

COLLABORATIVE CURRICULUM DESIGN FOSTERS GRADUATES' COMMUNICATION SKILLS

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Introduction

Concurrent engineering is a relatively new approach to project management [1], and as opposed to a sequential process, uses overlapping design stages with fewer 'gates', and cross-functional teams to shorten the development time of a project [2,3,4]. The major advantage is that a number of critical issues concerned with product development can be looked at and dealt with simultaneously at the early stages of the design development [5]; so that any immediate and future requirements can be taken into account [6,7]. It is argued that concurrent engineering fosters collaboration, communication and mutual appreciation and understanding between various team members from different disciplines; as it breaks down the boundaries between various disciplines by utilising cross-functional teams, consisting of key personnel from various functions [2,7,8,9,10]. Effective communication is essential for successful implementation of concurrent engineering [7,11], as it fosters integration between departments, and this will in turn lead to successful new product development [12]. The collaborative project described below in many ways parallels and reinforces the principles of concurrent engineering.

Communicative competence

Curriculum development in the higher education of industrial designers and engineers needs to take into account the changes in contemporary manufacturing organisations and provide students with skills sets for operating effectively in these settings. As such, the possession of effective communication skills are a fundamental expectation of a university graduate, yet students who study in the engineering and industrial design fields often concentrate on mastery of content at the expense of these vital skills. Being a competent professional requires advanced and critical writing, reading, listening and oral skills, however studies have shown that students from across all disciplines can graduate without the desired level of confidence or skills in communicating effectively [13]. This paper provides an example of a collaborative teaching model that has successfully integrated assessment tasks which scaffold and develop these skills into course content.

Cross-functional teamwork

Over the past few years at the University of Western Sydney (UWS), Industrial Design (ID) staff in conjunction with academic staff from the Learning Skills Unit (LSU), have incorporated academic literacy skills into the Industrial Design curriculum. This initially took the form of lectures and adjunct tutorials conducted by LSU academic staff. However

Industrial Design staff recognised the limitations of a bandaid approach and identified the need to develop a comprehensive academic experience for their students. To this end, Industrial Design academics carried out an involved process of mapping and prioritising the graduate attributes and skills that students need across their university career and identified the most appropriate subjects in which to locate these skills. This was achieved by allocating a number of dedicated days throughout the year to enable academics to meet, and with the facilitation of an Education Development Centre academic, participation of LSU, library and external staff, to methodically explore both the academic skills required for the successful outcome of each subject and the skills required for completion of the major final year project. The process of mapping skills, which was very time consuming and challenging, ensured a proactive approach that addressed long term outcomes and recognised the benefits of embedding academic skills within the curriculum. As such, one of the more immediate outcomes of the mapping process was the successful collaborative project between the ID staff and LSU staff which resulted in a comprehensive resource book being developed for first year students in the Industrial Design, Design Technology and Industrial Design Engineering programs. The project was funded as an equity grant and aimed at enhancing the critical literacy skills of first year students.

Perhaps one of the more significant aspects of this collaboration is the locating of academic skills within the discipline rather than being taught as generic skills which the students then need to transfer to their specific context. This was based on a recognition that each discipline has its particular ‘communicative competencies’ which can be described as an awareness that “ what constitutes a discipline and its ways of thinking and knowing are actually embedded in that discipline’s writing processes, its norms and conventions” [14]. Through immersion in the content of the subject, and regular discussion with ID academics, LSU staff were able to produce a resource that reinforced and modelled the communicative competence of the discipline. It has been suggested that the difficulties students encounter can often be due to differences between what academics expect and how students interpret the expectations [14]. The collaborative approach enabled the melding of the knowledge of the discipline with the fresh insight and expertise of the LSU staff, which was a means of addressing the gap between staff expectations and students’ interpretations. As is exemplified by the concurrent engineering approach, cross functional teamwork fosters a dynamic and effective process which allows for development of a more comprehensive and appropriate product.

Students are often both aware of and confused by the lack of explicit explanation from academics on both the purpose and the requirements of their assessment tasks [15]. Being able to address this issue requires the academic to have reflected on why they are setting a particular task and what they expect students to gain from completing it. Therefore the pedagogical implications of inviting LSU staff to participate in the process of subject and assessment design were substantial for both groups. Discussions ranged from the purposes of setting specific tasks to the expectations of chosen genres such as the annotated bibliography, and the less ‘regulated’ seminar paper and the need to generate marking criteria for each task. In addition, in the process of understanding the ‘worldview’ of Industrial Design, LSU staff were challenged to broaden their familiar ‘academic literacy’ discourse and to adapt to the more visual and sometimes abstract terminology and genres of Industrial Design. Consequently, the cross fertilisation of ideas and mutual understanding for each others fields that occurred also enhanced the quality outcome of the final product.

