

# Problems Affecting Physics Learning and its Effect on the Academic Performance of Students in Integrated Teacher Training Programme

OPEN ACCESS

Manuscript ID:  
ASH-2020-08023352

Volume: 8

Issue: 2

Month: October

Year: 2020

P-ISSN: 2321-788X

E-ISSN: 2582-0397

Received: 12.07.2020

Accepted: 19.08.2020

Published: 01.10.2020

Citation:

Noufal, P., et al. "Problems Affecting Physics Learning and Its Effect on the Academic Performance of Students in Integrated Teacher Training Programme." *Shanlax International Journal of Arts, Science and Humanities*, vol. 8, no. 2, 2020, pp. 58-64.

DOI:

<https://doi.org/10.34293/sijash.v8i2.3352>



This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License

**P. Noufal, Param Preet Kaur, K.G. Ambady and M.U. Paily**

*Regional Institute of Education, Mysore, Karnataka, India*

## Abstract

*Physics is one of the most common problematic subjects for the students in the degree and post graduate level. Students want to spend more time on the subject to get mastery over it. Similarly, to maintain the quality education, the teacher education institutes have a prominent role; they want to focus more on the education part of the subject. Students who are enrolled in the teacher training colleges should play a crucial role in developing and maintaining future science education. This study focussed on the problems affecting the Physics learning of the prospective teachers who are enrolled in the integrated teacher training programs and the different types of problems that they are faced to achieve better results. The study was conducted among prospective teachers of integrated teacher training college who are pursuing the MSc.Ed program. Data was collected by using a questionnaire prepared by the researchers, including provisions for open-ended answering. The sample of the study includes the students from various academic years. Results show that the majority of the students having a medium level of problems with Physics learning and male students are facing more problems compared to female students. The academic year also an influencing factor of problems in Physics learning. Other factors such as previous school education, current grade point average have no relationship with the problems affecting Physics learning.*

**Keywords:** Physics learning, Academic performance, Problems and Integrated Teacher Training Programme

## Introduction

Education is an enlightening experience, which provides an uplift in the knowledge, acquisition of different valuable skills, cultivation of values and beliefs, etc. Different educational areas have their own identity and importance in the learning process of the child. The ultimate purpose of providing education is to make the students excel in their interested field. Science education provides an insight into the acquisition of scientific literacy and the development of science process skills. It is true that there is more benefit while learning the science subject, whether it is pure science or any applied science. If they consider the higher educational level, Students can select their interested field where he or she wants to focus. Physics is one of the areas where many students are interested and concentrated on the specific field. At the same time, Physics is considered the most problematic area within the realm of science, and it traditionally attracts fewer students than other sciences like chemistry and biology. Most of the students perceived Physics as a difficult subject during high school days and becomes more problematic when they are in college. There are different factors that affect positively and negatively on the student's learning in the Physics subject.

Prior knowledge has a great effect on students' knowledge of scientific concepts. At the school level, the students want to build up the scientific concepts and their applications in a positive manner. Otherwise, they cannot be able to follow the subject at the higher educational level. The research study is needed to find the various academic problems that the students are facing when they are at school level and college level. This study focussed on the problems affecting Physics learning in the integrated teacher training program. In the integrated teacher training institute, the students want to learn the Physics subject, and also they want to learn how to teach the Physics subject.

### Review of Related Literature

Sintayehu Mekonnen (2014) conducted a study on "Problems challenging the academic Performance of Physics students in Higher Governmental institutions in the case of Arbaminch, Wolayita soda, Hawassa and Dilla universities." The major findings of the study were as follows. The aim of education is to make an individual self-reliant and earn a living a proper in chosen field, but in recent times the standards of education have fallen way too down. This is having a huge effect on the education system. Conducted or project on the above topic and the researcher prepared a questionnaire to conduct a survey and various conclusions reflecting the various reasons that effect the academic performance of the students has formed also depicting the relationship between the dependable variables and independent variables.

Richardo Trumper (2006) conducted a study on Factors affecting junior high school students' interests in Physics." In his study, it was learned that the interest of students is decreasing in science, which is going to vitally affect the scientific literacy of future generations. There was also seen that number of girls who took science at higher secondary level were very few - in this article basically dealt with Israel and how the gender of the students affects the interest and, in turn, the performance of the students. Various studies were conducted to find out the reasons and based on that, changes were induced. It was learned the boys always showed interest in physics.

