Practice Based Pedagogy and lesson Management to improve Teaching and learning in higher education engineering classroom

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Abstract

The action research project is carried out on the specific area of interest that focuses on the traditional teaching pedagogy that is mostly the teacher centric teaching and lesson management within the engineering classroom environment at higher education institution. In this action research secondary research data by Vellore Institute of Technology and the school of mechanical engineering that are collected through surveys and questioners among the teachers and learners are considered and analysed. These data are used under the knowledge of Professor and Dean Academic Dr. M. Anthony Xavior who is also a mentor for my teaching placement at the Vellore Institute of Technology, India.

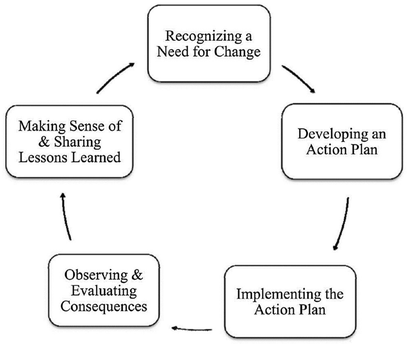
Methodology

(A) Student Score percentage at the Final Assessment Test (FAT) and (B) Students rating for the course undertaken with respect to the pedagogy used to deliver the subject concept.

Student Data for Theory composite manufacturing and technology (Sample Size n=37) 16 bachelors and 21 master students registered in the course

(A) Category of students		student scored %						
		<35%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%
Theory Assessment	Bachelor's students (Level 5)	3	1	6	4	1	1	-
	Master Students (Level7)	-	3	7	6	2	2	1
Practical Assessment	Bachelor's students (Level 5)	-	-	3	7	4	2	-
	Master Students (Level7)	-	-	2	8	6	4	1

(B) Category of students		Student Rating for the course validated against the understandability of the concept delivered with respect to pedagogy used					
		No participation	1	2	3	4	5
Theory Assessment	Bachelor's students (Level 5)	-	6	8	2	-	-
	Master Students (Level7)	-	4	11	3	3	-
Practical Assessment	Bachelor's students (Level 5)	-	-	2	3	5	6
	Master Students (Level7)	-	-	1	3	7	10



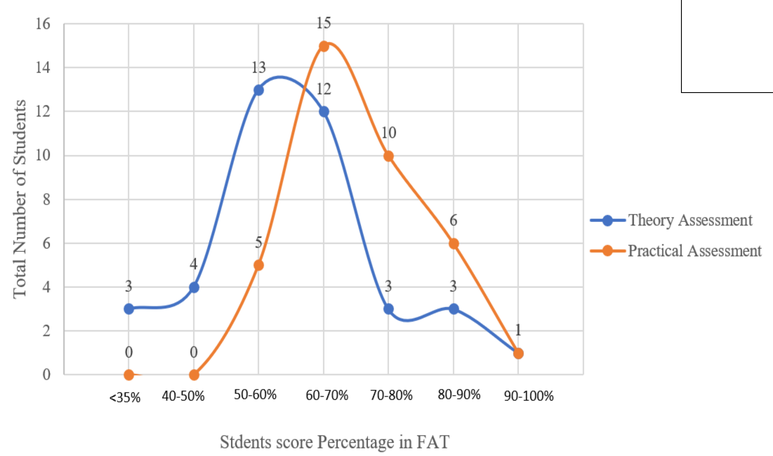
proposed action research cycle used **(Curtis, 2017)**

Research Question

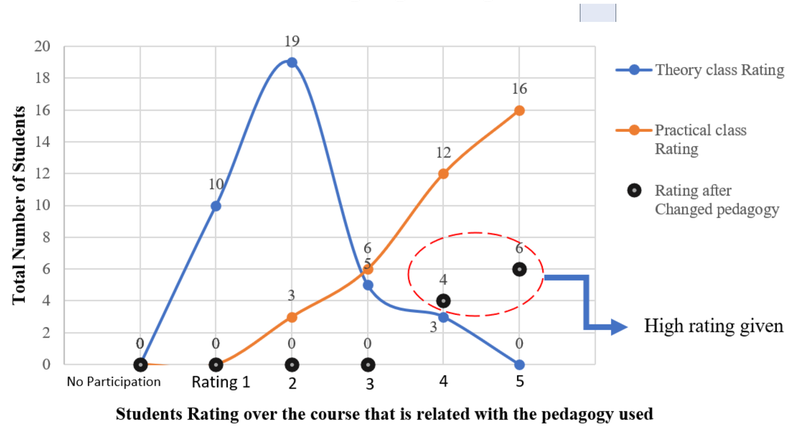
Research Questions:

