Assessment, benchmarking, impact and evaluation in engineering education

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To cite this article: Senay Purzer & Villas-Boas Valquiria (2019) Assessment, benchmarking, impact and evaluation in engineering education, Australasian Journal of Engineering Education, 24:1, 3-3, DOI: 10.1080/22054952.2019.1622271

To link to this article: https://doi.org/10.1080/22054952.2019.1622271

Published online: 31 May 2019.
This special issue is the second of two issues that feature outstanding papers presented at the Research in Engineering Education Symposium (REES), held in Bogotá, Colombia between July 6 and July 8 in 2017. This second issue, with three articles, expands the previous one published in January 2018 on the theme, Assessment, Benchmarking, Impact and Evaluation. The papers in the first volume investigated new approaches to assessment with valuable insights informing future research (Male, Purzer, and Villas-Boas 2018). This volume, with authors from South Africa, Ecuador, and Australia, complements the previous volume’s reach of authorship from Colombia, Germany and the United States. Hence, together, these two issues assemble contemporary research across continents.

In ‘Evaluation of Algorithms to Predict Graduation Rate in Higher Education Institutions by Applying Educational Data Mining’, Oswaldo Moscoso-Zea, Pablo Saa, Sergio Luján-Mora, from Ecuador, study educational data mining methods. In their analysis, the authors review educational data mining methods and algorithms to determine which can be used in predicting students’ graduation factors. With their findings, they discover patterns associated with graduation rate indicators and highlight trade-offs associated with random trees, with good precision but limitations due to the difficulty of interpretation. The authors recommend J48 algorithm for easy visualization of the classification of data and acceptable performance. The authors argue that data mining methods can play a critical role in supporting decision-making associated with student success factors in higher education institutions.

In ‘Student Learning Behaviours Around Assessments’, Teresa Hattingh, Laura Dison and Laurie Woollacott, from South Africa, argue that student learning approaches and outcomes are detrimentally influenced by classroom assessment practices. The authors specifically explore the relationship between classroom assessment practices and students’ learning-orientation. In this study, the researchers found out that the assessment approaches that are typically used in engineering classrooms promoted surface approaches to learning. The authors suggest that instructors should align their assessment practices with current learning theories and literature, recognize ways student internalize and interpret assessment, and develop a clear assessment strategy that promotes deep learning behaviours.

In ‘Assisting Engineering Students along a Liminal Pathway and Assessing their Progress’, Caroline Baillie and Sally Male evaluate a novel course aimed to support engineering students’ critical thinking abilities by engaging them in community projects involving complex socio-technical issues such as social justice, equity, and sustainability. The authors also use a threshold concept theory to design and implement a new assessment tool to track student progress through their liminal space of learning. Their analysis shows improvements in students’ critical thinking and highlights the importance of teaching models in promoting such as change. In addition, the authors argue that engineers must work together to mitigate against own contributions to sustainability and injustices.

The research articles compiled in this issue are inspiring and inciting. The collection presents diverse meanings attached to and approaches used to study Assessment, Benchmarking, Impact and Evaluation in engineering education. We invite you to explore them and take advantage of the ideas developed by these authors, since they can be very useful in your educational context and to your research studies. Enjoy!

Reference