

WebQuests in Inquiry-Based Learning in Online Assessment of Teacher Education: From a Theory to Practice

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Abstract

Teaching and learning activities in higher education institutions (HEIs) have been subject to unique challenges brought on by the coronavirus disease 2019 (COVID-19) pandemic. Although conversations surrounding inequality in learning during this period focused on the digital divide between and within countries, university administrators and classroom teachers were also concerned about ensuring equity in online assessment and evaluation for learners. The chapter offers an analysis of the theoretical underpinnings of Inquiry-Based Learning (IBL) and equity principles by elaborating on the process and its appropriateness as an assessment method for teacher education courses within the contextualized Emirati experience. In this chapter, the author reflects on the implementation of a model of a teacher education program in higher education where performance assessment is conducted through IBL and WebQuest. The importance of equity in assessment during online learning is highlighted, as well as the principles of an equitable online assessment.

Keywords

Equity, Online Assessment, Performance Assessment, Task-Based Learning, WebQuest, Teacher Education

1. Introduction

One of the outcomes of the coronavirus disease 2019 pandemic has been the monumental shift to online learning using learning management systems in HEIs. The capacity of the sector to adapt to online assessment and evaluation has become a fundamental requirement for its survival (Guangul et al., 2020). Although equity in higher education was a common trend, the pandemic re-

newed interest in the phenomenon due to the transition of teaching and learning to online platforms (Salmi, 2021). However, much of the attention focused on pedagogical instruction, which was not always linked with assessment (Willems et al., 2019). This suggested assessment was not a normal phenomenon or poorly designed for online usage, further highlighting inequities in education. While numerous works have highlighted progressive instructional approaches during the crisis (Guangul et al., 2020; Salmi, 2021; Halaweh, 2021), equity in higher education continues to be a complex, highly debated component. Some of the concerns have been the inclusion of traditionally marginalized groups based on gender, race, sociocultural backgrounds, and language (AlShamsi & Alsheikh, 2022; Willems et al., 2019) and their relationship with digital technologies. In countries such as the United Arab Emirates (UAE), advancing equity in assessment means that HEIs must use data to evaluate their practices to determine various approaches that ensure equally high outcomes for all students. This involves the removal of barriers such as socioeconomic status, language, and other dimensions and contextualizing specific contexts to benefit both learners and teachers. The method of assessment was also important, especially in the online environment. Therefore, an embedded discovery learning process in teacher-training programs that can easily be amalgamated into an online domain is posited to be useful in reducing inequities.

Incorporating performance assessment as part of the teaching and learning process through the IBL framework takes various forms (AlShamsi et al. 2022; Quirke & AlShamsi, 2023; AlShamsi & Quirke, 2023).

This chapter reflects on the use of performance-oriented evaluation to ensure equity in learning and online evaluation and highlights inquiry-based learning (IBL) as a flexible teaching and learning approach. Incorporating performance assessment through IBL using WebQuest, a task-based tool, maximizes equity among students by providing learners with the opportunity and latitude to self-direct their learning through an IBL framework. This seemed appropriate to promote a positive learning environment and an effective assessment process (AlShamsi, 2016), especially in an online environment (AlShamsi, 2022).

2. Inquiry-Based Learning

IBL is a form of active learning that requires a learner to apply critical thinking and problem-solving skills to contextualized and authentic questions and follow real-life scenarios while completing their investigation (Savery, 2015). IBL provides opportunities for learners to develop hypotheses and test them, hopefully making discoveries in the process (Pedaste et al., 2015). Unlike direct instruction or unassisted discovery, the concept positions the student at the center of the teaching and learning process and develops higher-order thinking skills (Purwasi, 2019). The primary goal of IBL is to encourage students to follow the process of researching and become independent learners by seeking answers to their questions (Chung & Behan, 2010).

