

# Employing Technology to Customize the Flipped Classroom Practice

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## **Abstract**

Higher education institutions have been a traditional source of innovations, yet, they continue to lag when it comes to employing innovative technological solutions that could improve the educational process. New teaching strategies that employ technology could help improve learning outcomes. This is the emphasis of flipped classroom techniques which rely on technology to change traditional practices in a way that encourages students to become focused on self-paced learning while steering the teaching and learning processes toward a more interactive and engaging setup. This paper summarizes the results from three studies by different instructors that utilized technology to implement the flipped classroom methodology at Texas A&M University at Qatar. The courses employed in the studies represented an array of subjects in engineering education with audiences from a wide range of backgrounds. Each instructor customized his own approach to the flipped classroom concept with each utilizing different technologies to achieve the end goal of improved learning outcomes. The research was concluded by student surveys to assess their views regarding the flipped classroom methodology and how it impacted their learning. The results of the studies demonstrate that non-traditional pedagogical practices that utilize technology to flip the classroom can positively impact students' performance.

**Keywords:** innovation; educational technology; teaching and learning; flipped classroom; engineering education; higher education

## **Biography**

**Mohamed Y. Ismail** received the B.Sc. degree in Electrical Engineering from the University of Toledo, Toledo, Ohio, USA, in 1989, and the M.E. and Ph.D. degrees in Electrical and Computer Engineering from the University of Florida, Gainesville, Florida, USA, in 1992 and 1997, respectively. He is currently a Senior IT Consultant with Texas A&M University at Qatar, since 2014. During 2013 and 2014, he taught a course on cyber security for the University of Maryland University College. From 1998 to 2014, he worked for several international companies in senior management roles.

**Hamid R. Parsaei** is a professor of mechanical engineering at Texas A&M University at Qatar (TAMUQ) and also hold tenure appointment in the Department of Industrial and Systems Engineering and Mechanical Engineering at Texas A&M University in College Station. He served as director of the academic outreach program (September 2014- August 2015), associate dean for academic affairs (September 2010-August 2014) and the interim chairman of department of industrial engineering (January 2001 – August 2010) at

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