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A study on high school students' perceptions toward biology learning (Myanmar)

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Abstract

This main aim of this study was to study high school students' perceptions toward biology learning. The participants in this study were 400 grades 10 and grade 11 biology students at 3 basic education high schools in Yesagyo Township in Myanmar. Survey method was used in this study. High school students' perceptions toward biology learning were taken to comprise of three dimensions, namely, intrinsic motivation to learn biology, individual interest in biology and perceived difficulty of biology and students' view about the way biology is taught. The comparison of students' perceptions toward biology learning was undertaken by two variables. In order to get the required data, the questionnaire involving 24 Likert-type items and the demographic data were developed. The collected data were analyzed using descriptive statistics; independent *t*-test and was used to compare students' perceptions toward biology learning in terms of variables. This study indicated that students have positive perceptions toward biology learning in all dimensions. Then, the study found that there was a significant difference between students' perceptions toward biology learning in terms of gender, grade level. Students' intrinsic motivation to learn biology had significant relationship with students' interest to biology and students' perceived difficulty of biology. Significantly correlated was also students' interest to biology to the perceived difficulty of biology. Therefore, students' perceived difficulty of biology, their intrinsic motivation to learn biology and their interest to biology were all positively correlated. Based on the results of the study, suggestions and recommendations were made to develop students' learning ability and achievement.

Keywords: High students' perception, biology learning

Introduction

In today's world, science encompasses many ways of gaining information which help individual know themselves and their environment and renew this information frequently. As the scientific technologies increase day by day, the living standards of humankind develop in our society. Among the branches of science, biological science is one of the most important fields for the better living of human beings. So, the young people are trained to be well-equipped with scientific knowledge of biology in every country. But, another important factor is the attitude and perception of the student to learn biology. Attitude and perception have a greater influence on the aspects of learning which are emphasized in the classroom (Akinola, 2003) ^[1]. Only if the students' attitudes and perceptions are positive to learning, their learning will be better.

Developing positive perceptions towards science is one of the most important goals of every country's national curriculum. It is more than obvious that students' attitudes and perception towards science constitute a major chapter in the scientific field of science education. But Zacharia and Barton (2004, cited in Mavrikaki *et al*, 2012) ^[2] suggested that "attitudes and perceptions are affected by students' interest levels in science, the curriculum and the learning climate", therefore literature focused on factors affecting students' interest in biology (Delpech, 2002, cited in Mavrikaki *et al*, 2012) ^[2] as also on other factors that affect their views or internal constructions about biology is also of great importance. Among the most important factors that shape students' views about school science, and consequently about biology, are considered:

1. Students' intrinsic motivation" or intrinsic motivation to learn biology: Its relevance to everyday life, "students' intrinsic motivation" or intrinsic motivation to learn biology,

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and the necessity of relatively good biological knowledge background for a future career in a field such as medicine or pharmacy, "students' future oriented motivation to learn biology".

2. Students' interest in biology: Students' interest as "personal orientation, predisposition or relatively stable tendency to engage with a particular domain, referred to as individual interest" which has been proven to have a strong impact on achievement.

3. Biology's perceived difficulty: Biology's perceived difficulty is mostly due to the way science is taught (transmissive pedagogy, teacher-centered) along with the overloaded science curriculum, and the irrelevant and boring science content (Mavrikaki *et al*, 2012) [2]

Research Hypotheses

The research hypotheses for the study are as follows.

1. There is no significant difference between students' perception toward biology learning in terms of grade.
2. There is no significant difference between students' perception toward biology learning in terms of gender.
3. There is relationship between high school students' intrinsic motivation and interest and their perceived difficulty of biology.

Materials and Methods

This research is intended to study high school students' perception toward biology learning in Yesagyo Township. This study was conducted with the survey type of the descriptive research. This study was confined to 400 students (200 male students and 200 female students) who were grade ten and grade eleven. In responding to the statements, students were asked to read each statement carefully and mark the degree to which they agree or disagree using the following keys: 1-strongly disagree, 2-disagree, 3-undecided, 4-agree and 5-strongly agree. In this study, the questionnaire developed by Mavrikaki *et al*, (2012) [2] was used to assess the perceptions toward biology learning in Myanmar. Questionnaires were focused on three dimensions.

