Investigating the Ties between Teal and Constructivism in Higher Education: A Micro-Level Study on Generation Z

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Abstract

Technological revolutions have brought changes in many fields, including teaching and learning. As a result of this spurt, the concept of e-learning was materialized. Over the period of time, E-learning evolved and paved way for much advancement in education sector. One such development is technology enabled active learning (TEAL). TEAL is a student centric learning technique. It consists of many strategies in order to help students learn easily by having them as an active participant. However, the versatility of this method of teaching-learning is not much explored especially for higher education in Indian scenario and is still in nascent stage. There are many factors that are to be considered for learning in higher education. One such element which determines the success of learning is constructivism according to bloom's taxonomy. A constructivist approach could possibly push the students beyond lower level cognitive skill (Fields, 2006). According to Armstrong, former assistant director, centre for teaching, the revised taxonomy in the year 2001 has the level of creating or generating or planning in the peak of the cognitive process. Therefore, teaching - learning can be considered success if it enables the students to construct a new knowledge based on the existing acquired one. In order to affirm this for TEAL method of teaching - learning, it is important to know the relationship between TEAL method of teaching – learning and constructivism. Thus this study focuses on analysing the relationship between constructivism and applied active learning strategy by conducting an experiment among University students in order to know if there is relationship between TEAL and constructivism in higher education and of what kind. It is revealed that applied active learning strategy definitely helps in the betterment of students' performance, by enabling them to construct their own understanding and knowledge gained during the experiment and reflects the same thereafter. Though, TEAL has positive influence in students' constructivism, there are other factors that are to be considered to make it a foolproof method of teaching and eventually bridging the gap between knowledge and technology.

Keywords: *Technology enabled active learning, e-learning advantages, active learning, e-learning for students' performance*

INTRODUCTION

Technological inventions have brought changes in many fields, including education. As a result of this boom, e-learning was emerged. Although e-learning requires a set environment or facilities for accessing, it can't be denied that e-learning has many advantages to offer for the society in various aspects. One of the biggest advantages is e-learning becoming the major source for learning and helping the students in their academic matters. One such pedagogical innovation is TEAL.

TEAL is nothing but technology enhanced active learning. Active learning is a constructive approach towards teaching and it is very much known for its student centric quality. It treats students as active participants unlike as passive learners in traditional instruction. There are numerous benefits in active learning method of teaching-learning that are unusual in traditional classroom. Some of them are increased content knowledge, critical thinking, problem-solving abilities and positive attitudes according to Anderson et al, 2005 (as cited in Active Learning Classrooms, n.d.). In an effort to evaluate the students' experience of lectures based on active learning strategies, the investigator reveals witnessing increased enthusiasm for learning both teachers and students (Thaman et al, 2013). Not only enthusiasm but also development of graduate capabilities such as critical thinking, problem-solving and interpersonal skills were improved when active learning approach was implemented (Kember & Leung, 2005). These are few prominent benefits of active learning. The benefits were numerous in active learning approach because it involves students as active participant and makes them undergo an experience in order to learn something new or to add to an existing knowledge. In either case, the engagement rate of learners was high in this type of teaching simply due to learning by doing technique i.e., active learning. Thus, in active learning approach the entire process of teaching can touch upon the "evaluate" stage mentioned in the Bloom's Taxonomy. But, to extend the process further in order to reach the "create" stage given in the Bloom's Taxonomy, ability to solve a problem and create their own understanding is required which is what is constructivism basically.

The constructivism is not much explored area in the Indian context because the Indian education system is more of theory oriented than demonstration or practical teaching. As it is new for the students' community, it is equally looked upon as too technical to handle by the majority of the teachers. Instructor's tendency toward the traditional or lecture method was a major factor to affect the successful implementation of active learning states Teshome, 2012. Contrary to the last line, the investigator from Lebanon displays positive perception of teachers favouring active learning implementation in the study Perceptions on the effectiveness of active learning strategies (Daouk et al, 2016). This reveals the volatile characteristic of active learning in various milieus. Unfortunately it is not much explored in Indian scenario. When this is the case with general no-access to technology active learning, it is totally out of question to even think about TEAL. However TEAL is need of the hour as majority of the students are from so called generation Z. Generation Z is nothing but people who are born from mid- 1990s through the second decade of this 20th century (Generation Z, n.d). They are digital natives in true sense. They grew up with technology. They won't probably remember how days were without YouTube and mobile communication (Claveria, n.d). Thus their educational needs are also different and significant. India is not an exception for this. But the still developing infrastructure and facilities makes the implementation of TEAL all the more difficult to an extent. Whatsoever, with the initiations like digitisation and digital India campaign India is definitely marching forward toward progress in everything including education. Thus, as a gateway to further development in Indian education scenario using TEAL, the study aims to investigate the relationship between TEAL and constructivism in the Indian context.

