

Enhancing the Classroom Experience with the Just in Time Teaching Methodology

Sami Tannous

Civil and Architectural Engineering Technology
Indiana University-Purdue University Fort Wayne

Abstract

This article discusses the author's own experience with some of the difficulties encountered by students in learning construction engineering technology subjects.

Just in Time Teaching is an active learning technique that engages the students in the course. There are three advantages to this teaching style. It helps the students to be prepared prior to class resulting in the student being able to grasp the material better, have a deeper understanding of the subject matter, and engage in the lecture.

Just in Time Teaching is proving to be an effective tool for faculty to identify different types of student learning methods. There are those students who are intrinsically motivated to learn for the purpose of getting educated, prepare for industry, and have a self determination about their educational path vs. those students who are less motivated, less enthusiastic and need more help and pay more attention so they can gain the knowledge in the class and be successful.

Using this teaching style opens up a productive classroom conversation. By opening up the group discussion and question/answer session in class, all students are benefited. Particularly, the less motivated students benefit and learn by not only just listening to the discussion and getting the answers but also by getting the courage to ask questions and engage in the conversation. This paper includes a description and analysis of a classroom situation where the Just in Time Teaching method has had a positive effect on the students' learning process in a traditional classroom lecture.

Introduction

The lecture is probably the oldest teaching method and is still widely used in universities throughout the world. One of the challenges facing a new instructor teaching in construction engineering technology using a traditional lecture method

is motivating and engaging students in the class discussion, and adjusting to different students' backgrounds, especially in a commuter/non-traditional campus. Some students are self motivated, while others resist any effort to be motivated. The ability to recognize the ones, who are motivated as opposed to those who are not and why, is an important factor that guides class discussion. To create an interactive and dynamic classroom environment takes the willingness of the students attending the class to participate in active discussions. The lack of student participation in discussions in class itself creates a lack of motivation. The ability to draw-out quiet students and yet keep the vocal ones interested is a fine balancing act by the instructor.

One of the best ways of overcoming these differences, based on the author's experience, is to use the Just in Time Teaching (JiTT) methodology.

JiTT is a new way of making some changes from the traditional lecture in a classroom. It is an active way of learning that helps students prepare for class, have a deeper understanding of the subject matter, and engage in the classroom. Students can and will learn when they are truly engaged and feeling that they are a part of the lecture. Students learn by doing and JiTT does that in the construction class.

Reaching Out to Students

JiTT is aimed at many of the challenges facing students and instructors in today's classrooms. Student populations are diversifying. The classroom is a kaleidoscope of traditional and nontraditional students, working and commuting students' with a wide range of backgrounds and skills. They come to our courses with a broad spectrum of educational backgrounds, interests, perspectives, and capabilities requiring individualized, tailored instruction. They need motivation and encouragement to persevere. It is both a desire and obligation to meet students where they are and help them learn and gain from their construction course².

The JiTT method provides remediation and encouragement to weaker students while providing enrichment and curiosity to stronger students. JiTT minimizes passive lectures by asking the students to get information on the questions before the next class. Requiring the students to answer the questions starts them thinking about the reading before class begins. For example, giving students an assignment on Monday that is due on Wednesday and taking the first fifteen minutes of class time to go over students' answers, comments and questions opens up a productive classroom conversation, group discussion and question/answer session so all students are benefited, particularly the less motivated ones. They benefit and learn not only by just listening to the discussion and getting the answers, but also by being encouraged to ask questions and engage in the conversation. Students are expected to demonstrate mastery of the fundamentals of the construction course content, connect the classroom to the real-world, develop cooperative work habits and communication skills, and be in control of their own learning process.

In a passive lecture, the instructor comes to class, presents the information to students and leaves. In a JiTT classroom lecture students construct the same content as in a passive lecture with two important added benefits. First, having completed the reading assignment they enter the classroom ready to actively engage in the activities. Second, they have a feeling of ownership since the interactive lesson is based on their own wording and understanding of the relevant issues. The common key is that the classroom component, whether interactive lecture or student activities, is informed by an analysis of various student responses.

Unfortunately, most students are passive recipients in class. Some students may come from cultures whose norms discourage speaking in class. JiTT helps students become participants in the class discussion section by increasing students' awareness of the values of participation, and creating a climate in which an important contribution is not lost because the person with the necessary idea did not feel free to express it¹.

Ingredient for Active Classroom Discussion

Answering the assigned questions gets students thinking about the material to be covered in the lecture. Students come to class motivated to learn what they have not been able to teach themselves. The instructor spends time on common misconceptions and stumbling blocks and not on material students has shown they have already grasped. Getting students' answers also helps the instructors adjust the pace of their courses and the quality of the instructional materials they use. If a point has clearly not been understood, additional time can be devoted to that subject. It also makes the lecture setting more participatory and student centered, because students' answers to the questions may be used in class¹.

In addition to helping students learn the subject at hand, JiTT can also bring benefits by helping students structure their time and the way they approach a new subject. Most instructors agree that students get more in classroom if they prepare for class by reading the text ahead of the lecture². It also helps students to develop and practice writing skills. JiTT promotes construction classes' instruction as a dialogue whether as student-student or student-teacher.

