Michael Richey,

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Dr. Michael Richey is an Associate Technical Fellow currently assigned to support technology and innovation research at The Boeing Company. Michael is responsible for leading a team conducting engineering education research projects that focus on improving the learning experience for students, incumbent engineers and technicians. His research encompasses sociotechnical systems, learning curves, and engineering education research.

Additional responsibilities include providing business leadership for engineering technical and professional educational programs. This includes development of engineering programs (certificates and masters) in advanced aircraft construction, composites structures, and product lifecycle management and digital manufacturing. The educational programs are aimed at furthering education in engineering and engineering technology by promoting global excellence in engineering and engineering technology, developing future generations of entrepreneurially-minded engineers. This is achieved by partnering and investing in educational initiatives and programs between industry and institutions of higher learning.

He has served on various advisory groups, including the Editorial Board of the *Journal of Engineering Education*, Boeing Higher Education Integration Board, American Society for Engineering Education Project Board, and the National Science Foundation I-UCRC Industry University Collaborative Research Center Advisory Board. Dr. Richey has authored or co-authored over 25 publications in leading journals addressing topics in large scale system integration, learning sciences, and systems engineering. He often represents Boeing internationally and domestically as a speaker-presenter and has authored multiple patents on computer-aided design and computer-aided manufacturing, with multiple disclosures focused on system engineering and elegant design.

He holds a B.A and M.Sc. from ESC Lille in program project management and a Ph.D. from SKEMA Business School with a focus on engineering education research.

Abstract

Aerospace Partners for the Advancement of Collaborative Engineering AerosPACE

This presentation presents engineering education research sponsored by Boeing that has transformed engineering higher education capstones through a) implementation a distributive social networking learning platform (including analysis on MOOC lectures) and b) the development of a MMORPG multi-user CAD/CAM prototype. Two years of focused research is highlighted wherein teams of students, working across multiple universities, leveraging a social network and multi-user CAD platform, model a design-build-test NASA CRM model. The capstone project enabled

students to transfer knowledge within a social network, mentored by peers, industry workplace experts and professors Through this translational framework the students developed strong outcomes in critical thinking, creativity and innovation.

Key objectives included:

- Develop an overall **concept and architecture** for an industry university student capstone and to develop and motivate the next generation of advanced manufacturing innovators.
- Develop a **coherent and interconnected curriculum structure** based on immersive hands on engineering problems
- Connect collaborative - distributive teams and design representations in such a way to ensure that **students were exposed to the industry principles of collaborative digital manufacturing**, targeting cyber-mechanical systems of high complexity.
- View learning as a social-technical process whereby knowledge is co-constructed within a social network, **mentored** by peers, industry workplace experts and professors through both face-to-face and a cyber infrastructure.
- Theory to Practice: Competencies and learning strategies **are directly linked to performance in the workplace**
- Target gaps at the Aero student pipeline competencies with implications to **businesses being able to meet future workforce needs**

The presentation concludes with next steps and a discussion around extending and leveraging the Boeing Engineering Higher Education, including multi-user prototypes and Social Networking methods within the academic partnerships.