Indika Grandia, Kristins Cuza, and Jenaro gesiseisola (2016) conducted a study on the topic "Attitudes and motivations towards Physics and its learning at both high school and university." With the advancement in science and technology, the infrastructure and the teaching faculty have improved but sadly the student's interest has been profusely declining. Hence a lot of work is done in science education to bring forth a change in the attitude of students. Their paper dealt with how to improve student's interest and attitude varied at different stages of education. A study is being conducted on high school students and engineering students.

Olusola, Olasimba O, Roptimi CO (2012) conducted a study on the topic "Attitudes of students towards the study of Physics in a college of education Ikere Ekiti, Nigeria." The attitude is comprised of two components parts which are effective in dealing with the mental processes. Attitude profusely affects students' performance. It was observed that a very less number of students were attracted to Physics because of poor infrastructure, laboratories, and various other factors like family and peer effects and one's interest. The devastating academic performance of students in Physics has been a topic of concern. Hence to unveil the reasons behind a questionnaire was prepared, and conclusions were made on the results.

### Objectives of the Study

1. To find out the difference in variables such as Gender, Year of study, previous school education on the Problems affecting Physics learning of students in the integrated teacher training program.
2. To find out the levels of problems in Physics learning concerning Gender, Year of Study on the students from the integrated teacher training program.
3. To find out the relationship between plus two percentages on the Problems affecting the Physics learning of students in the integrated teacher training program.
4. To identify the major academic problems of students concerning Physics learning.

## Hypotheses of the Study

1. There is no significant difference in the Problems affecting Physics learning of the students in the integrated teacher training program concerning Gender.
2. There is no significant difference in the Problems affecting Physics learning of the students in the integrated teacher training program concerning year of study.
3. There is no significant difference in Problems affecting Physics learning of the students in the integrated teacher training program concerning previous school education.
4. There is no significant relationship between plus two percentages and Problems affecting the Physics learning of students in the integrated teacher training programme.

## Method

The study was employed in the descriptive survey study method for fulfilling the objectives. The sampling technique used for this study was a simple random technique. The data was collected from the total population, and from that, it is selected randomly based on the positive feedback that they are given.

## Participants of the study

This study focussed on finding the problems affecting Physics learning on the academic performance of students in the integrated teacher training program. The population of the study was all the students who are enrolled for MSc.Ed Physics in the southern region of India. The sampling was done by a simple random method. The students joined for a first, second, third, fourth, fifth and sixth year of the integrated teacher training program was selected for the study. This study includes 24 male students and 39 female students.

## Instrument Used

The instrument used for this study contains three parts. In the first part, the general details related to the participants are collected, which consist of Name, Gender, Previous school of education, Age, and current GPA in the Physics subject that they got up to the present semester. The second part of

the instrument consists of questionnaires including 15 items related to the various problems affecting Physics learning. The questionnaire is based on the four-point rating scale consists of the following ratings (Strongly Disagree, Disagree, Agree, Strongly Agree). The questionnaire contains both positive questions and negative questions. The score for the positive questions as Strongly Disagree - 1, Disagree - 2, Agree - 3, and Strongly Agree - 4 and for the negative questions it is as vice versa. The score has given according to the positive and negative items. The third part of the instrument consists of the listing of various academic-related problems that the students are facing concerning Physics learning in the integrated teacher training program. The tool is prepared by the researchers and it is validated by the experts.

## Data Analysis and Interpretation

The data collected through the questionnaire contains 15 test items related to the problems affecting Physics learning in the integrated teacher training program are analyzed by using Statistical Package for Social Science (SPSS). Descriptive statistics are used to describe demographic data. Whereas inferential statistics, involving independent samples t-test and ANOVA test, is used to determine the differences between the groups involved in the research.

**Table 1: Percentage of Levels of problems affecting in Physics learning**

| Levels of problems | Frequency | %     |
|--------------------|-----------|-------|
| High               | 5         | 7.9   |
| Medium             | 57        | 90.5  |
| Low                | 1         | 1.6   |
| Total              | 63        | 100.0 |

The total score obtained towards the problems affecting Physics learning is classified into three levels, namely, High, Medium and Low problems. The maximum possible range of scores is 15-60, as the instrument consists of 15 items. This possible range is divided equally to classify into three levels. The scores of problems affecting Physics learning are classified into high problems (46-60), medium problems (31-45) and low problems (15-30). The number of students and the percentage of students

falling on each level is shown in table 1. It is clear that 7.9% of students having big problems with Physics learning in the integrated teacher training program. The majority of the students were having medium-level (90.5%) problems towards Physics learning. This result show that the students are facing problems with Physics learning in the integrated teacher training program.

