

Faculty as Designers of Authentic Learning Projects in Online Courses

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Abstract

This study investigated similarities and differences in faculty's interpretation of authentic learning and how their interpretations were manifested into their design and implementation practices in competency-based, fully online courses. From a theoretical perspective, designing for authentic learning calls for a holistic approach, which considers various aspects, such as real-world relevance, personal meaningfulness, authentic assessment, disciplinary authenticity, and teacher authenticity. In terms of similarities across participants in this study, most faculty interpreted authentic learning as including "real-world" characteristics -- that is, authentic learning is a type of learning that is situated in real-world contexts and is relevant to learners' future careers. In terms of differences, only a few participants emphasized that authentic learning requires removing the dichotomy of a hierarchical classroom environment based on the principles of co-learning. The findings of this study also highlighted examples of authentic learning and challenges associated with implementing authentic learning in competency-based online courses. The study further provides implications for future research and practice.

Keywords: Authentic learning, online instructional design, faculty experiences, public health competency-based courses

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Authentic learning has been discussed as a pedagogical strategy to situate learning in real-world contexts (Brown et al., 1989; Choi & Hannafin, 1995; Herrington et al., 2014; Kreber et al., 2007; Newmann & Gamoran, 1996; Paddison & Mortimer, 2016; Stefaniak, 2020; Wald & Harland, 2017). Particularly, Vo et al. (2018) argued that improving learning authenticity, or in other words, “reducing the gap between what [is] being taught at school and what [is] being used in the real world” (p. 391), is one of the challenges in higher education courses. Further, according to Herrington and Oliver (2000), knowledge should not be regarded just as the final product of education but rather a powerful tool for solving real-world problems. Due to the “real-world” characteristic of authentic learning, learners have an opportunity to apply concepts and problem solve in real-world contexts, which increase learner intellectual engagement. (Baldwin, 2019; Paddison & Mortimer, 2016). Further, Wald Harland (2017) stated that the approach of giving learners opportunities to apply knowledge in real-world contexts allows them to create knowledge and innovate in their chosen professions after graduation. Various empirical studies provided examples of authentic learning in online courses and reported its benefits (Devine et al., 2020; Houke, 2017; Lai et al., 2017; Lee, 2020; Loucks & Ozogul, 2020; Lowell & Moore, 2020; Luo et al., 2017; Ozverir et al., 2017; Peng et al., 2017; Trespalacios, 2017; Vo et al., 2018; Watson et al., 2017).

Authentic learning has a rich array of meanings and interpretations (Cranton & Carusetta, 2004; Lehman & Kovacs, 2019; Shaffer & Resnik, 1999), and may be manifested through a variety of different designs and implementations, such as: (1) project-based learning, including projects with a real client (Deale et al., 2010; Houke, 2017; Fitzsimmons, 2006; Lowell & Moore, 2020; Parry & Reynoldson, 2006; Peng et al., 2017); (2) capstone projects (Collis et al., 2009); (3) studio pedagogy (Clinton & Rieber, 2010); (3) case-based learning (Ferry et al., 2006; Miner-Romanoff et al., 2017; Trespalacios, 2017; Vo et al., 2018); (4) realistic simulated learning activities (Koenders, 2006; Ozverir et al., 2017); and (5) field experiences (Schumacher & Reiners, 2013). In addition to these multiple interpretations and different implementation approaches, online delivery formats may pose challenges for the implementation of authentic learning. For instance, a few challenges were reported in the literature: (1) difficulty managing group work; (2) comparatively high workload due to written communication and time spent on managing discussions; and (3) teaching and assessing interpersonal elements (Smith et al., 2009; Woo et al., 2007). Specifically, scaffolding and interactions are thought to be key in supporting authentic learning in online courses (Collis et al., 2009). However, further research is still needed to detail how authentic learning is designed and implemented in a variety of online contexts (Lowell & Moore, 2020; Vo et al., 2018). Thus, this study is situated in the context of public health training to detail faculty’s interpretation and design practices of authentic learning in online courses.

In the United States, most public health training programs are informed and accredited by national standards (Meredith et al., 2020), with the most recent accreditation standards released in 2016 by the Council on Education for Public Health (CEPH, 2016). These standards set forth competencies that reflect the practical realities of the work of public health professionals, and training programs place a significant emphasis upon authentic learning to meet those national accreditation standards. Regardless of whether they are taught face-to-face or online, public health training programs need to be designed to help students produce artifacts or products that demonstrate the mastery of these competencies. Faculty designing and teaching competency-based courses have an important task to ensure that learning experiences in public health courses help students acquire these required competencies.

