



FLIPPED CLASSROOM WITH POLL EVERYWHERE: ENGAGING STUDENTS WITH ACTIVE LEARNING IN LARGE GROUP SETTINGS

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ABSTRACT

Large group teaching has always been the most popular way of teaching from past decades. It is one of the most convenient and economical ways to transfer knowledge from the content expert to the learner. Educationists have always raised concerns about active learning in this method. The use of variety of methods would be included in classroom teaching and active learning should be encouraged. The objective of this study was to investigate the impact of implementing flipped classroom with the Poll Everywhere tool on student engagement in large group teaching for active learning by students. Blended method of active learning using flipped classroom with the use of Poll Everywhere tool has been widely accepted by learners in large group teaching. Poll Everywhere tool is useful to get immediate feedback from learners which will help the teacher to focus more on the difficulty level of learners. As per the feedback given by learners during large group teaching in classroom, teaching strategies can be amended to spend more time on those areas which needs to be addressed within a time limit of lecture. Study was conducted on the undergraduate students of the second year (semester 4) from Biomedical Science Program at International Medical University, Kuala Lumpur, Malaysia, between January to June 2014. Flipped classroom was introduced to same cohort of learners who were used to attend traditional class of learning for large group of teaching. Learners were well informed in advance with prior information of teaching learning material in elearning portal of university. Students were grouped in small groups and given some questions which were answered by using the Poll Everywhere tool in smart phones. Teacher centered learning will be changed into student centered learning and focused more on difficulty area of concepts. Combination of Poll Everywhere tool with flipped classroom was well accepted by students though needs lots of planning by teacher and high speed internet in university for effective learning method.

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Keywords: Large group teaching, Poll everywhere, Feedback, Elearning tool.

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Contribution/ Originality

This study contributes in the existing literature of flip classroom which was designed and analysed by author including literature search and the write-up of final manuscript.

1. INTRODUCTION

Large group teaching is the most common way of traditional teaching, but the core issue in this teaching style is always been a passive learning where teacher didn't have enough time to interact with each learner personally to understand their difficulty level due to time constrain and other factors. Dolmens define learning as a collaborative, constructive, contextual and self-directed process [1]. Researchers found that a variety of methods would be included in teaching; active learning was to be encouraged; relevance was important; time for self-directed study was to be provided; opportunities were provided to pursue individual interests; time for discussion and networking were built in; and activities to enhance transfer of new skills and knowledge were explicit [2]. Karen Mann emphasized on inclusion of variety of teaching methods in any instructional design [3] Flipped classroom, using poll everywhere tool will be one of the useful option to improve interaction with learner for effective large group teaching [1, 4-6]. Large group teaching method is a very economical way to transfer knowledge from content expert to large group of learners in education field, but there is always a question how to engage students within limited time frame with more opportunities to interact with teacher to make it more effective learning method. The objective of this study was to investigate the impact of implementing flipped classroom with the Poll Everywhere tool on student engagement in large group teaching for active learning by students. Lecture is one of the best examples of large group teaching where the teacher explain the concept of their respective subject/topic to large group of students, however, because of time constrain the teacher unable to get immediate feedback about the understanding of concept from learners. There is always an argument regarding the effectiveness of this teaching method [7, 8]. Literature provides a number of strategies for promoting the effectiveness of learning in a large group teaching [9]. It has always been a challenge for the teacher to interact with each and every student in a large group teaching [10-12].

Flipped classroom is a student centered learning where pre-reading material is provided a week before class and students are supposed to come up with preparation in class and if they have any difficulty in understanding the concept will be discussed in class with the help of provided scenario/activities. Large group of students were divided into small groups, to discuss the concept and participate in discussion with content expert and help their peers also to understand the concept [4]. A Survey was conducted by Herb et al, 2011 and they revealed that over 80% learners would recommend /highly recommend use of Poll Everywhere as they found it more comfortable and user friendly [6].

2. METHODOLOGY

A pilot study was conducted on undergraduate students of second year, from Biomedical Science Program under gastrointestinal tract system module at International Medical University,

Kuala Lumpur, Malaysia between January 2014 and June 2014. Verbal ethical concern was taken from each students and study was conducted on the basis of volunteer participation. Total number of students participated in study were thirty-three, however only twenty-four students were responded for this study. Students were well informed about the flipped classroom and instructed earlier to download Poll Everywhere in their devices. Prior conducting flipped class, following steps were followed to make sure that transition from traditional teaching to flip classroom should be smooth [13].

