

**MEDICAL EDUCATION: PEER-REVIEWED ARTICLE**

**Which Priorities Should Guide Design of Online Health Professions Capability-Based Curricula?**

Yianna Vovides, PhD and Jimson Mathew, MA

**Abstract**

*Inquiry-based learning* instructional design methods support online health professions *capability-based curricula*. This article proposes which instructional design priorities should guide development of inclusive, accessible online curricula and learning experiences.

**Inquiry-Based Learning**

In this article, we explore instructional design strategies related to *inquiry-based learning* (IBL) for online, or virtually mediated, health professions education. IBL is characterized by individual and team-based development and supports analytical reasoning through exploration and stimulating curiosity. We focus primarily on how such strategies have the potential to support online *capability-based curricula* that emphasize self-awareness and reflection in particular patient-care contexts to afford an accessible and inclusive learning environment.

**Cultivating Capability**

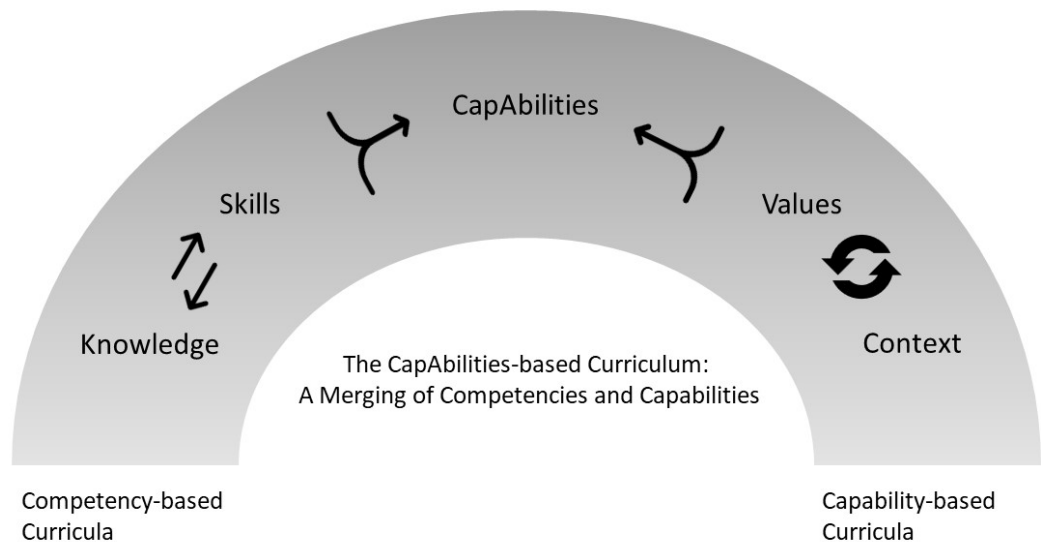
We begin by providing some context in relation to capability-based curricular design, given that health professions education has primarily adopted *competency-based curricula*, which are designed so that learning can be assessed by measuring particular outcomes (competencies).<sup>1</sup> Whereas competency-based curricula aim to teach observable abilities (eg, to diagnose and treat illness), capability-based curricula aim to support the development of professionals who can not only provide a medical diagnosis but also situate that diagnosis within the wider life of the patient.<sup>2,3</sup> Although a competency-based curriculum does aim to account for a comprehensive set of attributes, it tends to reduce lived experience to “lists of attributes ... that exoticize patients, ultimately obscuring social context, medical culture, and structures of power.”<sup>4</sup>

If competency-based curricula focus on the **science of medicine**, capability-based curricula focus on the art of medicine.<sup>5</sup> In particular, capability-based curricula encourage and challenge both instructors and students to explore previously unexamined beliefs and assumptions that influence their behaviors as health professionals. Capability-focused physicians would not just administer the right medicines and treatment plan; they would work with the patient to identify the most suitable pharmacy for pickup or delivery according to the patient’s needs or try to

schedule back-to-back referral appointments if they were aware that the patient is unable to keep medical appointments without taking time off from work. In other words, a capability-focused physician cultivates a holistic awareness of the patient in context. Such an awareness is considered to be an art rather than a science.<sup>5</sup> It necessitates that health professionals reflect on their assumptions about patient care and the kinds of questions they ask and fail to ask patients; foster an awareness of the patient's ailment; and recommend treatment that not only meets the patient's medical needs (science) but also is tailored to the patient's lived reality (art). In other words, a capability-based curriculum seeks to support the development of a health professional who is focused on *patient* care.