This sociocultural theory stems from the work of Vygotsky (Vygotsky, 1978) and contains three main themes: mental processes included in task interactions and collaborations, the required developmental approach for the mental processes, and actions mediated by the available resources (Wertsch & Toma, 1995). Vygotsky referred to mental processes as higher-order thinking skills to perceive and process our world, supported by social experiences and interactions (Vygotsky, 1978). Language proficiency is crucial here since it is used in social interactions to convert into inner speech that organizes thinking skills or mental processes. Therefore, social communications and interactions organize our mental processes, including the ability to reason, self-assess, reflect, and develop the habits of thoughts and actions required for each situation or task. Any cultural differences or habits among students must be considered to exclude any inequality in learning (Rogoff et al., 1993). Moreover, Cole stated that instructors must create a clear understanding of the various social actions that trigger students' individualized mental processes or higher-order thinking skills that pave the way for better learning opportunities (Cole, 1985). This sociocultural perspective perceives learning as an inner dialogic process of negotiation of meaning while completing a specific activity, in which novices work collaboratively to acquire expertise upon task completion (Forman, 1996). Mental processes or higher-order thinking skills are shaped or altered by the available resources and tools (Vygotsky, 1981). These resources consist of readings, discourses, assessment artifacts, language, web tools, etc. Certainly, what students can understand and process with these tools is different than what they can achieve without them (Gee, 2008). Vygotsky referred to this understanding as "internalization". For example, the appropriate level of language proficiency may lead to informed reasoning through comprehensive dialog activities.

Unlike unguided discovery learning techniques, IBL is highly scaffolded and finds its antecedents in constructivist learning theories such as Vygotsky's zone of proximal development and Piaget's constructivism theory of learning. IBL supports the premise that new knowledge should connect to preexisting knowledge for effective learning to occur (Dennick, 2016). All learning requires the construction of knowledge and learning (Hmelo-Silver et al., 2007). Hence, Vygotsky's theory regarding scaffolding is a crucial element in making complex tasks more accessible and manageable (Vygotsky, 1978).

According to Haruehansawasin and Kiattikomol, scaffolding is pivotal to IBL because it helps support learners until they can independently perform the tasks Haruehansawasin and Kiattikomol (Haruehansawasin & Kiattikomol, 2018). Under this premise, scaffolding can take the form of encouraging conversations, allowing learners to collaborate on projects, or providing any other foundational support.

2.1. Process of IBL

Different teaching strategies use different approaches to understand how a student constructs knowledge. The IBL approach contends that the student learns best when deeply involved in the knowledge construction process, rather than

having an instructor provide a completed construction in their delivery. Nevertheless, such unguided inquiry can leave the student devoid of the tools to evaluate different ways of constructing knowledge or the validity of different sources or research techniques (Hmelo-Silver et al., 2007). This can result in levels of inequity because some students may have higher natural or artificial resources than their counterparts. By contrast, a highly scaffolded IBL requires high-level student engagement in the knowledge construction process, as well as the provision of the necessary resources to enable this. These are important steps in guarding equity (Haruehansawasin & Kiattikomol, 2018) and supporting a knowledge-building economy.

In their meta-analysis of 72 studies to investigate the effects of IBL, Lazonder and Harmson (Lazonder & Harmson, 2016) concluded diverse effects from different types of guidance. The question of guidance revealed more specific or heuristic approaches, which can be strong for student knowledge construction, although it depends on the student. Different types of assistance can be provided at different stages of the project. For instance, at the introductory stage, general information can be provided; during the inquiry stage, students receive feedback; and on the completion of the project, a reflective discussion would be helpful along with simulations. One likely outlook is that as students conduct more types of IBL, they will improve, and the type of guidance they need will also change (Acar & Tuncdogan, 2019).

Pedaste et al. (Pedaste et al., 2015) conducted a meta-review of inquiry-based e-learning that revealed five general stages of the process, despite the use of different terminology for each stage. The first stage is orientation, in which a topic is introduced. Here, the student is provided with specific pedagogic resources through class teaching, reading, or other means, such as content-stimulating questions. The theory is explained, and the learner is in a receptive phase. The second stage is conceptualization when the problem is defined. Here, the student engages more than in the first stage to construct inquiry questions, determine what needs to be known, and perhaps generate hypotheses. The third stage is the main investigation phase. The student is primarily engaged while the actual research is conducted. Nevertheless, this is usually performed within a specified framework, and resources are provided. Evidence is collected and analyzed, and data interpretation identifies patterns. The fourth stage is the conclusion stage, in which the students use the data obtained to answer their research questions and perhaps discover new questions that may have arisen during the process. To complete the learning experience, the student enters the final phase, a discussion, when they reflect on their learning with peers and instructors. Depending on the nature of the course and the instructor's remit, an additional stage might be added, in which the knowledge constructed during the IBL process is applied to new situations or problems.

