondary schools. This implies that the opinion of teacher and student does not differ on the practical problems in teaching and learning biology topics in senior secondary schools. The null hypothesis that stated that there was no significant difference in teachers' and students' perception of professionalism problems in teaching and learning Biology practical topics in senior secondary schools therefore not rejected.

Research Question Three: Are there instructional strategies problems in teaching and learning Biology practical topics in senior secondary schools.

Table 3: *Participants' Response on* instructional strategies problems in teaching and learning Biology topics in senior secondary schools.

S/N	ITEMS	MEAN	SD
11	Video animations effectively engage me in the teaching process.	3.93	0.97
12	Diagrams and visual representation effectively help me visualise and teach complex information.	3.24	0.92
13	Video clips provide real-life examples and applications that make biology more relatable.	3.37	0.89
14	The instructional methodologies provide clear instructions and guidance for teaching activities in Biology.	3.28	0.87
15	The instructional methodology provides clear explanations and examples to support the teaching process.	3.63	0.82
	Grand Mean	**3.49**	

Table 3 showed a p-value of 0.097 with a degree of freedom of 178 at 0.05 alpha level shows that there was not significant difference since p-value of 0.097 was higher than 0.05.The null hypothesis two, which stated there is no significant difference in teachers' and students' perceptions of instructional strategies problems on teaching and learning biology topics in senior secondary schools was not rejected.

Hypothesis Testing

$H_0$1: There is no significant difference in teachers' and students' perception of professionalism problems in teaching and learning biology practical topics in senior secondary schools.

Table 4: *t-test on the difference in the perceptions of practical problems on teaching and learning of Biology topics in senior secondary schools.*

Variation	N	Mean	Std. Deviation	df	t–cal	t-crit	Remark
Teachers	60	66.0119	13.78186	182	0.87	1.96	Not Significant
Students	124	67.3021	11.39171				

* = significant at p

The analysis in table 4 shows that the calculated t-value of 0.87 is lower than the critical t-value of 1.96 at p<.05. Therefore, the null hypothesis one is accepted. This implies that there is no significant

difference in teachers' and students' perception of professionalism problems in teaching and learning biology practical topics in senior secondary schools.

$H_0$2: There is no significant difference in teachers' and students' perceptions of instructional strategies problems on teaching and learning biology practical topics in senior secondary schools.

Table 5: t-test on the difference in the perceptions of professionalism problem on teaching and learning of biology topics in senior secondary schools.

Variation	N	Mean	Std. Deviation	df	t-cal	t-crit	Remark
Teachers	60	61.0913	11.91123	182	0.077	1.91	Not Significant
Students	124	63.6118	8.73494				

The analysis in table 4 shows that the calculated t-value of 0.077 is lower than the critical t-value of 1.91 at $p<.05$. Therefore, the null hypothesis two is accepted. This implies that there is no significant difference in teachers' and students' perceptions of instructional strategies problems on teaching and learning biology topics in senior secondary schools.

Discussion of Findings

The study investigated problems faced in teaching and learning Biology practical topics in senior secondary schools in Offa LGA**,** Kwara State. These findings revealed the application of abstract biological concepts to real-life situations to help students to understand the relevance and importance of biology, real-life examples and case studies effectively to illustrate complex biological concepts to students and incorporating real-life applications of biology in teaching to enhance students' problem-solving and critical-thinking skills as the problems were faced by biology teachers and students in the teaching and learning of Biology topics. This may be as a result that there was not a conducive environment for practical activities. The finding is in line with Chala (2019) observed the practice and challenges facing practical work implementation in Natural Science Subjects at Secondary Schools. The result shows that practical work is either totally not done or poorly implemented in secondary schools.

The findings indicated that there was no significant difference in teachers' and students' perceptions of problems in teaching and learning Biology practical topics in senior secondary schools based on professionalism. This may be as a result that the professional and non-professional teachers do not attend to practical class well. This finding is in line with Ēimer (2011) who observed what makes biology learning difficult and effective: students' view. The results show that many concepts or topics in biology, perceived as difficult to learn by secondary school students and teachers.

The findings indicated that there is no significant difference in teachers' and students' perceptions of instructional strategy problems in teaching and learning biology practical topics in senior secondary schools. This is in line with Daba and Anbesaw (2016) who observed the factors

affecting implementation of practical activities in Science Education in Some Selected Secondary and Preparatory Schools of Afar Region, North East Ethiopia and the result indicated that there was no significant difference in the perception of respondents on factors affecting implementation of practical activities in Science Education.

Conclusion

1. There was no significant difference in teachers' and students' perception of professionalism problems in teaching and learning Biology practical topics in senior secondary schools.
2. There should be continued teacher training and development to enhance the professionalism and effectiveness of Biology educators.
3. There was no significant difference in teachers' and students' perceptions of instructional strategies problems on teaching and learning Biology practical topics in senior secondary schools.

Recommendations

Based on the findings made in this study, it is therefore recommended that:

1. There should be a continuous professional development for educators to enhance their teaching skills, stay updated on curriculum changes, and incorporate effective pedagogical methods.
2. There should be continued teacher training and development to enhance the professionalism and effectiveness of Biology educators.
3. There should be flexibility in adapting instructional strategies based on student feedback and performance. This supports students as they build their understanding and competence in Biology practical activities.

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