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Implementation of Research Papers and Industry Related Experiments by Undergraduate Students in the Field of Automation

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Abstract : Motivating a heterogeneous group of students towards engagement in research related activities is a challenging task in engineering education. An effort is being made at the Department of Electronics and Instrumentation Engineering, where two courses are taken up on a pilot basis to kindle research interests in students at the undergraduate level. The courses, namely algorithm and system design (ASD) and automation in process control (APC), are selected for experimentation purposes. The task is being accomplished by providing scope for implementation of research papers and proposing solutions for the current industrial problems by the student teams. The course instructors have proposed an alternative assessment tool to evaluate the undergraduate students that involve activities beyond the curriculum. The method was tested for the aforementioned two courses in a particular academic year, and as per the observations, there is a considerable improvement in the number of student engagement towards research in the subsequent years of their undergraduate course. The student groups from the third-year engineering were made to read, implement the research papers, and they were also instructed to develop simulation modules for certain processes aiming towards automation. The target audience being students, were common for both the courses and the students' strength was 30. Around 50% of successful students were given the continued tasks in the subsequent two semesters, and out of 15 students who continued from sixth semesters were able to follow the research methodology well in the seventh and eighth semesters. Further, around 30% of the students out of 15 ended up carrying out project work with a research component involved and were successful in producing four conference papers. The methodology adopted is justified using a sample data set, and the outcomes are highlighted. The quantitative and qualitative results obtained through this study prove that such practices will enhance learning experiences substantially at the undergraduate level.

Keywords : industrial problems, learning experiences, research related activities, student engagement
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