

# Effectiveness Of Blended Learning Among Undergraduate Students

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## ABSTRACT

Blended learning approaches are more effective. The investigators prepared a Moodle content on Physics and each Physics teachers, conducted through forum discussion, quizzes and assignments, and to give a link of online resources for further study. A convenience sampling of 120 students in a Bachelor's degree in Physics Class of Government, Aided and Self-financed Arts and Sciences Colleges at Salem District of Tamil Nadu in September 2019 were selected. The normal classroom teaching was taught to the control group whereas the blended learning approach was used in the experimental group. From this study, the investigators concluded that they supported blended learning than the normal class teaching in Undergraduate students.

## Keywords

Blended Learning, Physics content, academic achievement, undergraduate students

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## Introduction

Recent classrooms are filled with technology-oriented content and used the blended learning approach which is a combined form of both online and traditional modes of teaching. From this approach, we can fix the time and place of learning. It can interact with students on discussions and provide feedback that leads to the improvement of learning. A lot of reviewers have supported the Blended learning approaches are more effective. According to Banditvilai (2016), the blended learning method was more helpful for controlling the time place settings.

## Review Of Related Studies

Some related review studies are following; Freihat (2004) investigated in 157 students of the Pre-medicine level at Bahrain in the Arabian Gulf University and concluded the blended learning method develops educational skills to the students. Bates (2007) found out that, the students are utilized the classroom PowerPoint slides for their homework and their discussion was in classrooms about the materials. Shatin (2008) experimented on the achievement of a blended learning approach in Fifth grades in Egypt country at Al-Naser experimental School and concluded towards the favored experimental group.

Al-Hasan et al., (2013) evidenced the blended learning method in Biology students got more effectiveness in the experimental group. Lothridge et al., (2013) supported the view of blended learning is a learner-friendly and time-saving method. Al-Rimawi et al.,(2014) investigated in Jordan Schools in sixth grades of sixty students samples in the English language, and concluded that the blended learning in the experimental group had more effectiveness. Saritepeci et al., (2015) also explored in Language classrooms with its effectiveness of blended learning.

Maccoun (2016) discussed the blended learning effectiveness at fifth grade level in Biology classrooms with 30 samples and concluded the student's achievements under blended learning methods are more. Blended learning

awareness, exploration, adoption, and implementation methods are discussed by Porter et al., (2016). Jeffries et al.,(2016) explained the learning content at their own pace by blended method, and become more self-directed with confidence.

Nachimuthu (2020) also supported the blended learning effectiveness in Physics classrooms at the undergraduate level. They all are concluded blended learning was most effective in implementation with good planning of teachers.

## Methodology

The LMS of Moodle was prepared as online materials. The LMS means, learning management system and the Moodle means of Modular Object-Oriented Dynamic Learning Environment. It supports as a media and is linked to the learning contents and to support the students. Each Physics teacher, conducted through forum discussion, quizzes, and assignments and to give a link of online resources for further study. The online resources are collected from websites and other encyclopedias. Communication between the Physics teachers and students is by Google forms, e-mail, Moodle, and other social media. Through the Moodle, the teachers share worksheets and quizzes to the students and get their assignments.

This research study aimed to find out the effectiveness of blended learning among Undergraduate students from the Physics Subject in Salem District of Tamil Nadu State in India. This study was a pre and post-tests design of an experimental research study. From the population of 120 students in Bachelor's degree in Physics Class of Government, Aided and Self-financed Arts and Sciences Colleges in September 2019 were selected by convenience sampling technique. The data were collected from each college 60 Third-year Physics students by using pre and post-tests techniques through a developed and validated Opinions Tool (40 items) and a Physics achievement (30 statements). Both tools found out content validity and reliability 0.78 and 0.82 respectively. The normal method was taught to the control group whereas the blended

learning method was used in the experimental group. The analysis was done with the collected data and calculated the mean, standard deviation, 't' test, and F Test with a significance of 5% level.

### Data Analysis

The control group students in post-tests are not using the blended learning method and it also slightly increased academic achievement. It shows 48.98% 'strongly agree', 28.57% 'agree', 20.41% 'disagree', and 2.04% 'strongly disagree' results. Because of the utilization of the blended learning method of teaching, the Physics achievement means the score is more in the post-test. They obtained 64.85% 'strongly agree', 30.45% 'agree', and 3.68% 'disagree', and 1.02% 'strongly disagree' results. It indicates the experimental group got more achievements.

