



Just-In-Time Teaching (JITT): An Innovative Method

Dr. Renu Verma^a, Santosh^b

*Former Principal, Department of Education, Panjab University Chandigarh, India
Research Scholar, Department of Education, Panjab University Chandigarh, India*

ABSTRACT

This research paper explores a different instructional strategy. The Conventional teaching methods are being vastly used in teaching but are lagging in giving an impetus to the requirements of the modern day necessities of pedagogy. Therefore a dose of Just-in-time teaching, which is often abbreviated as (JiTT) and found in 1990, will boost pedagogy of teacher education. Just-in-time teaching is a teaching and learning strategy comprising of two elements: Classroom activities that promote active learning and web-based activities that are based to enhance the classroom component. Since the year 1999 Just-in-time teaching method has been found to improve the performance of students across all subjects of science and humanities. As per the saying goes well begun is half done, therefore in order to achieve instant and timely good results a combination of conventional and Just-in-time teaching methods needs to be implemented in teacher education for an improved Educational system for pre-service as well as in-service teachers.

Keywords: Just-in-time teaching; Conventional pedagogy; Pre-Service, in-service teachers.

1. Introduction

Teaching is an "art" and not everybody's cup of tea as the saying goes and so the success of a teacher lies in making his/her subject so simple and easy as to make it intelligible enough for his students to understand and enjoy the topic. For this he adopts such methods which educate, enlightens and inculcate a learning temperament in his students. The interest shown by the students in his/her subject in particular, depends on the teaching methods and materials, for them to demonstrate their mastery on completion of their course study. However, despite forces and stress on teaching strategies in a subject, student's performance in the subject is persistently showing lower trends. And above this is the changing Education system which in trying to remove the load of the bag has made the child free from books altogether. This decision of not failing the student and promoting to next class has made students free from all stress of studying. The results teachers also did not take pains for teaching as students were to be promoted without any conditions.

In various situations the teaching methods adopted by the teachers at teacher education Institutions have been identified as the major factors, contributing to the high, low, and below-low par performance, of students in many subjects. The classroom-based conventional teaching methods consist of direct instructions and lecture projects, demonstrations, etc., conducted by the teacher. This teacher-centered method emphasizes learning through the teacher's guidance at all times. Students are expected to listen quietly to lectures and learn from them. Though the government is the year marking grants and disbursing grants for up-gradation and improvements of infrastructure by providing computer hardware as well as software but the techniques so designed to make the optimum use of these teaching aids do not bring out the desired results. This is where JITT can be amalgamated with the existing conventional teaching-learning processes to bring out revolutionary learning methods and improve the student's learning horizon and teachers' teaching techniques.

Rationale:

The World has changed in the blink of an eye. Schools colleges and other educational institutions were closed overnight in the wake of the pandemic and the students were liberated from schools (but confined to their homes), and parents had to grapple with keeping their children busy and productive at home. In the stress of the lockdown, hand washing, and tracking the global spread of the virus, no one had paid heed to the sudden stress on the often neglected group-teachers and students. With schools remaining closed for an extended duration brought online teaching to the forefront with many challenges for the teachers, parents, and of course students who were not happy to sit in front of the screen for hours together instead of playing and chatting with their friends. Suddenly, it was no longer a buzzword or a fancy term. Now everyone had to do it. The problems they were going to face only a few knew about it. There has been a huge surge in search of phrases like "how to teach online", "best online teaching platforms", "online teaching tools", and "online teaching techniques" etc., etc.

So as per today's need blending of conventional pedagogy and just-in-time teaching method needs to be familiarized and introduced at all teacher's education institutes and schools above all, for the reason the majority of educational institutes are already equipped with computer hardware but least

utilized. The exposure of the would-be teachers or the teachers also to such a revolutionary method will have to equip them in their professional journey of teaching while they go out and impart education in schools and colleges of India. Teaching with computers or online teaching made teachers lose their confidence and security towards jobs.

Teacher training institutions have a mission of high responsibility to train competitive educators for change and future schools. To adequately prepare our pre-service and in-service teachers for the challenges of diverse classrooms, teacher education programs will have to develop a mission to address education equity for all students. Then, teacher education programs must prepare pre-service and in-service teachers with the appropriate skills and knowledge to ensure equitable academic opportunities and personal growth for all students.

