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Rubric for Assessing Epistemological Understanding of Students who are Learning Design

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There is an extensive base of literature that attempts to describe how college students understand "knowledge" and their role in generating it. Educators draw from this literature to help students develop increasingly sophisticated ways of using knowledge. Much of this research aims for broad generalizability. It is clear, however, that various disciplines have developed their own unique value systems. Scholars in the physical sciences are likely to hold very different ideas about the nature of "fact" and "inevitability" than those in the "softer" social sciences [1]. Various disciplines conceptualize, use, and generate new knowledge in ways that differ fairly dramatically, yet little research has been done to probe epistemological differences.

This paper investigates epistemologies specific to design-related disciplines. It presents a new tool—a rubric—that can be used to assess the cognitive, intellectual, and/or epistemological development of design students. The rubric is appropriate for use with students majoring in engineering, architecture, art, and a host of other technical and scientific fields (such as product design and software design) that require creative thinking.

The _Epistemological Development Rubric for Designers_ was created to help educators assess their students' epistemological understandings and track changes over time. The structure of the rubric is drawn from a _Design Strategies Rubric_ developed by David Crismond [2], a professor of science education at the City College of New York. The new rubric superimposes operational definitions of epistemological development posed by William Perry [3], Marcia Baxter Magolda [4], Mary Belenkey and her colleagues [5], and Patricia Love and Victoria Guthrie [6]—juxtaposing them with Crismond's rubric.

The _Epistemological Development Rubric_ is currently being tested for validity using blogs written across the span of a semester by 55 college juniors and seniors majoring in art, architecture, and material science engineering. The students were enrolled in a three-credit elective course where they worked in multi-disciplinary teams and were required to document their experiences on the Web. The students had to navigate through a series of ill-defined problems and come to terms with shared authorship. The students worked in teams of six, so it is possible to compare and contrast individuals' interpretations of similar events. It is also possible to see differences by major and by level of prior experience with design.

This paper describes the rubric, explains how to use it, provides text written by various students to illustrate specific concepts, and identifies points for further study and refinement. ■

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