Effective learners' engagement for learning

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Abstract: For effective learning to happen the learners are to be actively engaged in classrooms and laboratories. For effective engagement the learner's interest in the classroom is to be created. For better engagement the teachers' methods need to be inclined towards making teaching learning process more learners centric. The authors have experimented with several teaching learning strategies regularly in their classrooms for active engagement of learners which leads to effective learning. The results of surveys and measurement of learning outcomes indicate that with better learners' engagement the learning is more effective. This implies that better learners' engagement leads to more effective learning.

Keywords: Effective engagement, Teaching learning strategies, Effective learning.

1. Introduction

The learner engagement is very important for effective learning to happen. There are various ways in which learner engagement can be increased. The authors have experimented with multiple such methods in their courses. The learner engagement can be measured by various feedback mechanisms [1]. Another way of measuring learner engagement in computer equipped classrooms has been suggested in article [2]. The authors have experimented with these strategies in their theory and laboratory classes for multiple courses at undergraduate and post graduate level. The whole idea is to better engagement will lead to more effective learning. The authors have gathered evidences through various feedbacks from the learners to support their claim regarding effective learning.

2. Methodology

The authors have experimented with below mentioned strategies regularly in their classrooms with the objective of better active engagement of learners for their effective learning.

- Active learning strategies
- Activity and Project based learning:
- Incorporating 'Hands-on' activities

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- Effective Student evaluation
- Teacher reflection and improvements
- Feedforward instead of Feedback to students
- Designing Engaging curriculum
- Use of Technology and ICT tools
- Designing and using Rubrics effectively

- Active learning strategies: The activities [3] in the classroom and laboratory instructions have to involve learners actively. There are various established active learning strategies used by authors. The learners were actively involved for the lessons to stick with them for longer period of time. The authors engaged the learners using active learning strategies like Think-pair-share, peer learning, peer assessment, gamification of courses, role playing, polling, quizzes, jigsaws, student reflections and four corners etc.

- Activity and Project based [4] learning: The learners have to be engaged to a greater extent than merely sitting in the class and listening to the teacher's lecturing. This engagement was increased by delivering the content in activity based and project based strategies. The projects and activities needed applications of concepts that learners have learned and involve them at higher cognitive levels of application, analysis and creation.

- Incorporating 'Hands-on' activities: More interactive 'hands-on' activities need to be devised for theory and laboratory instructions to make learning interesting. This will help in retaining learners' interest in the courses and will act as catalyst in the learning process. This was achieved used Mini-Project based approach for Computer Engineering students.

- Effective Student evaluation: Evaluation of students should be used to assess the learning and it also helps a teacher know what the areas of students' difficulties are. The evaluation also helps in reinforcement of important concepts in learners mind. The authors conducted small

quizzes and tests in almost every class for identifying learners' knowledge and their difficulties.

- Teacher reflection and improvements: It is very important for teachers to do self-reflection about their experiences. A teacher should ask questions to himself / herself regarding his/ her own class. The questions like what went right, what went wrong, what was liked by learners, what did not go well in the class, what could have been done better, what activity was appreciated and what was not appreciated etc. the answers to such questions will help teachers to improve in future courses and their classes. Teachers can their share experiences with each other and evolve mutually from these kinds of reflections. These types of reflections were used to improvise content delivery and use of tools.

- Feedforward instead of Feedback to students: The focus has to now shift from feedback to feedforward. The leaners were given ideas and suggestions on how they can improve and carry their work ahead and improve on their learning.

- Designing Engaging curriculum [5]: The teachers thought process should be how to design a curriculum with following essential attributes:
  - more engaging for learners by incorporating more activities, more projects, more hands-on lessons etc. for learners
  - more appealing to current generation of learners
  - with proper objectives and outcomes defined at all levels
  - visually appealing to the learners and suits their learning style.

  The curriculum was designed with above attributes in mind.

- Use of Technology and ICT tools: The current generation of learners (Generation Z) are used to electronic gadgets and gizmos, so it is important that learning is also assisted by ICT tools which are very natural to them. For them the technology has always been a fully integrated experience into every part of their lives. The authors used several tools and integrated them in the courses for theory and lab classes.

- Designing and using Rubrics effectively: Evaluation is essential process of teaching learning process. The evaluation process has to be fair and transparent. Rubrics [6] play a very important role in making evaluation fair and transparent. The teachers should not only design proper rubrics for evaluation but also explain them to learners and what is expected from them during evaluation. The authors designed rubrics for each of assessment method and the rubrics were discussed all the learners well in advance.

These strategies were used by authors in their undergraduate level courses with the class strength of around 140, post graduate level with class strength of 18 and Ph.D level with class strength of 10 learners. All the learners were from computer engineering discipline.

