A STUDY OF THE DIFFICULTIES OF STUDENTS AND INFLUENCING FACTORS ON LEARNING PHYSICS AT THE BASIC EDUCATION HIGH SCHOOL LEVEL

Thu Thu Linn[1]

Abstract

The purpose of this study is to investigate the difficulties and influencing factors of students and the reasons for their difficulties in learning physics at the Basic Education High School Level in Myanmar. This study is descriptive research design. By using the simple random sampling method, 475 Grade Ten students and 448 Grade Eleven students who are learning physics in four Basic Education High Schools in Shwebo, Sagaing Region were used as the sample. In the collection of data, two instruments, the questionnaire for the difficulties of the students in learning physics and the questionnaire for the influencing factors of the students in learning physics were used. In order to analyze the data, descriptive statistics, independent samples *t* test, one-way analysis of variance (ANOVA) and Pearson product-movement correlation were used. According to the results of the study, it can be seen that there was nearly two third of the total population of participants who had difficulty in learning physics and the majority of students are likely to face difficulties in solving problems in physics. The reasons for the difficulties of the students in learning physics were the complex, abstract nature and too much calculation of physics, lack of interest, mathematics skills and negative attitude of the students, the lack of the adequate school facilities and instructional materials. It can be concluded that physics teachers should establish and maintain a respectful, supportive and safe learning environment that is emotionally and physically conducive to learning in order to learn physics with great joy and success.

Keywords: Difficulty, Learning, Factor, Physics, Learning Difficulty in Physics

Introduction

Science and technology play an essential role since they have contributed to individual fulfillment, the well-being of communities, and to the health of nations. Thus, science education plays a key role to produce good citizens and skillful scientists needed to build a modern developed nation. In Myanmar, a developing country, it is necessary to develop through science, technology, and human resource capacity for rapid industrialization that will ensure economic growth and sustainable development of the country. One of the policies of Myanmar Education is to expand the various disciplines including science and technology required to build a country. Therefore, science education plays a vital role in Myanmar in developing the scientific attitude and potentialities of the citizen in order to be relevant to the national development goals.

Physics is the most basic science subject for all scientific and technological development worldwide (Adeyemo, 2010). According to Nteere, Kwaria and Kirimi (2017), it is the basis of technology and for effective living in the contemporary age of science and technology. Moreover, it is an important subject for economic, scientific and technological development and an essential part of the intellectual life of a man at the present day (Adeyemo, 2010). Thus, knowledge of physics is a requirement in order to fit in the present society. Through the learning of physics, students will acquire conceptual and procedural knowledge relevant to their daily life. Therefore, it is essential that every child should be given the opportunity to acquire at least basic knowledge and the concept of physics as a science. Therefore, physics is taught as a major school subject in both Basic Education and Higher Education in Myanmar in order to expand the science and technology

[1] Department of Methodology, Mandalay Education Degree College

required to build the country. However, it is found that there is a lack of acquiring the aims of teaching physics at the Basic Education High School Level in Myanmar. It can be inferred that high school students are deficient in the sound knowledge and skill of physics and the ability to apply physics in real life. In view of the foregoing reasons, the researcher made a decision in order to attempt to investigate the learning difficulties faced by physics students, the factors influencing the learning of the students, and to find out the underlying reasons for their difficulties in learning physics at the Basic Education High School Level.

Purposes of the Study

The main purpose of the study is to investigate the difficulties of students, the factors influencing their learning and the reasons of their difficulties in learning physics at the Basic Education High School Level. The specific objectives are as follows:

- To explore the existing difficulties encountered by students in learning physics at the Basic Education High School Level.
- To examine the difference in the difficulties of students in learning physics in terms of gender, grade, and school.
- To identify the factors influencing students in learning physics at the Basic Education High School Level.
- To assess the difference in the factors influencing students in learning physics in terms of gender, grade, and school.
- To find out the reasons why students have difficulty learning physics at the Basic Education High School Level.
- To explore ways to overcome the difficulties of students in learning physics.
- To give suggestions and recommendations in implementing the effective physics teaching learning process.

Research Questions

1. What difficulties do students encounter in learning physics at the Basic Education High School Level?
2. Is there any difference in the difficulties of students in learning physics in terms of gender?
3. Is there any difference in the difficulties of students in learning physics in terms of grade?
4. Is there any difference in the difficulties of students in learning physics in terms of school?
5. What factors are influencing students in learning physics at the Basic Education High School Level?
6. Is there any difference in the factors influencing students in learning physics in terms of gender?
7. Is there any difference in the factors influencing students in learning physics in terms of grade?
8. Is there any difference in the factors influencing students in learning physics in terms of school?
9. Are there any associations among the difficulties of students and the factors influencing their learning in physics?

Definition of Key Terms

Difficulty - A problem, or a thing or situation that causes problems (Hornby, 2015).

Learning - A persisting change in human performance potential which must come about as a result of the learner's experience and interaction with the world (Driscoll, 2005).

Factor - One of several things that cause or influence something (Hornby, 2015).