This study is significant because it was focused on investigating public health faculty's design and implementation practices to meet accreditation standards while using authentic learning in a fully online graduate program, and how their interpretations of authentic learning were manifested in their courses. Other faculty interested in competency-based education in public health and other content areas can use the findings of this study to understand how authentic learning is conceptualized in the given context. Scholars and practitioners in the instructional design technology (IDT) discipline can use the findings of this study to inform their educational practices in preparing future instructional designers who will collaborate with faculty on the design of online courses in diverse content areas. Instructional designers can also gain insights from this study that would allow them to implement research-driven instructional design (ID) practices (Lachheb & Boling, 2018; McDonald & Stefaniak, 2020; Tracey & Boling, 2014).

Literature Review

Integration of authentic tasks is one of the best practices to effectively engage students in online courses (Britt et al., 2015). Authentic learning materials and activities relevant to practice have been reported to be one of the key design elements in award-winning online courses (Kumar et al., 2019). Additionally, scholars have discussed that authentic learning relates learners to real-world problems and future professions (Baldwin, 2019; Britt et al., 2015; Herrington et al., 2010; Watson et al., 2017). Various authors have reported the benefits of authentic learning in online courses, including improved intellectual student engagement and the acquisition of knowledge and skills that go beyond course learning outcomes (Baldwin, 2019; Devine et al., 2020; Herrington et al., 2003; Houke, 2017; Lai et al., 2017; Lee, 2020; Loucks & Ozogul, 2020; Lowell & Moore, 2020; Luo et al., 2017; Ozverir et al., 2017; Peng et al., 2017; Smith & Kennedy, 2020; Trespalacios, 2017; Vo et al., 2018; Watson et al., 2017). For instance, Trespalacios (2017) investigated students' perceptions of case-based analysis and discussions in an online instructional design (ID) course and concluded that the use of case studies drawn on real-world examples enhanced the students' learning of instructional design. Another empirical study conducted by Ozverir et al. (2017) investigated the use of authentic activities in an English as a Foreign Language (EFL) online class and examined how the use of authentic activities helped students achieve foreign language competency (i.e., B1- intermediate English). The learning activity used within the study was designed based on the key characteristics of authentic learning, such as an ill-defined task that has real-world relevance, which draws students into collaborative and reflective learning. The authors concluded that authentic learning tasks allowed students to purposefully use the target language in context, which contributed to their expansion of vocabulary and pragmatic use of the language.

In another example of authentic learning in online courses, Vo et al. (2018) investigated students' perceptions of authentic learning materials and tasks, particularly their effectiveness in supporting students' learning in an online sociology course. The authors included real-world examples to spark students' curiosity about the topics being covered, such as pieces of news or videos. Additionally, the authors incorporated authentic examples that served as models for students and helped them make a connection between the concepts and real-world issues. Further, the students were asked to complete a hands-on project, which involved collecting raw data from the environment around them. Upon completion of the course, students shared that discussing real-world issues in the course, along with hands-on assignments, positively impacted their learning.

Other empirical studies focusing on authentic learning in online courses claimed that authentic learning enabled more contextually relevant learning (Loucks & Ozogul, 2020; Lowell

& Moore, 2020), which provided learners with opportunities to solve complex real-world problems relevant to a particular professional practice (Finch & Jefferson, 2013; Koenders, 2006; Ladyshevsky & Ryan, 2006; Miner-Romanoff, et al., 2017). That is, authentic learning prepares learners to apply their knowledge and skills to future professional practice.

Practices of Designing Authentic Learning in Online Courses

As there is no single definition of authentic learning (Newmann et al., 1996; Roach et al., 2018; Shaffer & Resnick, 1999; Stoddard et al., 2015; Wald & Harland, 2017), the term is subject to different interpretations (Foug et al., 2019; Herrington et al., 2003). Commonly, authentic learning has been discussed as an eclectic pedagogy that centers on the philosophy of “learning by doing” in real-world contexts (Brown et al., 1989; Choi & Hannifin, 1995; Herrington et al., 2014; Kreber et al., 2007; Newmann & Gamoran, 1996; Paddison & Mortimer, 2016; Wald & Harland, 2017). Shafer and Resnik’s (1999) work introduced the term of *thick* authenticity, which includes the following four meanings: relevance to real-world, authentic assessment, disciplinary, and personal authenticity. Foug et al. (2019) recommended augmenting the *thick* authenticity by including a fifth meaning: teacher authenticity. According to the authors, teacher authenticity refers to teacher’s genuine interest in the subject matter, learning activities, and student success.

There are several frameworks to use when designing authentic experiences in online courses. Herrington and Oliver (2000) offered a framework consisting of nine design elements of situated learning environments. That is, students should be situated in an authentic context that encourages them to apply knowledge the way it is used in real life. In addition, students should be given authentic tasks and have access to modeling, coaching, and expert knowledge. Such a learning environment should provide students with opportunities to consider multiple perspectives, collaborate with each other, and reflect on their learning experiences.

