

Systems Framework for Global Engineering Education Curriculum

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Abstract

It is a systems world these days due to increased worldwide connectivity that is facilitated by fast travel modes and Internet connectivity. As a result, global engineering education requires a new look. In as much as the curriculum is the weapon of accomplishing engineering education, the methodology of this talk centers on a systems framework for global engineering curriculum. Global engineering curriculum of nowadays must take advantage of the emerging transition to digital engineering, artificial intelligence techniques, and remote learning. We cannot afford for engineering education to be static or become stagnant. Existing and new curricula must be upgraded to be adaptive, resilient, and responsive to developments around the world, at a fast pace. The emergence of COVID-19 in 2020 makes it even more imperative that we act fast and responsibly. This invited distinguished presentation focuses on using a systems framework to achieve the ideals of a world-centric engineering curriculum. The specific framework that will be discussed is the DEJI Systems Model®, a trademarked tool for achieving a structured design, evaluation, justification, and integration of the elements of engineering curriculum. Any curriculum that is not designed to align with local needs cannot be fully integrated into the socio-economic needs of the local population in any region of the world. This talk will offer specific actionable and results-based strategies for contemporary global engineering education.

Keywords

Engineering Education, Systems Engineering

Biography

Dr. Deji Badiru is the Dean and senior academic officer for the Graduate School of Engineering and Management at the Air Force Institute of Technology (AFIT). Dr. Badiru was previously Professor and Head of Systems Engineering and Management at AFIT, Professor and Department Head of Industrial & Information Engineering at the University of Tennessee in Knoxville, and Professor of Industrial Engineering and Dean of University College at the University of Oklahoma, Norman. He is a registered professional engineer (PE), a certified Project Management Professional (PMP), a Fellow of the Institute of Industrial Engineers, and a Fellow of the Nigerian Academy of Engineering. He holds BS in Industrial Engineering, MS in Mathematics, and MS in Industrial Engineering from Tennessee Technological University, and Ph.D. in Industrial Engineering from the University of Central Florida. His areas of interest include mathematical modeling, systems efficiency analysis, and high-tech product development. He is the author of over 30 books, 35 book chapters, 75 journal articles, 115 conference proceedings and presentations. He also has published 30 magazine articles and 20 editorials and periodicals. He is a member of several professional associations and scholastic honor societies. Deji Badiru has won several awards for his teaching, research, and professional accomplishments. He is the recipient of the 2009 Dayton Affiliate Society Council Award for Outstanding Scientists and Engineers in the Education category with a commendation from the 128th Senate of Ohio. He also won 2010 IIE Joint Publishers Book-of-the-Year Award from the Institute of Industrial Engineers. He also won 2010 ASEE John Imhoff Award for his global contributions to Industrial Engineering Education, the 2011 Federal Employee of the Year Award in the Managerial Category from the International Public Management Association, Wright Patterson Air Force Base, the 2012 Distinguished Engineering Alum Award from the University of Central Florida, and the

2012 Medallion Award from the Institute of Industrial Engineers for his global contributions in the advancement of the profession. In February 2013, he was selected as a finalist for the Jefferson Science Fellows (JSF) program by the US National Academy of Sciences and the US Department of State. Dr. Deji was the leader of the AFIT team that won the 2013 Air Force Organizational Excellence Award for Air University C3 (Cost Conscious Culture). His most recent award is the 2015 National Public Service Award at the overall US Air Force level.

Deji Badiru has served as a consultant to several organizations around the world including Russia, Mexico, Taiwan, Nigeria, Ghana, and Canada. He has conducted customized training workshops for numerous organizations including Sony, AT&T, Seagate Technology, U.S. Air Force, Oklahoma Gas & Electric, Oklahoma Asphalt Pavement Association, Hitachi, Nigeria National Petroleum Corporation, and ExxonMobil. He holds a leadership certificate from the University Tennessee Leadership Institute. He has served as a Technical Project Reviewer, curriculum reviewer, and proposal reviewer for several organizations including The Third-World Network of Scientific Organizations, Italy, National Science Foundation, National Research Council, and the American Council on Education. He is on the editorial and review boards of several technical journals and book publishers. He is also a program evaluator for ABET, the international engineering and technology accreditation body. In 2011, Prof. Badiru led a research team to develop analytical models for Systems Engineering Research Efficiency (SEER) for the Air Force acquisitions integration office at the Pentagon. He has led a multi-year composite manufacturing collaborative research between the Air Force Institute of Technology and Wyle Aerospace Group. He is the founder of the Association of Military Industrial Engineers (AMIE).