

## **45th Biennial Convention (16-20 November 2019)**

### **Interprofessional Nursing Education for Technological Advancement in Cardiac Arrest Documentation**

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According to the Quality and Safety Education for Nurses (QSEN) Institute (2018), interprofessional collaboration and informatics are competencies all nurses should meet. As current work environments for nurses are increasingly multidisciplinary, nursing students may have the opportunity to collaborate with other disciplines, but little or no interaction with the development of healthcare informatics. The National Academy of Medicine, the former Institute of Medicine (2018), recommends opportunities to participate in collaborative and interprofessional activities and software engineering provides a unique opportunity to learn the role of informatics in patient care (Gray & Christov, 2017). Information technology is increasingly permeating healthcare—from electronic health records and computers on wheels to smart pumps, various devices that monitor the patient, and even smart phone apps for instant communication and paging. Education that includes some form of technological background is increasingly important to enable nurses to quickly and effectively learn how to operate in a technology-permeated working environment. A deeper understanding of technology and how it is developed could also empower nurses to participate in the building of the devices and the software that they use on a daily basis. This could in turn result in more positive patient outcomes and higher-quality software used in healthcare (Qin et al., 2017). This bridging of the gap between technology professionals who deliver technological solutions and nurses who know what is needed, may remove some of the barriers to utilizing electronic health records by nursing (Houston-Raasikh, 2014). To better prepare nursing students to use technology and interact with professionals from the tech field, we established a collaboration between a nursing course and a software engineering (SE) course. As part of the nursing curriculum, the nursing students learn about codes for cardiac arrests and how to perform them. Together with their instructors, the nursing students serve as clients for teams of SE students on a course project. The project is to develop an electronic flow sheet that facilitates the documentation of cardiac arrest codes. The project consists of four phases:

- \* In Phase I, nursing professors provide SE students with background on codes for cardiac arrests and their documentation. SE students elicit the requirements for the code documentation course project, prepare mock-ups to illustrate their ideas for a prototype, and obtain feedback from the nursing professors
- \* In Phase II, SE students develop a first working version of a software application for documenting codes and demonstrate it to nursing students and professors for feedback and suggestions for modifications

\* In Phase III, SE students refine their software applications based on the feedback from the previous phase. At the end of phase III, SE students present their final applications to a jury of nursing students and professors who choose the top two software applications

\* In Phase IV, the top 2 applications are used by nursing students during cardiac arrest simulations

To evaluate the collaboration between the nursing and the SE courses, we administered surveys to both the nursing and the SE students. These surveys contained questions on the specific skills students learned through the course project, the value of the project in terms of appreciating interprofessional collaboration, and overall experience with the project. In addition, we also asked the instructors of the nursing course to compare the code sheets produced by nursing students using the software applications and those produced by nursing students using a traditional paper form.

The evaluation results indicate that the collaboration between the nursing and the SE course has been effective in terms of supporting interprofessional education. Both nursing and SE students reported overwhelmingly positive experience with the interdisciplinary project in terms of practicing interprofessional skills as well as learning skills specific to their own disciplines. Nursing instructors reported that, overall, nursing students who used the software application to document cardiac arrest codes produced higher quality code sheets than nursing students who used the paper form. Higher quality code documentation using an electronic system is supported by previous research (Grig et al., 2013; Coffey et al., 2015). The collaboration was deemed feasible in terms of faculty and student workload. Lessons learned include the need to build in more education on documentation of codes with pertinent fields prior to completion/filing of a code as well as the need to add to the current debriefing documentation review prior to filing. Suggestions for improvement for the code app development include making pertinent fields required prior to filing and to add a medical spell check. We believe that the collaboration framework we established as well as the lessons we learned could be useful for developing similar course collaborations that support interprofessional education in other institutions. In the future, we would like to institutionalize the collaboration in the nursing and SE curricula and perform further evaluation.

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**Title:**

Interprofessional Nursing Education for Technological Advancement in Cardiac Arrest Documentation

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Cardiac Arrest Documentation, Interprofessional Nursing Education and Technology Adoption

**References:**

Coffee, C., Wurster, L., Groner, J., Hoffman, J., Henderson, V., Nuss, K., ... Covert, J. (2015). A comparison of paper documentation to electronic documentation for trauma

resuscitations at a level 1 pediatric trauma center. *Journal of Emergency Nursing*, 41(1), 52-56.