Further, when designing for authentic learning, it is important to ensure that authentic activities center on ill-defined, complex, and real-world tasks. Such authentic tasks should allow students to analyze given problems from multiple perspectives and devise multiple solutions (Herrington et al., 2007; Herrington et al., 2010; Herrington et al., 2004; Herrington & Reeves, 2003). During such learning experiences, students should have access to expert knowledge and modeling while working independently on challenging problems and creating their own solutions (Herrington et al., 2010). Herrington et al. (2004) concluded that the nature and degree of authenticity is the result of the teachers’ and instructional designers’ perspectives and imaginations.

In addition to the above-described design guidelines, Hickey et al. (2020) offered insights into the design of online and hybrid courses that center on real-world cases and are meaningful to students. While the authors did not explicitly mention authentic learning, Hickey et al. (2020) discussed the importance of framing instruction into real-world cases, problems, and examples. The real-world nature of instruction is a key feature of authentic learning (Brown et al., 1989; Herrington et al., 2014; Herrington et al., 2020; Honebien, 1996; Shaffer & Resnik, 1999; Stefaniak, 2020). Hickey et al. (2020) particularly referred to three expansive framing design principles: (1) learners should make meaning of their own learning by themselves; (2) instructors should help learners keep themselves responsible for their learning and participation in the discourse related to a specific discipline; and (3) learners should be agents rather than passive consumers of disciplinary knowledge.

Overall, in authentic learning environments, each learner should be encouraged to find connection with real-world situations, engage in solving challenging problems individually and

collaboratively, and reflect on their learning. While such design guidelines can provide initial insights into the design process, design guidelines or models should be applied with a thoughtful consideration of a learning context and situation. As Gibbons et al. (2014) emphasized, strictly focusing on fitting a specific design situation to a particular design model or prescriptive steps can result in ignoring the uniqueness of a given learning context. Doing so could lead to a stereotyped approach to designing and, ultimately, ineffective learning. Additionally, Fougat et al. (2019) emphasized that authentic teaching exists as an act of balancing between different components of authenticity and that authentic teaching is situational. Therefore, no prescriptive steps could ensure authenticity in a particular course without taking the full actuality of the teaching context into account.

Competency-Based Education

Authentic learning is often intertwined with “competency-based education,” which structures academic content and designing assessments based on specific competencies, i.e., a student’s practical knowledge and skills (Oroszi, 2020). It originated from medical education and health related professions (McGaghie et al., 1978), and it is built around “functions” or competencies required for practice in a given professional setting (McGaghie et al., 1978). A competency-based approach entails innovative ways to design curricula to equip students with strategic skills and practices consistent with community and workforce needs (Coombe et al., 2020; Meredith et al., 2020; Pfeiffer et al., 2013). In the context of public health training, the CEPH accrediting body (CEPH, 2016) strongly emphasizes competencies. For example, students must “assess a specific community’s strengths, challenges, and the desired outcomes that are necessary for community well-being” (p.1). Further, for the competency “Design a population-based policy, program, project or intervention,” students must create a product such as “a research project, plan for a program, policy statement, etc.” (p.2). This can be achieved through “co-production of authentic work (needs assessments, epidemiologic profiles, conceptual frameworks, project plans, grant proposals, M&E [Monitoring and Evaluation] frameworks) with and for community partners.” (Meredith et al., 2020, p. 91). To develop and demonstrate such competencies, students need to have opportunities to bridge theory and practice in authentic contexts through experiential and hands-on learning projects, such as community engagement or service-learning projects (Anderson et al., 2020; Gakh, 2020; Cribbs et al., 2020; Hou, 2009; Pendergrast 2020; Rhodes et al., 2020).

The Current Study

Overall, the literature highlights authentic learning as one of the key components for successful online courses. In practice, authentic learning design principles emphasize student-centered learning environments that allow each learner to find connection with real-world situations, engage in solving challenging problems individually and collaboratively, and reflect on their learning. Taking into the consideration the above key points from the literature review, the following research questions guided the study:

- (1) What are similarities and differences in faculty’s interpretation of authentic learning in competency-based online courses?
- (2) What practices do faculty use to design authentic learning within their competency-based online courses?
- (3) What challenges do faculty report in designing and teaching integrated authentic learning for competency-based online courses?

Methods

Context of the Study

The study took place within several graduate competency-based public health courses taught within the Master of Public Health (MPH) online program at a large midwestern university. The program includes a variety of concentrations such as Public Health Administration, Environmental Health, and Epidemiology; all are accredited through CEPH and thus are required to align courses competencies with assessments. MPH students share core required courses and specific courses based on their concentration. Faculty members are encouraged to collaborate with instructional designers to ensure the alignment between competencies, course learning objectives, and assessments. The School of Public Health at the given university has a support unit which provides instructional design support for faculty designing online courses. As the MPH program is also offered online, the courses were initially designed as online courses, and were studied in 2019 before the university pivoted to full-scale remote instruction due to COVID-19. All courses were delivered through a university supported learning management system, were 16 weeks long, and had a maximum enrollment of 20 students.