Physics - The most basic and fundamental natural science which involves universal laws and the study of the behavior and relationships among a wide range of important physical phenomena (Cutnell & Johnson, 2007).

Learning Difficulty in Physics - A learning difficulty in physics is a situation where a student fails to grasp a concept or idea and to perform a learning task in physics such as solving a problem and doing practical work and so on.

Scope

The study aimed at investigating the difficulties and influencing factors of the students and the reasons for their difficulties in learning physics at the Basic Education High School Level. This study, therefore, is geographically delimited to four Basic Education High Schools of Shwebo, Sagaing Region. The study focuses on Grade Ten and Grade Eleven students. Thus, the subjects are confined to (475) Grade Ten Students and (448) Grade Eleven Students from four selected high schools in (2018-2019) Academic Year.

Review of Related Literature

The Role of Physics in School Curriculum

Physics education enables students to attain the required skills for scientific thinking, producing knowledge, keeping track of developing technological changes, understanding and interpreting the events occurring in the nature. Physics is one of the sciences in the secondary school curriculum, which plays a vital role that helps in the achievement of some national goals (Salleh, 2004).

Aims and Objectives of Teaching Physics

In Myanmar, teaching physics at the Basic Education High School Level aims at acquiring the basic knowledge and skill of physics, acquiring competence in reasoning, comprehension, analysis, synthesis and evaluation, knowing and understanding the application of the basic knowledge and skill of physics to daily-life phenomena and national production, developing the enquiring mind and scientific attitude, and laying the foundation for further study in science and technology (Ministry of Education, MOE, 2007).

Difficulties of Students in Learning Physics at High School Level

According to Angell et al., (2004), students find physics difficult because they have to contend with different representations such as experiments, formulas and calculations, graphs, and conceptual explanations at the same time.

Adegoke (2017) revealed that physics students fail to construct meanings of the problem statement, and are unable to interlink the meaning of the statement. Moreover, the difficulties in

solving physics problems are divided into four distinct categories. They are: comprehension, structure, operation, and judgment.

Influencing Factors on Learning Physics at High School Level

According to the various studies, there are a number of possible factors that contribute to the effective learning in physics. These factors are content-related factors such as the nature of the subject matter (Ornek, Robinson & Haugan, 2008), teacher-related factors such as positive attitude towards the subject and motivation of the teachers (Ogunmade, 2005), teaching-learning conditions such as the use of various teaching methods and instructional materials (Mills, 1991, as cited in Kipngeno, 2018), student-related factors such as interest and attitude towards the subject (Hidi & Harackiewicz, 2000; Nolen, 2003), parent-related factors such as supports for learning of children (Desforges & Abouchaar, 2003) and school-related factors such as adequate school facilities and teaching learning resources (Kelley et al., 2013, as cited in Baran, 2012).

Research Method

Subjects

The study was conducted in Shwebo, Sagaing Region. The participants were Grade Ten and Grade Eleven students from four Basic Education High Schools by using a simple random sampling method. The sample population for the study consisted of 923 physics students from the selected high schools (see Table 1).

Table 1 Demographic Data of Sample Population of 923 High School Students.

Characteristic of Sample Population	*n*	*Percent (%)*
Gender		
Male	364	39
Female	559	61
Grade		
Grade Ten	475	51
Grade Eleven	448	49
School		
A	238	26
B	232	25
C	242	26
D	211	23
Total	923	100

Instrumentations

The research instruments used for data collection in this study were survey questionnaires for both Grade Ten Physics students and Grade Eleven Physics students.

Questionnaire for Difficulties of Students in Learning Physics

In the study, this questionnaire was used to investigate the difficulties of students in learning physics at the Basic Education High School Level. It was divided into three dimensions and comprised of 21 Yes or No questions and two open-ended questions. The first dimension is concerned with the difficulties in understanding the subject, the second is related with the difficulties in solving problems and the last is with the difficulties in practical work, including 7 Yes or No questions in each dimension respectively.

Questionnaire for Factors Influencing Students in Learning Physics

The researcher made a decision to use this questionnaire to investigate the factors influencing the learning of the students in physics at the Basic Education High School Level. Instrument items in this questionnaire were content-related factors developed by Ekici (2016), teacher-related factors and parent-related factors developed by Gezahegn (2007), teaching-learning conditions developed by Buabeng (2015), student-related factors and school-related factors developed by Ogunmade (2005). The items selected to use in the questionnaire were modified to suit the purpose and context of this study. This questionnaire consists of (36) items: 12 items in teaching-learning conditions and parent-related factors with scales such as Never, Seldom, Sometimes, Often, Always and the other factors with five Likert scale such as Strongly Disagree, Disagree, Uncertain, Agree, and Strongly Agree.

After preparing the questionnaire and the test, experts review was conducted by three expert teachers from SUOE. After that, the questionnaires were modified. The questionnaires validated through pilot testing on (90) physics students at BEHS (3) Sagaing, Sagaing Region. The Cronbach's alpha of internal consistency for the difficulties of the students in learning physics was 0.789, and for the influencing factors on students' difficulties in learning physics was 0.767.

