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A Technical Writing Program Implemented in a first year Engineering Design Course at Ku Leuven

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A typical engineer can spend up to half of his work-day on writing [1]. Mastering these technical writing skills is important, but difficult for first year engineering students. Leaving secondary school, freshmen are not familiar with common technical writing style or best practices. They tend to write their reports by using a journal-type style. Often they do not proof read their manuscripts and forget about feedback on previous reports. Therefore the Engineering Faculty implemented an intensive technical writing program within the first year design course. This paper describes a study that was performed to evaluate this program.

In the first year engineering program, which is common for all engineering disciplines, a technical writing program is implemented within the project-based design course 'Problem Solving and Engineering Design' [2]. By embedding the program within a design course, the writing assignments are meaningful for the students and the contents of the reports matter as well as the writing style [3]. A mixture of teaching and assessment methods was developed to gradually improve students' technical writing skills. Subsequent assignments force the students to reflect upon the basic writing principles and to learn from their previous mistakes. The program consists of consecutive cycles of instruction with clear guidelines about writing style, learning by doing and reflection on received feedback. Furthermore, an interactive lecture using clicking devices is implemented, together with a peer review assignment. Literature shows that peer review can be very effective to improve student writing. The staff involved in the evaluation and feedback process, uses a checklist that summarises the desired writing abilities. This ensures they use the same evaluation norms and it makes the grading easier. Table 1 gives an overview of the assignments, indicating the number of students that work together and details about the instructions and evaluation process.

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	Assignment	Timing	Number of students working together	Instructions	Graded	Feedback	Focus of feedback
Introduction	Literature (2 pages)	Beginning of semester 1	2	Written	Yes	Written by didactic team	Writing style
Semester 1 Team project	Project report (6 pages)	End of team project, halfway semester 1	8	Written	Yes	Written by didactic team	Writing style and content
	Revised project report (6 pages)	End of semester 1	8	Oral	Yes	No feedback	No
Semester 2 Team design project	Concept report design project (3 pages)	Beginning of semester 2	8	Interactive lecture and written instructions	No	Written peer review by 8 individual students	Writing style
	Intermediate design report (12 pages)	Halfway semester 2	8	Written	Yes	Written by didactic team	Writing style and content
	Final design report (12 pages)	End of semester 2	8	Written	Yes	Oral after final design presentation	Writing style and content

Table 1. Overview of subsequent assignments within the first year engineering program to ensure that all students learn to write technical reports.

To study the efficacy of the implemented writing program, survey data was gathered. At the end of the first year (from 2003 until 2011), all students enrolled in the design course (about 400 each year), filled out an extensive questionnaire consisting of Likert-type closed statements and open-ended questions. The writing program was then evaluated by item analysis of the statements, examination of the open-ended questions and interviews with the staff involved.

Overall, the didactic staff involved, as well as the students, is enthusiastic about the approach. Because of the large number of students enrolled in the course (about 400 each academic year), the staff really appreciates the use of the checklist with desired writing abilities. The students most appreciated the peer review process. Furthermore they agree that the clicking devices, made them think actively about their writing skills during the lecture.

In future, the study will be completed by adding detailed information about the evolution of the students' grades. Furthermore the students themselves will be encouraged to keep track of the evolution of their technical writing skills by summarising received feedback in their portfolio. ■

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