Study Design and Instruments

To answer the above listed research questions, this study followed a mixed-method explanatory sequential design (Creswell & Clark, 2018), using both a quantitative survey and a qualitative interview approach. The goal behind using quantitative and qualitative methods was to provide rich and insightful answers to the posed research questions (Fraenkel et al., 2011). To ensure trustworthiness of the study, we recruited two faculty from the targeted participant group from the School of Public Health to pilot test both the survey and interview protocol. Pilot testing of the instruments allowed us to refine them by making changes such as formulate questions more clearly and avoid leading questions.

For the quantitative portion, we developed a questionnaire based on the literature about authentic learning (reviewed above) to capture all faculty members' insights about authentic learning in an efficient way). The questionnaire asked participants to indicate years of teaching online, content area, and level of teaching, undergraduate or graduate. It also included questions related to how they would describe authentic learning, types of authentic learning they implemented in their courses, and questions to indicate their level of agreement/disagreement with the following statements:

1. Authentic learning tasks should situate knowledge and skills in the context of future professional use.
2. Authentic real-world projects relevant to the context of public health help prepare students better for their future job.
3. Authentic learning is more suitable for graduate-level courses.
4. It is difficult to integrate authentic tasks in my content area.
5. Authentic learning is more difficult to integrate in online courses than in face-to-face courses.
6. Authentic learning provides opportunities for students to apply their knowledge in real-world contexts.

7. Authentic learning immerses students into practices and social interactions relevant to their future profession.

For the qualitative stage of data collection, we designed a semi-structured interview protocol which built from the survey results. That is, we analyzed the survey data, reflected on the responses, and then devised interview questions that would allow participants to elaborate further on authentic learning and their experiences designing and implementing it in their online courses. Questions in the interview protocol were organized into three sections: (1) questions related to participants' background (e.g., educational, professional); (2) questions related to their interpretations of authentic learning; and (3) questions regarding examples of authentic learning in their courses, including the design and implementation. After conducting the interviews, we did member checking with all participants, with two additional coders checking the qualitative data analysis.

Study Participants

Through the school's public health website and university course catalog, 22 out of 60 public health faculty were identified as teaching online graduate competency-based courses and were invited to participate in the study. The recruitment email explained why they were invited to participate in this study, the purpose of the study, what participants would be asked to do (such as complete a quick questionnaire and a follow-up interview, if they preferred), and a study information sheet. Thirteen of the 22 faculty responded to the questionnaire and agreed to participate in the study. The questionnaire also asked whether they would like to participate in a follow-up, semi-structured interview, and ten faculty agreed to participate in the interview. We were unable to link survey and interview responses due to the anonymity of survey respondents. We refer to the two overlapping groups of respondents as "survey respondents" (N = 13) and "interview participants" (N = 10).

All 13 questionnaire respondents had varying years of teaching experience, including teaching competency-based courses: Six faculty had one to two years of experience, three faculty had three to five years of experience, three faculty had six to 10 years of experience, and one faculty member had more than 10 years of experience. The faculty taught a variety of graduate courses in behavioral, social, and community health, biostatistics, public health administration, environmental health, physical activity, and recreation, park, and tourism studies.

Table 1 summarizes key characteristics of interview participants. While most (8 out of 10) had prior online teaching experience, it was the first time that they designed and implemented authentic learning in online competency-based courses (CEPH courses) that were subject to accreditation. One faculty member is a professor of gerontology courses, who offered her gerontology courses as elective in the MPH program. This faculty member's course was designed based on the competencies put forth by the Academy for Gerontology in Higher Education (AGHE).

Table 1
Characteristics of Interview Participants

Faculty/Participant #	Years of Teaching Online	Title	Content area
1	2	Adjunct Instructor	Public Health Administration
2	2	Professor	Behavioral, Social, and Community Health
3	5	Associate Professor	Epidemiology and Biostatistics
4	20	Professor	Behavioral, Social, and Community Health
5	10	Professor	Public Health Administration
6	3	Associate Professor	Public Health Administration
7	3	Assistant Professor	Behavioral, Social, and Community Health
8	6	Associate Professor	Physical Activity
9	6	Associate Professor	Physical Activity
10	3	Full-time Instructor	Environmental Health

Data Analysis

Descriptive statistics were used to analyze the data gathered from the questionnaire. Saldaña’s multiple cycles of coding (2015) process was used to analyze the interview data. The purpose of using the Saldana method (2015) was to look at the data holistically and identify trends and patterns in aggregate responses. In the first cycle of the data analysis, we used concept codes to code a transcript for each interview. Concept codes were words or short phrases that symbolically represented a suggested meaning for the statement of each participant. These concept codes were the result of our interpretative act of the data and not based on a pre-existing coding book or a coding sheet. After we coded statements for each participant, we used axial coding to group similarly coded data, reduce the number of codes, and construct conceptual categories that were broader. Further, we grouped themes generated from multiple participants into more abstract categories to generate an overarching theme.