Gray, M. B., & Christov, S. C. (2017). An innovative approach to experiential education and interprofessional collaboration between nursing and software engineering. *Computers, Informatics, Nursing: CIN*, 35(4), 169-173. doi:10.1097/CIN.0000000000000352

Grig, E., Palmer, A., Grig, J., Openheimer, P., Wu, T., Roesler, A., ... Ross, B. (2013). Randomized trial comparing the recording ability of a novel, electronic emergency documentation system with the AHA paper cardiac arrest record. *Emergency Medicine Journal*. doi:10.1136/emmermed-2013-202512.

Houston-Raasikh, C. (2014). What the others haven't told you: Lessons learned to avoid disputes and risk in EHR implementation. *Nursing Economics*, 32(20), 101-103.

National Academy of Medicine. (2018). About the name. Retrieved 12/18/2018 from <https://nam.edu/about-the-name>.

Qin, Y., Zhou, R., Wu, Q., Huang, X., Chen, X., Wang, W., ... Yu, P. (2017). The effect of nursing participation in the design of a critical care information system: A case study in a Chinese hospital. *BMC Medical Information and Decision Making*, 17(1). doi:10.1186/s12911-017-0569-3.

Quality and Safety Education for Nurses Institute. (2018). Competencies. Retrieved 12/18/2018 from <http://qsen.org/competencies/pre-licensure-ksas/>

### **Abstract Summary:**

To better prepare nursing students to use technology and interact with professionals from technological fields, collaboration between a nursing course and a software engineering course enhanced learning through the trial of two electronic cardiac arrest flow sheets for code simulations during cardiac arrests.

### **Content Outline:**

1. Review of the need for interprofessional collaboration and the value of integrating technology education in nursing curriculum based on the literature.
2. Review of the project's four phases:
  - In Phase I, nursing professors provide SE students with background on codes for cardiac arrests and their documentation. SE students elicit the requirements for the code documentation course project, prepare mock-ups to illustrate their ideas for a prototype, and obtain feedback from the nursing professors
  - In Phase II, SE students develop a first working version of a software application for documenting codes and demonstrate it to nursing students and professors for feedback and suggestions for modifications
  - In Phase III, SE students refine their software applications based on the feedback from the previous phase. At the end of phase III, SE students present their final applications to a jury of nursing students and professors who choose the top 2 software applications
  - In Phase IV, the top 2 applications are used by nursing students during cardiac arrest simulations
3. Review of the survey findings for both the nursing and the SE students to evaluate the collaboration between the nursing and the SE courses. As well as the survey findings of the instructors of the course to compare the code sheets produced by nursing students

using the software applications and those produced by nursing students using a traditional paper form.

4. Demonstration of a brief code and the Cardiac Arrest Code software to demonstrate the ease and efficiency as well as the quality of the output/report.

First Primary Presenting Author

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**Author Summary:** Margaret is an Asst. Professor of Nursing with over 35 years of clinical experience, the last 15 of which were in nursing informatics for which she is Board certified. She co-authored the article, An Innovative Approach to Experiential Education and Interprofessional Collaboration Between Nursing and Software Engineering in 2017. She received a University Innovation Grant in 2017 for tracking NCLEX readiness and also co-authored poster presentations related to Simulation, Interprofessional practice and software development.

Second Secondary Presenting Author

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**Author Summary:** Dr. Stefan Christov is an Assistant Professor of Software Engineering at Quinnipiac University. His research focuses on techniques for improving the quality and safety of human-intensive processes, in particular medical processes. He is also interested in pedagogical techniques for stimulating student engagement and learning via collaboration between different courses in the curriculum. He teaches software engineering and computer science courses as well as interdisciplinary courses, such as Software Engineering in Healthcare.

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**Author Summary:** Dr. Barbara Glynn is an Associate Professor at Quinnipiac University who has been involved with IPE across multiple disciplines for the last 6 years. She has been involved with case studies, simulations, gaming, and electronic health record projects. Dr. Glynn has also been an author on an IPE case study and simulation.

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**Author Summary:** Dr. Eileen Hermann is the Director of Upper Division of Nursing, Clinical Assistant Professor at Quinnipiac University. Her expertise is cardiology. Dr. Hermann currently teaches in the advance Med/Surg lab that simulates mock codes. While working as a critical care nurse educator, Dr. Hermann was the co-chair of the Cardiac Alert Committee that was responsible to reviewed all hospital cardiac alerts documentation, analyzed the data and made recommendations for improved outcomes.