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Paper

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Effect of Guided External Search on Product Design Performance: A Pilot Study

An integrated project team (IPT) is a multidisciplinary, relatively autonomous, project oriented work team. IPTs are used in industry, not only to increase productivity in solving problems but also to form and sustain strategic capabilities through employee learning. To prepare students for similar problem solving responsibilities, and to foster engineering principles learning, a comparable approach to IPTs is used during the Introduction to Engineering Design and Graphics (ED&G 100) course at the Pennsylvania State University.

In general, four-student project teams work on two design projects over a 16-week semester. Design projects focus on product improvement or solution designs. To date, several variables affecting the performance of design teams have been studied, such as team composition, female/male ratio in the organization, and teamwork skills training, to improve the performance of product designs. This study furthers this effort by investigating the effect of guided external research during the concept generation phase of the development process.

The paper first proposes a systematic approach for inclusion of external research, and then it reveals the results of the pilot study conducted at the Pennsylvania State University in selected ED&G 100 course sections. Design team performance is measured using: 1) peer evaluations of the design demonstration (25%), and 2) a blind evaluation of the team's design report (75%). Criteria for project performance include thoroughness of the project report, timeliness of the project report submission, compliance to project requirements, and utilization of engineering problem solving skills.