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Flipped Classroom – A novel breakthrough in learning

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ABSTRACT

Flipped classroom alters the conventional learning environment and brings out innovation and creativity in the teaching-learning process. The flipped classroom has begun to enhance the way the students receive information from their mentors. Audiovisual aids create a virtual classroom at home. Classroom time is more focused on student-centred learning activities, such as concept mapping, process-oriented guided inquiry learning, peer-led team-based learning, game-based learning, critical pedagogy. This improves better understanding of the subject, develop cognitive skills and enhance the conceptual learning of the students. Academic performance of the students exposed to flipped videos integrated with iBooks was evaluated and compared with the traditional learning environment.



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INTRODUCTION

Innovation and creativity are the major core of teaching and learning process. Globally, research in education is underway to create a better learning platform. One such research outcome in education is the flipped classrooms. The flipped classroom has begun to enhance the way the students receive information from their mentors. This creates active and creative thinkers among the student community. Nowadays flipped classrooms have gained popular attention (Roach *et al.*, 2014). In this new methodology of learning, there is blended learning instruction in which the traditional classroom is flipped. This methodology asserts that students can participate and engage

more successfully in their class and can attain better learning when their classroom is flipped (Jin Su Jeong *et al.*, 2018). This new learning methodology has its roots in constructivism and conceptual learning (Hill *et al.*, 2009).

In a regular flipped classroom, videos integrated iBooks are provided to the students in their iPads. Therefore, classroom time is more focused on student-centred learning activities, such as concept mapping, process-oriented guided inquiry learning, peer-led team-based learning, game-based learning, critical pedagogy.

A flipped-classroom model can be considered as a mixture for both traditional and online education systems by utilizing in- and out-of-class time, completing more effective learning chances and perspectives (Jin Su Jeong *et al.*, 2018). The flipped classroom education design gives importance to evaluate the performance and achievement of students on the pedagogical methodology (Isikoglu *et al.*, 2009). In the instance of the flipped-classroom model, evaluation and assessment are still underreported and informed, especially in science, technology, engineering, and mathematics (STEM), and numerous preliminary courses (Love *et al.*, 2013). The flipped class is a novel educational

trend that constitutes a methodology where the active participation of students in the learning process stands out (Tucker B 2012).

From time immemorial, students are instructed by their mentors to come prepared in their subject to the class by reading the study material. The flipped learning model blends new technology to provide an audiovisual aid to students as they prepare for class. More important, it redefines class time as a student-centred learning environment (Sams A 2013). The flipped classroom in undergraduate education was towards developing deep learning (Mason GS *et al.*, 2013). The use of technology is not the solution unless supported by interactive student-centred activity based on small group learning (Helena Anolak *et al.*, 2018).

This study is a comparative evaluation of the teaching methodology among the students pursuing dentistry at Saveetha Dental College, Chennai, India.

MATERIALS AND METHODS

This study was a comparative evaluation of teaching methodologies followed at Saveetha Dental College, Chennai, India. The study participants were students pursuing the first year under graduation in dentistry. The evaluation was done in the subject of Biochemistry for these students.

Teaching Methodology

- A. Small group learning: In the year 2014, students were exposed to small group activity based learning. The classes were supported with powerpoint presentations. Students were evaluated at the end of the session.
- B. Flipped Classroom: From the year 2015 onwards, a powerpoint presentation was replaced by flipped videos.

The entire syllabus was converted into flipped videos by department faculty members. Flipped videos comprise of topics with less than 5 minutes duration. These flipped videos were integrated into iBooks. Students used these iBooks as their study material. The evaluation was done at the end of the session.

RESULTS AND DISCUSSION

The data pertaining to class average, number of distinctions were analyzed and results were interpreted.

Class Average

The class average was calculated and compared for the academic years based on the university examinations conducted in 2015, 2016 and 2017 respectively (Figure 1).

There was a significant increase in the class average marks for the examinations in the year 2015 – 2017. In the examination conducted in the year 2015, class average in Biochemistry for first-year students pursuing dentistry was 73 %. There was a significant increase in the class average over the years. In 2016, the class average raised to 80 %, after the introduction of flipped classes. In the subsequent year 2017, the class average was 82 % with a consistent increase.

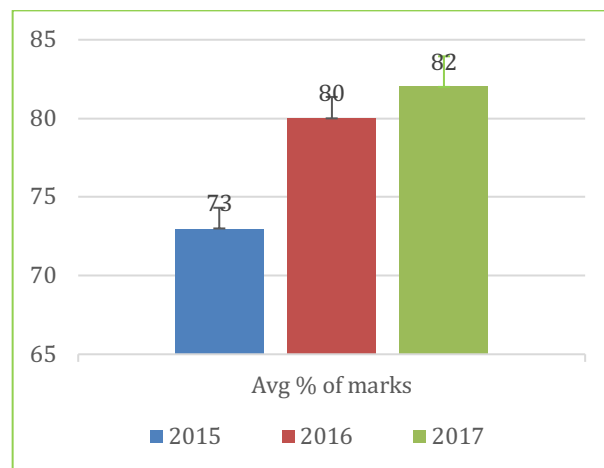


Figure 1: Class average marks in Biochemistry

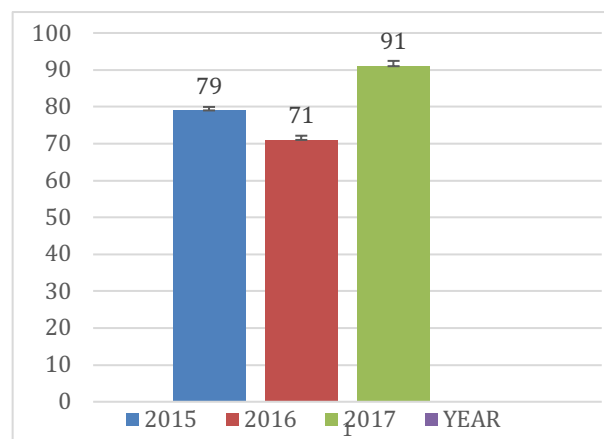


Figure 2: Percentage of distinction in Biochemistry

Distinctions

The percentage of distinctions was calculated and compared for the academic years based on the university examinations conducted in 2015, 2016 and 2017 respectively (Figure 2).

There was a significant increase in the number of distinctions from the year 2015 – 2017. 79 % of first-year students pursuing dentistry passed Biochemistry examination with distinction in the year 2015.

After the introduction of flipped classes and iBooks, distinction increased from 79 % in the year 2015 to 91 % in the year 2017.

Flipped classrooms are suitably designed to facilitate small group learning aided with audio-visual

learning strategy. The videos along with lecture notes are custom made by the faculty in the department which focuses on improving the understanding ability and conceptual learning of the students. iBooks created a good platform for easy learning and understanding of the subject by the students.

As it is evident from the results, flipped classrooms have significantly increased the class average as well as the percentage of distinctions in the subject of Biochemistry. There was a consistency in the results in the subsequent years. This new concept of learning has helped the students to revise the topics even while they are on a journey. The audiovisual aids to create a virtual classroom even at home. The students have an idea of concepts to be taught henceforth and they come prepared for their classes. The interest of the students towards the subject has developed, which is evident from the increase in the number of distinctions. The flipped teaching methodology has sown the seeds for enhanced learning, improved understanding ability, conceptual learning.

CONCLUSION

Flipped classroom replaces the conventional learning environment, where the students learn and re-learn the concepts in their subjects. Flipped Classroom utilizes a student-centred activity based teaching model to ensure that it is primarily aimed to contribute student's overall success in obtaining holistic learning.

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