1. Which aspect of the teaching pedagogy and the class lesson management affects the learner's from understanding the complex engineering concepts?
2. What are the aspects that the practitioners need to consider in achieving this full potential of learner outcomes after the lesson delivery when it is specifically focused on complex engineering concepts?
3. Will changing the teaching pedagogy to a practice-based pedagogy improve the level of understanding of the complex concepts delivered and achieve effective learning outcomes in an engineering classroom?

influence of the type pedagogical practice on the participants final FAT performance

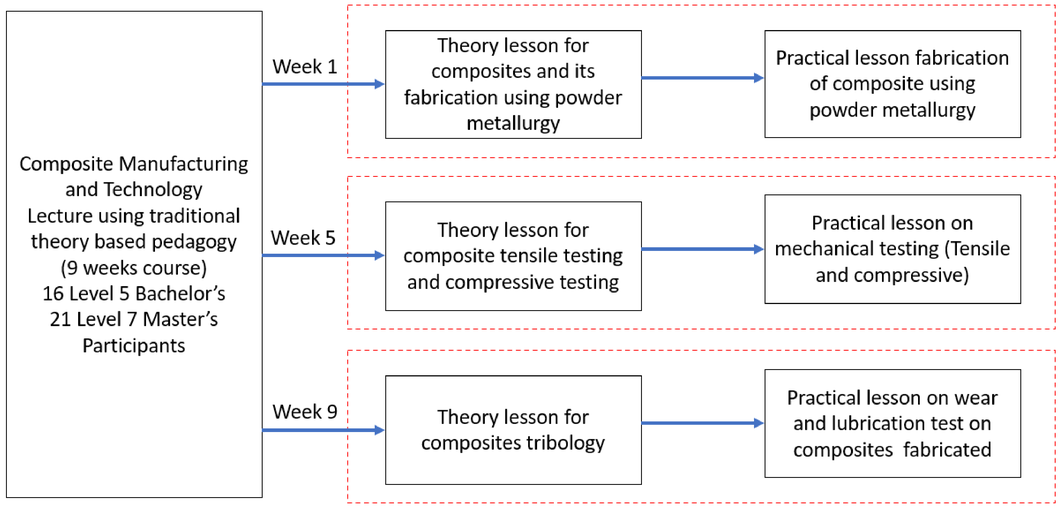


Inventive practice-based pedagogy and changed class structure proposed to Dr. Anthony at department of manufacturing engineering



Results and Discussion

Traditional theory-based pedagogy and class structure used by Dr. Anthony at department of manufacturing engineering



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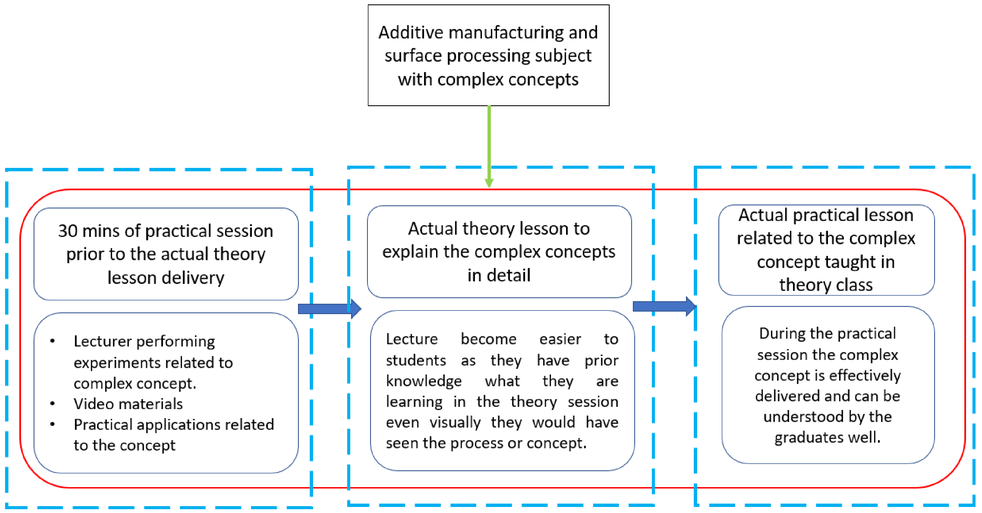

Conclusion

1. Teaching practice with theoretical pedagogy as the main style to deliver engineering complex subjects had adverse effect on the learner's performance both in their theory and practical assessments. As measuring the level of understanding is difficult in the theory based pedagogical practice.
2. Change in lecture delivery and class management by using practice-based pedagogy at the start of the class before every theory lesson facilitated the learner engagement and improved the level of understandability which was observed by Dr. Anthony where students were proactive in asking questions related to the complex concept delivered which is a clear engagement behaviour observed among the engineering students studying the course.
3. Student feedback also prove the necessity of changing pedagogy from theory based traditional technique to practice based pedagogy with necessary change in class structure.

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