Research Question:

Now the question arises:-

What is Just-in-time teaching and how it is different from the conventional teaching methods? Will it prove to be helpful if used with conventional teaching methods?

2. Theoretical Framework

2.1 What is Just-in-Time Teaching (JiTT)?

JiTT is a pedagogical technique that emerged in the 1990s. This teaching method was created by a team led by university professor Gregor Novak. It was first implemented in a physics course where the instructor wanted to find a different way to meet students' learning needs (Novak, 2007). During that time there was a concern among professors related to students' mastery of key concepts, thus professors began to evaluate the quality of the pedagogical techniques used in the classroom and started to explore new strategies to be implemented in the lessons (Lorena, 2016). It integrated real-life and virtual instruction to maximize the efficacy of both.

Some new learner-centered strategies emerged to replace conventional/traditional lectures method and one of those strategies was JiTT (Just-in-time teaching). This pedagogical technique was designed based on the constructivism theory. Constructivism states that all learners have a piece of background knowledge and they use it to generate new information. The initiators of JiTT considered the students' background knowledge extremely important in enriching the learning course material (Guertin, Zappe, & Kim, 2007). The authors of this strategy took into account that a student's learning process is facilitated when there is active participation. They wanted students to be engaged, prepared for class discussions, motivated during and outside class time, and be curious about the course content. Likewise, the authors of this strategy used web-based technology to foster communication between students and teachers when they were not in-class hours. This type of communication could provide teachers a piece of valuable information related to students' performances and concerns about classroom topics.

This method involves a two-step series of learning activities:

Because of that, JiTT created a more productive experience for instructors and students: instructors were able to adjust their teaching activities to better serve student misconceptions or areas that they were struggling with (Kurt, 2019):

1. Students completed a focused set of activities (e.g., reading from the textbook or using other resources, etc.) online (through a course website, or a learning management system) before coming to the class. These pre-instruction assignments were called warm-ups. These activities often required complex answers even though they are open to interpretation. Then, students submit their assigned work to the instructor a few hours before the class started.
2. The instructor collects students' responses and identifies the areas of understanding and misunderstanding to adjust teaching activities in a meaningful way. This left the instructor to focus class time on cooperative problem-solving activities.

This method lets the instructor maximize the efficiency of class-time to allow for more focused and more meaningful exploration of the teaching materials.

2.2 Implementing JITT

The process is commenced by asking questions to the students and the responses are reviewed by the teachers, hence participating in the interaction and discussion advances the learning process. There are few steps for the implementation of JiTT:-

Step -1 Consideration of the factors.

JiTT can be applied to every subject by using the approach effectively by the concerned subject teacher. It is for the teacher who should reflect upon the questions before implementing them in the classroom. There are many factors to be considered before implementing this approach in the classroom and which are as follows:-

1. Class size
2. Students level/aptitude
3. Spectrum of progress
4. Dominant pedagogy
5. What will be the grading process
6. How much time to be devoted

7. How the teacher and the students will make use of the results generated by JiTT

Step -2 Framing of the right questions

JiTT is designed to help the students to learn properly. For this, the teacher needs to frame the right type of questions and mold the curriculum in accordance to respond to good communication with the students. Step one should complement the step in encouraging the students to elaborate on the ideas in the class.

Step -3 Assessing the responses

Step one and step two have a great impact on the work of the students. Analyzing and assessing the student's responses encourages the students to interact and participate better in the learning process.

Step -4 Keeping JiTT active

Step four follows many avenues. The simple use is of sharing the responsibilities of the students within the group without disclosing their identity. This should be done by generating high levels of interaction within the class and requiring each student to participate fully and make the most out of it with enthusiasm and zeal.

JiTT is a proven pedagogical strategy in which faculty use the World Wide Web to make face-to-face classes more active and student-centred. It enhances interactions among faculty and students and encourages students to be fully engaged. It promotes active learning and student engagement and is often used in combination with other active learning methods and provides a window into students' attitudes and ideas about course content, study habits, and other issues. This enables faculty to respond effectively to students' needs and creates an opportunity to begin educational research projects.

Web 2.0.

Web 2.0 is a term used to describe a series of websites and applications which allow users to create and share information. According to Vallance, Vallance, and Matsui (2009), the use of web 2.0 tools can promote a constructivist approach to language learning and teaching as learners focus on constructing knowledge rather than receiving it; they can think, understand, analyze, and apply information and not just memorize. Students become active and not passive learners.