**Hypothesis 1:** There is no significant difference in the Problems affecting the Physics learning of the students in the integrated teacher training program concerning Gender.

**Table 2: T-test on Gender Versus Problems Affecting Physics learning**

| Gender | N  | Mean  | S.D  | t     | Sig. (2-tailed) |
|--------|----|-------|------|-------|-----------------|
| Male   | 24 | 39.79 | 4.12 | 2.037 | .046            |
| Female | 39 | 37.56 | 4.27 |       |                 |

To find the significant difference in Gender on Problems affecting physics learning, an independent sample t-test was done. The results show in the table (2). From the table,, there is a significant difference between males and females on Problems affecting physics learning. So the hypothesis is rejected. It is also clear from the table that male students (Mean=39.79) have more problems than the female students in Physics learning (Mean=37.56).

**Table 3: Levels of Problems affecting Physics learning on Gender**

| Gender | Levels       | Frequency | %            |
|--------|--------------|-----------|--------------|
| Male   | High         | 3         | 12.5         |
|        | Medium       | 21        | 87.5         |
|        | <b>Total</b> | <b>24</b> | <b>100.0</b> |
| Female | High         | 2         | 5.1          |
|        | Medium       | 36        | 92.3         |
|        | Low          | 1         | 2.6          |
|        | <b>Total</b> | <b>39</b> | <b>100.0</b> |

The total score obtained on the problems affecting Physics learning is classified into three levels: high, medium, and low, based on Gender. The number of students falling on each level is shown in the table (3). Compared to girls, boys having high problems with Physics learning. It is clear that, among boys, 87.5% having medium level problems, whereas among girls, 92.3% having medium level problems in Physics learning.

**Hypothesis 2:** There is no significant difference in the Problems affecting Physics learning of the students in the integrated teacher training program concerning year of study.

**Table 4: ANOVA on Problems affecting Physics Learning by Present Year of Study**

| Year of Study | N         | Mean         | S.D.        |
|---------------|-----------|--------------|-------------|
| 1             | 14        | 39.14        | 5.67        |
| 2             | 9         | 36.78        | 2.05        |
| 3             | 14        | 35.71        | 3.65        |
| 4             | 8         | 38.38        | 4.50        |
| 5             | 12        | 41.58        | 2.99        |
| 6             | 6         | 39.17        | 2.64        |
| <b>Total</b>  | <b>63</b> | <b>38.41</b> | <b>4.32</b> |

|                | Sum of Squares | Df        | Mean Square | F    | Sig. |
|----------------|----------------|-----------|-------------|------|------|
| Between Groups | 257.52         | 5         | 51.50       | 3.26 | .012 |
| Within Groups  | 899.75         | 57        | 15.79       |      |      |
| <b>Total</b>   | <b>1157.27</b> | <b>62</b> |             |      |      |

In order to find the significant relation between Problems affecting Physics learning over year of study one way ANOVA was done. The result obtained is included in the table (4). From the table it is clear that there is a significant difference between year of study and Problems affecting Physics learning. Hence the hypothesis is rejected. It shows that year of study of the students is an influencing factor of students towards the Problems affecting Physics learning. In order to find the distribution of problems in each year of study Post Hoc test was done. The result was shown in the table 5.

**Table 5: Post Hoc Tests on Problems affecting Physics learning and Year of Study**

| (I) Present year | (J) Present year | Mean Difference (I-J) | Std. Error | Sig.  |
|------------------|------------------|-----------------------|------------|-------|
| 1                | 2                | 2.37                  | 1.69       | .855  |
|                  | 3                | 3.43                  | 1.50       | .402  |
|                  | 4                | .77                   | 1.76       | .999  |
|                  | 5                | -2.44                 | 1.56       | .784  |
|                  | 6                | -.02                  | 1.93       | 1.000 |