Procedure

First of all, the survey questionnaires were developed under the guidance of the supervisor in order to get the required data. For the validation of the instrument, the survey questionnaires were distributed to three experts from Department of Curriculum and Methodology in Sagaing University of Education. The instruments were modified regarding the advice and guidance of the experts before the pilot testing. After validating the instruments from the experts, a pilot testing was conducted on 28th September, 2018. According to the results of the pilot testing, some items were modified in order to be suitable for the main survey. Then, the major survey was conducted on 29th November, 2018. The questionnaires were distributed to the participants in order to collect the required data. After that, the researcher marked the responses with honesty. In the end, the data obtained from this survey were analyzed by using the Statistical Package for the Social Science (SPSS 20.0).

Data Analysis

The data were analyzed by using the descriptive statistics and inferential statistics; mean, standard deviation, one-way ANOVA (Analysis of Variance), *t* test for independent samples and Pearson *r* correlation matrix in order to investigate the difficulties and influencing factors of students and the reasons for their difficulties in learning physics.

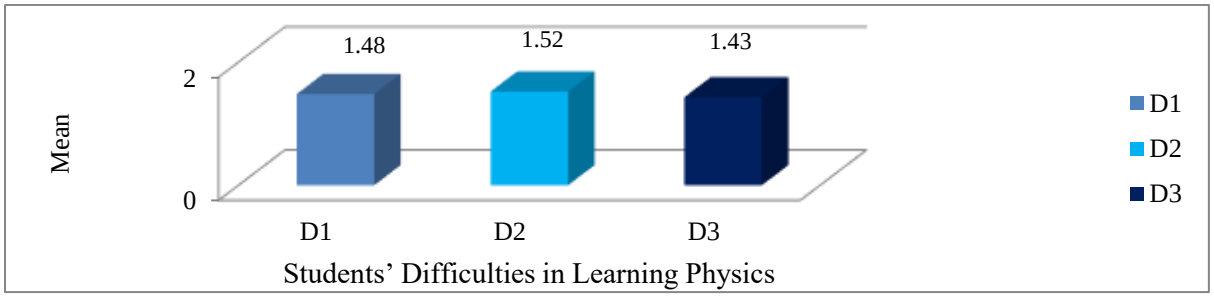
Findings

Findings on the Difficulties of Students in Learning Physics

Table 2 Means and Standard Deviations for Each Dimension of the Difficulties of Students in Learning Physics.

Dimension	*M*	*SD*	Mini	Max
Difficulties in understanding the subject	1.48	.223	7	14
Difficulties in solving problems	1.52	.230	7	14
Difficulties in doing practical work	1.43	.245	7	14

Table 2 and Figure 1 describe about the means of the difficulties of the students in understanding the subject, solving problems, and doing practical work in learning physics at high school level. In accordance with the results of the mean, it was found that the majority of students had difficulty solving problems in physics, accounting for 1.52 of the mean, whereas there was a minority of students faced the difficulty in doing practical work in physics, representing 1.43 of the mean.



Note. D1 = Difficulties in understanding the subject, D2 = Difficulties in solving problems, D3 = Difficulties in doing practical work

Figure 1 Comparison of the means for the difficulties of the students in learning physics

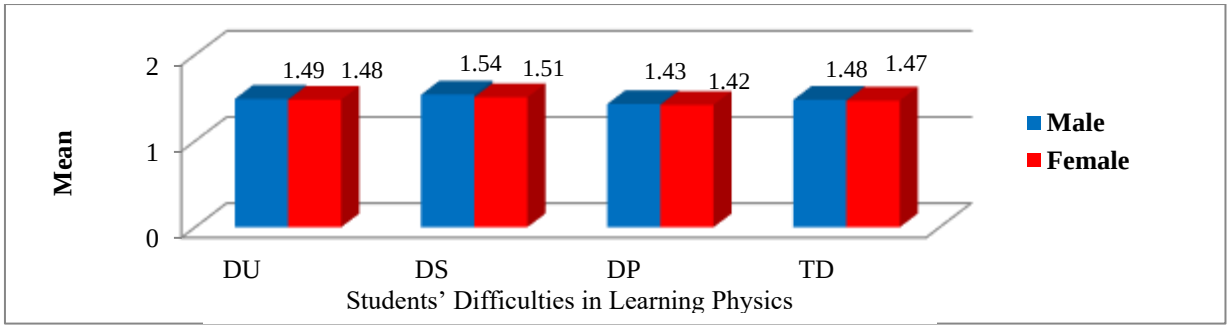
Findings on the Difficulties of Male and Female Students in Learning Physics

The independent samples *t* test was computed to determine gender differences in the difficulties of 329 males and 523 females in learning physics.

Table 3 Comparison of Male and Female Students on the Difficulties in Learning Physics.

