

Longitudinal Effects of Team-Based Training on Students' Peer Rating Quality

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Abstract

This paper examines peer rating result data for two consecutive core team-based first year engineering courses. Engineering students will be expected to work in teams, and the ability to effectively cooperate and communicate is increasingly recognized by technical corporations. Teamwork is an important outcome included in the accreditation criteria of ABET, and is also progressively integrated into engineering courses. However, the effect of the length of students' exposure into team-based projects training is not well studied. Given the ad-hoc experience, which is the more students experience teamwork, the better they perform in teams, we hypothesize that peer evaluation behaviors for the second team-based course will be better on average comparing to the first team-based course. This study will further help better bridge college students with industry in terms of teamwork competency. It will also inspire university administrators and instructors to design curriculums that help engineering students improve teaming skills.

Keywords

Teamwork, Engineering Education, First-year-engineering, Peer Evaluation, CATME

Biographies

Siqing Wei received both bachelor's and master's degrees in electrical and Computer Engineering from Purdue University. He is currently pursuing a Ph.D degree in Engineering Education at Purdue University. After years of experience of serving a peer teacher and a graduate teaching assistant in first year engineering courses, he is a research assistant at CATME research group studying the existence, causes and interventions on international engineering teamwork behaviors, the integration and implementation of team-based assignments and projects into STEM course designs and using mixed-method, especially natural language processing to student written research data, such as peer-to-peer comments. Siqing also works as the technical support manager at CATME research group.

Dr. Daniel M. Ferguson is CATME Managing Director and the recipient of several NSF awards for research in engineering education and a research associate at Purdue University. Prior to coming to Purdue he was Assistant Professor of Entrepreneurship at Ohio Northern University. Before assuming that position he was Associate Director of the Inter-Professional Studies Program [IPRO] and Senior Lecturer at Illinois Institute of Technology and involved in research in service learning, assessment processes and interventions aimed at improving learning objective attainment. Prior to his University assignments he was the Founder and CEO of The EDI Group, Ltd. and The EDI Group Canada, Ltd, independent professional services companies specializing in B2B electronic commerce

and electronic data interchange. The EDI Group companies conducted syndicated market research, offered educational seminars and conferences and published The Journal of Electronic Commerce. Dr. Ferguson is a graduate of Notre Dame, Stanford and Purdue Universities, a special edition editor of the Journal of Engineering Entrepreneurship and a member of Tau Beta Pi.

Dr. Matthew W. Ohland is Professor and Associate Head of Engineering Education at Purdue University. He has degrees from Swarthmore College, Rensselaer Polytechnic Institute, and the University of Florida. His research on the longitudinal study of engineering students, team assignment, peer evaluation, and active and collaborative teaching methods has been supported by the National Science Foundation and the Sloan Foundation and his team received Best Paper awards from the Journal of Engineering Education in 2008 and 2011 and from the IEEE Transactions on Education in 2011 and 2015. Dr. Ohland is an ABET Program Evaluator for ASEE. He was the 2002–2006 President of Tau Beta Pi and is a Fellow of the ASEE, IEEE, and AAAS.

Behzad Beigpourian is a Ph.D. student and Research Assistant in Engineering Education at Purdue University. He earned his master's in Structural Engineering from Shahid Chamran University in Iran, and his bachelor's in Civil Technical Teacher from Shahid Rajaei Teacher Training University in Iran, Tehran. He has been official Technical Teacher at Ministry of Education in Iran from 2007 to 2018 and received many certificates in education such as Educational Planning, Developing Research Report, and Understanding School Culture. Mr. Beigpourian currently works in the CATME project, which is NSF funding project, on optimizing teamwork skills and assessing the quality of Peer Evaluations.

Chuhan Zhou is a junior undergraduate student and Research Assistant in Engineering Education at Purdue University. He is currently majoring in Applied Statistics and minoring in Economics. He is interested in topics regarding data analysis and probability modeling. Chuhan has worked in CATME since 2018 and is currently conducting research regarding the CATME peer evaluation system, with a specific focus on how demographics might affect teamwork behaviors.