



Ref.JIPE/VOL.9/02/12/01

27th May 2018

JOURNAL OF ISSUES AND PRACTICE IN EDUCATION
(JIPE)

LETTER OF ACCEPTANCE

Dear author, Dr. AHMED, Mulkah Adebisi, be informed that after a peer review of your paper, I am pleased to advise you that, your paper titled: ***"INFLUENCE OF GENDER AND YEARS OF TEACHING EXPERIENCE ON TEACHERS' PERCEPTIONS OF DIFFICULT TOPICS IN SENIOR SECONDARY SCHOOL BIOLOGY CURRICULUM IN OSUN STATE, NIGERIA"*** has been accepted for publication by JIPE Vol. 9 No. 2, issue of December, 2017 SUBJECT to improvement as per reviewers feedback.

Congratulations for adding knowledge in the area of Gender and Teaching and Learning of Biology in Senior Secondary Schools.

JIPE is published twice a year, that is, June and December. We thus receive manuscripts/ journal articles for possible publication after a critical peer review at any time in the year.

Sincerely yours,

The Open University of Tanzania

Dr. Evaristo Andreas Mtitu

THE CHIEF EDITOR

~~XXXXXXXXXXXXXXXXXXXX~~ INFLUENCE OF GENDER AND YEARS OF TEACHING
EXPERIENCE ON TEACHERS' PERCEPTIONS OF DIFFICULT TOPICS IN SENIOR
SECONDARY SCHOOL BIOLOGY CURRICULUM IN OSUN STATE, NIGERIA

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Perception of science subjects especially biology could help policy makers, teachers and teacher educators plan more effective teaching activities that can help students learn the science subject matters and have more positive attitudes towards it (Cimer, 2012). Eggen and Kauchak (2001) stated that perception can be viewed as the process by which people attach meaning to experience after attending to certain stimuli in their sensory memories, processing continues with perception. Agogo (2003) remarked that what may appear difficult to someone may be simple to another person since the concepts of easiness or difficulty as perceived by people are dynamic. There are several factors that contribute to the level of difficulty in teaching and learning of science and these include gender and teacher's teaching experience.

Gender, as explained by Adigun, Onihunwa, Irunokhai, Sada, and Adesina (2015), is the range of physical, biological and mental characteristics pertaining to, and differentiating between the feminine and masculine (female and male) population. Mavrikaki, Koumparou and Kyriakoudi (2012) suggested that gender does not seem to affect learners' views about difficult topics and male or female students do not have positive views about the difficult topics in biology. Gender differences were most possible to be associated with a number of variables related to classroom experiences including pedagogical variables (Logan & Skamp, 2008). Mallam (2004) opined that the teachers are said to be all knowledgeable and are expected to transfer useful knowledge and skills to the learners during teaching.

Teacher's experience has a significant effect on pupils' performance in primary schools and at upper secondary level and also have a richer background of experience to contribute insight and ideas to the course of teaching and learning Kosgei, Mise, Odera, and Ayugi (2013). Harris and Sass (2006) stated quality teachers are considered to be those who bring about student learning, and the best way to assess teachers' effectiveness is to look at their work performance with what they do in the classroom and how much progress their students make on achievement tests.

On teachers experience, Edu and Edu (2013) observed that teachers who cultivate negative attitude and particularly with less than ten years teaching experience perceived the concepts more difficult than others who cultivate positive attitude and have above 10 years of teaching experience. Rivkin, Hanushek, and Kain (2000) suggested that inexperienced teachers are less effective than their experienced counterparts and the benefits of experience level-off after a few years.

The study, therefore, aim to explore the influence of gender and years of teaching experience on teachers' perceptions of difficult topics to teach in senior secondary school biology curriculum.

Purpose of the Study

The study sought to:

1. determine the topics in senior secondary school biology curriculum that are perceived difficult to teach by senior secondary school biology teachers;
2. determine the influence of gender on their perceptions of difficult topics to teach in senior secondary school biology curriculum;
3. find out the influence of teachers' experience on their perceptions of difficult topics to teach in senior secondary school biology curriculum and
4. examine the reasons why topics were perceived difficult to teach in senior secondary by school biology teachers.

