



# A STUDY ABOUT THE EFFECTIVENESS OF SIMULATED VIDEO ON ACADEMIC ACHIEVEMENT OF BIOLOGY STUDENTS

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## **Abstract**

This research paper wants to identify the research objective that the effect of simulated video in biology learning for senior secondary students on academic achievement. 60 students (30 control group, 30 experimental groups) who studied at Rishi Bhumi Inter College Saurikh, Kannauj affiliated with Uttar Pradesh Senior Secondary Education Board U.P. (India) in the academic year 2018-2019 participated. In this research quantitative method was used to conducting research. The instructional material included biology subject topic “cell and development biology” concept used in simulated video teaching. The result of present research endeavour that the experimental group of students was getting more enhancement in academic achievement who were taught by simulated video than the control group of students taught by the conventional style of the teaching. Based on data analysis, the researcher finds out that the academic achievement of experimental group is more than control group.

**Keywords:** *Biology, Simulated video, Effectiveness, Academic achievement, Learning*

## **Introduction**

The present world is the era of technology. Day by day many technologies developed to make simple human beings' life. Many technologies-based tools and applications used to encounter the problems related to the education field. The adoption of technology became simpler and easier in the educational context in now a day. Technology deals with educational perspectives called education technology which is based on educational paradigms. It provides flexibility to the learners for the promotion of learning. It also gives adequate conditions to access learning material easily and freely manner. The new innovative initiative of education technology is simulated video technology which is used to teach biology concepts now a days.

Simulation technology is that technology that represents the real-world situation in an artificial manner. The simulation in science education context works as a simulated video regarding critical and typical concepts of science

education. It provides a flexible and adequate environment in the classroom for students to enhance and explore their biological knowledge. Simulated video is the new innovative outcome of technological development. Simulated video is based on the simulation techniques which provides the real-life situation in an artificial manner. Simulated video of biological concepts made by various organizations like the media production department of NCERT, CIET, and other responsible authorities to enhance the learning of biology. Simulated video based on technical and psychological aspects. It gives an understanding of concepts to the students according to their interests. It is also provided an adequate and detailed description of any concepts in an easy and free manner because it is the combination of audio-video and graphical-based contents.

The new concepts of education namely as behaviouristic also support the use of simulated video to promote and enhance science education (Cleminson, 1990).

Biology subjects also considered in science education. In the traditional classroom of biology students faced many difficulties regarding the teaching-learning process. Some topics in biology are very difficult to understand by traditional teaching methods. So the use of simulated video in biology classrooms enhances the quality of education. There is less study present to encounter the effectiveness of simulated video in biology learning and if studies available which are not concluded the importance and effectiveness of simulated video on classroom learning of the students in biological concepts. The topic, cell, and development biology has great importance in biology education because it explains every aspect of human growth and development and also deals with cell division like mitotic and meiotic which described the development of basic cell unit which works as a basic unit of human physiology, reproduction and genetics aspects of plant and human physiology (Ozatas., H & Ozay, E., 2003).

Many times, in-classroom biological concepts, creates more confusion to understand concepts with traditional teaching method and students faced many problems in learning of those biological concepts (Sasikala, P., & Tanyung., S., 2016).

The main purpose of this study to evaluate academic achievement of students about learning of biology by used new innovative simulated video in teaching and also examine the aspects of biological concepts to promote better and understanding learning.

To ensure this study the researcher wants to know the existence of differences in academic achievement of students based on quasi-experimental design, which included means scores of the tests of experimental group as well as control group of students.

**Research Question**

- ✓ What is the effectiveness of simulated video on the academic achievement of biology students?

**Objective**

- ✓ To identify the effectiveness of simulated video on the academic achievement of biology students.

**Null Hypothesis**

- ✓  $H_0$  1. There is no statistically significant difference in the academic achievement of biology students.

**Methodology**

A Non-Randomized Quasi-Experimental Design will be created concerning the design of the study. Two groups will be created, one experimental and other controlled. The experimental group will be taught by developing a simulated video. The controlled group will be taught through the traditional method.

| Group                     | Pre-test       | Treatment | Post-test      |
|---------------------------|----------------|-----------|----------------|
| Experimental group<br>(A) | O <sub>1</sub> | X         | O <sub>1</sub> |
| Control group (B)         | O <sub>2</sub> |           | O <sub>2</sub> |

O<sub>1</sub> – Pre-test & Post-test for Experimental Group

O<sub>2</sub> – Pre-test & Post-test for Control Group

X – Simulated Video

This present research confined to a quasi-experimental research paradigm used to conduct it. It was included two tests: pre-test and post-test for representative groups. Quantitative research paradigm method was used to perform this study. The deep understanding and analysis were necessary to make a sure and certain show off all aspects of this research. The major goal of this study to achieve the objective for that very important thing was the findings of the study should be reliable and validate so the useful and related quantitative research methods used for this study. The division of the group based on the student's choice. Those students who are in favour of simulated video considered in the experimental group and others who are not interested in simulated video and favour to traditional method included in control group. The control group of students taught cell and development biology with a traditional method like a blackboard, chalk duster method and on the other hand experimental group taught with simulated video of cell and development biology. To identify the present condition of the student's researcher, prepare a questionnaire to conduct the pre-test for group B and group A before the treatment use like simulated video used to teach the experimental group.

