PREFACE: ONLINE ENGINEERING EDUCATION

With pleasure I present this special issue, "Online Engineering Education," for the *International Journal on Innovations in Online Education* (IJIOE). The contributions come from opposite sides of the world—the USA and Australia. Of the five papers in this issue, two papers by Gary, Long, and their colleagues describe whole, accredited undergraduate programs offered online. They include both innovations in pedagogy as well as the performance of the programs in terms of enrollments, student progression, and satisfaction. Both papers demonstrate that complete undergraduate engineering programs can be offered online, can be viable in the long term, and are worth the effort. They also present numerous ideas and lessons that new online educators might adopt in designing courses and programs.

The remaining three papers deal with specific issues in online education as applied to teaching engineers. Authors Hoyt, Theodore, and Alford demonstrate how the use of education tools helped one course be developed for online delivery. The instructor employed a number of educational tools to assist with its delivery, including a learning-management system, web conferencing, video lessons, and an e-book. One of the lessons learned from this work is the need to build an online community among students and instructors, and this task is just as important as in the case of face-to-face teaching, perhaps more so.

Ghabraie presents his work on using computers to assess student learning in an online engineering course. While software makes the task of assessment a bit easier and most certainly faster for the instructor, to also be educationally effective, it needs to be designed carefully. It may no longer be good enough to check a student's final answer and mark it right or wrong. A multistep problem can be computer assessed in steps, if one designs the questions in similar steps. It is also helpful to the student if multiple attempts are allowed on a given question. Computer-marked assessments can be designed to offer some limited but immediate feedback to the student. The paper recommends that the instructor also make more detailed, personal feedback available if the student requests it.

Finally, authors Slavina, Karabulut-Ilgu, and Jahren present work on how students interact with educational videos in a civil engineering course. In a laboratory setting, the authors tracked and measured students' eye movements in an attempt to see how students interact with online modules, how much of each module attracts their focus, and what aspects of the modules they found most helpful for their learning. The study did not find any significant relationship between how the students interacted with the online course material and their resulting academic performance on the assessment. The students

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appeared to use different strategies to learn from the videos and apply that knowledge to the assessment tasks.

I would like to thank all the contributors to this special issue. I also believe that the lessons learned from these papers will be helpful to those teaching online courses in any field. Secondly, I offer my sincere gratitude to the reviewers who gave of their time to read each manuscript and offer numerous suggestions to the authors. Finally, many thanks go to the chief editors of IJIOE and Begell House Publishers for the opportunity to put together this special issue about teaching engineering online.

Guest Editor:

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