Research Questions

Three research questions guided the study as listed below:

1. what are the topics in senior secondary school biology curriculum that are perceived difficult to teach by senior secondary school biology teachers?
2. how do male and female biology teachers differ in their perceptions of difficult topics to teach in senior secondary school biology curriculum?
3. do experienced, moderately and less experienced biology teachers differ in their perceptions of difficult topics to teach in senior secondary school biology curriculum?
4. what reason(s) do biology teachers give for the identified difficult topics to teach in senior secondary school biology?

Research Hypotheses

The following hypotheses were formulated and tested in this study:

Ho₁: There is no significant difference in the perception of difficult topics to teach by male and female biology teachers.

Ho₂: There is no significant difference in difficult topics to teach by experienced, moderately and less experienced biology teachers.

Significance of the Study

The result of this finding may give more knowledge that would help biology teachers to find solutions to the problems of learners who are not performing well in biology. It would help teachers to identify teaching strategies and appropriate instructional materials to be employed in teaching topics which are difficult to comprehend by students. It would also help teachers to find solution in order to simplify the level of difficulties so as to improve teaching and learning. The findings may also help schools to plan workshops or in-service courses that would help teachers to learn or acquire new instructional skills to teach these important but difficult topics in biology for improvement of academic achievement in secondary schools.

Methodology

The researcher adopted the descriptive research of the survey type to conduct the study. The population for the study consisted all Senior Secondary School Biology Teachers in Osun central senatorial district. Purposive sampling technique was used to sample three hundred and two (302) biology teachers from private and public schools. The research instrument used in the study was 'Teachers' Perceptions of Important Topics Perceived Difficult in Biology Curriculum Questionnaire (TPITPDBCQ) which was adapted by the researcher from Nigerian Educational Research and Development Council (NERDC). The reliability Coefficient of 0.92 was obtained. Frequency and percentage were used to analyzed data for research question one, chi-square and Analysis of Variance (ANOVA) were used to analyzed research questions two and three which translated to hypothesis one and two while only frequency was use to analyzed the data for research question four

Results

The data analysis was done and the results presented in tables.

Research Question One: What are the topics in senior secondary school biology curriculum that are perceived difficult to teach by biology teachers?

Table 1 reveals that the eleven topics in the biology curriculum were rated to be difficult since the percentage were also above 50%, the difficult topics were in the following ascending order that is from most difficult to least difficult: adaptation for survival with 77.80%, tissue and supporting system (76.80%), biology of heredity (74.80%), variation and evolution (73.50%), evolution (69.50%), micro-organisms in actions (69.20%), micro-organisms and better health (69.20%), nervous co-ordination (68.90%), the cell and its environment (65.60%), reproduction in unicellular organisms and invertebrates (63.20%) and Micro-organism around us (55.30%). These topics were rated to be difficult to teach by biology teachers while the remaining topics were not difficult to teach by biology teachers since the values were less than 30%.

Table 1

Biology Teachers Perceptions on Difficult Biology Topics to Teach.

S/N	TOPICS	Difficult to teach		Not difficult to teach	
		Frequency	%	Frequency	%
1	Adaptation for survival	235	77.80	67	22.20
2	Tissues and supporting	232	76.80	70	23.20
3	Biology of heredity (genetics)	226	74.80	76	25.20
4	Variation and Evolution	222	73.50	80	26.50
5	Evolution	210	69.50	92	30.50
6	Micro-organism in action	209	69.20	93	30.80
7	Micro-organism and better health	209	69.20	93	30.80
8	Nervous co-ordination	208	68.90	94	31.10
9	The cell and its environment	198	65.60	104	34.40
10	Reproduction in unicellular organisms and invertebrates	191	63.20	111	36.80
11	Micro-organism around us	167	55.30	135	44.70

Research Question Two: How do male and female teachers differ in their perceptions of difficult topics to teach in senior secondary school biology curriculum?