1. Intrinsic motivation to learn biology(1=not motiv,5=very motiv)
2. Interest in biology (1=not interest,5=very interest)
3. Perceived difficulty of biology and students' view about the way biology is taught. (1=very diff, 5=very easy).

The data was analyzed by using descriptive statistics (percentage) for each dimension. In addition to this, *t*-test was used to compare the students' perception toward biology learning in terms of variables. Pearson product-movement correlation was also used to assess the relationship.

Research Findings

Table 1: Comparison of Means Scores for All Dimensions

Dimension	Participants	Mean	SD	Minimum	Maximum
Intrinsic Motivation	400	4.26	.381	1	5
Interest	400	4.27	.447	1	5
Difficulty or Easy	400	4.13	.482	2	5
Overall	400	4.22	.369	1	5

According to Table 1, the mean score for intrinsic motivation to learn was 4.26, the mean score for interest in biology was (4.27) and the mean score for perceived difficulty and views about teaching was (4.13).In the third dimension, if the mean score is greater than sample mean

score (3.00), it can be interpreted that students have no difficulty in biology learning. Most of the high school students in Yesagyo Township possess positive or good perceptions toward biology subjects because the overall mean score was (4.22).

Table 2: "t" Value for the Students' Perceptions toward Biology Learning in terms of Grade

No.	Dimensions	Grade	N	M	SD	MD	t	df	p
1.	Intrinsic motivation to learn biology	Grade 11	200	4.24	.433	-0.24	-0.623	398	.534
		Grade 10	200	4.27	.321				
2.	Interest in biology	Grade 11	200	4.25	.502	-0.46	-1.020	398	.308
		Grade 10	200	4.30	.385				
3.	Perceived difficulty or easy	Grade 11	200	4.15	.522	-1.49	-3.120	398	.002**
		Grade 10	200	4.20	.427				
4.	Overall	Grade 11	200	4.18	.422	-0.74	-1.795	398	.049*
		Grade 10	200	4.26	.304				

Note:* $p < .05$ and ** $p < .01$ According to Table 2, it indicated that there was a significant difference between students' perception toward biology learning in terms of grade.

Table 3: "t" Value for the Students' Perceptions toward Biology Learning in terms of Gender

No.	Dimensions	Gender	N	M	SD	MD	t	df	p
1.	Intrinsic motivation to learn biology	Male	200	4.20	.418	-1.09	-2.880	398	.004**
		Female	200	4.31	.332				
2.	Interest in biology	Male	200	4.21	.506	-1.31	-2.948	398	.003**
		Female	200	4.34	.369				
3.	Perceived difficulty or easy	Male	200	4.06	.526	-1.30	-2.719	398	.007**
		Female	200	4.19	.425				
4.	Overall	Male	200	4.18	.411	-1.23	-3.375	398	.001***
		Female	200	4.26	.312				

Note: ** $p < .01$ and *** $p = .001$ According to the Table 3, it indicated that there was significant difference between students perception toward biology learning in terms of gender.

Table 4: Correlation between Students' Intrinsic Motivation to Learn Biology and Interest in Biology

Correlations			
		Intrinsic Motivation	Interest
Intrinsic Motivation	Pearson Correlation	1	.619**
	Sig. (2-tailed)		.000
	N	400	400
Interest	Pearson Correlation	.619**	1
	Sig. (2-tailed)	.000	
	N	400	400

** Correlation is significant at the 0.01 level (2-tailed)

Table 5: Correlation between Students' Intrinsic Motivation to Learn Biology and Perceived Difficulty of biology

Correlations			
		Intrinsic Motivation	Difficulty or Easy
Intrinsic Motivation	Pearson Correlation	1	.515**
	Sig. (2-tailed)		.000
	N	400	400
Difficulty or Easy	Pearson Correlation	.515**	1
	Sig. (2-tailed)	.000	
	N	400	400

**Correlation is significant at the 0.01 level (2-tailed)

Table 6: Correlation between Students' Interest in Biology and Perceived Difficulty of Biology

Correlations			
		Interest	Difficulty or Easy
Interest	Pearson Correlation	1	.582**
	Sig. (2-tailed)		.000
	N	400	400
Difficulty or Easy	Pearson Correlation	.582**	1
	Sig. (2-tailed)	.000	
	N	400	400

**Correlation is significant at the 0.01 level (2-tailed).

According to table 4, 5, and 6, Students' intrinsic motivation to learn biology was significantly ($p < .01$) correlated to students' interest to biology and students' perceived difficulty of biology ($r = .52$ and $r = .62$ respectively). Significantly correlated ($p < .01$) was also students' interest to biology to the perceived difficulty of biology ($r = .58$). Therefore, students' perceived difficulty of biology, their intrinsic motivation to learn biology and their interest to biology were all positively correlated.

