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# Student Learning of Attending the World Congress on Industrial Engineering and Operations Management

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## Abstract

The major goal of this project was to provide an opportunity for minority undergraduate and graduate students to attend and participate in the Ninth North American International Conference on Industrial Engineering and Operations Management (IEOM). Students were exposed to Industry 4.0 and artificial intelligence focusing on IoT, data analytics, iCloud, cybersecurity, product lifecycle management, industry solutions, simulation, and digital twin. Pre and post-surveys were conducted to assess the learning experiences of conference attendees. Twenty-two students participated in the pre-survey and 12 students participated in the post-survey. Students were asked about their understanding of Industry 4.0 / cyber-physical systems (CPS) before and after the conference. It was an increase from 40.9% to 66.7%. Students were asked where their exposure was to companies that operate internationally. It increases from 40.9% to 58.3%. In the pre-survey, 30% - 40% of students were very knowledgeable in Industry 4.0 and in the post-survey, 50% - 60% of students had a piece of very good knowledge in the same areas. Understanding and learning improvement of the percentage of awardees in other areas of Industry 4.0 who mentioned some knowledge and very knowledge between pre-conference and post-conference survey responses are listed below:

- Internet of Things (IoT): 68% to 58%
- Artificial Intelligence and Machine Learning (AI-ML): 86% to 83%
- Big Data and Data Analytics: 72% to 83%
- iCloud and Cybersecurity: 72% to 75%
- Simulation and Visualization: 68% to 66%
- Innovation and Entrepreneurship: 68% to 83%
- Industrial Automation: 45% to 66%
- Integrated Systems: 27% to 83%
- Industry Best Practices: 40% to 66%
- Logistics and Supply Chain: 54% to 66%
- Operational Excellence and Productivity Improvement: 54% to 74%
- Lean Six Sigma: 41% to 66%
- Digital Twin: 32% to 58%

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- Digital Manufacturing: 40% to 75%

Students improved in most of the areas except a few. Only a few had a decrease. It could be due to the sample size variation between pre-survey (22 responses) and post-survey (12 responses).

## Biographies

**Ahad Ali** is an Associate Professor and Director of the Industrial Engineering Program in the A. Leon Linton Department of Mechanical, Robotics, and Industrial Engineering at the Lawrence Technological University, Southfield, Michigan, USA. He earned B.S. in Mechanical Engineering from Khulna University of Engineering and Technology, Bangladesh, a Masters in Systems and Engineering Management from Nanyang Technological University, Singapore and PhD in Industrial Engineering from the University of Wisconsin-Milwaukee. He has published journal and conference papers. Dr Ali has completed research projects with Chrysler, Ford, New Center Stamping, Whelan Co., Progressive Metal Manufacturing Company, Whitlam Label Company, DTE Energy, Delphi Automotive System, GE Medical Systems, Harley-Davidson Motor Company, International Truck and Engine Corporation (ITEC), National/Panasonic Electronics, and Rockwell Automation. His research interests include manufacturing, simulation, optimization, reliability, scheduling, manufacturing, and lean. He is a member of IEOM, INFORMS, SME, and IEEE.

**Don Reimer** is a managing member of The Small Business Strategy Group, L.L.C and serves as an adjunct professor at Lawrence Technological University**.** Mr. Reimer holds a Bachelor of Science degree in Industrial Management from Lawrence Technological University and a Master of Arts degree in Political Science from University of Detroit/Mercy. He has been recognized as a professional management consultant with over 45 years of experience in working with closely held businesses. He has taught courses in entrepreneurship, management and corporate entrepreneurship and innovation for engineers. Mr. Reimer served as a member of the Minority Economic Development Committee of New Detroit. He has served as a KEEN Fellow for The Kern Family Foundation. He is member of the Lawrence Tech Alumni Board of Directors and has elected a Fellow of the IEOM Society International. Mr. Reimer is a faculty advisor of the Student Chapter of the IEOM Society at Lawrence Tech.

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