A capability-based curriculum does not detract from a competency-based curriculum but rather enhances it. By enhancing competencies with capabilities, the curriculum design approach becomes a holistic one (see Figure 1). For competency-based curricula, instructional design methods for **online environments** emphasize didactic materials and knowledge acquisition. For capability-based curricula, the emphasis shifts to strategies that enable inquiry in order to facilitate the learner's awareness of the learning process. Presently, there is a large body of literature related to designing online competency-based curricula.<sup>6,7,8,9,10,11,12,13</sup> Little has been written about designing capability-based curricula for online medical education, however. The rest of the article elaborates on the latter.

**Figure 1.** The Capabilities-Based Curriculum: A Merging of Competencies and Capabilities



### Postures for Online Capability-Based Learning

Rather than focusing on observable skills, capability-based curricula aim to foster *postures* that enable building patient-centered awareness. The 3 postures that we address in this article are *radical relationality*, *collective knowledge building*, and *critical self-reflection*.<sup>14,15,16,17</sup> We generated these postures from examination of other disciplines—including **disability studies**, social justice education, and feminist studies—that aim to foster learners' critical consciousness.<sup>2,16,18,19</sup> Before we connect these postures to concrete design strategies, we define them below.

*Radical relationality.* This posture is adapted from Veletsianos and Houlden's concept of radical flexibility.<sup>14</sup> In relation to learning and caring, radical relationality involves seeing all individuals as connected to one another and considering the multiple and changing roles and responsibilities that exist due to this connection. Individuals have rich histories and experiences that have shaped and continue to shape them throughout their lives. Radical relationality recognizes this interconnectedness and calls for responsibility on the part of the clinician to provide life-sustaining and life-supporting care reflective of the reality of each unique individual.<sup>14</sup> A professional practicing radical relationality would ask patients about not only the nearest pharmacy but also how they feel about taking medicine or if they have cultural beliefs that inform their approach to receiving medicine.

*Collective knowledge building.* For collective knowledge building to occur, medical education must be seen not as a one-way transmissible process but rather as a nonhierarchical discovery process in which students and educators collectively generate answers to problems.<sup>15,16,19</sup> Educators become problem posers and enable learners to think critically about medical issues.<sup>15</sup> Ideally, a collective knowledge-building approach to clinical care is one in which a physician might invite patients to raise questions about their health care or to create mutually agreeable short-term goals.<sup>15</sup> Such a posture might enable students to recognize patients as playing a vital role in their own health.

*Critical self-reflection.* Through reflection, one engages in self-probing approaches to gain insight that can aid one's professional development.<sup>20</sup> In critical pedagogy, the posture of critical self-reflection involves assessing one's personal beliefs and personal and professional interactions so that one becomes aware of the various inequities that are present in the lives of one's patients, society, and medicine as a whole; how personal biases can influence patient care; or even how professionals can support one another in cases of less-than-optimal outcomes (eg, uncooperative patients or inopportune circumstances).<sup>16, 17, 19</sup> Through critical reflection, educators and students can foster empathy, examine their assumptions to manage their biases, and commit to practices that provide equitable outcomes for those they serve.

To weave these postures into online health professions education, we focus on IBL strategies.

### **Why IBL Is Key to Online Capability-Based Learning**

With the rise of online education since the early 2000s, there has been increasing interest in more human-centered instructional strategies. IBL emphasizes a problems-first approach, starting with an examination of what the problem might be. The design of IBL activities tends to follow a sense-making process that allows for exploration in problem identification and strategy formation. According to Lim, in order for "inquiry to be meaningful, the topics need to be developed based on the learners' needs and capabilities."<sup>21</sup> IBL accommodates this tailored approach to inquiry by enabling the addition of new approaches or the adaptation of existing ones as needs arise.