Assignments are posted on the web which students access and respond to via the web before class time. Some samples of questions given to the students include:

1. Regardless of the type of specs used, there are instances when the contractor will be perplexed. For example "Install shoring in all trenches if so desired by the architect." Will the architect require shoring? Will the other bidders exclude shoring in their bids? How can this type of problem be avoided?

2. In your opinion, are mistakes in bids considered as grounds for nullifying? Are there any cases proof otherwise?
3. In construction contracts, do you believe that the issue of offer and acceptance is clearly defined for subcontractors who submit bids to general contractors?
4. When a contractor defaults, what are the possible options a surety company has and what are the various types of defense it can claim to recover from their losses?

Benefits of JiTT

The JiTT assignments are designed to encourage students to come to class prepared, engaged and motivated. It is a highly flexible system that can be adapted to different class schedules and levels, and different subject areas. The key principle is assessment between what students do during class, and what they do before and after. Based on student responses, the instructor selects an appropriate set of items that will make up the lesson. By enhancing and relying on this feedback, instructors and their students can achieve many benefits. In addition to the mastery of the subject, which is a main concern to the faculty, several goals could be achieved from using JiTT:

1. Motivate students and focus their study process.
2. Make the classroom more active by engaging the students in the lecture.
3. Recognize students' needs for self-focusing on study.
4. Help students understand why what they learn matters.
5. Create conditions that enable students to succeed in their learning activities or processes.
6. Create a classroom environment that promotes a mastery orientation focused on the development of knowledge and mastery of material and skills.
7. Provide students with opportunities to discuss issues in classroom and be proactive in lectures.
8. Help students read course material and complete assignments efficiently and effectively.
9. Help students develop the skills they need for working together effectively.

10. Focus students' study on important materials which encourage them to prepare for class and also for taking tests and quizzes. That focus puts the students at ease so they won't feel overwhelmed with a lot of information to remember.

11. Listen to students' answers and feedback and make sure the students are not lost but are on the right track.

12. Establish an interactive environment in the classroom and open up the room for more question/answer sessions and discussions between students, and students/faculty. (Creating a dynamic, interactive, classroom).

Some of the students' comments on using the JiTT assignment for the class were: "I use the assignment to formulate questions to ask in class". "I correct my written answers while we review in class." "The JiTT assignment increases my interest in our class discussion." "We have a real interactive environment in our lecture classroom." "My instructor relates material to be learned with material already studied and real world situations." "The JiTT questions assignment helped me study better. I was able to read through the chapter, understand the content, and come to class prepared, engage in class discussion, answer questions and prepare for tests and quizzes. I think JiTT assignments are a perfect way of developing great teaching skills." "The JiTT assignments were helpful in preparing for exams and quizzes. They did help to narrow the focus into specific topics in the text that related to class and real world. Students lack reading and focusing skills. JiTT helped guide students with this to better their ways of focusing their studies and getting involved with the class discussion."³

Some of the instructor's benefits from using JiTT in the classroom are:

1. The instructor becomes a better "explainer" because he or she has some insight into what students are thinking.
2. The instructor uses class time more efficiently by focusing on topics that are giving students the most trouble.
3. The instructor teaches more enthusiastically because JiTT is a significant change in teaching techniques.

Conclusions

JiTT is a teaching and learning strategy which gives the instructor the opportunity to listen to students as much as students listen to faculty. It allows the instructor to find out what students are thinking and if they understand the material presented during the lecture. In reviewing students' answers, the instructor will be able to better gauge at what point they were ready to discuss the material. From the answers, it was clear to the instructor that some students have read the assignment

and have a deeper understanding of the material. The instructor will be able to skip introductory material and build on the ideas that students were already thinking about, but maybe not articulated or realized.

A survey was administered to 24 students in the Specs, Contracts, and Codes class (CNET 276) and analyzed. The results of the survey data are as follows:

Question stem: How do you use the JiTT assignment/questions provided by the instructor?

8 = I read them after I read the chapter to see how much I know or learned

15 = I write out the answers to the assignment before I attend class reviews

17 = I use the questions as a study guide when I am reading the chapter

11 = I use them to formulate questions to ask in class

17 = I correct my written answers while we review in class

9 = I talk to other students in the class about my answers

7 = I write directly on the outlines before coming to class.

The next set of questions was designed to capture aspects of the JiTT techniques. Students were asked to what extent they agree (5) or disagree (1) with the following statements. Answers are reported as a mean.

1. The JiTT assignment/questions increase my interest in the class discussion = 4.00
2. The JiTT assignment/questions seem to structure the classroom discussion = 3.87
3. It is easier to study for the exams when the JiTT assignment/questions is used = 4.23
4. Having the JiTT assignment/questions before the lecture gives me a sense of confidence = 4.05

The survey indicated that 75% of students are writing out answers to the chapter questions before they attend class and 25% are answering them in class for the first time. About 50% use the JiTT assignment/questions to formulate questions to ask in class.

The preliminary JiTT assessment data are very encouraging. The effectiveness of the "Just-in-Time Teaching" strategies at Indiana University-Purdue University Fort Wayne suggests that it may be as well applicable in a variety of other settings.

References

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SAMI TANNOUS

A Lebanese-American assistant professor in the construction engineering technology program at Indiana University-Purdue University Fort Wayne (IPFW). He is a member of ASEE, and ASSE. His teaching experience is at IPFW, Kansas State University, and Pittsburg State University. His expertise area is in construction safety.