This method lets the instructor to maximize the efficiency of class-time to allow for more focused and more meaningful exploration of the teaching materials.

3. Conventional Teaching

Conventional method of teaching is the chalkboard for teachers; pen and paper for students. Earlier education was delivered was through recitation and memorization techniques, whereas the modern way of doing things involves interactive methods. It consist of different teaching methods like lecture, demonstration, project method and so on have been in use for past so many years with very little improvements or variations however, there is a very serious need of the hour where a major shakeup is needed by introducing such a technique which gives results in making the learning processes more productive.

In this context JiTT method has proved beneficial in the knowledge and grasp of subjects by the students outside their classrooms as per a few studies conducted by researchers. Instructors used e-mails, at first, and then learning management systems, by igniting their intuitive and cognitive reach.

From the above, it can be concluded that it is obvious that in JiTT the work which the students do at home or outside the school office hours is used to leverage the time they spend in class. The use of JiTT as a teaching method is very simple. Between classes, students are given short assignments typically focusing on materials that will be covered in the next class. The students do the assignments and submit them electronically to the teacher. Once submitted, the teacher will review the students' JiTT response before the class and use the responses to organize and modify the upcoming classroom session –hence the “Just – In – Time” teaching strategy. Excerpts from students' submissions are presented during the class as the basis for discussion. Naboth (2014), Egenti (2017) concluded that achievement grades of students taught financial accounting using the JiTT method were greater than those taught using the conventional method. The American Society for Cell Biology (2004) and Marrs, Blake, and Garvin (2003) and has reported the JiTT revolutionary effects in classroom interactivity, study habits and performance.

4. Pre-Service and In-Service Teachers

Preparing teachers for regular class teaching has undergone a major pedagogical shift in recent years. Training institutions are required to ensure that pre-service teachers are competent enough to cater the needs of an increasing range of diverse learners which include their attitudes, beliefs, expectations and acceptance of people with diverse needs may well be challenged. Although this is such an important area, limited international studies have been carried out to understand pre-service teachers' concerns and preparedness for teaching diverse learners.

5. Review of Literature

Novak, Patterson, Garvin & Christian (1999) found that if teaching approach combines the use of out-of-class web-based exercises with active learning pedagogy. As a teaching method, JITT addresses two critical issues in teaching and learning activities. These issues include the relative scarcity of active learning based teaching method and the lack of new technology-based instructional innovations (Simkins, 2006).

Furthermore, Cohen & Kulik (2009), Guretin (2010), Osmond (2011), Monnie & Pavel (2016), (Egenti, 2017), Madiraju (2017) derived that in different subjects like mathematics, geo-sciences, sciences statistics, immunology, etc respectively showed accelerated learning and active participation in the classroom when they taught the same lesson with JITT methods. And Lorena (2016) in her study investigated that students' engagement was revealed when they invested time in the designed activities through the use of the JITT strategy; with the use of this technique, learners were able to invest time to increase their cultural capital based on topics that were appealing to them.

Novick (2011) successful implementation of the JITT strategy depends critically on the teacher and the students' total buy-in. If students see the online assignments merely as an add-on to the course, to be completed performed to relieve in the shortest time possible and then discussed briefly at the beginning of the class, before the 'real' lecture, they will resent the extra work and will not get any additional benefit from JITT. Quality learning among students needs quality teaching while quality teaching produces quality learning that can only be had if quality methods of handling classes are employed. The quality of teaching refers to the appropriateness of the method selected to achieve the identified objectives for a certain subject matter (Duque, 2003). Nadanwu and Nawankwo (2019) in their study found that just in time has improved the achievement of students in cataloging concepts as students taught with just-in-time had a higher mean in their posttest scores than students taught without just in time.

So, it's an effort to improve science and other subjects teaching and learning in the schools, the government introduced learner-centered pedagogy in the school curriculum and subsequently disseminated this through pre-service and in-service teachers.

6. Recommendations

According to Nobath, (2014), the following are the recommendations regarding JITT:-

1. To improve students' performance JITT should be formally adopted in schools.
2. To make it popular among the teacher's workshops and seminars should be organized for teachers to be trained for the use of JITT.
3. Both pre-service and In-service school teachers should undergo training in computer application so that they can learn the utilization of the JITT method in teaching students.
4. In this method teacher should act as facilitators of knowledge to maintain the students-centered nature of the method.