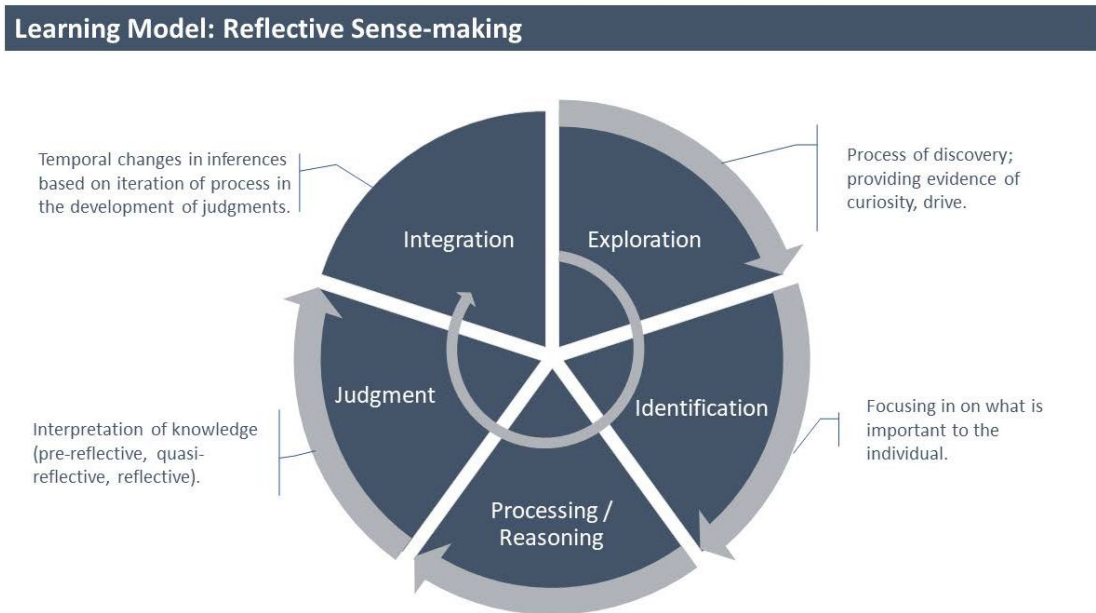
IBL can be thought of as the umbrella framework that includes more specific methods, such as problem-based learning (PBL), project-based learning, and design-based learning.<sup>22</sup> PBL became prominent in medical education curricula that focus on the development of both individual critical thinking and clinical skills and team-based development.<sup>23</sup> IBL as the method of choice to support critical problem-solving skills has the added advantage of enabling a more holistic and flexible reasoning process. For

example, instead of starting a sequence of online activities with a lecture, the curricular design would begin with an exploratory activity, such as an online poll asking learners to select a response to a complex scenario, followed by a brief write-up of the justification of that selection. Once a learner submits this information, immediate feedback would be provided in relation to what their peers have also selected and justified, inviting learners to reconsider their response or justification. Starting with inquiry that fosters the postures of collective knowledge building and critical self-reflection allows learners to become active participants in their learning process.

Similar to a learner’s reasoning being enhanced by awareness of peers’ perspectives, making the right prescription requires understanding of context—here, the context surrounding the patient’s ability to obtain the prescribed medication based on cost or physical or logistical issues (the posture of radical relationality). It is therefore important to design medical education curricula that focus on the development of capabilities based on the 3 postures. Using IBL as the design framework with a focus on the sense-making process allows interrogation of the instructional strategies we currently use and exploration of strategies that we should consider using in capability-based medical education.

Consider the following sense-making model<sup>24,25</sup> shown in Figure 2. This model focuses on the types of cognitive processes that take place as part of problem-solving activities: exploration, followed by identification, processing/reasoning, judgment, and integration, all of which are enhanced by the 3 postures. It represents the sense-making process as a dynamic cycle that culminates in the integration of knowledge. What this model enables us to do is to consider activities that merge instructional and learning strategies.

**Figure 2. Reflective Sense-Making Learning Model**



Text adapted from Lotrecchiano et al.<sup>24</sup>

The IBL strategies we believe align postures and components of the sense-making process are the following: *questioning*, *pattern spotting*, and *adaptive actioning*. These

strategies are drawn from the field of human systems dynamics, which is grounded in inquiry-based methods that have been tested in online learning environments.