Dimension	*M*	*SD*	*t*	*df*	*p*	*d*
Difficulties in understanding the subject			.33	850	.741	.02
Male	1.49	.235			(ns)	
Female	1.48	.215				
Difficulties in solving problems			1.95	850	.051	.13
Male	1.54	.233			(ns)	
Female	1.51	.228				
Difficulties in doing practical work			-.09	850	.929	.04
Male	1.43	.250			(ns)	
Female	1.42	.242				
Total difficulties in learning physics			.946	850	.348	.06
Male	1.48	.186			(ns)	
Female	1.47	.171				

Note. ns = not significant



Note. DU = Difficulties in understanding the subject
DS = Difficulties in solving problems
DP = Difficulties in doing practical work
TD = Total difficulties in learning physics

Figure 2 Comparison of the means of the difficulties of the students in learning physics in terms of gender

It can be seen in Table 3 and Figure 2 that there was no significant difference between male and female students' difficulties in understanding the subject, solving problems, and doing practical work in physics. Moreover, a significant difference does not exist in the total of the difficulties in learning physics. It can therefore be interpreted that male student faced the same number of difficulties in learning physics as female students did.

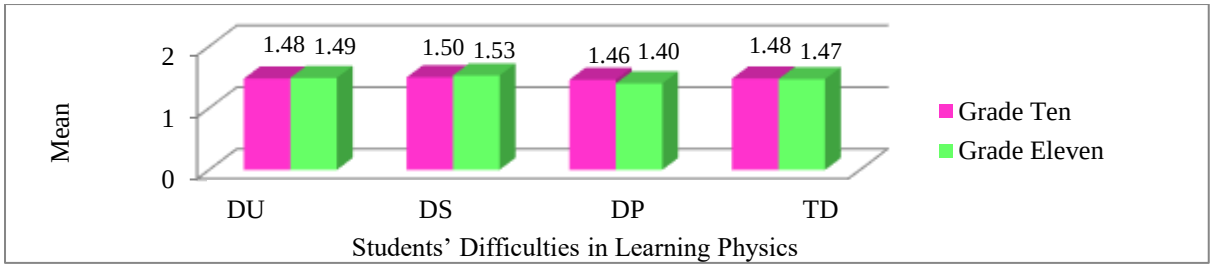
Findings on the Difficulties of Grade Ten and Grade Eleven Students in Learning Physics

In order to assess whether there was any significant difference in the difficulties in learning physics between 440 Grade Ten and 412 Grade Eleven students, or not, the independent samples *t* test was computed (see Table 4).

Table 4 Comparison of Grade Ten and Grade Eleven Students on the Difficulties in Learning Physics.

Dimension	*M*	*SD*	*t*	*df*	*p*	*d*
Difficulties in understanding the subject			-.677	850	.499	.04
Grade Ten	1.48	.219			(ns)	
Grade Eleven	1.49	.227				
Difficulties in solving problems			-1.78	850	.075	.13
Grade Ten	1.50	.228			(ns)	
Grade Eleven	1.53	.232				
Difficulties in doing practical work			3.44	850	.001**	.25
Grade Ten	1.46	.247				
Grade Eleven	1.40	.240				
Total difficulties in learning physics			.526	850	.599	.06
Grade Ten	1.48	.171			(ns)	
Grade Eleven	1.47	.184				

Note. ** $p < .01$, ns = not significant



Note. DU = Difficulties in understanding the subject
DS = Difficulties in solving problems
DP = Difficulties in doing practical work
TD = Total difficulties in learning physics

Figure 3 Comparison of the means of the difficulties of students in learning physics in term of grade

With regard to Figure 3, it was apparent that there was no significant difference between Grade Nine and Grade Ten students' difficulties in understanding the subject and solving problems in physics. However, it was found that there was significant difference between Grade Ten and Grade Eleven students' difficulties in doing practical work in physics at .001 level (p = .001). Therefore, it was found that the difficulties of Grade Ten students in understanding the subject and solving problems in physics were equivalent to that of Grade Eleven students, whereas there were more Grade Ten students than Grade Eleven students who faced difficulties in doing practical work in physics. Furthermore, it can be generally interpreted that Grade Ten students faced the same difficulty in learning physics as Grade Eleven students had since there was no significant difference in the total of the difficulties of Grade Ten and Grade Eleven students in learning physics.

Findings on the Difficulties of Students in Four High Schools in Learning Physics

The one-way ANOVA was conducted to measure whether there are significant differences among the difficulties of 852 students from the selected schools in learning physics.

Table 5 One–Way Analysis of Variance Table Comparing the Difficulties of Students in Four High Schools in Learning Physics.

Source	*df*	*SS*	*MS*	*F*	*p*
Difficulties in understanding the subject					
Between Groups	3	.742	.247	5.060	.002**
Within Groups	848	41.456	.049		
Total	851	42.199			
Difficulties in solving problems					
Between Groups	3	.218	.073	1.374	.249
Within Groups	848	44.758	.053		(ns)
Total	851	44.976			
Difficulties in doing practical work					
Between Groups	3	.910	.303	5.099	.002**
Within Groups	848	50.471	.060		
Total	851	51.382			
Total difficulties in learning physics					
Between Groups	3	.557	.186	6.007	.000***
Within Groups	848	26.204	.031		
Total	851	26.760			

Note. $^{**}p < .01$, $^{***}p < .001$, ns = not significant

According to Table 5, ANOVA results provide information about there was a significant difference among the four high schools concerning the difficulties of the students in understanding the subject, $F(3,848) = 5.060$, $p < .01$, concerning the difficulties of the students in doing practical work in physics, $F(3,848) = 5.099$, $p < .01$, and concerning the total of the difficulties in learning physics, $F(3,848) = 6.007$, $p < .001$. However, it was seen that there was no significant difference among the students in the selected schools concerning the difficulties in solving physics problems, $F(3,848) = 1.374$. Therefore, it can be interpreted that the difficulties of the students in learning physics except in solving problems in physics differed among the selected schools.