LITERATURE REVIEW

TEAL rides on the coat tail of technology. The world embraces the technology particularly developing countries such as U.S and UK without qualms. This could be seen evidently from the scheme of providing computers to all public schools in the ratio 1:5 in the U.S. The expenditure goes up to three billion dollar on digital content creation every year (Herold 2016). Unfortunately a developing country cannot have the same luxury of spending this exorbitant price especially India. But, the efforts initiated towards ICT projects of late by India were tremendous. It starts from the school under the initiation called RMSA (Rashtriya Madhyamik Shiksha Abhiyan) initiated by Ministry of Human Resource Development,

government of India in December 2004. The ministry had even announced National Award for innovative use of ICT to motivate teachers and teacher educators (ICT, 2018).

Active Learning/TEAL and Constructivism Worldwide

Constructivism was a theory developed by Jean Piaget. But the concept of social constructivists often dwells on Vygotsky's idea to explain teaching (Palmer, 2005). In the social constructivist approach, it is significant for learners possess skills such as problem solving, analysis, synthesis and knowledge (Steffe and Nesher, 1996; Koc and Demirel, 2007; Murphy, 1997; Terhart, 2003; Tynjala, 1999). On top of it, \ Holzer and Andruet 2000 says that active learning leads to significant gains for students. Also, it is credited for more rewarding and enjoyable teaching in the classroom by them. TEAL is said to affect both students' performance and teaching (Patil & Kudte, 2017). In Riyadh, teachers from a primary school were studies for application of constructivism in teaching mathematics. Surprisingly, they insisted silent classrooms and they also lacked confidence where student prior knowledge is assessed and built (Alsharif, 2014). On contrary to this, Belcher et al, n.d., shares the impact of TEAL project conducted among MIT students. TEAL classroom was able to produce twice the average normalized learning gains compared to traditional instruction he says.

The teaching profession is suggested to progress towards the outcome of constructivists' practices using technology (Becker, 2002). As per Linda Darling-Hammond's description of Finland schools, it is a rare sight to witness students being lectured. Students are likely to be participating in the workshops, working in group and ask their teachers questions to enable environment for discussion. United States has its share active learning seekers as well including many of the Hybrid pedagogy authors. For instance, Cathy Davidson, a CUNY professor currently experimenting active learning in her classroom and proven its advantage for student's success (CCEj.F16, 2016). Active learning helps to achieve higher order skills of Bloom's taxonomy. Implementing the Curriculum with Cambridge: A Guide for School Leaders is Cambridge's guide is drawn around active learning approach. Not only in US or UK, active learning has been in practice in Russian Universities as well (N.M., 2013). Active learning in Japan is regarded by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) as an alternative to traditional learning. It is also called as problem based learning (PBL) by them. As they believe, problem solving skills are the ones to stand good later in life (Nae, 2018).

Active Learning/TEAL in India

India is still at its nascent stage when it comes to active learning approaches for higher education. The investigator reveals the problem in integrating ICT in the Indian context as resource constrain, existing solution need examination and solution sustainability in the study, Large-scale teacher professional development for effective technology integration (Murthy, 2017). But if implemented appropriately in the Indian context, TEAL/Active Learning tend to bring out the positive learning outcomes. Learners in India are welcoming towards usage of technology for education. But, faculty development programmes were recommended in order to equip the trainers/facilitators in incorporating technology for instruction and assessing the outcome obtained using technology (Hirkani & Supe, 2018). However, the cognitive achievement in terms of the problem solving rate is high if the students were exposed to active learning in advance (Banerjee et al, 2015). From the literature, it is evident that the reach of active learning/TEAL is in its infancy in India but practiced and available in the prestigious institutions alone. This gap is mainly due to the lack of knowledge about benefit of TEAL and infrastructure. Thus, this study attempts to explore the benefits of TEAL and constructivism along with relationship with each other in the Indian context.

