

# A Study to Evaluate the Learning Outcome of Students Using Traditional and Blended Methods in Chemistry

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## Abstract

The 21<sup>st</sup> century is a digital era and the students are motivated and focused when they have to work with technology. With the use of technology in classrooms, teachers are able to communicate with appropriate examples and provide experiential learning for students. In order to evaluate the effectiveness of technology in education, an experiment was set up with two groups of 32 students each. One group was taught using traditional method, the other using blended method. Pretest was conducted to estimate the baseline and post-test to evaluate the learning outcome. This study concludes that teaching using blended method is a better approach.

## Introduction

Blended teaching method is fast catching up in the educational system. Blended method continues to preserve the human touch in education and not give it away completely to the digital world (Nazarenko, 2015). With the use of technology in education, there is a clear shift from teacher-centered approach to student-centered approach. With the use of graphics, animation and videos, it provides students with experiential learning giving them opportunity to understand and comprehend better.<sup>6</sup> With this combination, education is made more meaningful and understanding.

With digital technology catching up it was found that in the study conducted by Islam et al.,<sup>6</sup> students performed better, with blended methods, when compared to traditional and visual method of learning. However, students taught with traditional method had better retention than compared to game-based teaching method.<sup>7</sup> Also in a survey conducted 100% of the students preferred blended teaching method (Nazarenko, 2015). In a descriptive study conducted, engineering students opted for module-based learning over routine classroom teaching.<sup>9</sup>

Jena et al.<sup>11</sup> statistically proved in a quasi-experiment among secondary schools that intervention of multimedia in classroom had a better learning outcome. (Pérez-Marín and Pascual-Nieto<sup>3</sup> in a case study conducted on computer science students showed that students were more engaged in studies after class when blended learning approach was used than paper format provided. Salajegheh et al.<sup>8</sup> have proved that medical students were able to interpret the X-ray more efficiently and interpretation improved when digital technology was used to aid them in their learning.

Review of literature indicates that use of technology enhances learning outcome of students.

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## Need for the Study

Traditional method of teaching has been the educational system since ages. In today's world, digital technology is catching up in every field. The current generation is digital native, who is motivated and focused with the use of technology in class. Teachers are digital immigrants who are not accustomed to the use of technology and hence do not use it as much. However, the entire world is moving towards digitization of the educational system. There are a number of studies conducted to debate the relevance of using technology in education.

Considering the importance of technology in education, the researcher decided to conduct an experiment to evaluate the learning outcome of students, using traditional and blended method in chemistry.

## Operational Definition

Blended teaching method – Mixed mode of instruction. Method of teaching which is a combination of instructions or explanations from the facilitator along with the use of multimedia such as videos, images and PowerPoint explanation.

Traditional teaching method – It is the chalk and talk method of teaching.

## Objectives of the Study

- To evaluate learning outcome of students when taught with traditional and blended methods.
- To compare the learning outcome across genders.

## Variables of the study

- Independent variables of the study include the two teaching methods – traditional method and blended method.
- Dependent variable – learning outcome of students.

## Hypotheses of the Study

- There is no significant difference in the learning outcome of students when taught using blended and traditional method.
- There is no significant difference in the learning outcome across genders.

## Sample

Two groups of thirty-two students were selected by random sampling method from VII<sup>th</sup> standard, ICSE School, Bangalore.

## Methodology

Two groups of thirty-two students each were selected

from VII<sup>th</sup> standard ICSE board. The following chemistry topics were selected:

- Classification of chemical reaction.
- Global warming, and
- Water treatment.

A written pre-test was conducted, using the achievement test prepared by the researcher for both the groups of students before transaction of content to determine the baseline. The first group (control group) of students was taught using traditional method, which was chalk and talk method and the second group (treatment group) of students was taught using blended method on the same three chemistry topics. The blended method included an additional use of teaching aids such as videos, pictures and PowerPoint presentations in addition to the chalk and talk method. Post-test was conducted for both the student groups, after respective intervention. The results obtained were statistically analyzed.

## Analysis

Paired sample T-test was conducted on the pretest and post-test scores obtained. On analyzing the pretest scores of both the control and treatment groups, a significance value of 0.642 was obtained, which indicated that there was no significant difference and hence the baseline for both the groups, control and treatment groups, is the same, which indicates that both the groups of students were equally competent.

Similarly on analyzing post-test scores, after the intervention of both the control and treatment groups with paired T-test, a significant value of 0.0002 was obtained, which indicates that there is a significant difference. On comparing the mean difference, it was found that blended method was 20.09, which is higher than the traditional method of 14.47, indicating that the blended approach has a better learning outcome when compared to the traditional method.

## Results

Based on the results obtained, it was found that students learnt and understood better when multimedia was used as an instructional aid to transact information in the class. However, no significant difference was observed with the learning outcome of students across gender.

## Implications of the Study

From the studies conducted and with analysis of the data that was obtained, it is clear that in the present generation of digital era, it is important to have professional competencies where facilitators are well equipped to bring technology to the classroom.

The present generation is more dependent on technology-

oriented educational transaction. Technology keeps them focused and responsive. This should be used to the best of ability to keep them focused and motivated to learn. Developing a student-centered teaching approach is the essence of current educational system.

The educational system needs to diversify and make the required changes in the educational policies to integrate technology in classroom transaction and design efficient learning modules.

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