1. Prior declaration of date in timetable
2. Explain the Flipped Model
3. Provided prior learning material on elearning portal
4. Brainstorming of students prior lecture
5. Get students to ask questions
6. Peer learning under the supervision of lecturer
7. Make sure everyone has access to the Internet
8. Prior download Poll Everywhere software for instant answers for questions
9. Evaluation by students

During traditional classroom teaching, the lecturer taught the students using power point slides and explained the concept in detail as this was teacher centered. Whereas, in flipped classroom the teachers have planned the class in advance with preplanned activities in class. The teaching material was uploaded in elearning portal a week before lecture and students were well informed about flipped classroom concept in advance via timetable and proper instructions were given to download Poll Everywhere tool in their electronic devices for immediate effective feedback. Large group of students were subdivided into four small groups. They have given names for their team to answer questions to motivate them to work in team. Students came with pre-reading material and lecture slides. Brainstorming was done using Poll everywhere tool. If most of students answered question wrongly then concept was clarified by explaining them with the help of videos and activities. Students who understand the concept, explained the concept to other students in presence of facilitator to make sure that student understand correctly. Few of incomplete lecture notes were filled during class by students. These activities helped the teacher to interact with each student as teacher had enough time to attend each group while students were doing their activities. Student’s evaluated the lecture and lecturer twice for different mode of delivery of lecture (Traditional and flipped class) on the basis of given items at the **Likert scale** of four as mentioned in Table 1 and Table 2. Response rate of students was 72.73%.

Table-1. Student evaluation form for lecture evaluation

S.no	Items	Strongly Agree	Slightly agree	Slightly disagree	Strongly disagree
1	Lecture was clear				
2	Lecture was interesting				
3	Lecture was easy to understand				
4	Lecture was well organized				
5	Lecture was interactive				

Table-2. Student evaluation form for lecturer performance.

S.no	Items	Strongly Agree	Slightly agree	Slightly disagree	Strongly disagree
1	Lecturer was enthusiastic				
2	Lecturer was clearly audible				
3	Lecturer seemed confident				
4	Lecturer gave clear explanation				
5	Lecturer encouraged participation				

3. RESULTS

Students showed positive response for flipped classroom using Poll Everywhere tool, which helped teacher to get immediate feedback as well as engage students in large group teaching. This tool is recommended by previous researchers also for student engagement and interaction which was used to understand student’s difficulty level [13]. On the basis of learning outcomes of lecture, questions have been asked to understand learners concept about gastrointestinal system by using Poll Everywhere to get immediate statistical data which were shown in Figure 1,2,3,4,5.

1- Which of the following is involved in the regulation of bile release into the small intestine?

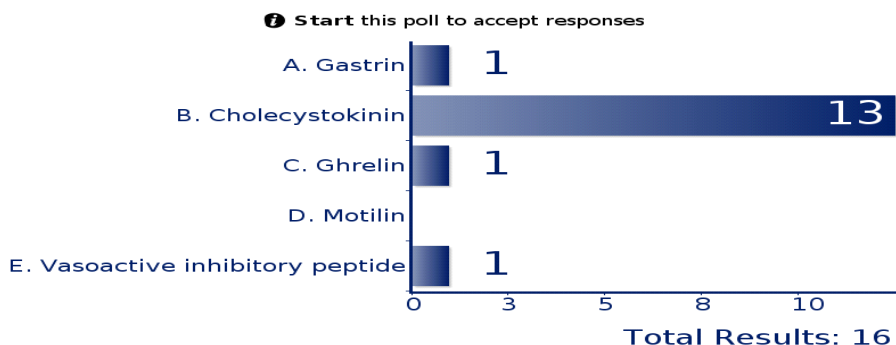


Figure-1. Result of student response by Poll everywhere for question no 1.

2- The normal pH of the contents within the stomach cavity is

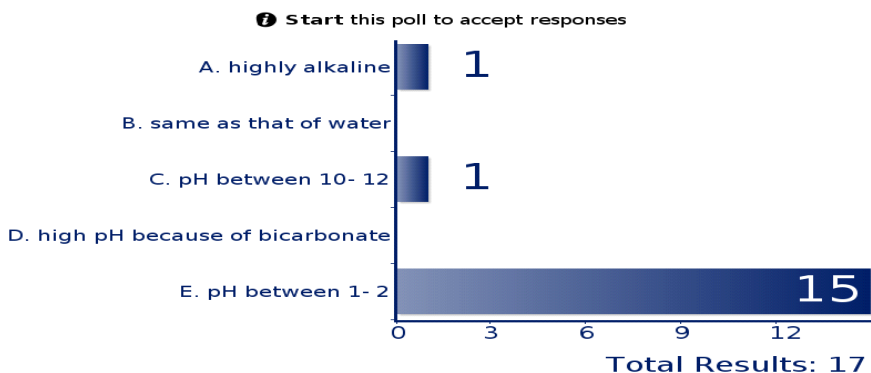


Figure-2. Result of student response by Poll everywhere for question no 2.