7. Conclusion

JITT borrows eclectically from many learning theories and instructional techniques developed over the past decades. Studies that seek to understand how students construct new knowledge on top of the pre-existing knowledge are particularly relevant to JITT. So is the body of work that concerns itself with students' motivational beliefs and with the effects on learning of classroom contextual factors. The relationship between the above findings indicates that the Just-in-time teaching method will improve student's performance, student's engagements, the achievement of the students irrespective of the subject's area or geographical location, so it becomes imperative to introduce Just-in-time teaching in teacher education institutes curriculum and disseminated this through pre-service teachers.

REFERENCES

- [1] Cohen, Kulik, and Kuliks (2009). Educational Outcomes of Informing: A meta-analysis of findings. American Education Journal 19(2) 232-248.
- [2] Enwere, J.O. (2012). Comparative effect of using Just in time teaching method and conventional methods of teaching on student's academic achievement and retention in secondary school. An Unpublished Master thesis in Nnamdi Azikiwe University, Awka.
- [3] Enwere, J.O & Enwere, E.C (2014). Effect of using just in time teaching and conventional teaching methods on students' academic achievement in financial accounting. Nigerian Journal of business education.2(1) 366-373.
- [4] Guertin, L. A. (2010), "Using Just in Time Teaching in the Geosciences," Just in Time Teaching: Across the Disciplines, Across the Academy, Sterling, VA: Stylus Publishing, pp. 101–116.
- [5] Kurt, S. "Just-in-Time Teaching (JITT)," in Educational Technology, September 28, 2019. Retrieved from <https://educationaltechnology.net/just-in-time-teaching-jitt/>
- [6] Marrs, K.A. & Blake, R. & Garvin, .A. (2003), Use of warm-ups exercise in Just-in-time teaching: Determine students' prior knowledge and misconceptions in biology, chemistry and physics. Journal of college of science teaching,42-47.

- [7] Marrs, K. A., & Novak, G. (2004). Just-in-Time Teaching in Biology: Creating an Active Learner Classroom Using the Internet. *Cell Biology Education*, 3(1), 49–61. <http://doi.org/10.1187/cbe.03-11-0022>.
- [8] Madiraju, Charitha et al (2017)."Implementation of just-in-time teaching strategy as an active learning instructional pedagogy for Pharm D integrated microbiology and virology course." *The Journal of Immunology* 198(1) .128.
- [9] Monnie McGee, Lynne Stokes, and Pavel Nadolsky (2016) 'Just-in-Time Teaching in Statistics Classrooms', *Journal Of Statistics Education*, 24(1), pp. 16-25. Available at: <http://dx.doi.org/10.1080/10691898.2016.1158023> (Accessed: 20 march 2018).
- [10] Naboth-Odums, A. (2014) 'Critical Assessment of Just-In-Time Teaching Method as Against Conventional Teaching Methods on Academic Performance of Business Studies Students', *Journal of Educational and Social Research MCSER Publishing*, Rome-Italy, 4(5), pp. 59-66.
- [11] Novak, G. M. (2011). Just-in-time teaching. *New directions for teaching and learning*, 2011(128), 63-73.
- [12] Novak, G., and Patterson, E. (2010), "An Introduction to Just in Time Teaching (JiTT)," *Just in Time Teaching: Across the Disciplines, Across the Academy*, Sterling, VA: Stylus Publishing, pp. 3–24.
- [13] Osmond, P., & Goodnough, K. (2011). Adopting just-in-time teaching in the context of an elementary science education methodology course. *Studying Teacher Education*, 7(01), 77-91
- [14] Simkins, S. & Maier, M, (2004). Using Just-in-Time teaching techniques in the principles of economics course. *Social Science Computer Review*, 22. 444-456
- [15] Novak, G. M. (2011). Just-in-time teaching. *New directions for teaching and learning*, 2011(128), 63-73.Cite this article as: Kurt, S. "Just-in-Time Teaching (JiTT)," in *Educational Technology*, September 28, 2019. Retrieved from <https://educationaltechnology.net/just-in-time-teaching-jitt/>