EXPLORING OPPORTUNITIES FOR INTERPROFESSIONAL EDUCATION IN A SOFTWARE ENGINEERING COURSE THROUGH A COLLABORATION WITH A NURSING COURSE

FACULTY POSTER ABSTRACT

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One important challenge in software engineering (SE) education is providing opportunities for SE students to experience interprofessional collaboration typical for many SE workplaces. Software engineers often build and maintain software systems (e.g., electronic health records) for experts from other domains (e.g., medical professionals) and thus need to learn how to work with such experts and to obtain knowledge in the domain of these experts. To address this challenge, we established a collaboration between an SE course and a nursing course. The value of such a collaboration is further supported by the rapidly increasing number of computing jobs in healthcare [1] and by recent reports (e.g., [2]) emphasizing the importance of affording interprofessional education opportunities to students in the medical professions.

The collaboration we established is between a junior-level SE technical elective course, Software Engineering in Healthcare, and a junior-level nursing required course, Holistic Integrated Laboratory. SE students worked in teams of two or three to build a clinical decision support (CDS) software system to assist nurses during insulin administration. Nursing students and professors served as the domain expert consultants. The project spanned ten weeks and included four phases. In the first phase, the SE students were given a high-level guideline for insulin administration and constraints for the CDS system they had to build. The guideline included eight main activities involved in insulin administration but with no detail of subactivities or what activities need to be performed when exceptional situations arise. The constraints included some high-level requirements, such as the CDS system must have a graphical user interface, the CDS system must include the steps specified in the high-level insulin administration guideline, and the CDS system must support at least three exceptional situations. The SE students were asked to reflect on the project assignment and the insulin administration guideline and think of areas of question.

The second phase consisted of the SE students visiting two nursing classes to learn about the theory and the practice of insulin administration, to get their questions answered by nursing professors and students, and to collect additional requirements for the CDS system to be built. The first class the SE students visited was a two-hour lecture on medication administration. The second class they visited was a hands-on lab in which the SE students practiced insulin administration together with nursing students.

In the third phase of the project, each team of SE students built an initial prototype of a CDS system for insulin administration based on the requirements and domain knowledge obtained during the previous two phases. Each team was allowed to choose the technology in
which to implement the CDS system. During that phase, one lesson of the SE course was dedicated as a working day for the SE students to make progress on the prototype and to bounce ideas off and obtain feedback from the SE professor. At the end of this phase, each team of SE students gave an informal demonstration of their prototype to nursing students and professors.

Based on the obtained feedback, the SE students improved their prototypes during the fourth and last phase of the project. At the end of this phase, the SE students gave a formal presentation and demonstrated the final CDS system to the nursing students and professors.

Our evaluation of the collaboration focused on three aspects—student learning, student experience, and feasibility of the collaboration. To evaluate student learning, the faculty examined the quality of the produced CDS software systems and of the in-class demos and presentations of these systems. All student teams produced working systems that supported the key activities of insulin administration. Furthermore, these systems included a variety of features that nursing students and professors deemed useful, such as automatic documentation of the insulin administration process and visuals (e.g., body diagrams showing recommended injection sites). The final presentations of the SE students were professional and the SE students were prepared to answer questions from the audience. The SE students were also able to correctly use new SE and nursing concepts and terminology they learned during the course.

To evaluate student experience, we surveyed SE students after the completion of the CDS project. The survey contained questions related to the students’ perception of the CDS project, such as opportunities to exercise various SE skills, overall enjoyment and perceived usefulness of the project, workload, inter-professional collaboration, and suggestions for future improvements. The survey results are overwhelmingly positive indicating students had a positive and useful experience with the CDS project.

We deemed this course collaboration feasible in terms of time and effort invested by the professors. A nursing professor prepared the high-level insulin administration guideline used by the SE students, but preparing this guideline did not constitute a significant overhead as the main activities in the insulin administration process were already specified in a grading rubric used by the nursing professor. The SE professor reviewed the guideline to ensure appropriate scope for the CDS project and familiarized himself with the insulin administration procedure and terminology to be able to provide accurate feedback to SE students. The SE professor dedicated two lessons from the SE course to serve as working days to assist SE students with the project. The nursing professor dedicated about 30 minutes of three lessons to allows SE students to obtain feedback on initial prototypes and make final presentations/demos.

Based on the preliminary results, the collaboration appears to have been successful in terms of student learning and experience. We plan to carefully revise the collaboration based on student feedback and repeat it in the future. In particular, we are considering ways to incentivize SE and nursing students to spend additional time outside of class on the project as some students expressed such desire on the survey we administered.

REFERENCES
