

MAKING STUDENTS ACTIVE IN LARGE CLASSES

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ABSTRACT

Due to a shortage of lecturers, large classes (over 100 students) are very popular in Vietnam universities. Lecturers have to build up their own teaching techniques to handle large classes. Even though our school, the school of Information Technology, University of Science, Vietnam National University – Ho Chi Minh, is one of the top schools in Vietnam teaching computer science, there are still many classes which have more than 100 students. In order to improve the teaching and learning quality, at the end of each academic year, we have organized a teaching and learning workshop in which lecturers have discussed and shared their teaching experience. One of the hottest topics in the workshop is how to make students active in large classes. There have been many techniques discussed. However, some are not very appropriate due to the fact that it is difficult and takes much time to prepare. In this paper, we will summarize techniques which are appropriate to large classes in Vietnam. In those techniques, some might be applied particularly for the field of Information Technology. In the last couple of semesters, the techniques have been applied and monitored. According to different characteristics of the techniques, we classified them into 3 main groups: for individual activities, for peer work or group work, and for the whole class. According to the feedback from both students and lecturers, they are very interested in these new teaching and learning experiences.

KEYWORDS

Large classes, active learning, teaching techniques, teaching methods

INTRODUCTION

In Vietnam, large classes in universities are very popular. Even in our university which is one of the top universities in Vietnam, many of my classes have more than 100 students. Some even gets up to 300. With the new campaign from the government on improving the teaching and learning quality, the university decided to choose the school of Information Technology as the pilot program to adopt the CDIO framework into its teaching and learning [3, 5]. In the past three years, we have spent a lot of time understanding the framework and adopting it into the teaching and learning at the school. Firstly, we has revised and re-built the learning outcomes of the school based on the CDIO syllabus [4]. The new learning outcomes have been verified by different stakeholders, such as the scientific committee of the school, lecturers, alumni, and industrial partners. We have also done the black-box exercises and

the ITU mapping in order to form up a revised integrated curriculum for the school. Then, we have reviewed the learning outcomes of each course and re-built the courses' syllabi to reflect the changes and provide the supporting details. In the last two years, we have carried out the new teaching and learning curriculum and syllabi for a few courses based on CDIO.

Even though we manage to create smaller classes comparing to those before, there are still many classes which have more than 100 students due to the shortage of lecturers and the limitation of school facilities. Until now, there have been many studies on active learning in large classes [1, 2, 6, and 7]. However, many of them are not very appropriate to carry out in Vietnam due to the fact that we have a different culture and are affected by Confucius philosophy. Thus, the adopted techniques to handle large classes are required to improve the quality of teaching and learning. In our school, at the end of each year, lecturers are gathering in a workshop to discuss and share their teaching experiences. One of the hottest topics of the workshop is how to handle large classes and make students active. So far, we have collected and summarized different techniques which, we think, are very appropriate to our students in large classes in Vietnam. The techniques are classified into three different groups as follow:

- Individual activities
 - Minute question: applied at the beginning or at the end of the class. It provides information or feedback to the lecturer.
 - Concept test: to assess students' comprehension during the lecture
 - Background knowledge check: for a certain problem, lecturer can check how much background knowledge students currently have.
 - Blogging: to motivate students note their understanding and problems. It is a good way to see the feedback from students while some of them are too shy to express their ideas in class.
- Peer or group work
 - Mind mapping: a small group of students are asked to develop and brainstorm their idea based on the central idea.
 - Peer/Group Competition: peer/groups compete with each other on a certain problem in class.
 - Individual-Group work: each group is allowed to discuss the problem at the beginning. After that, each member has to do his/her work individually. The score of the group is the average of the members.
 - Cross assessment: provide correct answer keys and ask students to assess other students' work. It helps to reduce the workload for the lecturer and also provides students opportunities to understand the process of assessment.
- Whole class
 - Hand counting: to quickly assess the comprehension of the class on a certain problem.
 - Interactive board: the programming is projected directly on the white board. Students are selected to discuss and allowed to write directly on the board.

- Minute pause: after about 15-20 minutes of teaching, lecturers should go around the room to make sure students fully understand the lesson or if they have any question. A closer in geographical distance will make students more confident in asking questions.
- Bonus scores for active members: Normally, Vietnamese students are timid. They will not express their idea if they do not have to. Thus, the bonus scores are stimuli to improve their personal characteristics.

The following sections will describe each technique in more details. The techniques are grouped into different categories. The discussion and our practical experiences on each technique are also mentioned.

INDIVIDUAL ACTIVITIES

There are several individual activities which can be applied in a large class to make students active. The techniques are often applied by asking students directly in oral communication and receive their answers. Some might be applied in writing as the individual feedback. For these techniques, students are expected to think independently and individually when giving out their ideas and answers.