|   |   |        |      |       |
|---|---|--------|------|-------|
| 2 | 1 | -2.37  | 1.69 | .855  |
|   | 3 | 1.06   | 1.69 | .995  |
|   | 4 | -1.60  | 1.93 | .983  |
|   | 5 | -4.81  | 1.75 | .203  |
|   | 6 | -2.39  | 2.09 | .933  |
| 3 | 1 | -3.43  | 1.50 | .402  |
|   | 2 | -1.06  | 1.69 | .995  |
|   | 4 | -2.66  | 1.76 | .807  |
|   | 5 | -5.87* | 1.56 | .024  |
|   | 6 | -3.45  | 1.93 | .674  |
| 4 | 1 | -.77   | 1.76 | .999  |
|   | 2 | 1.59   | 1.93 | .983  |
|   | 3 | 2.66   | 1.76 | .807  |
|   | 5 | -3.21  | 1.81 | .681  |
|   | 6 | -.79   | 2.14 | 1.000 |
| 5 | 1 | 2.48   | 1.56 | .784  |
|   | 2 | 4.80   | 1.75 | .203  |
|   | 3 | 5.87*  | 1.56 | .024  |
|   | 4 | 3.21   | 1.81 | .681  |
|   | 6 | 2.42   | 1.98 | .913  |
| 6 | 1 | .02    | 1.93 | 1.000 |
|   | 2 | 2.39   | 2.09 | .933  |
|   | 3 | 3.45   | 1.93 | .674  |
|   | 4 | .79    | 2.14 | 1.000 |
|   | 5 | -2.42  | 1.98 | .913  |

\*The mean difference is significant at the 0.05 level.

From the table it is clear that the third-year students and fifth-year students having significant problems towards physics learning.

**Table 6: Levels of Problems affecting Physics Learning on Present year of study**

| Present year | Levels of problems | Frequency | %     |
|--------------|--------------------|-----------|-------|
| 1            | High               | 2         | 14.3  |
|              | Medium             | 11        | 78.6  |
|              | Low                | 1         | 7.1   |
|              | Total              | 14        | 100.0 |
| 2            | Medium             | 9         | 100.0 |
| 3            | Medium             | 14        | 100.0 |
| 4            | High               | 1         | 12.5  |
|              | Medium             | 7         | 87.5  |
|              | Total              | 8         | 100.0 |

|   |        |    |       |
|---|--------|----|-------|
| 5 | High   | 2  | 16.7  |
|   | Medium | 10 | 83.3  |
|   | Total  | 12 | 100.0 |
| 6 | Medium | 6  | 100.0 |

Total score obtained towards the problems affecting Physics learning is classified in to three levels namely high, medium and low based on year of study. The number of students falling on each level based on year of study was shown in the table (6). In all the year, the students having high problems towards the Physics learning. Compared to other years, in the 5th year, the percentage of high problems affecting students are more (16.7%). In all the years, the students are facing more amount of medium levels of problems towards Physics learning.

Hypothesis 3: There is no significant difference on Problems affecting Physics learning of the students in the integrated teacher training programme with respect to previous school education

**Table 7: One way ANOVA by Previous School Education On Problems Affecting Physics Learning Previous School Education**

| Previous School Education | N         | Mean           | S.D.           | Std. Error    |
|---------------------------|-----------|----------------|----------------|---------------|
| CBSE                      | 28        | 38.4643        | 4.63067        | .87511        |
| ICSE                      | 10        | 40.7000        | 2.79086        | .88255        |
| State Board               | 25        | 37.4400        | 4.24343        | .84869        |
| <b>Total</b>              | <b>63</b> | <b>38.4127</b> | <b>4.32038</b> | <b>.54432</b> |

**Table 8: One way ANOVA by Previous school education on Problems affecting Physics learning**

|                | Sum of Squares | Df | Mean Square | F     | Sig. |
|----------------|----------------|----|-------------|-------|------|
| Between Groups | 76.046         | 2  | 38.023      | 2.110 | .130 |
| Within Groups  | 1081.224       | 60 | 18.020      |       |      |
| Total          | 1157.270       | 62 |             |       |      |

In order to find the significant difference on previous school education problems affecting Physics learning, on way ANOVA was done. The results shows in the table (7) and (8). From the table it is clear that there is no significant difference between previous school education on Problems

affecting Physics learning. Hence the hypothesis is accepted. It shows that previous school education has not influencing the on Problems affecting Physics learning the integrated teacher training programme.

Hypothesis 4: There is no significant relationship between plus two percentage and Problems affecting Physics learning of students in integrated teacher training programme.

**Table 9: Correlation between plus two percentage versus Problems**

|                     | Mean    | S. D    | N  | Pearson Correlation | Sig. (2-tailed) |
|---------------------|---------|---------|----|---------------------|-----------------|
| Plus two percentage | 88.2021 | 9.05306 | 63 | -.139               | .278            |
| Problems            | 38.4127 | 4.32038 | 63 |                     |                 |

In order to find the significant relationship between plus two percentage on problems affecting Physics learning, independent sample t-test was done. The results shows in the table (9). From the table it is clear that there is no significant relationship between plus two percentage towards problems affecting Physics learning in the integrated teacher training programme. Hence the proposed hypothesis is accepted. The value of Pearson coefficient obtained is -.139. This shows that the percentage of marks obtained during plus two level is not related with the problems affecting Physics learning.