- **Questioning.** Questioning has been widely used across disciplines to foster critical thinking about subject matter knowledge.<sup>26</sup> According to Tofade et al, “well-crafted questions lead to new insights, generate discussion, and promote the comprehensive exploration of subject matter.”<sup>27</sup> To support capability development, we also need to focus on using questioning strategies that enable identification, a sense of connection “to some external entity (such as an idea, philosophy, person, group, or organization) that gives some measure of meaning to their identity.”<sup>28</sup> By doing so, we are more likely to enable critical self-reflection.
- **Pattern spotting.** Pattern spotting emerged from research on complex adaptive systems.<sup>29</sup> It is a type of processing/reasoning that involves recognizing patterns by identifying differences, similarities, and connections when trying to make sense of ill-structured problems. Through inquiry, we can home in on the challenges that emerge within a particular space by noticing differences and similarities between current and past problems. By doing so, we are more likely to enable collective knowledge building.
- **Adaptive actioning.** Adaptive actioning flows from pattern spotting. While pattern spotting involves analysis of the past and present, adaptive actioning enables us to consider what actions to take in the future, which takes judgment,<sup>30</sup> and in turn enables critical self-reflection.

### IBL Strategies in Action

We offer the following guidance to make design decisions with intention that will support an inclusive online teaching and learning environment. Tables 1, 2, and 3 present the IBL strategies, along with guiding questions that are aligned with the postures essential to building patient-centered awareness. In addition to these questions, we present examples through which instructors can foster the exploration of these questions in an online course, either in real time (synchronous) or outside class time (asynchronous). While these examples are adapted to health professions education, several of them are based on educational interventions from other disciplines.<sup>18,19,31,32,33,34,35,36,37,38,39</sup>

*IBL Strategy 1: Questioning.* What are you assuming about this patient that might not be true?<sup>40,41</sup>

**Table 1.** IBL Strategy: Questioning

Online synchronous example	Online asynchronous example
<p>Find a historical case in which a professional made an incorrect response.</p> <ul style="list-style-type: none"> <li>• Describe this case to students, removing a few key details and adding some red herrings. Do not inform them that this incident occurred in real life.</li> <li>• Invite students to contemplate possible solutions. If there are multiple answers, invite students to consider what evidence they prioritized to arrive at their response.</li> </ul>	<p>Find 2-3 historical cases in which a professional made an incorrect response. These cases should be similar to ones a health professional would expect but prompt distinct questions a health professional would ask based on the situation.</p> <ul style="list-style-type: none"> <li>• Create professional-patient dialogues based on the cases, such that every patient response elicits another option or set of options from the professional.</li> </ul>

- Reveal the omitted details and retract the red herrings. Do not inform your students just yet that the case describes a real incident.
- Ask your learners what conclusion they would have arrived at with the real facts of the incident. Inquire whether they would have prioritized their evidence differently with extra information.
- Finally, reveal the historical incident and the context behind the incident. Are elements of the incident within learners' experience? How might a professional recognize a variety of diagnostic or treatment possibilities when they provide care?
- What factors can enable a professional to be open to other possibilities? What factors can impede open-mindedness (eg, limited time, understaffing, bias, patient issues)?
- Repeat this cycle until the professional arrives at a conclusion, which may be similar to or different from the historical case.
- Create multiple-choice assessment questions with the help of course software, a survey, or the learning management system.
- Share with learners the different incidents the narrative was based on.
- Instruct learners to reflect on why they prioritized certain questions to the patient over other possible question choices. Learners could also look at the other incidents to recognize other possibilities.
- Allow learners to share their reflections with the class on the group discussion board, and ask them to respond to another peer's reflections, preferably someone who made a different set of choices.

*IBL Strategy 2: Pattern spotting.* Do I assume different outcomes because of a patient's race, ethnicity, sexuality, or linguistic background?<sup>42</sup>

**Table 2.** IBL Strategy: Pattern Spotting

Online synchronous example <sup>a</sup>	Online asynchronous example <sup>b</sup>
<p>Ask students to write a paragraph about a person they know well that includes that individual's age group, occupation, height, weight, and 1 or 2 pieces of personal information (eg, marital status, habits).</p> <ul style="list-style-type: none"> <li>• Inform students that these paragraphs will be shared with their peers.</li> <li>• Every week, assign a paragraph to a student and ask the student to create a narrative about how they ("the patient") acquired certain symptoms related to course topics.</li> <li>• Pair the student in the patient role with another student to act as a health professional who asks the patient questions to arrive at a diagnosis.</li> <li>• After the diagnosis is made, elicit a brief group discussion on why the professional asked those particular questions and phrased things a certain way, and ask the learner who wrote the paragraph and whether they would ask the same or different kinds of questions (and if different, which ones) based on their greater knowledge of this individual.</li> <li>• Invite all students to privately reflect on the scenario and the questions asked and inquire if there's a pattern to how these questions were asked. What is the impact of this pattern on their professional interactions with patients?</li> </ul>	<p>Ask students to keep a weekly log of patient interactions of particular significance to them.</p> <ul style="list-style-type: none"> <li>• They can note salient aspects of the conversation; how they felt before, during, and after the conversation; why they felt this conversation was significant; and how this interaction informed their understanding of being a health care professional.</li> <li>• At specific moments during the semester, ask students to examine their previous logs and to observe any patterns that arise from their logs, either in how they see themselves as caregivers or in the kind of care they provide to patients of different identity markers.</li> </ul>