Minute Questions

The minute questions are often applied at the beginning or near the end of the class. Normally, at the beginning of the class, a lecturer can ask a couple of simple questions to remind students what they have learnt in the last session. Those questions are aiming to recall students what they have learnt. It is also considered as a warm-up process while a lecturer also has an opportunity to remind the keywords or the name of important topics that he or she taught. The technique does not take much time due to the fact students only need to answer with the names of key points of the last learning sessions.

The technique is applied very well in large classes since there are more possibilities to have students who still remembered the last lessons. In Vietnam, due to the effect of Confucius philosophy, students are quite timid in the class. The technique is very necessary to trigger the activeness of the class and warm it up for new lessons.

Toward the end of the class session, those minute questions will help students summarize what they have just learnt. The technique could be done by asking each student to write the answer in a piece of paper. These answers are good feedback for the lecturer what is clear and what is not clear from the lessons.

Concept Test

Unlike minute questions, concept test is often used around the beginning or during the lectures. Before coming into the detailed explanation on any particular topic, the concept test will help students start thinking at a high abstraction level of the topic. If it is being used after the topic has been explained clearly, the test is a wrap-up to assess the students' comprehension on big topics of the lessons.

In large classes, students become more active in thinking on a certain problem and giving out their concept ideas on the topic. From our experience in applying the technique, students are willing to participate in the activity and keep moving toward what we intend to convey to them. It also shows that the technique quickly helps "weaker" students jump on "the same boat" of what is currently going on in the lecture.

Background Knowledge Check

In some cases, when we are about to move to a new topic and would like to make sure students already have desired background to be ready for the move, lecturers can ask questions which can be answered orally or students can do it in writing on the blackboard. The technique is to make sure students are ready to go to the new topic. For the students who have forgotten or do not have expected background, it is also a good opportunity for lecturers to explain it or build it up quickly for the students.

In our experience, in large classes, it is very hard to guarantee that all students are ready to move on to a new topic. The technique is to help covering students who are not ready yet. In reality, after asking the background question, we might pick students up randomly to answer the question. It is not only to check the readiness of the students, but it also triggers the preparation from the students before moving to a new topic. Students start thinking quickly on the answers or ask their neighbouring students for help.

Blogging

Taking advantage of the movement of technology and the trends, we can apply the blogging technique easily in real life to get feedback from students. Nowadays, students spend a lot of time on their computers at home. It is also trendy that they spend much time on social networks. Thus, the requirement to express their ideas via blogging is not so hard to apply. In these days, there are more people who use blogging websites to record their understandings and summarize their knowledge and experience. It is a good opportunity for lecturers to ask their students to participate in the activity and do something similarly. With the help of current technologies, it is not difficult to build up a common place on internet for students to blog or write their diaries.

In large classes, it is very difficult for all students to participate in any activity. The blogging technique is one of the best techniques which overcomes this. It is also mentioned above that our Vietnamese students are very shy to express their ideas due to the culture. Blogging is a good mean of communication for those students. In our experience, we are very surprised of what have been expressed and written down on the blog pages. The blogs will help lecturers understand their students much better, especially in large classes when they have no time to take care all students during the lectures.

PEER WORK OR GROUP WORK

In class activities, besides individual participation, peer work or group work is preferable due to the fact that students have opportunities to interact and discuss with each other. This section describes some popular and effective techniques for peer work or group work in large classes.

Mind Mapping

In this activity, a small group of students are asked to develop or brainstorm their ideas on a central topic. The discussion and interaction between students will help them moving quickly on the topic. Mind mapping is a well-known technique for generating, visualizing, structuring and classifying ideas. It helps students to have a better understanding of the central idea and have links to related ideas. In large classes, the technique is also easily applied due to the simplicity and the familiarity of the work.

In our school, due to the size of the classroom and the limitation of facilities, the technique is only applied for students who are currently sitting next to each other. They can do their work together right at their tables. According to our surveys, it has shown that students are more active and feel they are parts of the class.

Peer/Group Competition

The technique is to divide the whole class into small groups of 3-4 students to take part in the competition. Each group will work together to solve a certain problem. In our case of IT, we often have small programming problems to apply in these situations. Each group will do it in writing and submit their work on a piece of paper with all the team members' names. Normally, we often apply competitions like only the fastest 3 groups who have correct answers to the problem are accepted. This kind of activities motivates students and encourages them to come to the class. It is also a good opportunity for students to collaborate together when working under much pressure. The technique is also proved to be very effective to keep top and smart students active.

In large classes, it is very difficult to motivate all the students. In our experience, the challenges are the best ones to activate their motivation. Especially, in large classes, it is not only the "weak" students who need to be taken care of, but the best students are too. Top students are easily getting bored on the lessons which are intended for average students. Thus, challenging activities will keep the class motivation.