### Findings and Conclusions

Students are facing different academic-related problems in their learning time. Physics in the subject where the students wants to spend more time in order to get better understanding and better results. Different factors will influence the academic problems of the students. From this study, it is shown that boys are facing more problems than girls with respect to the Physics learning. Majority of the students enrolled in the integrated teacher training program are having more medium level problems and it is remaining according to the progress of year of study.

Students were suggested that the content taught was diluted and was not at par with the other universities. Education subjects were taking a lot of time hence reducing the time given to core subjects. Because of that the students cannot able to concentrate more on Physics learning. Enough workshops and other updated programmes related to the Physics subject are not conducted to aware the students about the latest advancements in science. Same syllabus is taught from long time, syllabus is not changed with changing times. So there needs a continuous revision of syllabus based on the latest

advancements in the Physics that will fulfil the needs of the students. Students opined the problems related to the practical work and the infra structural and administrative problems related to the Physics laboratory and library.

From this study it shows that the problems were not based on the previous school education, or plus two percentage marks or the academic performance in the present programme. With their own interest, the students are jointed for the integrated teacher training program. So it is the responsibility of the all the associated persons (teachers, administrators, etc.) to provide maximum academic and non-academic input to the students and provide the aspirations of the students and reduce the problems related to the Physics learning process.

### References

- Apata, Olukayode Emmanuel. "Predictive Validity of School and Student Factors on Secondary School Students." *IOSR Journal of Research & Method in Education*, vol. 9, no. 5, 2019, pp. 34-42.
- Bruner, Jerome. *The Process of Education*, Havard University Press, 1976.
- Gosling, Chris. "Challenges Facing High School Physics Students: An Annotated Synopsis of Peer-Reviewed Literature Addressing Curriculum Relevance and Gender." *Journal of Physics Teacher Education*, vol. 2, no. 2, 2004, pp. 3-9.
- Arandia, Endika, et al. "Attitudes and Motivations towards Physics and its Learning at both High School and University." *International Journal of Education and Information Technologies*, vol. 10, 2016, pp. 58-65.
- Chrzanowski, Janusz, et al. "Challenges in Teaching and Learning Physics for First Year Students."

- Scientific Journals Maritime University of Szczecin*, vol. 33, 2013, pp. 11-15
- Dilshad, Muhammad, and Ahmad Saeed. "Teaching of Physics at Higher Secondary Level in the Perception of Students." *International Journal of AYER*, vol. 2, 2015, pp. 491-496.
- Snetinova, M., and Z. Koupilova. "Students' Difficulties in Solving Physics Problems." *WDS'12 Proceedings of Contributed Papers*, 2012, pp. 93-97.
- National Curriculum Framework*, National Council of Educational Research and Training, 2005.
- Ogunleye, Ayodele, et al. "Effect of Students' Background Knowledge of Mathematics on Senior Secondary School Students' Achievement in Physics." *Bulgarian Journal of Science Education*, vol. 23, no. 6, 2014, pp. 863-880.
- Olusola, Olasimbo O., and C.O. Rotimi. "Attitudes of Students towards the Study of Physics in College of Education Ikere Ekiti, Ekiti State, Nigeria." *American International Journal of Contemporary Research*, vol. 2, no. 12, 2012, pp. 86-89.
- Trumper, Ricardo. "Factors Affecting Junior High School Students' Interest in Physics." *Journal of Science Education and Technology*, vol. 15, 2006, pp. 47-58.
- Mekonnen, Sintayehu. "Problems Challenging the Academic Performance of Physics Students in Higher Governmental Institutions in the case of Arbaminch, Wolayita Sodo, Hawassa and Dilla Universities." *Natural Science*, vol. 6, 2014, pp. 362-375.

#### Author Details

**P. Noufal**, Regional Institute of Education, Mysuru, Karnataka, India, **Email ID:** noufalmrk@gmail.com.

**Param Preet Kaur**, Regional Institute of Education, Mysuru, Karnataka, India, **Email ID:** pparam648@gmail.com.

**K.G. Ambady**, Regional Institute of Education, Mysuru, Karnataka, India, **Email ID:** ambadykg@gmail.com.

**M.U. Paily**, Regional Institute of Education, Mysuru, Karnataka, India, **Email ID:** mupaily@yahoo.com.