**Table-1.** 't'-test results of Blended Learning Opinion level (Gender-wise)

Gender	N	Mean	S.D	't' value	p-value
Male Students	60	73.84	16.58	3.0914 *	0.0025
Female Students	60	82.18	12.72		

(\* = Significant at 0.05 level)

Table-1 shows that concerning their gender (male & female) wise, there was a significant difference between the blended learning opinion of Physics students, with the value 't' = 3.09 and p= 0.0025 ( $p < 0.05$ ). Based on the meaning obtained, Female students in the Physics Classroom have a higher mean (mean = 82.18) compared with the mean of Male students in the Physics Classroom (mean = 73.84). This shows that blended learning Opinion of Physics students in their gender-wise. The investigators concluded, concerning their gender, there is a significant difference exists between the opinions of blended learning in physics classrooms.

**Table-2.** 't'-test results of Blended Learning Opinion level (Locality-wise)

Locality	N	Mean	S.D	't' value	p-value
Rural Area	60	74.62	16.72	3.0276*	0.0030
Urban Area	60	82.86	12.84		

(\* = Significant at 0.05 level)

Table-2 shows that concerning their locality (rural & urban) wise, there was a significant difference between the blended learning opinion of Physics students, with the value 't' = 3.03 and p= 0.0030 ( $p < 0.05$ ). Based on the meaning obtained, urban students in the Physics Classroom have a higher mean (mean = 82.86) compared with the mean of rural students in the Physics Classroom (mean = 74.62). This shows that blended learning Opinion of Physics students in their gender-wise. The investigators concluded, concerning their locality, there is a significant difference exists between the opinions of blended learning in physics classrooms.

**Table-3.** ANOVA results of Blended Learning utility level (Type of Institution wise)

Sources	Sum of Squares	df	Mean Squares	F value	p-value
Between	192.284	2	96.142	6.8761 *	0.0015*
Within	1635.894	117	13.982		
Total	1828.178	119	110.124		

(\* = Significant at 0.05 level)

From the table-3, explains the F value of 6.88. Using  $\alpha$  of 0.05, we have F 0.05; df 2,117 in the F distribution table= 3.087. Hence the F value is larger than the critical value, is accepted the null hypothesis indicates that there are statistical differences in the population means. The p-value for F=6.88 at 0.0015 is significant at that level. Hence, it concluded that the control and experimental groups differ. Less than or equal to the significance level of the p-value (0.0015) is considered to reject the null hypothesis, and all the samples are equal. This indicates that, concerning with their Institution (Government, Aided and Self-financed) wise, there is a significant relationship between the achievement level of Physics in the control and experimental group.

**Table-4.** ANOVA results of Blended Learning utility level (Type of net-sources wise)

Sources	Sum of Squares	df	Mean Squares	F value	p-value
Between	191.736	2	95.868	6.6455*	0.0018*
Within	1687.842	117	14.426		
Total	1879.578	119	110.294		

(\* = Significant at 0.05 level)

From the table-4, explains the F value of 6.65. Using a  $\alpha$  of 0.05, we have F 0.05; df 2,117 in the F distribution table= 3.087. Hence the F value is larger than the critical value, is accepted the null hypothesis indicates that there are statistical differences in the population means. The p-value for F=6.65 at 0.002 is significant at that level. Less than or equal to the significance level of the p-value (0.0018) is considered to reject the null hypothesis, and all the samples are equal. Hence, it is concluded that the control and experimental groups differ. This indicates that, concerning their net-sources (Institution, Home, and Cyber-cafe) wise, there is a significant relationship between the achievement level of Physics in the control and experimental group.

The findings of this study, that there is a difference occur in control and experimental groups indicate the effectiveness. Nachimuthu (2019) also supported the views of the effectiveness of the blended learning approach. Dangwal et al., (2017) found out and recommended that the blended learning approach is good in learning outcomes. Students are interested to work on their own-pace, due to the blended learning approach in classroom settings. Due to their satisfactory level increased in this approach, the Physics teachers are enhanced their skills to teach through this method of teaching. More number of reviews are supported the blended learning and its effectiveness in different

subjects. The major limitations of this study were, the research done in a single institution.

### Conclusion

Lim & Morris (2009) and concluded the learning outcome is more and more student's satisfaction with blended learning also more and effective. Face-to-face along with online classrooms are now familiar in higher education levels, particularly in Physical science teachers. Likewise, more number of studies are also supported by the blended learning approach like Popolzina (2014) and Porter et al., (2016). The blended learning model has many advantages such as: improving the effectiveness and efficiency of learning by exploring students' abilities through online media; and building communication with students through online media (Clyde & Delohery, 2005).

While using Physics teaching, the blended learning method improves their academic achievement. The physical science teachers developed their learning strategy towards the Blended learning approach is more effective than the normal classroom and they can assess easily the Physics learning skills through this approach. For the student's academic achievement in Physics is more in the blended learning approach used group indicates a further improvement in their class teaching.

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