Agile Course Planning in Educational Programs

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Abstract

An approach to course planning in educational programs was presented in Madan and Gnanendran (2020). There, each student's journey through a degree program was viewed as a "project" requiring completion of a set of tasks (courses) with each task having a specific duration (semester) and, possibly, precedence requirements (prerequisites). The institution is expected to offer courses in an appropriate sequence and timing so that students may progress toward graduation efficiently. Given the large number of students that could matriculate every semester, the institution needs to manage myriad individual degree pathways. To make this problem tractable, Madan and Gnanendran (2020) considered *cohorts* of students, rather than individuals, according to when each entered the program. The institution then only needs to manage a limited number of simultaneous projects with outcomes that are measured on the typical criteria of time and cost.

Recently, researchers (e.g., Rigby *et. al.*, 2016) have espoused the "agile" approach over the traditional "waterfall" approach to managing projects in environments where changes to requirements are to be expected, the work can be modularized, and there are avenues to collaborate with end-users. Since degree programs possess all of these characteristics, we propose heuristics based on agile methodology to address course planning and demonstrate their application via numerical examples.

Keywords
Project Management, Multi-Project Scheduling, Agile, Heuristics, Course Planning

Biographies

Manohar Madan is a Professor in the Information Technology and Supply Chain Management Department in the College of Business and Economics at the University of Wisconsin-Whitewater. His teaching and research interests are in the area of Operations and Supply Chain Management. He has a Ph.D. in Operations Management from the University of Tennessee. Manohar's research has been published in many professional journals such as *the Journal of Operations Management*, *IIE Transactions*, *OMEGA*, *International Journal of Operations and Production Management*, *International Journal of Production Research* and the *Journal of Operational Research Society*. He is a member of APICS, and also is certified as CPIM by APICS.

Kingsley Gnanendran is a professor of operations management and director of the online MBA program at the University of Scranton, Pennsylvania, USA. He earned a B.S. in mechanical engineering from the University of Sri Lanka, an M. Eng. in industrial engineering and management from the Asian Institute of Technology, Bangkok, and a PhD in management science from the University of Tennessee-Knoxville. His research interests involve the application of optimization modeling to supply chains, and his publications have appeared in: *Decision Support Systems*, *International Journal of Production Research*, *European Journal of Operational Research*, and *International*

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