WHY LEARNING IS HARD: Challenges That MOOCs May Miss Providing?

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1. INTRODUCTION

Perusal of recent popular press and vision statements by senior government and university leaders suggests that higher education is undergoing a massive shift with the recent release of well-polished online courses (Massively Open Online Courses, MOOCs). Today’s online materials provide students and instructors with readily available resources that create incredible opportunities for higher education institutions. But are these online resources sufficient for creating effective learning environments? The present thesis is that the deep learning expected of engineering students involves aspects that are difficult to address in the MOOC’s framework.

2. THE LEARNING CHALLENGE

The premise of the present thesis is that engineering programs aim to transform incoming students into expert practitioners. As novice practitioners, incoming students typically apply scientific and mathematical knowledge according to “rules” without any awareness of context and will resist making judgements. Expert practitioners, on the other hand, will use guiding principles and experience to make judgements appropriate for the context of the application. This novice/expert distinction manifests itself within individual disciplines and courses. For example, in the field of mechanics it is common for novice practitioners to believe that force is proportional to velocity (specifically true for drag forces in many everyday contexts) while expert practitioners know that force is proportional to acceleration, [1].

In order to reach an expert level of understanding and practice it is necessary for students to undergo a transformation in which they recognize their misconception, give up their existing perspective, acquire a deeper understanding, and then practice to develop proficiency, [2]. Throughout this transformation students feel a period of lowered capability and perceived understanding.

3. RESULTING TEACHING CHALLENGES

Besides making discipline content clear to students, a significant instructional role is to support students going through this psychologically disturbing period of lowered capability. In particular, effective teaching needs to: motivate students to ensure students confront their misconceptions and see the relevance of attaining expert capability; and support the transformation process by developing learning environments that provide purposeful activities and multiple opportunities for feedback. Feedback throughout the transformation process is crucial to ensure students move forward and do not give up.

4. SUMMARY

Supporting students undergoing transformations of understanding is particularly challenging for online courses because of the remote “psychological” connection between instructor and student. While MOOCs make content available, existing technologies and practices do not yet address this issue. Fortunately many conventional on-campus classroom practices do address this crucial role in facilitating for effective student learning.

References
