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Enhancement of Learning Outcomes through Implementation of best practices in Teaching Learning Process: A case study

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Abstract: Learning outcomes of students are very important for the success of every class. Student's mind at entry level to first year Engineering course is a mixture of so many thoughts; as students come from various social and psychological backgrounds. In the present study we have made an attempt to eliminate the psycho-logical barriers of the mind of the student with parental affection and friendly behaviour from the teacher side and simultaneously implementing some of the best teaching learning practices. With the implementation of above said ideas, we have observed that the class average marks of students have increased from the first (test-1) to third (test-3) assessment by about 24%. Also, about 75% of the students acquired grades A and B indicating a reasonably good performance at the semester end exams. A detailed case study of this episode is the subject matter of this paper.

Keywords: Best practices, learning outcomes

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1. Introduction

The students entering the first year engineering course are from various backgrounds. About 20% of them will not be very conversant in English language. Some will have difficulty in adjusting to new environment. Few students will also be under parental and peer pressure to outperform. Many of these issues may result in psychological barriers among the students leading to their under-performance in the first year. There is a possibility of this under-performance percolating into the subsequent years affecting the overall performance of the student. We have introduced few measures as best practices to overcome the under-performance and also to attain the course outcomes at the first year level.

In general, such best practices have been suggested to bring in differences in students and teacher's learning and also address the changing education policies [https://www.nwea.org/blog/2013/five-best-practices-improving-teacher-student-learning-post-one/: Dr. Anne Udall/Dec02&Dec09,2013]. We present here the best practices which we implemented in a class to improve the performance of students. We also discuss their role in the attainment of course objectives.

2. Methodology

We have chosen Engineering Physics course and a class of sixty students as a sample to implement the best practices. The students in the chosen class

belonged to different branches of engineering and were from various backgrounds (e.g. urban, rural etc.). Further, their performance levels at pre-university examinations were also heterogeneous. We adopted following best practices for this study.

a) Content delivery in the class using outcomes based education tools

Here we start each unit with a fixed objective by adopting the method called as known to unknown; that is building the concepts with the help of prior knowledge which exist in the student. By this practice the students feel confident about the concept and may pay more attention. At the end of the unit or chapter, students will be encouraged to explain the learning outcomes from the covered portion of the syllabus.

b) Daily assignment questions on the topics covered

One more method of cross checking the learning outcomes is by writing. If the students write down the concepts taught in the class regularly then the level of knowledge and confidence about the concepts delivered in the class will be improved. This can be practiced by giving one question each day to answer at the end of the class as an assignment.

c) Group presentations in the form of seminars

Platform presentation is one more way to unfold the learning outcomes of the students. In this practice, students will be divided into groups of 4 or 5 and each group starts discussing about the topics and the way of presentation in the class. By organizing this kind of group activities, there will be improvement in learning outcomes and the confidence level of the students.

d) Answering to all the questions at the end of every internal tests

In this method students will be encouraged to answer all the questions of the internal tests irrespective of choices with the help of books or notes. While answering, students will come to know the mistakes they might have committed and hence improves their performance during future tests or exams.

e) Establishment of virtual class room and doubt solving sessions through Google groups.

Google group was created with students email. With this group mail, students can interact with faculty even after the class (offline discussion). Hence, this doubt solving session can be called as virtual class rooms where in student who may be hesitating to ask doubts can interact with faculty and clarify their doubts effectively.

Table1: Continuous Internal Evaluation results analysis

Test number	Class Average (Max marks : 10)
Test – 1	5.94
Test – 2	6.10
Test – 3	8.29

Table 2 shows the grades earned by students in the Engineering Physics course at SEE. Total 75% of the students have obtained grades A and B indicating a reasonably good performance at SEE.

Further, the analysis presented in the Table 3 and Figure 1 show that all the course outcomes are attained and implementation of best practices have enhanced students learning outcomes.

Table2: Semester End Exam results analysis

Level	Grade	Grade Points	Marks in percentage	No. of students in the present case study	Percentage
Outstanding	S	10	≥ 90	2	3.50%
Excellent	A	9	≥ 75 &<90	19	33.33%
Very Good	B	8	≥ 60 &<75	24	42.10%
Good	C	7	≥ 50 &<60	7	12.28%
Average	D	5	≥ 45 &<50	0	0%
Poor	E	4	≥ 40 &<45	1	1.75%
Fail	F	0	< 40	4	7.01%

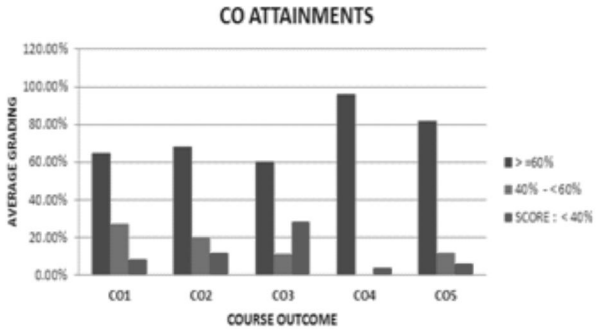

Table3: Attainment of Course Outcomes in Percentages

Course Outcomes	Grading AVG on Scale of 3	Distribution %		
		3	2	1
CO1	2.56	64.58%	27.08%	8.33%

CO2	2.56	68.00%	20.00%	12.00%
CO3	2.31	60.00%	11.43%	28.57%
CO4	2.76	96.30%	0.00%	3.70%
CO5	2.93	82.00%	12.00%	6.00%

3. Conclusions

An implementation of few best practices in a heterogeneous class of first year engineering has shown positive effect on the performance of students. A microscopic analysis choosing a small population and individually assessing the performances will help in the proper choice of the best practices.

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References

[1] https://www.nwea.org/blog/2013/five-best-practices-improving-teacher-student-learning-post-one/:Dr.Anne Udall/Dec02, 2013.

[2] https://www.nwea.org/blog/2013/five-best-practices-improving-teacher-student-learning-post-two/Dr.Anne Udall/Dec02, 2013.

[3] Renuka, T, Chitra, C, Pranesha, T. S. (Jan 2016) Evolving Philosophy of OBE in Engineering Physics Course -A case study, 29(3), 14-19.

[4] http://www.k12.wa.us/SSEO/pubdocs/MathMenuBestPracticesStrategies2015.pdf

[5] Academic Rules and Regulations (August 2017) booklet prepared by BMS College of Engineering, Bengaluru.