Findings

RQ1: What Are Similarities and Differences in Faculty’s Interpretation of Authentic Learning in Competency-Based Online Courses?

The majority of survey respondents (92%) agreed with the statements that authentic learning should have the following four characteristics: (1) be related to the real world; (2) be personally meaningful; (3) model disciplinary practices; and (4) be aligned with assessment. Despite this overall agreement, when they were provided the opportunity to further elaborate in further survey and interview responses, some faculty emphasized some characteristics more than others, as discussed below.

Across both the survey and interviews, most faculty strongly emphasized that authentic learning should be situated in real-world contexts and related to future profession. Survey responders indicated that authentic learning should situate knowledge in the context of professional future use (77%), should provide opportunities for students to apply their knowledge in real-world contexts (92%), and should immerse students into practices and social interactions relevant to their future profession (85%). Interviewees shared similar insights. For instance, interviewees stated:

Real-world is different, and that's really what I mean by authentic learning too is that we've moved this false dichotomy, we crashed the false dichotomy between real-world and classroom.

Authentic learning is a type of learning that is relevant to their career, real life, it's situated in a real-life situation. It's not constructed artificially for the purposes of a classroom.

In interviews, four faculty also emphasized the meaningfulness of authentic learning, which they clarified by stating that it should be personally meaningful for students. For example, one interviewee stated:

Authentic learning is a learning space where learners can find their own learning path and identify with something because of their own self that they bring to the learning space. It is authentic in that way, and that it is true to me, the learner.

Two interviewees also brought up an idea of learning community and culture of co-learning when talking about authentic learning. For instance, an interviewee said:

Authentic learning to me is learning that is practical, that is applied to real world settings, that is iterative, meaning that everyone contributes to the learning community, and the curriculum develops from that organism that is a group.

RQ (2) What practices do faculty use to design authentic learning within their competency-based online courses?

Across the 13 survey respondents, 85% indicated that they most frequently designed a project with a real organization as a type of authentic learning in their online courses. In addition, most survey respondents indicated that they designed case-based instruction based on real data/events (69%), community engagement or service learning (62%), or research into practice projects (62%).

Interviewees' insights allowed us to analyze how their interpretations of authentic learning manifested in their design and implementation practices, resulting in two key themes. First, most interviewees discussed how to situate authentic learning in real-world contexts and students' future profession, and second, four interviewees discussed how authentic learning could be made personally meaningful for students. These two themes are explored in more detail below.

Theme 1: Designing Activities Relevant to Students' Future Profession

When further discussing the design of authentic learning, interviewees stressed the importance of making learning activities in the course relevant to students' future careers. In this regard, designing courses in compliance with the competencies put forth by the public health professional organizations automatically made learning relevant and authentic. Particularly, one interviewee said:

You just have to be creative about how to create assignments to map on these competencies that are authentic in the eyes of the students. I think that aligning the learning activities and tasks to the competencies automatically makes them relevant to what is seen as something important to the public health practice.

Interviewees stated that competencies guided the design. As such, interviewees mentioned that they broke down competencies into learning objectives. Further, it was important they made sure competencies, learning objectives, learning resources, activities and assessments were aligned. For checking for alignment, five interviewees shared that they created a design matrix with instructional designers. The design matrix served as a key design document used as the master plan for the course design process, aimed at ensuring a strong alignment between learning outcomes, assessments, and course competencies while integrating authentic learning in competency-based online courses. As such, one interviewee stated that working with instructional designers allowed them to ensure such alignment. Specifically, one interviewee stated:

I feel I've been very advantaged in the last five years working with instructional designers who have helped me better relate designing these activities to specific course learning outcomes rather than just sort of vaguely associate them with the goal of a course. I think what I heard was how much they [students] appreciated the real-life experience, how much they liked getting out of the kind of the format online, week to week.

Interviewees were asked to share examples of authentic learning projects they implemented in their online competency-based courses. In designing their competency-based courses, interviewees relied mostly on asynchronous activities, such as asynchronous discussion. For example, one interviewee gave an example of a class discussion in which an interviewee/faculty member encouraged students to relate the concept (e.g., life course perspective) to their own lives and incorporate their own experiences in their discussion.

Similarities in interpretation of authentic learning among interviewees manifested in their practices of designing and implementing application projects. As such, interviewees gave the following examples of application authentic learning projects: (a) Projects with a real organization, (b) case-based instruction rest on real data or events, and (c) research into practice.

When it comes to designing the above listed authentic learning, interviewees shared that it was crucial that they were able to find sites (e.g., real clients or projects) for such authentic learning projects. Interviewees stated that they first explored options available in communities nearby campus, such as local hospitals, assisted living residences, public health organizations, or local legislatures. In cases when most students were in different places, students were tasked to look for organizations in their own communities with which to work on a project. If students could not find a client to work with, faculty provided necessary resources to help students find a client via distance.