This study consisted of a total of 60 students: 30 from group A and 30 from group B, who studied in the senior secondary course in 11<sup>th</sup> class (Section-D1 & D2) of Rishi Bhumi Inter College in the academic year 2018-19 were selected for research purpose. 15-19 years old students participated in this research study. The researcher prepared tools namely a questionnaire which consists of a multiple-choice question, fill in the blanks, matching questions related to cell and development biology. The questionnaire has 50 items related to basic knowledge, process, mechanism, nature, use of cell and development biology. For the identification of reliability and validity of tools (questionnaires), a study conducted in a pilot form on 30 students of biology studied in class 11<sup>th</sup> of biology section Rishi Bhumi Inter College Saurikh, Kannauj U.P.

The study-related data gathered from groups by pre-test and post-test from traditional method support group (control group) and simulated video support group (experimental group) respectively.

The analysis of collected data was used as a quantitative approach to interpreting it. The data entered in the technology-based software SPSS 20.0 for analysis of data to find the means value of the scores. Statistical methods also applied in the interpretation of obtained data from pre-test and post-test. Because this study based on two groups so statistical independent t-test was used to compare the means value of data.

## Results and Interpretation

**Table 1. (a) Shows the data of representative groups**

| Group            | N  | Mean SD      | SE   | P   |
|------------------|----|--------------|------|-----|
| Control (B)      | 30 | 29.280±1.242 | 1.42 | 0.5 |
| Experimental (A) | 30 | 28.93±1.232  |      |     |

**Table 1. (a)**

The table 1. (a) presented the results of control group of the biology students which are taught by the traditional method is 29.280 although the mean score of experimental group who was taught by simulated video is 28.93 which is very equal to compare with the control group. Thus, based on the above findings we can say that there is no significant difference between means of the experimental and control group of biology students. Findings of this study encountered that both students group has equal cognitive level and understanding about cell and developmental biology.

**Table 1(b). highlighted the post-test-based score of both groups.**

| Group            | N  | Mean SD | SE   | P         |
|------------------|----|---------|------|-----------|
| Control (B)      | 30 | 48±2.22 | 1.59 | p < 0.001 |
| Experimental (A) | 30 | 73±3.14 |      |           |

**Table 1. (b)**

The findings of post-test endeavour mean value of group A is 73±3.14 and the control group is 48±2.22. the mean value of the group A is more compared to group B of students. Based on this analysis we find that there is a statistically significant difference between group A and group B students of senior secondary (p< 0.01). The results regarding study show that experimental group students have a better academic achievement than other biology students.

Hence based on final results this study finds that simulated video supported teaching methods for biological concepts are much more effective compare to traditional methods of teaching.

**Table 1 (c). shows section-based detail of the student's group of biology.**

| Items based questions   | Experimental (A) | Control (B) | SE    | P    |
|-------------------------|------------------|-------------|-------|------|
| Multiple choices (20)   | 3.89±1.423       | 3.69±1.423  | 0.543 | 0.84 |
| Matching (15)           | 3.756±1.342      | 3.877±1.211 | 0.742 | 0.83 |
| Fill in the blanks (15) | 3.556±1.223      | 3.877±1.211 | 0.743 | 0.49 |

**Table 1. (c)**

The summary of table 1. (c) shows the O<sub>1</sub> results of experimental and control group section namely multiple-choice, matching, and fill in the blanks mean score. Experimental group section-wise shows means are  $3.89 \pm 1.42$ ,  $3.756 \pm 1.342$ , and  $3.556 \pm 1.223$  than the control group as  $3.89 \pm 1.423$ ,  $3.877 \pm 1.211$ , and  $3.877 \pm 1.211$ . based on the above interpretation, the researcher finds that the experimental group has better their academic achievement compared to control group.

The outcome of the research highlighted that there is no statistically significant difference between the means of experimental and control group about cell and development biology based on section wise questions asked in a questionnaire related to O<sub>1</sub>. In this interpretation, the researcher finds that both the groups of senior secondary students have the same cognitive level and understanding about biological concept namely cell and development biology.

**Table 1. (d) shows the mean value of the student groups in O<sub>2</sub>.**

| Items based questions   | Experimental<br>(A) | Control (B)       | SE    | P       |
|-------------------------|---------------------|-------------------|-------|---------|
| Multiple choices (20)   | $5.678 \pm 1.571$   | $4.69 \pm 1.043$  | 0.432 | P=0.01  |
| Matching (15)           | $5.978 \pm 1.521$   | $4 \pm 0.982$     | 0.542 | P<0.001 |
| Fill in the blanks (15) | $6.675 \pm 0.987$   | $4.323 \pm 0.654$ | 0.462 | P<0.001 |

**Table 1. (d)**

The O<sub>2</sub> result of this research highlighted that the value of mean score of A and B group in table 1. (d). the section-wise findings respectively show that the means score like  $5.678 \pm 1.571$ ,  $5.978 \pm 1.521$ , and  $6.675 \pm 0.987$  of experimental group compare to  $4.69 \pm 1.043$ ,  $4 \pm 0.982$ , and  $4.323 \pm 0.654$  respectively of control group. Based on the above interpretation of obtained data, results of this research endeavour that there is a statistical and significant difference among the means value of both groups of students about cell and development concept.

### Conclusion

This research endeavour that simulated video-based teaching of biology is very useful and beneficial to promote achievement in the academic perspectives of biology learners. Based on interpretation researcher find that traditional teaching style is not adequate concerning the simulated video-based teaching method. The mean score value of the data also focused that there is a significant difference in achievement of academic conditions of control group and experimental group. Finally, it was found that simulated video-based teaching is much better compared to conventional teaching style.

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