Hypothesis 1: There is no significant difference in the perceptions of difficult topics to teach by male and female biology teachers.

A Chi-square analysis as revealed in Table 2 was conducted to compare the perceptions of difficult topics to teach by male and female biology teachers. The result revealed that there was no significant difference in the perceptions of difficult topics perceived to teach by male and female biology teachers with chi-square value [$\chi^2_{(10, 302)} = 11.86, p > 0.05$]. Since the p-value (0.29) is greater than 0.05 (level of significance), so the null hypothesis (H_{01}) was not rejected.

Hence, biology teachers' gender does not influence their perceptions difficult topics to teach in senior secondary school biology curriculum.

Table 2

Chi-Square Analysis of Male and Female Teachers' Perceptions of Difficult Topics to Teach by Biology Teachers

Gender	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.86 ^a	10	.29
Likelihood Ratio	11.97	10	.29
Linear-by-Linear Association	.90	1	.34
No of Valid Cases	302		

Research Question 3: Do experienced, moderately and less experienced teachers differ in their perceptions of difficult topics to teach in senior secondary school biology curriculum?

Hypothesis 2: There is no significant difference in difficult topics perceived difficult to teach by experienced, moderately experienced and less experienced biology teachers.

Table 3 investigates the perceptions of experienced, moderately and less experienced teachers on difficult topics. It revealed that there was no significant difference in the perceptions of experienced, moderately experienced and less experienced teachers since p-value (0.52) is greater than 0.05 (level of significance), the null hypothesis (H_{02}) was not rejected. Hence, years of teaching experience does not influence teachers' perceptions on difficult topics to teach by biology teachers.

Table 3

ANOVA Analysis of Perceptions of Difficult Topics Based on Years of Teaching Experience

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	7.00	2	3.50		
Within Groups	1572.59	299	5.26	.67	.52
Total	1579.59	302			

Research Question 4: What reasons do biology teachers give for the identified difficult topics to teach in senior secondary school biology?

Table 4 reveals the number and percentage of the reasons for the topics that are perceived difficult. The table depicts some reasons identified by the biology teachers. The topics such as adaptation for survival, nervous co-ordination, the cell and its environment, and reproduction in unicellular were perceived difficult due to lack of teachings aids, tissues and supporting system and micro-organisms in actions were perceived difficult due to substandard laboratory. Also, biology of heredity, micro-organisms in actions, micro-organisms and better health and micro-organisms around us were said to be difficult as a result of their microscopic nature while variation, evolution and evolution were sophistication.

Table 4

Reasons for Identified difficult Topics Perceived Difficult in Senior Secondary School Biology Curriculum

S/N	Important Topics Perceived Difficult	Complexity of Contents Areas	Lack of Teaching Aids	Abstractness	Sophistication	Microscopic Nature	Substandard Laboratory	Total
1	Adaptation for survival	47	67	51	11	28	31	235
2	Tissue and supporting system	45	12	9	53	36	77	232
3	Biology of heredity (genetics)	38	52	29	22	59	26	226
4	Variation and evolution	13	20	37	65	43	44	222
5	Evolution	10	18	37	62	40	43	210
6	Micro-organisms in actions	10	12	18	47	61	61	209
7	Micro-organisms and better health	14	23	36	42	50	44	209
8	Nervous co-ordination	39	41	26	33	29	40	208
9	The cell and its environment	12	55	45	5	39	42	198
10	Reproduction in unicellular organisms and invertebrates	12	54	42	11	38	34	191
11	Micro-organism around us	7	22	29	10	56	43	167
	Total	247	376	359	361	479	485	2307

In Table 5, sub-standard laboratory with 485(21.02%) had the highest percentage of reason for perceived difficult topics followed by microscopic nature with 479(20.76%) of the respondents, lack of teaching aids 376(16.30%), sophistication 361(15.65%), abstractness 359(15.56%) and complexity of the contents area with 247(10.71%) of the teachers agreed to as the reasons responsible for teachers' perceptions of difficult topics in biology curriculum.