Conclusion

1. High school students possess high or positive perceptions toward biology because overall mean score (mean=4.22) is greater than sample mean score (mean=3.00).
2. There was a significant difference between the perceptions students toward biology learning in terms of grade.
3. There was also a significant difference between the students' perception toward biology in terms of gender.
4. Finally, students' perceived difficulty of biology, their intrinsic motivation to learn biology and their interest to biology were all positively correlated.

Discussion

Again, in line with the objectives of this investigation, the perceptions towards biology were analyzed by Grade. Both Grade 10 and Grade 11 students are different in biology perceptions. Grade 10 students appreciate biology subject more important than Grade 11 students. It may be due to the students' newly experience to this biology contents in teaching-learning process. And then biology is firstly taught

to them as one of the science combination subjects since Grade 10. According to Spell (2004, cited in Mavrikaki *et al*, 2012) [2], the older the students the less positive they become towards biology, this was the truth in our sample from Yesagyo, since statistical significant differences were found between younger and older high school students in their overall opinion about biology. Moreover, Grade 11 students review biology more difficult than Grade 10 students because grade 11 students orient to get high mark in matriculation examination. Biology subject depends on memorization so that, it is more difficult to get high mark than another science subjects. This pattern seems to be greatest problem for both teachers and students. This situation may be attributed to the nature of biology itself which includes texts rather than numerical operations, and also the way of instruction that teachers follow.

The study revealed that the female students had more positive perceptions towards biology than male students. This result has the same opinion with the previous studies of Prokop, Prokop and Tunnicliffe (2007), which indicated that females had more positive attitudes towards biology. Gender difference was also found in three aspects of biology perception. Consequently, female high school students of Yesagyo Township have higher biology perceptions than male high school students of that Township in this study.

According to the Pearson product moment correlation, there was significant correlation between high school students' intrinsic motivation and their interest to biology and the relationship is positive correlation. It can be said that the interest plays an important derivative role in intrinsic motivation behavior in that people naturally approach activities that interest them. Most of the students have

positive perceptions toward biology. As they are positive perceptions toward biology's usefulness in their lives and perceive it as not difficult, they are very interested in it. This result was congruent with the study of Mavrikaki *et al* (2012) [2] which indicated that there is relationship between intrinsic motivation and interest and perceived difficulty of biology respectively. Interest and motivation have been considered important predictors of achievement in science. Based on the findings of the study, the researcher would like to give the following suggestions.

1. The biological instructions should be given by emphasizing with their daily life processes deals with biology. In this way, students realize the importance of biology in their daily lives and also unduly have more positive intrinsic motivation to learn biology.
2. Moreover, biology lessons should be instructed to students by connecting the various possible vocations in biological fields in order to not only gain more understanding and interesting in biology subject but also the higher positive biology attitudes. The more the students believe the advantage of these vocations that need to apply biological knowledge, the more the students show the positive perceptions towards biology.
3. Biology is dependent on memorization and biology has an abstract nature and some of the students thought that biology is boring. In order to reduce these difficulties, the teachers should use some experiments and many kinds of materials such as overhead projector, models and computer. The teacher should also perform discussion. In addition, teachers should give examples for real life.
4. If the teachers encourage the pupils in biology classes for giving them self-confidence, the pupils' perceptions towards biology will increase. So, the students should be praised (both verbal and facial expression), and should be rewarded, in biology class. By doing so, the students have satisfactions in biology learning process and then develop more positive attitudes towards biology. It is true that biology teachers can certainly influence their students' attitudes towards biology. Therefore, biology teachers should be trained to improve positive attitudes towards biology subject since their pedagogic training at the institutes of education both Sagaing and Yangon.

Briefly, high school student's positive perception towards biology is prerequisite factor for learning biology, and for their whole lives. Hence the investigation of high school students' perception towards biology contributes to learning biology in the school practice and to the educational system as a whole.

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