3- The small intestine secretes hormones. The one whose secretion is stimulated by an acid in the lumen of the upper small intestine is

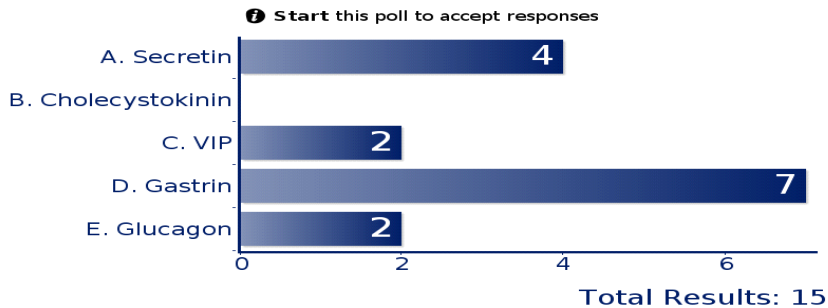


Figure-3. Result of student response by Poll everywhere for question no 3.

4. The small intestinal motility is increased by

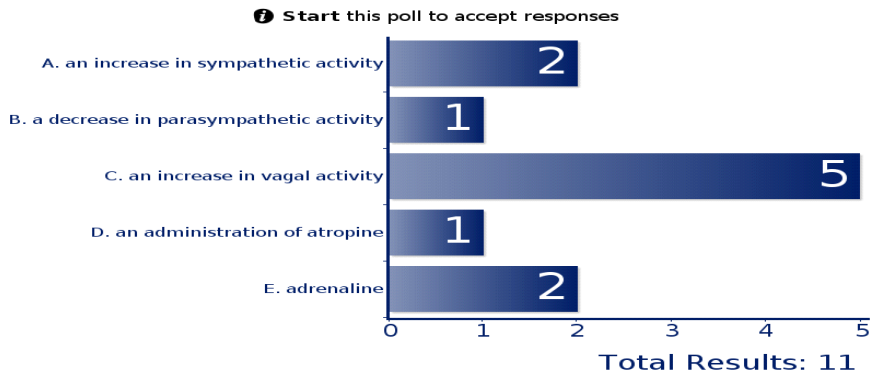


Figure-4. Result of student response by Poll everywhere for question no 4.

5- Which of the following hormone increases the discharge of electrolytes and fluid components of pancreatic juice during digestion of lipid in small intestine?

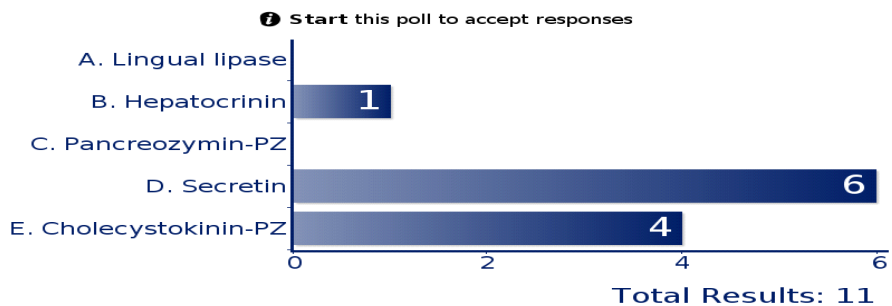


Figure-5. Result of student response by Poll everywhere for question no 5.

On the basis of the student's response for respective questions, the teacher spend more time to explain specific concept to students rather than spending time on all contents which learner understand by self-learning/prior knowledge with the help of pre reading material. This activity also helps learner more responsible towards learning process.

3.1. Traditional Teaching

For traditional teaching class 80% students have given the highest score (Strongly agree) for item lecturer enthusiasm, clear audibility, confidence and encouraged participation items, whereas 0% students gave the lowest score (strongly disagree) for same items. Only 30% students have given the higher score for interesting lecture whereas 65% students slightly agreed that lecture was interesting and 5% slightly disagree for same item. For organization of lecture, students have given 50% for both strongly agree and slightly agree. Only 40% students strongly agreed for interactive lecture and 55% students slightly agreed for the same item which was our objective to improve in flipped classroom. The most interesting result was recorded for clarity of lecture where 60% students strongly agreed for clarity of lecture, however 35% participates slightly agreed and 5% slightly disagreed for the same item.