Students benefit as they “arouse their curiosity, challenge their conceptions or misconceptions, explore potential solutions, and reorganize and reconstruct

their current knowledge and understandings to develop explanations based on the evidence they derive from their own investigations” (Gillies, 2020, p. 4). The inclusion of teaching tools such as WebQuest can effectively scaffold students’ learning by guiding learners through a process of inquiry where they must follow certain stages to arrive at valid conclusions.

2.2. WebQuests and IBL

Bernie Dodge and Tom March designed WebQuests, a technology-based teaching and learning tool, in 1995 (March, 2004). WebQuests are based on a constructivist philosophy in which students construct their knowledge through cooperative learning within a scaffolding of teaching and learning (Johnson, 2005). The tool provides students with the necessary scaffolds through the provision of resource links and has been established as a useful model for IBL. Generally, WebQuests are considered a highly effective instructional method through which instructors build technology-rich activities while supporting cooperative learning and performance-oriented assessments (Noordin et al., 2017).

WebQuest can increase student motivation and encourage higher-order thinking (Awada et al., 2020; Liang & Fung, 2020). Besides promoting student engagement, which can increase cognitive development, WebQuest is useful for group learning to generate specific results. For instance, peer group interaction can influence degree completion, and enhanced teacher-student relationships are connected with improvements in students’ intellectual development and critical thinking (Kaur & Kauts, 2018). Repeated rounds of feedback, which are possible within WebQuest, can potentially strengthen the relationship between teachers and learners. The success of the technique has been documented in preservice teaching education (Abu-Elwan, 2007; Aydin, 2016), as has its use in enabling assessment practices to facilitate lifelong learning.

2.3. Assessment and IBL

IBL and assessment are highly interlinked and are the core of instructional activity. Regardless of the type of learning, assessment plays a pivotal role in measuring the progress of student learning. An essential component of the teaching and learning process is assessment, which gathers, interprets, and analyzes data on student performance. The caliber of classroom assessment techniques dictates the caliber of learning (Khan, 2012). However, depending on the type of learning method—traditional or non-traditional—an assessment’s forms, designs, and effects differ. Assessing students’ progress toward the three main learning objectives of inquiry-based science education—conceptual understandings of science, scientific inquiry skills, and understandings of inquiry—in the context of inquiry is thus necessary. (National Research Council, 2000)

By using high-level questioning and discovery to draw connections to real-world situations, inquiry-based learning engages students in a way that is different from standard teaching and evaluation techniques. It’s a method of

teaching that pushes students to solve problems and learn through experience (Mieg, 2019). Because IBL is flexible and open-ended, it necessitates complementary evaluation strategies that are less formal and more informative in order to provide teachers and students with phase-by-phase progress reports on their learning. Deep comprehension, interpretation, assessment, and complex communication are fundamental components of inquiry-based education (King et al., 2009). It was believed that being able to recite information from memory in an exam was a sign of knowledge back in the days of traditional teaching methods, which required students to memorize facts and figures (Friesen & Scott, 2013). In an inquiry-based learning approach, on the other hand, the data is not provided; instead, it is discovered, assessed, and considered in order to fully gauge the deeper understanding that the inquiry process has brought about.

Effective assessment procedures enhance student learning and direct instructional strategies (Willms et al., 2009). If our goal is to genuinely center education on learning, then we should center our assessment around giving students feedback and letting them evaluate their own learning (Barnes, 2015). This unconventional method of assessment works well with inquiry-based learning. Three key components of assessment were identified by Barron and Darling-Hammond (Barron & Darling-Hammond, 2010) as necessary for effective integrated learning. These components are: 1) the development of intellectually challenging performance assessments; 2) the provision of tools and assignment guidelines for students' progress evaluations; and 3) the regular use of formative assessment to inform instructional decisions all along the way.

Inquiry-based classroom assessment adopts a more comprehensive viewpoint on the rich learning that the standards need. It poses questions about what each student understands and knows, what is unclear or lacking, and what the pupils can accomplish with their knowledge. Students' abilities to formulate and clarify questions, create plausible explanations, organize and carry out investigations, and use facts as evidence to support or refute their own answers are all determined by their assessment. In its broadest sense, it assesses students' ability to appraise the types of questions scientists look into, comprehend the goals of those investigations, and rate the quality of the information, justifications, and arguments (National Research Council, 2000). When inquiry is used, assessment takes place continuously. The process of inquiry is equally as significant as the outcome of inquiry-based learning. At every step of the inquiry process, students acquire and exhibit a variety of skills, and it is these talents—when precisely linked to curriculum expectations—that can be evaluated.