HYPOTHESIS

From the above literature, the study draws hypothesis to be,

H1: There is a positive relationship between TEAL and constructivism in Indian context

THEORETICAL FRAMEWORK

This study is heavily framed with Piaget's (1936) constructivism theory and few concept of Vygotsky namely problem solving in ZPD (Zonal Proximal Development). Jean Piaget's was the first psychologist to study cognitive development methodically (Mc Leod, 2018). Piaget put forth the idea of connecting existing cognitive framework and relatively new experiences. He essentially talks about the development of cognitive abilities among learners. They build their own knowledge through experiences he says. Within this theory falls social constructivism (Constructivism, 2010). Vygotsky (1978) states that learning occurs first on social level and then within individual level. The foundation of individuals' knowledge lies in the learners' interactions with their social surroundings i.e., around other people before their

knowledge is internalized states Roth, 2000 (as cited in Amineh & Asl, 2015). It is implicit from the above evidences, that active learning occurs during the process in which a learner involves, experiences something and acquires knowledge or adds to already existing knowledge by constructing new meaning out of the experience. It is also obvious from the above theory and literature that problem solving is one of the concepts of social constructivism and this study efforts to throw light on that when TEAL method of teaching - learning happens in the Indian context.

METHODOLOGY

Having education accessible for everyone is still a question in the developing countries for numerous causes. But the quality of learning becomes a major concern in India to the extent of affecting as basic as student enrolment rate itself. As a proof, Pratham's annual report of 2013 had revealed that on an average of 60 percent children from standard V and III cannot even read standard II text. Though technology is found to be one of the solutions, a more officially driven effort is required on this front in order to suit Indian system (Sahni, 2015). Technology is suggested as one of the solutions because there is a gap between learning outcomes and what a student exhibit in classroom is not in line with the students' enrolment rate states Cain, project manager (Education) at Google.org (Ajmal, 2018). However only someone who knows Indian context and the end user can bridge this gap tells, Cain (Ajmal, 2018). Thus, the literature reveals TEAL as an appropriate strategy to deal with this setback for two reasons. First is TEAL has technology to satisfy the generation Z and second is the ability to bring better learning outcomes i.e., problem solving skill in this context. Hence, to prove the above mentioned hypothesis, an experiment was conducted. The experiment was quasi-experimental in nature and random sampling technique was adapted.

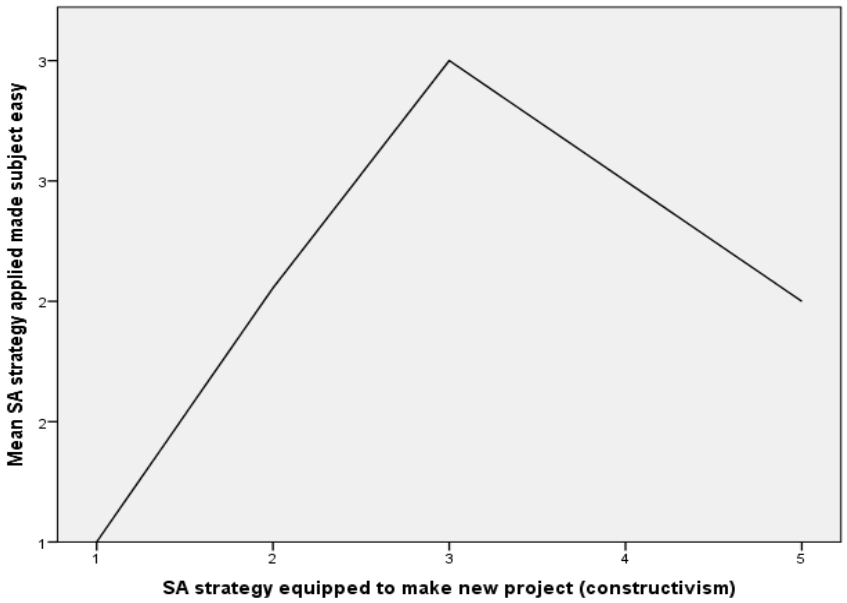
Experiment

There are numerous techniques in active learning method among which in-class worksheet was used for the study. University freshmen were chosen for the study aged between 17 and 19 randomly. The sample consisted of 14 female and 18 male students. The students were chosen from the media course although it was confirmed that they don't have any prior exposure towards media content as they were just enrolled. They were briefed about the activity and subjected to an online tutorial about basic audio editing software called sound forge. Students showed interest to watch the tutorial and thus it went on for 14 minutes and

