

EFFECT OF TEACHING BIOLOGY THROUGH SMART CLASSROOM ON CRITICAL THINKING OF MALE AND FEMALE SENIOR SECONDARY SCHOOL STUDENTS

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ABSTRACT

The main aim of the present study was to investigate the effect of teaching Biology through smart classroom on critical thinking of senior secondary school students. The causal-comparative method was used in this study. The sample included 100 senior secondary school students in Shimla district selected by the random sampling technique. A tool developed and validated by Deepa and Sadanandan (2011) to test the critical thinking of students was used. The findings of the study showed a significant difference on critical thinking with respect to gender. The study revealed that female students have high critical thinking than male students.

Keywords: Critical Thinking, Smart Classroom.

Introduction

Critical Thinking is the ability to analyze and evaluate information. It enhances person's ability to think clearly and logically and help to develop decision what to do or what to believe. It is the objective analysis of facts. It is self-disciplined, self-monitored, and self-corrective and self-directed thinking. Critical Thinking means reviewing the ideas produced, making a decision and solving the problem logically. It includes the ability to engage in independent and reflective thinking. Critical thinking is one of the major components of thinking skills that are appraised as crucial in the field of academics because it enables an individual to scrutinize, assess, explain and restructure his/her thinking skills, thereby decreasing the risk of adopting, acting upon or thinking with a false belief. Critical Thinking improves comprehension abilities and promotes creativity.

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Critical Thinking helps in self-reflection, accuracy, precision, relevance, depth, significance, logic and fairness.

Smart Class is an advanced technology implementation for schools, which provides tools and other content for the students' learning using the latest media presentations. These classrooms are also called digital or new media classrooms. Smart Class is an educational software arrangement that provides unified communications and collaboration functionality for the school level and higher education institutions. Smart Classrooms are technology enhanced classrooms that give opportunities for integrated learning technology, such as interactive whiteboards, specialized software, networking, CD/DVDs, etc. Thus, it is an innovative way of knowledge acquisition, knowledge creation, knowledge transmission, and knowledge sharing. teaching in smart classroom is a new transforming experience for teachers and students. Smart classroom teaching brings a complete transformation in classroom learning and enhances critical thinking of students.

Background of the study

Kalelioglu and Gulbahar (2014) investigated the effect of instructional techniques on critical thinking and critical thinking dispositions in an online discussion. The results of the study revealed that the mixed technique showed the best ability for critical thinking than the rest of the instructional technique.

Sefi *et.al.* (2015) determined the effect of computer games on students' critical thinking disposition and educational achievement. It was found that playing computer games had a positive effect on students' educational achievement, but has no significant effect on critical thinking disposition.

Salashshoor and Rafiee (2016) studied the relationship between Critical Thinking and Gender: A case of Iranian EFL Learners. The findings of the study revealed that male and female were not significantly different from one another in applying critical thinking skills.

Afsahi and Afghari (2017) studied the relationship between mother tongue, age, gender, and critical thinking level. The results of the study indicated that there was no significant relationship between gender and critical thinking level.

Tomislav and Milan (2017) studied critical thinking as a dimension of constructivist learning: some of the characteristics of students of lower secondary education in Croatia. An Interpretation of the results indicated that girls were more likely to highlight the personal importance of studying, critical thinking and student negotiation, while there was no difference in the assessment regarding gender in the control of studying and uncertainty of learning with new media.

Mawaddah *et.al.* (2018) examined the gender differences of mathematical critical thinking skills of secondary school students. The results showed that the critical thinking skills of female students were slightly better than that of male students.

Significance of the study

Smart classroom is a new concept introduced in education to assist teachers to make their teaching effective through the technological inputs. Thus, smart classroom can prove as a boon, for qualitative improvement in teaching. Smart classroom empowers the students by engaging them in the learning process and enhancing their thinking skills. Smart classroom helps the students to increase their critical thinking by engaging them in problem-solving activities. Technology helps students to increase their reasoning, abstract thinking and making assumptions of ideas. Furthermore, this study will help the teachers to make students more critical thinker.

Objective

To study the effect of teaching Biology through smart classroom on the critical thinking of male and female senior secondary school students.

Hypothesis

There is no significant difference in mean scores of male and female senior secondary school students on critical thinking with respect to teaching Biology through smart classroom.

Methodology

For conducting the present study, the investigator used a causal-comparative method, a part of descriptive survey method to collect the data. In the present study, 100 students from eight senior secondary schools of the Shimla district of Himachal Pradesh constituted the sample of the study. Out of twelve districts of Himachal Pradesh, Shimla district was selected on the

basis of a random sampling technique. From the Shimla district, eight schools will be selected by purposive sampling. The sample of the students was drawn randomly from XIth grade. For the present investigation, smart classroom was taken as independent variable and critical thinking was taken as dependent variable. For collecting desired data for the present study, a questionnaire prepared by Deepa and Sadanandan (2011) was used. Scoring was done as per the directions and procedures given in the manual of the tool. The statistical measures such as Mean, S.D., and t-test were applied to analyze the obtained raw scores for testing the hypothesis and drawing the inferences.