Findings from the Factors Influencing the Students in Learning Physics

For exploring the factors influencing on the 852 students in learning physics, descriptive statistics was employed.

Table 6 Means and Standard Deviations for the Factors Influencing Students in Learning Physics.

Factor	*M*	*SD*	Mini	Max
Content-related Factors	2.74	.666	1	5
Teacher-related Factors	3.10	.333	2	5
Teaching Learning Conditions	2.79	.413	2	4
Student-related Factors	2.74	.459	1	4
Parent-related Factors	3.07	.334	2	5
School-related Factors	3.04	.443	2	4

It was found in Table 6 that among the means of the factors, the mean of teacher factors was the highest and that of content factors, and student factors were the lowest. Thus, it can be interpreted that the most influencing factors of students in learning physics were teacher factors, whereas content factors and student factors were the least influencing factors among those factors in learning physics.

Findings from the Factors Influencing Male and Female Students in Learning Physics

To examine whether there are significant gender differences in the factors influencing on 327 males and 523 females in learning physics, independent samples *t* test was computed.

Table 7 Comparison of Male and Female Students on the Factors Influencing Students in Learning Physics.

Factor	*M*	*SD*	*t*	*df*	*p*	*d*
Content-related Factors			2.59	850	.01*	.19
Male	2.82	.671				
Female	2.69	.660				
Teacher-related Factors			-1.60	850	.11	.12
Male	3.07	.343			(ns)	
Female	3.11	.327				
Teaching-learning Conditions			.928	850	.353	.07
Male	2.81	.419			(ns)	
Female	2.78	.409				
Student-related Factors			.306	850	.760	.02
Male	2.75	.464			(ns)	
Female	2.74	.455				
Parent-related Factors			.303	850	.762	.03
Male	3.07	.353			(ns)	
Female	3.06	.322				
School-related Factors			2.349	850	.019*	.16
Male	3.08	.469				
Female	3.01	.423				

Note. *$p < .05$, ns = not significant

Table 7 reveals that there were significant differences between male and female students concerning content factors (p = .01), and school factors (p = .019) at .05 level but not in teacher factors, teaching learning conditions, student factors and parent factors. Therefore, it was clearly seen that content and school factors were more likely to influence male students than female students in learning physics and similar proportions of teacher factors, teaching learning conditions, student factors and parent factors influenced male and female students in learning physics.

Findings from the Factors Influencing Grade Ten and Grade Eleven Students in Learning Physics

Independent samples *t* test was computed in order to assess whether the factors influencing 440 Grade Ten and 412 Grade Eleven students are significantly different or not.

Table 8 Comparison of Grade Ten and Grade Eleven Students on the Factors Influencing the Students in Learning Physics.

Factor	*M*	*SD*	*t*	*df*	*p*	*d*
Content-related Factors			-3.28	850	.001**	.23
Grade Ten	2.67	.656				
Grade Eleven	2.82	.669				
Teacher-related Factors			-2.48	850	.014*	.15
Grade Ten	3.07	.338				
Grade Eleven	3.12	.327				
Teaching-learning Conditions			1.11	850	.266	.07
Grade Ten	2.81	.425			(ns)	
Grade Eleven	2.78	.400				
Student-related Factors			-1.39	850	.166	.08
Grade Ten	2.72	.448			(ns)	
Grade Eleven	2.76	.469				
Parent-related Factors			1.13	850	.260	.09
Grade Ten	3.08	.344			(ns)	
Grade Eleven	3.05	.324				
School-related Factors			-2.21	850	.028*	.14
Grade Ten	3.01	.431				
Grade Eleven	3.07	.453				

Note. *$p < .05$, **$p < .01$, ns = not significant

In accordance with Table 8, it can be seen that there were significant differences between Grade Ten and Grade Eleven students for content factors at .01 level (p = .001), and for teacher factors (p = .014), and school factors (p = .028) at .05 level but not for teaching and learning conditions, student factors and parent factors. Therefore, it can be interpreted that more Grade Eleven students than Grade Ten students were influenced by content, teacher, and school factors in learning physics.

Findings from the Factors Influencing Students in Four High Schools in Learning Physics

In order to measure whether there were significant differences among the factors influencing on 852 students from the selected schools, a one-way ANOVA was executed.

Table 9 One–Way Analysis of Variance Table Comparing the Factors Influencing the Students in Four High Schools in Learning Physics.