Case-based instruction with real data or events included analysis of various cases related to real-world situations. It included discussions centering on real-world issues happening in the field of public health, such as recent news or issues taking place at a community, state, or

national level (e.g., outbreaks of infectious disease and the role of vaccination, access to clean water, health care access, Medicaid/Medicare extension). Faculty gave two examples of class discussions revolving around the most current and pressing issue in public health. They also needed to account for online nature of learning environment. They and their students needed to leverage online resources, such as virtual tours, online video conferencing tools for getting connected to organizations/clients and using the CourseNetworking platform for interacting and discussing real-world issues.

Theme 2: Designing Personally Meaningful Authentic Learning from Students' Point of View in the Environment of Co-Learning

In ensuring personal meaningfulness of learning, interviewees emphasized the importance of considering students' feedback from previous semesters in the design process. In addition, students should be surveyed before the semester or right at the beginning of the semester to identify their interests and what particular public health issues mattered to them. Thus, in courses, authentic learning was designed based on students' expressed interests captured through a survey and through an open dialogue between students and faculty.

One interviewee stated that their design practice was to blend course competencies with students' interests and personal experiences. They stated that it might have been easier to do in their policy and politics class, since topics were relatable to students on a personal level. For instance, in one of the online competency-based classes, the interviewee assigned students to prepare a policy brief that advocated for an issue that was dear to students (e.g., they had personal experience with a specific health issue). This interviewee stressed,

I think authenticity in learning is really more about the learner in the environment and what the environment provides to link in with the learner.

One of the key differences in interpreting authentic learning among interviewees was the idea of co-learning that two interviewees stressed. As such, one interviewee stressed that at the heart of designing authentic learning was removing the dichotomy of a hierarchical classroom environment based on the principles of co-learning, with students learning from the professor and the professor learning from students. This interpretation of authentic learning was manifested in discussion-based activities, in which a faculty member constantly involved students to share their input and perspectives regarding concepts and topics being discussed, as well as allowing them to lead discussion. One such activity was a synchronous mind-mapping activity to facilitate students' metacognitive abilities. Specifically, interviewees stated:

As a professor, if I am not a part of the learning, then I feel like I'm not doing my job well. I rarely in conversation use the word learning or teaching as separate ideas. I talk about how I engage in the process of learning and teaching. I often will share things with my students about the joy I have in learning alongside them and being taught by them. So, it should be authentic to everybody because it's authentic interaction.

I think back to this whole hierarchy of learning, yes, I will evaluate their work. They're going to evaluate the work, too. They do a lot of co-evaluation, and then they become really sharper doing that. But they teach me something, too. And that's the pieces we call co-learning in a learning environment with opportunities for applied development.

RQ3: What Challenges Do Faculty Report in Designing and Teaching Integrated Authentic Learning for Competency-Based Online Courses?

Most survey respondents (62%) indicated that authentic learning was more difficult to integrate in online courses compared to face-to-face courses. Thematic analysis of the interview data provided further insight into this finding. The following three themes were constructed regarding challenges of designing and implementing authentic learning in online competency-based courses: (1) time commitment and pre-planning; (2) different geographic locations of students to arrange authentic learning; (3) lack of real-world, face-to-face interactions with students.

Theme 1: Time Commitment and Pre-Planning

Since faculty taught competency-based courses that were subject to accreditation and considered high-stake courses, they reported the need to collaborate with instructional designers on course design. Instructional designers' expertise was especially necessary to ensure the alignment of learning activities with assessment, as well as to ensure the authenticity and relevancy of projects in meeting the required competencies. Further, because the authentic learning was to be delivered in an online format, the design process required a considerable time commitment for pre-planning. As two participants shared, pre-planning did not work with certain authentic learning tasks, such as discussing the most current news, issues, and events in the field of public health. Thus, as two faculty specifically noted, faculty should be willing to leave some activities unfinished and complete them as those current events progressed and resolved.

While this challenge is not unique specifically to the design for authentic learning in online courses, it is worth noting the courses were designed around specific competencies put forth by the accrediting body. As one of the participants specifically pointed out, knowing that those competencies were put forth based on what was seen as "must have" by public health professionals helped them feel more reassured about their design and teaching practices. Therefore, the majority of participants did not report any factors that would impede designing and implementing authentic learning, but they referred to the limitations of the online delivery mode when implementing authentic learning.

Theme 2: Different Geographic Locations of Students to Arrange Authentic Learning

Additionally, faculty stated that it was difficult to organize and arrange authentic learning activities when students were in different geographic locations. For example, a faculty member shared the following observation:

In face-to-face classes, it's possible to do some field trips, for example, to local communities where students meet with community members and organizations within that community. Students could be exposed to more real-world health issues than what they chose to focus on in the online course. However, in online, students still work in their community with community members and organizations, but on projects they find.

