Announcing the Final Examination of Hamed Almalki for the degree of Doctor of Philosophy

Time & Location: June 21, 2016 at 10:00 AM in Engineering 2 312L
Title: A HOLISTIC FRAMEWORK FOR EFFECTIVE ENGINEERING LEADERSHIP DEVELOPMENT USING VIRTUAL SIMULATION

Engineering Leadership development is essential for modern industries. However, due to cost and inefficiency, traditional engineering leadership development does not seem very effective. The failures of traditional leadership development can be attributed to the absence of embedded leadership development among engineering professionals and the challenge of applying the right leadership strategies in the right contexts. Despite the encouragement of enhanced leadership development, many studies lack an examined framework, especially when it comes to leadership development for undergraduate engineering. In this research effort, the impact of 3D virtual simulation on enhancing the leadership abilities of engineering students, at both the individual and team levels, is based on a framework that carefully incorporates utilizing SWOT analysis (strengths, weaknesses, opportunities, and threats), the Matrix of Change (MOC â€“ based on Total Quality Management (TQM) House of Quality), and the Balanced Scorecard (BSC) to the virtual leadership environment design planning process. In this developed framework, the virtual simulation was used to provide experiential learning by replacing human beings with avatars that can be managed or dramatized by real people. This framework has been examined and validated by a randomized pretestâ€“posttest control group design. Paired tâ€“test has shown a significant development in the average team leadership skills in the experimental group while no significant change occurred in the teams of the control group. Similar results were noted by using twoâ€“sample tâ€“tests when both experimental and control group were evaluated. There is a reduction in the mean of individualsâ€™ test which indicates there is a small enhancement in the individual’s leadership skills, but that change is small and not statistically significant. It was found in this exploratory study that administration of 3D virtual leadership simulation on the undergraduate engineering students had a significant effect on the team average leadership skills. These results can enable engineering managers to create live, practical, measurable, and customizable leadership development programs. The research has great insights that might assist engineering programs to improve curricula for the purpose of better engineering leadership preparation to meet the industry’s demands.

Major: Industrial Engineering

Educational Career:
Bachelor's of B.S.E.E, BS, 2008, American University of Sharjah
Master's of MBA, MBA, 2013, Rollins College
Master's of M.S. I. E., MS, 2015, University of Central Florida

Committee in Charge:
Dr. Luis Rabelo, Chair, Industrial Engineering and Management System
Ahmad Elshennawy, Industrial Engineering and Management System, UCF
Gene Lee, Industrial Engineering & Management Systems
Ana Ferreras, National Academy of Sciences

Approved for distribution by Dr. Luis Rabelo, Committee Chair, on June 21, 2016.

The public is welcome to attend.