3. Results and Discussion

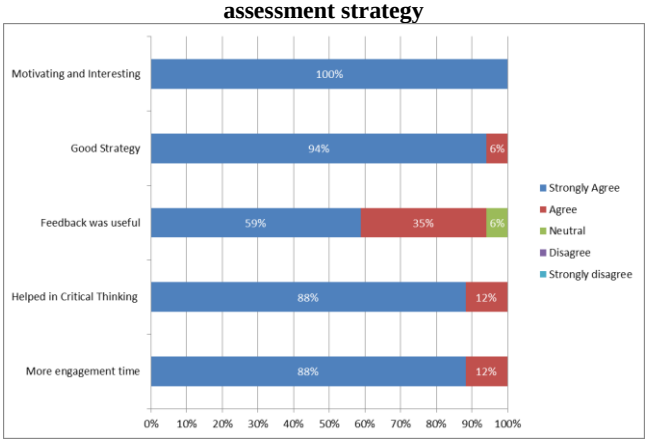
The authors conducted a survey of all involved learners to test effectiveness of various strategies. This survey was conducted in the form of interviews and through survey form. The leaners were from undergraduate, post graduate level and Ph.D level courses. Almost all learners participated in the survey. There can be many parameters for evaluation of this strategy. The authors have chosen commonly used metrics like effectiveness, efficiency, attractiveness and accessibility for evaluating efficacy. As can be seen from interviews of learners regarding use of active learning strategies (refer Table-I) it suggests that the learners were motivated to use the strategy, it gave them more time to engage with their research topic, the feedback from their peers was useful, it was challenging and gave them enough opportunity to think critically (in case of peer assessment), it was good strategy to be adopted for higher education and it was motivating and interesting to work upon. The challenges faced during implementation of these strategies were to keep the students motivated throughout the course. The students at undergraduate level were very receptive and participated actively for peer evaluation and use of tools. The students at post graduate and Ph.D level participated actively in project based learning strategy.

Table 1. Findings from interviews of learners regarding use of Active learning strategies

Evaluation criteria	Comments by learners
It was challenging and gave enough opportunity to think critically	"This Strategy is very good and useful. Gives better opportunity" "The curation strategy was interesting and challenging."
It gave more time to engage with research work	"More time to engage"
It is good strategy to be adopted for higher education	"It is a very good and innovative strategy."

The table below (refer Table-2) shows the results of feedback from learners using survey questions regarding use of peer assessment tool. It can be concluded that almost all learners found it motivating and interesting to use. The feedback received from peers was useful to learners. It gave them more time to engage with the content.

Table 2. Results from survey questions regarding use of peer assessment strategy

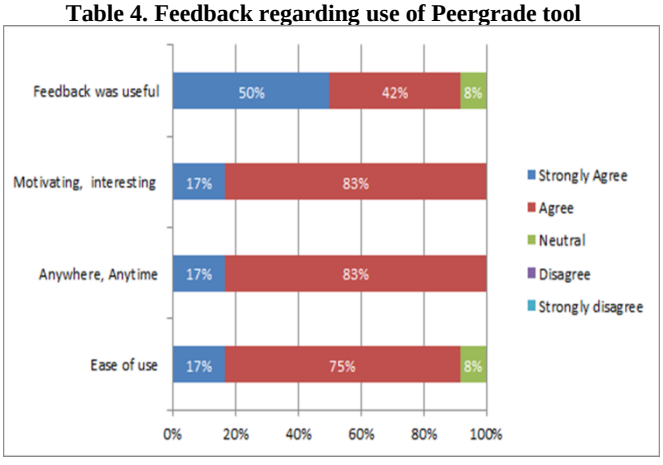


The below feedback interviews of learners regarding use of ICT tools (refer Table-3) gives an indication that learners got useful feedback from their peers; the tools were available to them anywhere and anytime. The tools were easy to use, interesting and motivating for their work. The table (Table-4) below shows the responses of learners regarding use of Peergrade tool [7].

Table 3. Results from interviews regarding use of ICT tools

Evaluation criteria	Comments by learners
Feedback was useful	"great for anonymous yet useful feedbacks." "got feedback from our peers about how we could have improved our assignment"
Motivating, interesting	"Very good and useful tool" "Good tool and should be used more"
Anywhere, Anytime	"Available on my all devices"
Ease of use	"This feedback tool is very easy to use with simple features. It is time efficient way of peer assessment"

Table 4. Feedback regarding use of Peergrade tool



4. Conclusion

In this paper the authors have documented use of various strategies for increasing student engagement in theory and laboratory classes. The mentioned strategies have been tried to increase student engagement in their classes and laboratories. With increase in learners active participation the learning is bound to be more effective. The authors have used various methods of feedback like surveys, interviews and questionnaires to gauge the effectiveness of learning. The results of student assessments have also been used to check whether learning outcomes have been better achieved due to use of these strategies by teachers. The results of surveys and measurement of learning outcomes indicate that with better learners' engagement the learning is more effective. This implies that better learners' engagement leads to more effective learning.

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