Further, synchronous online activities were crucial for authentic learning tasks for collaborative knowledge construction in online authentic learning environments (Herrington et al., 2010). That is, one of the participants used a synchronous mind-mapping activity with students in class to help them organize their ideas about a policy brief assignment. Collaborative knowledge construction was more challenging to do in an online course, since students were in different physical locations and time zones, thus, not everyone was able to participate.

Theme 3: Lack of Real-world, Face-to-Face Interactions with Students

When it comes to teaching integrated authentic learning, three faculty noted that it was not more difficult to do than in face-to-face courses. The other seven faculty stated that teaching integrated authentic learning online was more challenging than in face-to-face classes. Even though authentic learning implies an open-ended nature of projects in which contexts and tasks should not be simplified, students still need to have access to expert knowledge and coaching (Herrington et al., 2010). According to the faculty, didactic materials, such as lectures, served as expert knowledge and coaching for students, and were easier to deliver in a face-to-face setting, since it allowed for live interactions. That is, due to the lack of real-world interaction with students, faculty felt there were not enough opportunities to get to know students well and monitor to what extent students comprehended and saw value in a particular authentic learning project. Particularly, a faculty stated:

There's always a disconnect, especially for undergrad students, because even though we put it there, if they don't read it, they don't get it. In an online environment, you have to rely on them to see it, read it, comprehend it, and you don't get that face-to-face engagement.

To help students navigate through the authentic learning, faculty indicated that students still needed to be provided with clear structure and scaffolding through well-composed and well-presented instructions on a course site. As one faculty noted:

An LMS needs to be well designed, presented well to the students. Also, clear directions and expectations should be included, and at the same time leaving room for students to create their own projects.

Discussion

The purpose of this study was to investigate public health faculty's design and implementation practices to meet accreditation standards while using authentic learning in a fully online graduate program, and how their interpretations of authentic learning were manifested in their courses. One of the key findings was that there were similarities and differences in interpreting authentic learning among participants. The key similarity in interpreting authentic learning across participants was the real-world characteristic of authentic learning. That is, authentic learning is a type of learning that is situated in real-world contexts and relevant to learners' future careers.

Similarity of interpretations of authentic learning could be because participants/faculty designed in the same public health learning context. Interestingly, as described in the findings, participants gave different examples showing that authentic learning projects differed in their nature. This may speak to the importance of core teacher beliefs (Ertmer et al., 2012) and core design judgments (Nelson & Stolterman, 2014) which are unique to each faculty.

Participants also offered different interpretations of authentic learning, such as authentic learning is a type of learning that is personally meaningful. This interpretation of authentic learning manifested in aligning course projects with student interests. This is a difficult balance to strike when designing authentic learning—that is, designing learning experiences that should be both personally meaningful and discipline-relevant for students who could come from diverse backgrounds. This practice presents a challenging design situation or problem (Nelson &

Stolterman, 2014), and in such challenging design situations, there is no one right design solution and outcome. Additionally, when using feedback from previous semesters, it is important to avoid stereotypical representation of student population in each course. A generalized student persona might not capture unique characteristics and experiences of learners, which raises the issue of equity and inclusion.

Other different interpretations of authentic learning included the absence of power hierarchy between faculty and students. That is, authentic learning provides a co-learning environment in which students learn from professors and vice versa. This is something that was not highlighted in the reviewed literature, as the major focus was placed on students. This interpretation of authentic learning maybe related to students being adult learners in this context. We speculate that professors who treat their students like peers may increase the buy-in from the students and may also increase student engagement in online courses.

It is worth noting that in the given context, differences in faculty's interpretation of authentic learning did not appear problematic. That is, whether students worked with a real client or analyzed cases based on real data, such projects were aligned with accreditation standards. It could potentially be problematic if differences in interpretation of authentic learning led to design and teaching practices not up to par the accreditation standards. It is also worth noting that this study was situated in competency-based courses. For us, this means that competencies set forth by professional organizations provided cognitive offloading to some extent, particularly in regard to thinking through and researching what was relevant and, thus, authentic. However, at the same time, it takes effort to design various authentic learning that allows students to make meaning of it. In addition, faculty needed to strike a good balance between instructor support and student autonomy over their learning. For us, the authors of this study, the creative aspect of design that faculty noted implies an iterative process. This iterative design process is inevitable in finding a balance among needed instructional support, access to expert knowledge (Herrington et al., 2010), and student agency of their learning experience. Additionally, Correia et al. (2010) stressed the challenge between balancing instructional support and allowing students to take ownership of their learning.