Source	*df*	*SS*	*MS*	*F*	*p*
Content-related Factors					
Between Groups	3	6.297	2.099	4.794	.003**
Within Groups	848	371.322	.438		
Total	851	377.619			
Teacher-related Factors					
Between Groups	3	1.709	.570	5.198	.001**
Within Groups	848	92.916	.110		
Total	851	94.625			
Teaching-learning Conditions					
Between Groups	3	.578	.193	1.132	.335
Within Groups	848	144.447	.170		(ns)
Total	851	145.025			
Student-related Factors					
Between Groups	3	1.670	.557	2.661	.047*
Within Groups	848	177.322	.209		
Total	851	178.992			
Parent-related Factors					
Between Groups	3	.756	.252	2.263	.080
Within Groups	848	94.446	.111		(ns)
Total	851	95.202			
School-related Factors					
Between Groups	3	3.859	1.286	6.692	.000***
Within Groups	848	163.029	.192		
Total	851	166.888			

Note. *$p < .05$, **$p < .01$, ***$p < .001$, ns = not significant

It is clear in Table 9 that ANOVA results describe about there was a significant difference among the students in four high schools concerning the content factors and teacher factors influencing in learning physics, $F(3,848) = 4.794, 5.198$, $p < .01$, concerning the student factors influencing in learning physics, $F(3,848) = 2.661$, $p < .05$, and concerning the school factors influencing in learning physics, $F(3,848) = 6.692$, $p < .001$. However, a significant difference did not exist among the schools concerning the teaching learning conditions and parent factors. Thus, it was clearly seen that the content factors, teacher factors, student factors, and school factors that influence the students in four high schools in learning physics differed, whereas teaching learning conditions and parent factors of the students were equivalent among the students in the four high schools.

Findings from the Reasons for the Difficulties of the Students in Learning Physics

To find out the reasons for the difficulties of the students in learning physics, Pearson product-moment correlation was computed and Table 10 shows the correlations among the difficulties of 852 students and the factors influencing on learning physics.

Table 10 Correlations between Difficulties of the Students and Factors Influencing in Learning Physics.

Variable	DU	DS	DP	TD
Content Factors	.321** (*p* = .000)	.197** (*p* = .000)	.180** (*p* = .000)	.303** (*p* = .000)
Teacher Factors	-.027	-.007	-.084* (*p* = .014)	-.056
Teaching-learning Conditions	-.089* (*p* = .009)	-.010	.020	-.029
Student Factors	-.151** (*p* = .000)	-.208** (*p* = .000)	-.192** (*p* = .000)	-.242** (*p* = .000)
Parent Factors	-.012	-.053	-.037	-.051
School Factors	-.074* (*p* = .031)	-.004	-.131** (*p* = .000)	-.093** (*p* = .006)

Note. DU = Difficulties in understanding the subject
DS = Difficulties in solving problems
DP = Difficulties in doing practical work
TD = Total difficulties in learning physics

According to Table 10, there were positive correlations between the content factors and all dimensions and total of the difficulties of the students in learning physics at the .01 level, amounting to r (850) = .321, .197, .180, .303, p = .000. Therefore, it can be interpreted that if the content factors are high, the difficulties of the students in learning physics will increase and if the content factors are low, the difficulties of the students in learning physics will decrease. On the other hand, there was a negative correlation between the teacher factors and the difficulties of the students in doing practical work in physics at .05 level, showing r (850) = -.084, p = .014, not in other difficulties. This means that if the teacher factors are high, the difficulties of the students in doing practical work in physics will decline. Furthermore, there was a negative correlation between the teaching learning conditions and the difficulties of the students in understanding the subject in physics at .05 level, accounting for r (850) = -.089, p = .009. Thus, it was found that if the teaching learning conditions are great, the difficulties of the students in understanding the subject in physics will drop off. Similarly, there were negative correlations between the student factors and all dimensions and total of the difficulties of the students in learning physics at .01 level, representing r (850) = -.151, -.208, -.192, -.242, p = .000. Therefore, it was found that if the student factors are high, the difficulties of the students in learning physics will decrease or if the student factors are low, the difficulties of the students in learning physics will increase. Besides, there was also a negative correlation between school factors and the difficulties of the students in learning physics at .05 level except in solving problems, contributing to r (850) = -.074, p = .021, r (850) = -.131, p = .000, r (850) = -.093, p = .006. Thus, it was seen that if the school factors are high, the difficulties of the students in learning physics, except in solving problems in physics will decrease and vice versa. On the contrary, there was no significant correlation between the difficulties of the students' parent factors.

Discussion and Suggestions

Discussion

The study aimed at investigating the difficulties of the students, factors influencing the students and finding out the reasons for their difficulties in learning physics at Basic Education High School Level.

In accordance with the results of the study, it was clearly seen that there was nearly two third of the total number of students who experienced difficulties in learning physics at the Basic Education High School Level. The greatest number of students faced the difficulties in solving problems in physics such as the difficulties in selecting the formulae to solve the problem, in classifying the given facts in the problem, in solving the rephrased problems, in understanding the meaning of a problem, in arriving at the correct answer and in computing the complex problems. Problem solving is at the heart of physics education (Adegoke, 2017). Thus, if a student is good at solving problems in physics, it can be interpreted that the physics teacher can implement the objectives of teaching at high school level with a great success. Therefore, physics teachers should be well aware how students face difficulties in learning physics and try to be able to handle it in order to achieve the objectives of teaching of physics.

