

Conversation: Curriculum Development using Threshold Concepts and Personas

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Faced with a curriculum ready for a thorough examination beyond reshuffling content, whether for a course or for a program, significant reform can be difficult to conceptualize, let alone enact. Moreover, beyond the discrete topics populating the syllabi, a deeper question about the courses concern the utility of the ideas and activities to the diverse population of students in the classroom. At the program level, the flow of students into a department is not just a set of admissions statistics; rather, we must consider who the program is designed to serve and how the curriculum can be intentionally formulated to compensate for the wide range of abilities and interests. The intended flow out of the program should also be accounted for, as a factory of workers laid upon a conveyor belt from “diploma to desk” at the typical portfolio of companies is not driven by educational values. In this conversation session we will present two novel methods for curriculum development originating from economics and user interface design, threshold concepts and personas respectively. Examples of both methods from an ongoing project to rejuvenate Virginia Tech's Electrical and Computer Engineering department's curriculum will be offered to contextualize the discussion.

Designing a student-driven curriculum should logically start with discussing who the curriculum is intended to serve and how it should work. Certain human qualities can be used to form abstract characterizations of students who will be applying to the college, populating the classrooms, engaging in projects within the college, and eventually walking across the stage in May (or December) – these profiles are called personas (Lidwell, Holden, & Butler, 2010, p. 182). Conceptualized in the seminal work of Cooper (2004), personas are a design strategy that helps designers consider the multidimensionality of the human experience and avoid designing for the fallacy that is the “average user.” Thus, personas bring a “shared basis for communication” (Pruitt & Grudin, 2003, p. 3), as the “average user” is split into more tangible constructs. To use the technique, the designer or team of designers creates a small set of “archetypal users” (Lidwell, Holden, & Butler, 2010, p. 182) that represent a conglomerate of users in a subpopulation. Using qualitative techniques such as interviews (Creswell, 2014, p. 191-192) to elicit distinguishing characteristics of the subpopulations, the resulting persona will include the following: a photo, name, description, interests, and specific behaviors relevant to the design (Lidwell et al., 2010, p. 182). Personas offer the designer(s) a social lens to curriculum, but a different tool aids in understanding how the discrete pieces of the curriculum fit together - threshold concept theory. Threshold concepts are ideas that are considered “troublesome” to learn (Meyer & Land, 2003). In the process of acquiring new knowledge, students pass through a liminal space – a conceptual purgatory where the student is aware of a concept and may mimic procedures to solve problems involving the concept without full understanding (Meyer & Land, 2003, p. 10). Once a threshold concept is learned, however, it transforms the student epistemologically and ontologically (Meyer & Land, 2003). The transformative nature is the defining feature of threshold concepts, but other qualities include: bounded, discursive, integrative, irreversible, and reconstitutive (2003).

The goals of this conversation session are as follows: Externally: Introduce participants to novel techniques in curriculum design, particularly those that elicit a critical examination of the following questions: first, those focused on the curriculum itself, -What defines transformative and essential knowledge in a curriculum? -How do the transformational and essential concepts relate to one another and bind other disparate ideas to them? and questions about the inputs to the curriculum, those that experience the design: -Who does the curriculum serve versus who do we want it to serve? -What outcomes does the curriculum produce in students in terms of career/professional pathways versus what career pathways are intended? Internally: Document feedback on the use of the design techniques and explore suggestions in the curriculum development process for the Electrical and Computer Engineering department at Virginia Tech.

The topic to be discussed is the process of curriculum design using threshold concepts and personas. Both are design techniques used to develop an end product, one being a curriculum and another a user-interface for a website or application. This session will discuss the combination of the theory of threshold concepts and the user-centered intentions of personas to design a curriculum that is not only pedagogically sound, but also meets a broader set of departmental and institutional objectives such as diversity in matriculation, retention, and ultimately graduation

rates. Examples will be centered in engineering, but will still be relevant to general education. Participants from all fields are welcome to join the session.

We will begin with a short, ten-minute overview of the two design techniques, threshold concepts and personas. Examples from an ongoing project in the Electrical and Computer Engineering department at Virginia Tech will be shared to spark discussion (Reeping et al., 2017). To guide the conversation, groups of three to four will be formed as appropriate. Guiding questions about who the curriculum is designed to serve from the participants' point of view in their contexts, whether at the course level or at the program level, will be posed. Matriculation and graduation objectives with respect to assumptions about the student population will also be considered. Also, the question of who should be involved in the process of development will be posed. (20 minutes) Facilitators will prompt the audience to share experiences where they have explored these, or similar, design techniques and lessons learned from those experiences. Facilitators will also prompt the audience to discuss the type of support faculty would need to explore the implementation of these design techniques in the redesign of their own courses, larger curriculum, or departmental structure. (20 minutes) The perceived value of using such design techniques to understand the students in their courses and programs will close the session. (10 minutes)

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