Individual-Group Work

Similar to the peer/group work, this technique also creates a challenge for students. However, the technique aims to facilitate the group discussion and the sharing between top students and average students. The activity is carried out in 2 phases. In the first phase, students in group are sitting together to discuss and explain the solutions on a certain problem. In the second phase, students have to work individually and submit his or her work. The score of the students is the average score of the group in which he or she participates. With this constraint, top students are encouraged to help and explain solutions to average students to maximize the score of the group.

In our experience, it is very interesting to see the discussion going on in the class when running this activity. The class is very active. However, the activity requires the classroom is big enough to arrange the group and discussion to avoid the interference among groups.

Cross Assessment

One of the biggest problems in maintaining large classes is to assess the students' work. It requires much of a lecturer's time at home to give feedback and evaluate the work. Thus, the cross assessment technique is an efficient and effective solution for the problem. Lecturers only need to prepare answer keys and the assessment guidelines for students. After the quizzes, students' work is shuffled and re-delivered to them. They will follow the guidelines and the answer keys to evaluate their friends' work.

In our practical experience, this helps to reduce much workload for lecturers in large classes. In addition, the technique also helps students understand the assessment process so that they can do their assignments or exams better.

WHOLE CLASS ACTIVITIES

Besides the individual or group work activities, there are situations that we need to have participation from the whole class. This section will describe some of the popular techniques that we often use to support our teaching activities in large classes.

Hand Counting

This is a very popular technique to get quick feedback from students on a certain problem in large classes. In our experience, it is a very efficient way to count the number of students in the class who agrees or disagrees on a certain answer. With this technique, we can evaluate roughly the percentage of the class which understands the lesson. However, from my personal experience, especially in Vietnam where the culture makes students not active in participating in any kind of activities of the class even on hand raising, we need to ask the students by one way and the other way round to double check the percentage.

The technique does not take much time but gives us a quick response on a percentage estimation of the class for a certain problem. The shortcoming of technique is the participation of the class members and also the effect when students seeing others' answers. However, comparing to the facilities which allow students to press buttons to give feedback, this is a cheap and efficient approach for large classes.

Interactive Board

In computer science, there are a lot of times that we need to discuss on a certain problem in programming with students. It is more influential if the students can see it in reality and interact with them directly. In Vietnam, we do not have enough money to buy interactive boards or tablet laptops where students and lecturers can work and discuss directly on it. Instead, we try to use the white board as an interactive board where we project our programming problems directly onto the board. Then, we can use colour pens to write directly onto the board for discussion and interaction as if we write on the screen of the tablet laptop.

The technique has shown a great effect to students when they have been explained directly on the problem. The students could remember the explanation longer and feel interested in the lessons. The only problem with this technique is the light reflection from the board is still very strong and sometime annoying.

Minute Pause

According to a study from Stuart and Rutherford [8], students' concentration rose sharply for the first 10-15 minutes and then drops very quickly for the next an hour. Thus after each 15 minutes of teaching, the lecturer should give a minute pause or so for the students to re-gain their concentration. The minute-break also helps students to quickly revise what they have just been taught.

In our experience, the lecturer should move around the classroom and get closer to students. The shorter geographical distance makes students more confident in asking questions and expressing their ideas. The technique is very effective for Vietnamese students who are often shy to express their ideas.

Bonus Scores For Active Members

Last but not least, one of the key ideas in making the class active is to give bonus scores for class contribution. Especially in large classes, students tend to keep quiet and listen to their

lecturer or other active friends. It is always true that if there is something beneficial, people will take it easily. Thus, it is always good that if the activeness and the contribution in the class brings something back for them. According to our observation and survey, students are much more active in discussing and answering questions in the class if they can receive bonus scores.

In Vietnam, students are very timid to express their ideas. Thus, most of the time, they will not participate in the activities if they do not have to. However, if they realize that there are some bonus scores waiting, their participation is much more active.

CONCLUSION

The paper has presented different techniques which can be applied in large classes to make students active. In our practical experience, they are very effective and efficient. Some informal surveys from the courses which have applied those techniques have shown a great effect from both lecturers and students. They are very interested in studying and teaching using those techniques. Recently, we have performed formal surveys for students and lecturers in those classes. However, due to the limit of time, we have not summarized the results of the surveys yet.

One of the main concerns about activities in large classes is how much time it is needed to carry them out. From our experience, many of those techniques mentioned in the paper do not require much time of the class. To some lecturers, they are very worried that they could not cover their lessons on time if they apply the active teaching techniques. However, from feedback in practice, students and lecturers are happier when participating in those classes. They study more effectively and remember the lesson longer.

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Dr. Dinh Ba Tien is currently the Head of Software Engineering Department, Faculty of Information Technology, University of Science, Vietnam National University – Ho Chi Minh city. He graduated from the University of Huddersfield, United Kingdom in 2007. He is one of the key members of the CDIO team of the school who participates in a 7-year project with the goal of teaching and learning improvement.

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