Additionally, it was found that the difficulty of male students in learning physics was approximately equivalent to that of female students. It supposes that this is because both male and female students had the same interest, attitude towards the subject and mathematics skills in learning physics. Furthermore, it can generally be interpreted that both Grade Ten and Grade Eleven students faced an equal amount of difficulty in learning physics at the Basic Education High School Level.

Moreover, it was seen that there were many factors that can make the learning of students in physics progress and success. These factors were the nature of the subject such as complex and abstract concepts in physics, positive attitude of the teacher towards the subject, teacher's motivation to be interested in the subject and to active participate actively in the teaching learning process, teacher's explication, the use of instructional materials, student's interest, student's attitude towards the subject, student's mathematics skills, active participation of the students in leaning, parent's support in child's learning such as giving enough study time, provision of necessary materials, parent's encouragement and interest in child's learning, provision of sufficient school facilities such as buildings, classrooms, furniture, laboratories and teaching learning resources such as instructional materials and apparatuses.

With regard to the findings of the study, it was seen that students experienced difficulties in learning physics because of the complex and abstract nature of physics, too much calculations in physics, lack of interest, mathematics skills and negative attitude of the students towards the subject, and the lack of the adequate school facilities and instructional materials. Thus, physics teachers should take cognizance of the difficulties of the students and reasons for their difficulties in learning physics and apply them in teaching the students with learning difficulties in order to lessen their difficulties and improve their abilities in learning physics.

Suggestions

In accordance with the findings of the study, the researcher believes that physics teachers should take some considerations into teaching physics at the Basic Education High School Level in Myanmar. Firstly, in order to teach the students to be able to grasp the fundamental concepts of physics, physics teachers should make students adequately comprehend the fundamental concepts, laws, and basic principles of physics and should encourage them to memorize the new vocabularies, symbols, and units in physics. Secondly, they should endeavor to teach students to acquire the adequate understanding of the concepts and techniques for solving problems and to select the data that are required to solve the problem. Furthermore, they should train students how to solve the physics problems with the easy way in the classroom. Students should also be given the ample time and opportunity to solve the physics problems during the process of learning physics. Moreover, they should often give students homework to solve the related problems after a unit and also a note on key topics in the lesson in order for the students to get the key and fundamental concepts in physics. Further research that investigates the difficulties of the students in learning physics at the Basic Education High School Level should be conducted by using achievement tests, or by case study research design. It will also be required to study

with a larger sample size in other regions of the country. In addition, further research with other influencing factors on learning physics should be conducted since there may be other factors that influence students in learning physics.

Conclusion

Physics is an important subject for economic, scientific and technology and can help students to develop conceptual and procedural knowledge relevant to their daily life (Erinosho, 2013). This study aimed at investigating the difficulties, influencing factors of the students and the reasons of their difficulties in learning physics at the Basic Educational High School Level. The findings revealed that students are likely to have the highest level of difficulty in solving physics problems. Therefore, physics teachers should give the students the practice of being able to read the statement of the problem properly, carefully and thoroughly, to identify the given facts and the unknown facts, and to think the meaning of the problem critically during the instruction. Moreover, the findings from the study provide insight about attitude towards to the subject, motivation, encourage and assistance of a teacher are one of the most important features that can promote the students' ability and performance in learning physics. Similarly, students experience difficulties in learning physics due to the complex and abstract nature of physics and too much calculation. Thus, physics teachers should explain the lessons to students by associating with the daily life and give examples from daily life in order to acquire the sound fundamental concepts of physics and the ability in order to apply physics in their daily lives. Moreover, lack of interest, positive attitude and mathematics skills of the students can be the reasons why they had difficulty learning physics. Therefore, physics teachers should strive to encourage students to be interested in physics and to appreciate the importance of physics in their daily lives. For these reasons, this study will provide valuable information for physics teachers about how they can effectively teach physics, how they deal with the students of the different abilities and how they facilitate the learning difficulties of the students. In the same way, through this study, school administrators can grasp at the ways to generate the new brilliant generations and scientists. Likewise, it can give an opportunity to high school students to notice their own abilities and difficulties in learning physics. Thus, the researcher strongly believes that this study will serve as a worthful way for the journey to the improvement of the science education.

Acknowledgements

I would like to express my heartfelt gratitude and sincerest appreciation to Dr. Myat Myat Thaw (Rector, Sagaing University of Education), Dr. Khin Hnin Yee and Dr. San San Lwin (Pro-Rectors, Sagaing University of Education) who enabled me to undertake the study. I want to convey my wholehearted respect and indebtedness to Dr. Soe Than (Retired Professor and Head of Department of Curriculum and Methodology, Sagaing University of Education) for his aspirations and valuable contributions to shape the quality of this study. I would like to expend my reserved and immense gratitude to Dr. Wai Wai Oo (Professor and Head of Department, Department of Curriculum and Methodology, Sagaing University of Education) who gave the invaluable advice and inspiration for performing the study.

