Learning Engineering:
A New Academic Discipline and Engineering Profession

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Background: As learning technologies scale within the context of maturing artificial intelligence and ubiquitous cloud computing, the need for professionals who can bring to the enterprise both expertise in engineering methodologies as well as learning science increases rapidly.

Discussion:

Talking Point #1: What are the risks of failing to combine engineering methodologies and learning science as learning technologies scale globally?

Talking Point #2: What is the difference between instructional design and learning engineering?

Talking Point #3: What would an employer's job description of a learning engineer look like?

Recommendations:

Recommendation #1: In defining learning as an experience and a formative process, as opposed to a correct response pattern to a standardized summative assessment, we place learning within the context of the living world. With regard to the data of the learning experience, this means that we dramatically increase the potential data points and both the volume and throughput of those data points. In the corporate workplace, this may mean correlating learning data against streams of business workflow and productivity. In athletics or physical endeavors ranging from warfighting to working in a rapidly changing physical environment such as encountered by first-responders, contextual data key to understanding formative learning may include biometrics and environmental data. These real-world event-based and activity stream driven data push the limits of scale and without the implementation of proven engineering methodologies, the systems depending on this data will fail just as a highway system incapable of handling the scale of traffic will fail.

Recommendation #2: Learning engineering is not the next-generation of instructional design. Key capabilities in the tool set of the learning engineer are to understand the backend processes supporting data and IT systems in the learning enterprise, standards and technical specifications that provide increased interoperability and decreased technical bottlenecks at scale -- including those related to learner privacy, complex pedagogical processes, and multi-domain learning ecosystems -- and options with regard to cloud computing infrastructure and cloud formation templates that will provide the ability to automate and monitor the health and viability of code

and technical processes up and down the learning stack. At a high level, learning engineers form the translation layer between IT and programmers on the one hand and instructional designers and pedagogical domain experts on the other.

Recommendation #3: A learning engineer should have competencies that allow them to interface professionally with those creating the content and pedagogical inputs of learning, those supporting the code and infrastructure that provides the digital environment that can provide for the scale of learning as an enterprise, and those analyzing and assessing the outputs both of learning behavior as well as the behavior of those technological systems that support learning.