Another interesting insight that struck us was the need for a physical environment for authentic learning in the given fully online courses. While discussing the design practices, the faculty noted that they needed to find a physical site for students or direct them to resources or advice or a contact to find a place for their authentic learning. This finding resonates with Herrington's et al. (2010) design framework, which asserts that, in online authentic learning environments, a learning context should provide "a physical environment which reflects the way the knowledge will ultimately be used" (p. 20). At the same time, Herrington et al. (2003) discussed the importance of *cognitive realism* in online authentic learning environments. That is, they specifically discussed how the major emphasis should be placed upon the design of authentic, intellectually stimulating tasks in virtual reality environments, rather than recreating the real setting through graphics and interface designs. If following the same logic for the design of authentic learning in online courses, should this learning experience be tied to a specific physical environment? This invites the following questions: (1) Why was there a need to ground online authentic learning experiences in a physical face-to-face environment? In this case, while students have physical presence with clients, are they still engaged in an online authentic learning experience? (2) To what extent do students have equitable learning experiences if they have unequal affordances in finding an organization to treat as a client? (3) What online resources are easily accessible and could be leveraged to promote equity among students?

Additionally, we find it noteworthy that the support and role of instructional designers was noted by the faculty members. The role of instructional designers was specifically noted in ensuring the alignment of competencies and assessments, as well as ensuring the relevancy and authenticity of learning experiences. This is an important insight as to how faculty can be supported in their institutions when designing online courses, for instance, designing courses aligned with national standards and that are subject to accreditation.

Implications for Research

Findings of this study highlight the link between interpretation of the term of authentic learning and design and teaching practices. According to the study findings, faculty embedded their meaning of authentic learning into the design and teaching of their courses. We can see the variance in their design practices based on their interpretation of authentic learning. Therefore, future research can investigate the role of faculty in designing authentic learning and the core teaching beliefs and judgements they bring into the design of authentic learning. The way practitioners operate with terms might be different from the way they are presented or explained in the literature, thus, a closer look into the practitioner's professional activities can provide insights as to how practice can inform theory and where theory lacks practitioners' perspectives.

Based on the theory, multiple aspects should be considered while designing authentic learning. However, in practice, this might not be easy or possible to carry out. It is also worth noting that context plays an important role in shaping certain design and teaching practices. Therefore, continued research that provides detailed accounts of design practices of authentic learning in online courses in a variety of content areas will enrich the body of knowledge regarding instructional design theories for authentic learning, e.g., importance of factoring in learning contextual nuances and differences.

Investigating creative ways of designing and implementing authentic learning that present equitable, inclusive, and sustainable learning design solutions could provide further insights as to how such experiences can still be done in the case of emergent situations. Further, continued research on completely online authentic learning could enrich instructional design theories with additional approaches as to how to support authentic learning.

Implications for Practice

It is important to know that the tension between theory and practice exists. Concepts and terms might not be used the same way in practice as they are defined in theory. Therefore, it is crucial to understand and value one's background, experiences, and perspectives while working on the course design projects. Instructional design is a multi-step process involving many stakeholders (e.g., faculty, instructional designers, administrators, and students). Therefore, it is essential to have methods and tools that help navigate this multifaceted process. As the first step, it is important for key stakeholders to agree conceptually and tactically how to design and implement authentic learning. For instance, if interpretations of authentic learning vary greatly among faculty that results in inequitable learning experiences among students, it might call for the need to clearly operationalize authentic learning and strategies implementation at a school or a department level.

In the given case, the design process revolved around competencies that were to be met for accreditation purposes. Although such competencies defined what students were to master by the end of each course, during the design process faculty still needed to be creative and build intellectual ties between authenticity and personal meaningfulness in student learning. In case a course is not built on competencies, practitioners can use this study to get insights regarding the

design of authentic learning and to gain ideas for authentic learning for their content areas based on the examples provided. As emphasized by scholars (e.g., Lowell & Moore, 2020; Vo et al., 2018), more studies that provide examples of how authentic learning is designed and implemented in online courses are needed for both further research and practice. This study provides faculty interpretations of authentic learning, specifically in online courses, and the challenges associated with designing and integrating authentic learning in online courses, while presenting examples from online public courses in the public health context.

Study Limitations

This study is situated in the context of graduate public health courses; thus, it is limited in its scope. Depending on the context, authentic learning can take many forms, and it is crucial to investigate how authentic learning is designed and integrated in other content areas and contexts. Also, the sample in this study is small which does not allow drawing generalizable results. Additionally, we acknowledge social desirability bias as a limitation of this study, meaning that the study participants may have reported only success stories omitting information about any failures in the design or teaching process.

Conclusion

With the growth of online learning, efforts from both scholars and practitioners are made to make online learning experiences as meaningful as in face-to-face settings. Authentic learning has been regarded as one of the most effective pedagogical approaches for that purpose. However, due its elusive and multifaceted nature, the term *authentic learning* has multiple interpretations and meanings. While in theory it is clear that authentic learning should situate students in settings in which they would use their minds and skills in the same way they would in the real world, in practice it is not as straightforward. While in the given context, designing real-life projects that require students to apply knowledge can be seen as a given, it comes with certain caveats. Therefore, thorough consideration of a learning context, which also includes design judgments, teacher core beliefs, and learners is paramount when designing and implementing authentic learning.

Conflict of Interest

The authors declared no conflicts of interest.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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