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Threshold Concepts for
California State University, Monterey Bay's
University Learning Outcomes

The following "metadisciplinary" threshold concepts ([Basgier, 2016](#)) were developed by CSUMB faculty to complement the [University Learning Outcomes (ULOs) Assignment Guides and Rubrics](#). The threshold concepts were developed to help identify where students struggle to learn and can implement approaches to engaging productively with the challenge, such as [Reading Apprenticeship routines and strategies](#).

Critical thinking threshold concepts
- **Uncertainty is valuable, knowledge is limited, and there are degrees of probability**
- **Empirical evidence requires justification**
- **Epistemologies, values, and assumptions require justification**
- **What is and what should be may be different things**

Information literacy threshold concepts
- **Authority is constructed and contextual:** Authority is constructed in that various communities may recognize different types of authority. It is contextual in that the information needed may help to determine the level of authority required.
- **Research as inquiry through strategic exploration:** Research is iterative and depends upon asking increasingly complex or new questions whose answers in turn develop additional questions or lines of inquiry and any field. Searching requires the evaluation of a range of information sources and the mental flexibility to pursue alternate avenues as a new understanding develops.
- **Information creation as a process:** Iterative processes of researching, creating, revising, and disseminating information vary, and the resulting product reflects these differences.
- **Scholarship as conversation:** Communities of scholars, researchers, or professionals engage in sustained discourse with new insights and discoveries occurring over time as a result of varied perspectives and interpretations.
- **Information has value:** As a commodity, educationally, and as a means to influence Legal and socio-economic interests influence information production and dissemination.

Quantitative reasoning threshold concepts
- **Quantitative reasoning is an iterative process:** Quantitative Reasoning is "habit of mind", a logical, reflective, intuitive, and iterative practice, not a linear process, which includes the consideration of context, authority, and appropriateness. It is an intellectual discourse designed to eventually converge, or at least get us closer, to truth while reducing uncertainty.

- **Discovering, defining, and demonstrating functional relationships between variables:** Quantitative systems define relationships among variables/objects in terms of abstract patterns (some of which include variation, covariation, and causation).
- **Bidirectional translation between the abstract and the concrete:** Quantitative Reasoning involves transitioning back and forth between the concrete (observations, theories, situations, information), and the abstract (representations) in the creation, interpretation, and evaluation of models of reality.
- **Proportional reasoning and comparisons:** Recognizing that the comparison of two or more quantities often requires the use of multiplicative-- not additive--thinking, via proportion, percentages, ratios, base rates, probabilities, and that interpretation of the comparison of quantities depends on context.
- **Visual representations:** Recognizing that visual representations of quantitative information are created or constructed and used in processes of inquiry and argumentation. The creator's point of view is often reflected in the design choices for the visual representation and must be considered in the interpretation of the visual representation.

Written communication threshold concepts
- **Writing is an activity of meaning making and a subject of scholarly study**
  - Reflective
  - Iterative
  - Metacognitive
- **Writing occurs in contexts, and no two contexts are exactly alike**
  - Personal
  - Social
  - Rhetorical
- **All writers have more to learn; writing can be practiced and improved**
- **Writing speaks to situations & audiences through recognizable forms or genres**
- **Writing creates identities and ideologies**

Oral communication threshold concepts
- **Oral communication connects speakers and listeners through embodied experiences**
  - Audience awareness during delivery
  - Audience engagement
  - Uses space and time
  - Co-creation of experience
  - The experience is emotional as well as cognitive
- **A speech is not just a paper on legs**
  - Assesses audience
  - Time is limited and only moves forward
  - Repetition is more necessary and overt than in writing
  - Preparation (to intimately know content)

- ○ Use of vocabulary (spoken versus written)

- **Oral communication speaks to situations & audiences through recognizable forms or genres**
    - ○ Situations repeat, resulting in genres
    - ○ Credibility/trust is contextual and constructed
    - ○ Medium is an element of genre
- **Dialogue is an ongoing process of co-creating knowledge**
    - ○ True dialogue involves really speaking and listening, which is a meaning-making activity
    - ○ Dissonance can be good/productIve

Personal, professional & social responsibility threshold concepts
- **Individual in the Social World**
    - ○ Individuals do not exist in isolation. Rather, individuals shape and are shaped by social systems.
- **Ethical Frameworks**
    - ○ Ethical frameworks are multidimensional, acquired, constantly renegotiated, and guide action differently based on context.
- **Public Responsibilities**
    - ○ Individuals have personal and professional identities, and those identities have public responsibilities that need intentional development.
- **Learning Through Public Action**
    - ○ All learning happens in relationship to what one already knows and believes, and is connected to and influenced by one's experience in the world. Learning requires applying knowledge and acting in the world.