<sup>a</sup> This activity is good for small groups. <sup>b</sup> This activity was adapted from a study on preserving third-year medical students' empathy.<sup>17</sup>

*IBL Strategy 3: Adaptive actioning.* How might you derive value from a situation involving a bad outcome?

**Table 3.** IBL Strategy: Adaptive Actioning

Online synchronous example <sup>a</sup>	Online asynchronous examples <sup>b</sup>
<p>Invite students to experience some of the difficulties that patients experience that are relevant to health and health care. For example, suggest that students visit communities where many of their patients reside and try to obtain healthy food or reliable transportation.</p> <ul style="list-style-type: none"> <li>• These experiences could be further enriched if students partner with local community organizations as part of the course.</li> <li>• Facilitate conversations on students' experiences, provide literature on why barriers to accessing care exist and how they affect health care, and invite students to ponder how they could remove barriers in their professional role.</li> </ul>	<p><b>Example 1.</b> Faculty can utilize the platform's analytics to identify course materials and activities that students may not be fully engaged in. Doing so allows the instructor to provide additional resources or reach out to individual students to provide more guidance, both with the goal of improving performance.</p> <p><b>Example 2.</b> Whether in lectures, demonstrations, or interviews or on discussion boards, instructors can say "I don't know" with respect to an unfamiliar topic and then respond by researching the topic, whether through recording a screen capture and referring to the medical literature, sending students a mass email answering a question raised on the discussion board, or modeling an interaction in which the instructor and a patient develop short-term goals if the patient was unable to follow the original treatment plan.</p> <p><i>The goal of these examples is to help learners avoid becoming discouraged in the midst of unfamiliar topics or difficult health care situations beyond their control. When instructors model how to respond in the "low-stakes" classroom environment, they are aiming to enable students to respond with curiosity and compassion in unfortunate circumstances.</i></p>

<sup>a</sup> This example was taken from DasGupta et al.<sup>15</sup> <sup>b</sup> This strategy involves the instructor modeling the role of adaptive actioning.

### Conclusion

In capability-based curricula, instructional design emphasizes understanding contextual factors that influence individuals as well as factors that influence how the work gets done within an organization. This design enables an examination of values held at both the individual and the organizational level (ie, nonobservable attributes). The awareness of context and values influences students' approach to and success in developing their capabilities.

In design of online capability-based curricula, we propose a model that synthesizes a competencies approach based on outcomes and a capabilities approach based on cognitive processes through theoretical and practical applications. In this proposed reflective sense-making model, students are trained to recognize symptoms and provide treatment to patients (competencies) while also situating patients' health in their lived experience (capabilities). Through application of the 3 IBL strategies, educators can help students foster postures that promote patient-centered awareness. This holistic awareness, in turn, enables students to better understand the lived reality of their patients and the unique factors that promote or impact their health, as well as to tailor treatment to the individual.

Our future research aims to explore how both competency-based and capability-based curricular design approaches can come together. We hope to examine this framework in relation to online learning within the context of medical education and identify more IBL strategies that support the postures of radical relationality, collective knowledge building, and critical self-reflection, which in turn enhance learning of capabilities.

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**Yianna Vovides, PhD** is the senior director at the Center for New Designs in Learning and Scholarship and a professor in the Program in Learning, Design, and Technology at Georgetown University in Washington, DC. She has more than 20 years of experience in higher education focusing on online education and the use of technology in teaching and learning.

**Jimson Mathew, MA** is the assistant director for online learning in the College of Population Health at Thomas Jefferson University in Philadelphia, Pennsylvania. In this role, he supports the design and development of online programs and courses, ensures the delivery of courses, and produces new instructional assets.

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