13 seconds. Followed by this an assignment was given to complete in two hours time. The assignment was to submit an audio clip edited using sound forge software by working as a two member per team of their choice. Students were ensured for having wifi connection to download the software. At the end of the two hours, questionnaires were distributed to know if the newly gained knowledge had really helped them to work on the given assignment or so to say problem solving in this context.

ANALYSIS & DISCUSSION

The data collected was analysed to know if there is any correlation between the TEAL strategy applied and constructivism. Scale developed by NCVER (National Centre For Vocational Education Research) 2012 was used for the study. It was modified to suit the study nature and to test the invented hypothesis. Items were measured using five point Likert-scale. The questionnaire was distributed and collected during the same hour after watching the tutorial. The software used to perform the statistics in the study was IBMSPSS version 20. The collected data was tested to determine the relationship between TEAL strategy applied and constructivism. As the sample size is small but has to be computed for correlation between TEAL and constructivism, Kendall tau-b was found to be suitable and thus used for the study. Indisputably, the result obtained showed strong positive correlation between the TEAL strategy applied and constructivism or problem solving ability that was significant statistically. Kendall tau-b correlation coefficient, T_b was 0 .519 and p = .001which is less than 0.05.



It is obvious from the above graph that there were meagre number of people who didn't think this TEAL strategy had equipped them to solve the given problem in other words given assignment. Whereas majority of them have felt that the strategy had given the required knowledge to solve the problem. Therefore as mentioned in the social constructivism theory, this methodology had assisted students in solving the given assignment or rather problem to them but not by adding knowledge to the existing one, as they are fresh out of school and have no knowledge about audio editing but by actively involving them in the process of learning and giving them a newer experience. As mentioned by Roth 2000, students learn from the social interactions before customising the acquired knowledge to suit them (as cited in Amineh & Asl, 2015). In addition to this, it is revealed that they prefer to learn from their peers specifically.

FINDINGS & CONCLUSION

TEAL is making waves in the field of Indian education of late. Though India is not among the early adopters of TEAL, it realised the potential of it in Indian scenario recently to name a few, opportunity of quality distance education, advantage in classroom learning, encouragement in having learning management system and simplifying learning through mobile apps (User, 2016). Even then there were apprehensions about implementing TEAL due to poor infrastructure, quality of teachers who can handle technology and affordability (Avasthi, 2018). It is suggested by the same author that learning should be measured on individual basis by assessing student performance and providing them with sincere feedback to perform better. On top of it, teaching for generation Z makes it all the more inevitable to incorporate technology into education. All these necessities drive towards TEAL and its benefits. As a cogency of above evidences, Students showed interest and enthusiasm during the experiment. Also, they inclined to learn from their peers rather than technology. On the other hand, the applied strategy had equipped them to work on the given assignments on their own i.e., as a team of two members by using the knowledge obtained from the tutorial screened and most importantly from their peers during the activity session. In addition to this, students were seemed to gain confidence in doing the assignments without much of instructors' guidance as it renders a feeling of autonomous to the students.

Thus, it is revealed from the above statistics and literature that the adapted TEAL strategy has given positive output by the students. However a negligible amount of students felt the need of prior knowledge in the selected software. In spite of a small sample size and other odds,

the output has contributed to the literature in the field of education in Indian context for future reference purpose and for implementation of TEAL as well in a small way.

LIMITATIONS

India is diverse in terms of culture, language, socioeconomic growth, educational set up, etc. But the study location was confined to Chennai, Tamil Nadu. Hence, the demography is a limitation in order to generalize the findings. As already mentioned in the previous chapter, infrastructure, resource to handle technology, affordability and accessibility are all obstacles identified in the way of immediate implementation but not in the long run definitely. Sample size could have been larger to include students' perception as it tends to differ and affect the adaptation of newer teaching methods to make e-learning or so to say TEAL an infallible method of teaching.

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