Integrative knowledge threshold concepts
- **Transfer is a cycle: experience, metacognition, communication.**
    - ○ Transfer happens within and between disciplines and co-curricular experiences. Communication both demonstrates that transfer is occurring and promotes synthesis of knowledge and experience.
- **Transfer must be taught and explicitly requested; students do not transfer knowledge automatically.**
    - ○ Instructors must be explicit about what type of knowledge/experience that they want students to transfer, where that knowledge/experience is coming from, and where it is being transferred to.
- **In order to transfer, students must be able to get, comprehend, and evaluate knowledge.**
    - ○ Students need enough relevant knowledge before they can transfer meaningfully. Comprehension comes before transfer; students who are struggling to

comprehend knowledge will also struggle to transfer it. Students must also be taught how to evaluate the types of knowledge/experience that are appropriate to transfer in a given context.
- **Metacognition is necessary for learning to transfer knowledge.**
  - We all transfer knowledge in our daily lives, but are not necessarily aware we are doing it. Meaningful transfer requires awareness that transfer is occuring. Learning to transfer requires making the process explicit, and as students develop proficiency, transfer becomes more implicit.

About threshold concepts & learning outcomes
Threshold concepts are ideas that students typically struggle with but once understood are transformative. They are different from learning outcomes. Learning outcomes describe where we want students to arrive. They are end points and they are assessment-focused. Threshold concepts describe a process and experience with which students need to actively engage to achieve the outcomes. They are a means to an end and pedagogically-focused. If learning outcomes are the destination, threshold concepts provide frameworks for helping them get there.

Estreem (2015) puts it this way, "...as usual as outcomes are, they can't account for the messy, hard, uneven work of learning. They can provide useful snapshots of end points, of what students are able to do... Threshold concepts articulate the messiness of student learning in a way outcomes alone won't. They help faculty, students, and potentially, external stakeholders focus on the 'long tunnels' of learning difficult and critical concepts...."

According to Weimer (2014), "A threshold concept is discipline-specific, focuses on understanding of the subject and … has the ability to transform learners' views of the content" (Zepke, p. 98). It's not the same as a core concept, although that's a useful place to first put the idea. "A core concept is a conceptual 'building block' that progresses understanding of the subject; it has to be understood, but it does not necessarily lead to a qualitative different view of the subject matter" (Meyer and Land, p. 4). Threshold concepts have five characteristics, according to Meyer and Land. They are:

- **Transformative –** The change that results from understanding the threshold concept is significant. Meyer and Land use the adjective "powerful" to describe it. It can change how learners think about the discipline, about themselves, or about the world.
- **Bounded –** Thresholds border with other thresholds, and those boundaries and frontiers come to define disciplinary areas and academic territories.
- **Integrative –** "Once understood, it enables students to knit dissimilar elements of a subject together" (Zepke, p. 100). Students suddenly get the large picture. They see how details or a set of ideas fit together. Suddenly a whole variety of things make sense.
- **Irreversible –**These are not changes likely to be unlearned or forgotten. Meyer and Land use Adam and Eve as an example. The knowledge they acquired caused them to be expelled from the Garden of Eden. As they passed through the threshold from

innocence, the landscape before them was totally transformed. Once the threshold concept is understood, that new knowledge makes it all but impossible to go back to former ways of thinking.

- **Troublesome –** Here Meyer and Land defer to the work of Perkins, who previously explored the idea of troublesome knowledge. Threshold concepts, Meyer and Land claim, are troublesome in the sense that they are difficult for students to understand. Perkins defines troublesome knowledge "as that which appears counter-intuitive, alien (emanating from another culture or discourse), or incoherent" (quoted in Meyer and Land, pp. 5-6). They are not easily or automatically understood when first encountered.

References

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