Table 5

Summary of Reasons for Difficult Topics Perceived Difficult

S/N	Reasons	Frequency	Percentage
1	Complexity of the contents area	247	10.71
2	Lack of teaching aids	376	16.30
3	Abstractness	359	15.56
4	Sophistication	361	15.65
5	Microscopic nature	479	20.76
6	Substandard laboratory	485	21.02

Discussion of Findings

This study was carried out to find out on influence of gender and years of teaching experience on teachers' perceptions on difficult topics in senior secondary school biology curriculum. The findings of the study revealed eleven topics perceived as difficult to teach and it includes: adaptation for survival, tissue and supporting system, biology of heredity (genetics), variation and evolution, evolution, micro-organisms in actions, micro-organisms and better health, nervous co-ordination, the cell and its environment, reproduction in unicellular organisms and invertebrates, micro-organism around us. This finding is in agreement with Olorundare and Oni (2010) and Abimbola (1998) who both established difficult topics in biology. The finding is in disagreement with Koksai and Cimen (2008) who only stated different organs perceived to be in biology.

The findings also revealed that there was no significant difference in the perceptions of important topics perceived difficult to teach by male and female teachers. It shows that both male and female teachers perceived topics in biology difficult to teach the same way since they are exposed to the same methodology and curriculum in schools. This finding is in accordance with Alake (2013) and Afolabi (2013) who both mentioned that there was no significant difference between the perceptions of male and female teachers.

There was no significant difference in difficult topics to teach by experienced, moderately experienced and less experienced biology teachers. This implies that years' of teaching experience do not significantly affect the understanding of teachers on difficult topics to teach. Hence, the more the numbers of years spent in teaching biology the less difficulty the teachers would perceive the topics to teach. This finding is in agreement with Afolabi (2013) who concluded that there was no significant difference between the perceptions of untrained and trained, inexperienced or experienced teachers. This findings however, is in disagreement with Olorundare and Oni (2010), Edu, D. O and Edu, G. O (2013), and Ahmed and Abimbola (2011) who found out that years of teaching experience significantly influence teachers' perception of difficult topics.

The findings revealed reasons on teachers' perceptions of difficult topics to teach were substandard laboratory, microscopic nature, lack of teaching aids, sophistication, abstractness and complexity of the contents area. This serves as the major problems affecting biology teachers in disseminating knowledge while teaching the difficult topics. This finding is in agreement with Abimbola (1998); Ahmed (2007) and Ahmed and Abimbola (2011) who stated that complexity, lack of teaching aids, abstractness, sophistication and insufficient teaching experience were reasons for level of difficulty in biology concepts but in disagreement with Gongden, Gongden and Lohdip (2011).

Conclusion

The study concluded that biology teachers perceived some topics difficult to teach in biology curriculum. However, biology teachers' gender and teaching experience had no influence in their perceptions of difficult topics to teach in biology curriculum.

Recommendations

Based on the major findings and conclusion of this study, the following recommendations are considered relevant:

1. Since some topics are difficult to teach to some teachers, Biology teachers should present difficult topics in a simpler form. This is by breaking the topics into smaller teachable units for proper understanding of the students. The teaching of abstract topics should be concrete and biology teaching should be more of practical and use of appropriate teaching method(s) in standard laboratories.
2. Government should employ qualified and dedicated biology teachers irrespective of their gender who have passion for teaching of biology to handle the subject.
3. Both experienced, moderately experienced and less-experienced Biology teacher should be encouraged to attend seminars, workshop and conferences in order to expose them to new findings based on the curriculum so as to reduce the level of difficulty in biology since they don't differ significantly in their perception of the difficulty topics.
4. Also, government should provide standard laboratory with well-equipped materials to solve the problem of complexity, abstractness, sophistication and lack of standard laboratory for the teaching of biology curriculum.

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