3.2. Flipped Classroom with Poll Everywhere

Flipped classroom results were found interesting as there is a difference in all items except clarity of lecture was same with traditional teaching though nobody disagrees as they were in traditional teaching. In rest of other items students response for strongly agree is increased drastically. 95% students were rated for highest score i.e. strongly agree for encouraged participation whereas 90% students were given highest score for lecturer's enthusiasm, clear audibility and confidence. Statistical analysis of student's feedback was carried for Mann-Whitney U-Test and significance of items were identified for lecture and lecturer performance as mentioned in Table 3.

Table-3. Statistical analysis of student's feedback on lecture and lecturer evaluation

Items	Content	Median	Inter Quartile Range	Mann-Whitney U-Test	P-Value
1	Lecture was clear	4	3-4	260.00	0.494
2	Lecture was interesting	3	3-4	234.000	0.199
3	Lecture was easy to understand	4	3-4	226.00	0.149
4	Lecture was well organized	4	3-4	246.00	0.314
5	Lecture was interactive	4	3-4	154.000	0.001*
6	Lecturer was enthusiastic	4	4-4	274.500	0.649
7	Lecturer was clearly audible	4	4-4	264.000	0.388
8	Lecturer seemed confident	4	3-4	276.000	0.640
9	Lecturer gave clear explanations	4	4-4	244.000	0.228
10	Lecturer encouraged participation	1.5	1-2	239.500	0.081

* Significant finding at $p < 0.05$

Table-4. Comparison between effective modes of delivery of lecture.

Items	Mode of Delivery	Mean Rank
1-Lecture was clear	Traditional	23.33
	Flipped Classroom	25.67
2-Lecture was interesting	Traditional	22.25
	Flipped Classroom	26.75
	Total	
3-Lecture was easy to understand	Traditional	21.92
	Flipped Classroom	27.08
4-Lecture was well organized	Traditional	22.75
	Flipped Classroom	26.25
5-Lecture was interactive	Traditional	18.92
	Flipped Classroom	30.08
6-Lecturer was enthusiastic	Traditional	23.94
	Flipped Classroom	25.06
7-Lecturer was clearly audible	Traditional	23.50
	Flipped Classroom	25.50
8-Lecturer seemed confident	Traditional	25.00
	Flipped Classroom	24.00
9-Lecturer gave clear explanation	Traditional	22.67
	Flipped Classroom	26.33
10-Lecturer encouraged participation	Traditional	22.48
	Flipped Classroom	26.52

4. DISCUSSION

In today's world of technology, teaching has been well blended with specific tools to support teaching. Technology will be an added useful tool for visual learners to understand concept and supports teacher to achieve learning outcomes within limited time. As per the demand of the topic, suitable tools can be used to enhance teaching style. Now a days, to support teaching, there are lot of tools/software's available which will be useful to get immediate feedback. Poll Everywhere is one of the tools which can be used for effective feedback. Feedback plays an important role to improve only if it could be done immediately. Poll Everywhere tool was used with flipped classroom concept for this pilot study which was greatly accepted by students. Advantages of using Poll Everywhere tool in class was mainly to get timely and anonymous feedback. The disadvantage of using Poll Everywhere tool in teaching were cost and time consuming process if internet service is not fast. The teacher has to plan activities ahead and be good in time management as in one hour lecture, the teacher has to spend some time to assess students understanding of pre-loaded lecture contents and to clarify misconceptions if students are unable to understand. The teacher also needs to dedicate some time for questions and response by students to identify their areas of difficulty. For effective use of learning tools it is very important that the institute should have strong elearning /IT support. If students face a problem in elearning /IT should be supported by experts and most importantly all students should have electronic devices to vote. Teacher has a flexibility to reduce time limit for response. Poll Everywhere is a good tool for places where universities have better facilities with high speed internet, smart phones etc whereas places where these facilities are not

available, then Poll Everywhere software can be replaced by colored card feedback method with some limitation for large group teaching [13].

5. CONCLUSION

This Study was started with the research question on how to engage students in large group teaching with active learning process? To identify the impact of implementing flipped classroom with the Poll Everywhere tool on student engagement in large group teaching for active learning by students, student evaluation was used with ten items on mode of Interesting results were found, as per study the mode of delivery is changed from traditional teaching (teacher centered learning) to flipped classroom with the use of Poll Everywhere tool (Student centered learning) for feedback, significant results were found (p value=0.001) for item 5 (Lecture was interactive) with flipped classroom than in traditional teaching which concludes that Flipped classroom with Poll Everywhere tool is a useful blended teaching method to enhance active learning in large group teaching. Flipped classroom was well accepted by students though it needs lots of planning, fast internet and IT support to conduct class by teachers to make it more interesting and effective learning method.

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