References

Adegoke, B. A. (2017). Effect of explicit problem-solving instruction on secondary school students' achievement in physics. *International Journal of Scientific Research in Education* (IJSRE), *10*(1), 87-101. Retrieved from http://www.ijsre.com/assets/vol.%2C-10(1)-adegoke.pdf

Adeyemo, S. (2010). Teaching/learning physics in Nigerian secondary school: The curriculum transformation, issues, problems and prospects. *International Journal of Educational Research and Technology*, *1*(1), 99-111. Retrieved from http://www.soeagra.com/ijert/vol1/ijert15.pdf

Angell, C., Guttersrud, O., Henriken, E.K. & Isnes, A. (2004). Physics: Frightful, but fun. Pupils' and teachers' views of physics and physics teaching. *Science Education*, *88*(5), 683-706. Retrieved from https://www.academia.edu/12063589/Physics_Frightful_but_fun_Pupils_and_teachers_views_of_physics_and_physics_teaching

Baran, M. (2012). An analysis on high school students' perceptions of physics courses in terms of gender. *Journal of Education and Training Studies*, *4*(3), 150-160. doi:10.11114/jets.v4i3.1243

Buabeng, I. (2015). *Teaching and learning of physics in New Zealand high schools* (PhD thesis). Retrieved from https://core.ac.uk/download/pdf/35473072.pdf

Cutnell, J. D., & Johnson, K. W. (2007). *Physics* (7th ed.). New Jersey: John Willey & Sons Inc.

Desforges, C., & Abouchaar, A. (2003). *The Impact of parental involvement, parental support and family education on pupil achievements and adjustments* (Publication No. 433). Retrieved from https://www. nationalnumeracy. org.uk/sites/default/files/the_impact_of_parental_involvement.pdf

Driscoll, M. P. (2005). *Psychology of learning for instruction* (3rd ed.). Boston: Peasrson Alyn and Bacon Inc.

Ekici, E. (2016). Understanding high school students' difficulties in learning physics. *Journal of Education and Practice*, *7*(7), 95-107. Retrieved from https://files.eric.ed.gov/fulltext/EJ1095264.pdf

Erinosho, S.Y. (2013). How do students perceive the difficulty of physics in secondary school?: An exploratory study in Nigeria. *International Journal for Cross-Disciplinary Subjects in Education*, *3*(3), 1510-1515. Retrieved from https://infonomics-society.org/wp-content/uploads/ijcdse/published-papers/special-issue-volume-3-2013/How-Do-Students-Perceive-the-Difficulty-of-Physics-in-Secondary-School.pdf

Gezahegn, Y. B. (2007). *Barriers to teaching and learning mathematics in Grade Four* (Master thesis). http://dx.doi.org/10.4236/ns.2014.65037

Hidi, S., & Harackiewicz, J. M. (2000). Motivating the academically unmotivated: A critical issue for the 21st century. *Review of educational research*, *70*(2), 151-179. Retrieved from https://journals.sagepub.com/doi/10.3102/00346543070002151

Hornby, A. S. (2015). *Oxford advanced learner's dictionary* (9th ed.). England: Oxford University.

Kipngeno, L. (2018). *Teacher factors influencing academic performance of secondary school students in physics: A study of secondary schools in Bureti Sub country, Kericho country-Kenya* (Master thesis). Retrieved from http://ir.mu.ac.ke:8080/xmlui/bitstream/handle/123456789/ 1113/Langat%20Kipngeno%2 02018. pdf?sequence=1&isAllowed=y

Ministry of Education (MOE) (2007). *Physics teacher's manual for the high school*. The government of the Union of Myanmar: Basic Education Curriculum, Syllabus and Textbook Committee.

Nolen, S. B. (2003). Learning environment, motivation, and achievement in high school science. *Journal of Research in Science Teaching*, *40*(4), 347-368. Retrieved from https://doi.org/10.1002/tea.10080

Nteere, N. M., Kwaria, J. M. & Kirimi, N. K. (2017). Influence of selected factors on students' attitude towards physics in public secondary schools. *American Journal of Educational Research*, *5*(9), 939-943. doi: 10.12691/education-5-9-2

Ogunmade, T.O. (2005). *The status and quality of secondary science teaching and learning in Lagos State, Nigeria* (PhD thesis). Retrieved from
https://www.researchgate.net/publication/49282187_The_status_and_quality_of_secondary_science_teaching_and_learning_in_Lagos_State_Nigeria

Ornek, F, Robinson, W.R., & Haugan M.P. (2008). What makes physics difficult? *International Journal of Environmental & Science Education*, *3*(1), 30-34. Retrieved from https://www.researchgate.net/publication/228689133_What_makes_physics_difficult

Salleh, K. M. (2004). Role of physics community for the development and advancement of physics in the globalization era. *Indonesian Journal of physics*, *15*(1). Retrieved fromfile:///C:/Users/User/Downloads/99-Article%20Text-446-1-10-20161103%20(1).pdf

SPSS for windows. *Statistical package for social science*. Version. 20.0: SPSS Inc.