Analysis of data

This section presents the details of the analysis of data to highlight the significance of the difference between mean scores of male and female senior secondary school students on critical thinking with respect to teaching Biology through smart classroom.

Table 1

t-value showing the significance of difference between mean scores

Group	Number	Mean	S.D.	Calculated 't' Value	Table value	Remark at 5% level
Male	50	60.64	7.18	3.22	1.98	Significant
Female	50	65.60	8.22			

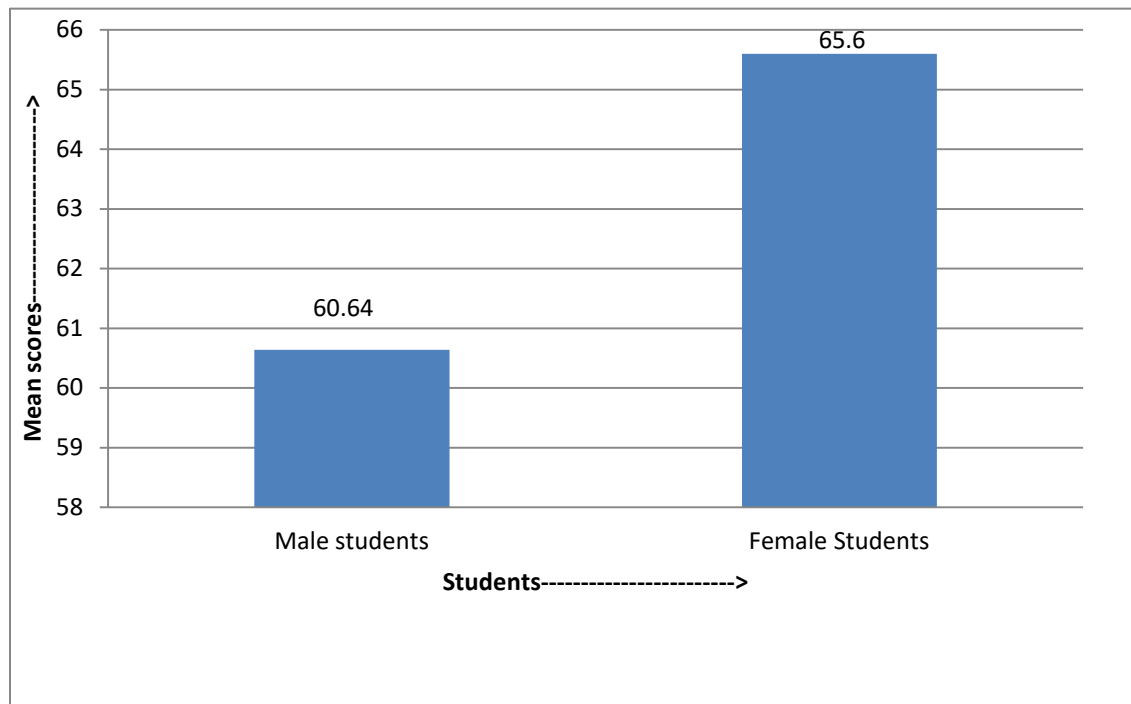
It is evident from table 1 that mean score and standard deviation of male students came out to be 60.64 and 7.18 respectively, whereas mean score and standard deviation of female student was found to be 65.60 and 8.22 respectively.

Table-1 shows that 't' values showing the significance of difference between mean scores male and female senior secondary school students on critical thinking with respect to teaching Biology through smart classroom is 3.22 which is significant against the table value(1.98) at 0.05 level of confidence. Thus, the null hypothesis stated "There is no significant difference in mean

scores of male and female senior secondary school students on critical thinking with respect to teaching Biology through smart classroom” stands rejected.

Figure 1.

Means scores of male and female senior secondary school students on critical thinking with respect to teaching Biology through smart classroom



Findings and interpretation

The inference can be drawn that critical thinking of male and female senior secondary school students with respect to the effect of teaching Biology through smart classroom differ significantly. Further, on the basis of mean scores (Table-1, Figure-1), it is clear that female secondary school students possess more critical thinking than male secondary school students with respect to teaching through smart classroom. This finding is partly supported by the researches of Tomislav and Milan, 2017; Mawaddah, Ahmad and Duskri, 2018; who found that the female senior secondary students possess higher critical thinking than male senior secondary school students. However, our results are in contradiction to the results of Salashshoor and Rafiee, 2016; Afsahi and Afghari, 2017; who found no significant difference between male and female students on critical thinking.

The reason for high critical thinking shown by female senior secondary school students may be due to teaching through smart classroom. It was seen that, male and female are different in behavioral terms. Female are more interested in real life issues, whereas males are more interested in abstracts.

Educational implications

In view of the findings the following educational Implications can be laid down:

1. The study helps to develop instruments that enhance the critical thinking of both male and female students.
2. The study helps to think on technology supported learning methodology for the development of critical thinking of students.

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