Embedded academic skills

A core 1st year unit was chosen for the collaborative project. Concern about the ‘problematic nature’ of the first year experience at university is well documented [16,17,18,19]. It is recognised that the initial academic assignments are an opportunity for integration of students into their learning community especially where there are supportive interactions between academics and students [20]. In consideration of these factors the resource book was designed to scaffold the students’ first major written assessment tasks and in so doing provide an introduction to the major communication skills. The assessment tasks were a series of annotated bibliographies and a subsequent seminar presentation and seminar paper which were all based on research into a significant designer. In order to provide contextual and authentic models, LSU staff researched a designer and in consultation with Industrial Design staff created models of both assessment tasks. These were then annotated with structural and analytical comments. The resource book also included additional literacy support modules such as analysing a task, reading and note making, academic writing style, paraphrasing and referencing, oral presentations and maintaining a visual diary. LSU staff met with the subject tutors to discuss how the resource book could be effectively integrated as a teaching tool. They also ran the subject tutorials in a specific week to facilitate development of the academic skills required for first assessment task.

A practising professional needs to be competent in not only written skills but also in the presentation of their information in visual and oral modes. A report into the competencies required by employers found that oral communication skills were considered vital attributes of graduates and are considered to be the single biggest factor in determining a student’s career success or failure [21]. The students’ assessment tasks reflected the multiplicity of skills they are required to attain and students had to present the findings of their research as a structured oral presentation. Expectations of these presentations were made explicit through provision of detailed marking criteria as well as a comprehensive module in the resource on oral presentations specifically tailored to the task. As LSU staff had previously been invited to a number of different forums where students had presented they were able to apply to the resource book the insights they had gained from observing these presentations.

Evaluation

The importance of the relationship building aspect of this project cannot be underestimated. The mutual trust that had been slowly established through prior interactions between the Learning Skills Unit and the School of Industrial Design provided a firm foundation for this collaborative project. Although not all the staff involved in the collaborative staff knew each other previously, there was a shared history between the disciplines which enabled the project to be initiated with a sense of assurance rather than caution. This was furthered by the collegial respect that had been formed during the mapping process. Despite the difficulties of working on campuses located several kilometres apart, the project team members met in person on a regular basis, especially in the early stages of the project. Although this was more time consuming than telephone or email contact, the sense of being a team was engendered. Once a common understanding was established, and team members allocated roles and tasks, the basis for a positive working relationship was established. Potential issues were identified early and the cross discipline approach meant that there were more creative solutions generated to address them.

A comprehensive evaluation of the project has provided both positive feedback and the impetus to continue collaborative work to see academic literacy embedded across all core programs. The academic responsible for the targeted subject was very impressed with the outcomes of students' work and commented that the criteria for the assessment tasks were generally met. These criteria included both analytical and structural components. She also commented that the learning objectives of the unit seem to have been understood and met. The tutors found the resource book invaluable as it enhanced their appreciation of academic discourse and provided teaching materials where they needed to make this discourse explicit.

Overall students reported positively that they had been well supported by the resource book in its usefulness both for the targeted subject and in other aspects of their course. Over 80% of students found the resource book aided them both in terms of confidence and preparedness for their assessments tasks. Many found that the book was transferable across other subjects as 70% of students used it to assist them with other assignments and over 80% anticipate that it will be useful for further study. The modules that focussed on analysing the task, writing an annotated bibliography, avoiding plagiarism and paraphrasing, referencing and writing a seminar paper were ranked as the most useful. Students comments included; 'it was very useful in this subject and in others – will use it in the future', 'without it I would not have known where to start', 'it was like a mobile teacher, answered all my questions'. Most of the suggestions for improvement focussed on the need for a clearer format and requests for more examples.

Conclusion

The success of this collaborative project has led to a second edition of the resource book being developed and integrated into a new core first year subject for both Industrial Design and Engineering students. Once again this was developed in close consultation with the involved faculty academics and immersion in the subject by LSU staff. This edition is more deeply embedded into the curriculum as the unit coordinators have woven it into their tutorial resource book and identified the purpose of the different literacy modules in the students learning processes. Student requests for a clearer format have been acknowledged and the book follows closely the tutorial topics and necessary skill development. It can be seen that there are substantial benefits in transferring an approach that is identified as successful in the professional arena into the teaching /learning paradigm. The principles of collaboration, communication and mutual appreciation and understanding that characterise concurrent engineering are very much the principles that underpinned the successful production of the resource book and the continued collaboration between LSU and Industrial Design and Engineering staff.

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