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3. Online Evaluation and Assessment

The Covid-19 pandemic forced a shift from face-to-face teaching to online learning. For most institutions, the immediate emphasis was on introducing some form of blended teaching to address students' immediate concerns (Slade et al., 2022). However, institutions soon concurred that students' capabilities and readiness also needed to be assessed (Halaweh, 2021).

3.1. Performance Assessment

Performance assessment involves response tasks that measure students' performance in skills such as critical thinking and problem-solving. Performance tasks are valuable because they relate to real-life tasks that students will do in the work situation for which they are training. It enables education to be specifically tailored for real-life domains and enables a foundation to assess the requisite skills (Shavelson et al., 2019). Critical thinking skills are pivotal in the 21st century and crucial for preservice educators because they must be able to recognize and transmit pivotal information during instruction. Additionally, performance assessment is appropriate to make sure equity occurs during online learning. Performance assessment depends on the children being able to do the task to show their capability instead of merely how they write about the task or reproduce facts about it. Notably, it is that specific skill that is being tested, not additional skills such as essay writing or exam technique (Jeschke et al., 2019).

When designing and applying performance assessments, four main aspects should be considered (Linn & Millar, 2005) to ensure rigor in implementation. First, instructors need to ensure standardization of content and implementation so the same conditions can be replicated by other groups of students to complete the same assessment and their performances compared. For example, determine week-by-week content delivery, the time for each task completion, the platform in the case of online assessments, and access to resources. Second, tasks should involve stimulus materials or information to measure the targeted construct, such as problem-solving and critical thinking. Third, the subtasks should follow the main task description and scoring criteria to guide learners to the desired response or product. Fourth, the weight given to the assessment should be considered to provide clear educational goals.

3.2. Equity Principles

Although technology has provided students with a substantial opportunity to engage in learning in the transition to online schooling, it raises equity concerns. For instance, there are concerns about disproportionate access, i.e., the variation in students' abilities to use technology and their opportunities for access at home. Home environments sometimes present challenges for students, especially those with special needs, limited English proficiency, and social and family issues (Guangul et al., 2020; Salmi, 2021). Not unexpectedly, underrepresented university cohorts are present in online learning and include indigenous stu-

dents, first-generation college students, the disabled, and those from low socioeconomic backgrounds (Phillips & Colton, 2021).

Equity frameworks such as Siegel's "McCes, Sounds Like Success" focus on equitable assessment opportunities for students with limited English language proficiency (Siegel, 2007). To this end, they identify the five main principles of this framework support:

- 1) match the learning goals and the language of instruction;
- 2) be responsive to English learners, both linguistically and culturally;
- 3) challenge students to consider difficult ideas;
- 4) elicit student understanding; and
- 5) scaffold the use of language and support student learning.

The first principle matches learning goals and the language of instruction. English is the language of instruction for core subjects and higher education in the UAE (AlShamsi & Alsheikh, 2020; AlShamsi, 2021; AlShamsi, 2022). A fair online assessment is required to provide students with equitable opportunities to showcase their knowledge on the subject (Hewson, 2012; Lam, 1995). The second principle is to be holistic English learners, i.e., conflating linguistics and culture. When considering the range of students' abilities and needs, instructors should plan for equitable assessments that use various methods to fulfill their needs (Siegel, 2014). This endeavor requires designing high-quality assessments. Every student should be supported in their learning and have the opportunity to acquire the appropriate target knowledge. The third principle is to challenge students to consider difficult ideas. The level of this challenge requires an increasing level of inquiry. The fourth principle is to elicit student understanding. Performance-based assessment supports real-world problem-solving activities that probe students' understanding through critical thinking (Shavelson et al., 2019). The fifth principle states that assessment should scaffold the use of language, support student learning (AlShamsi, 2016; Aydin, 2016), and highlight the crucial role it plays in facilitating content learning.

Institutional support is pivotal to providing equity in online learning. Stone (Stone, 2017) indicated that institutions must recognize online learning as core and have an institution-wide appreciation of the diversity of the student cohort and quality standards for online education. Xie et al. (Xie et al., 2018) emphasized the need for standards and quality oversight to ensure equity for diverse cohorts, e.g., students with disabilities. Teacher presence is also vital in online learning to provide students with a sense of belonging to the course and improve student retention. One significant difference between online and in-person teaching is the difficulty of providing "affective" support to students in the form of encouragement that boosts morale beyond mere informational or technical input, which online course leaders must consider (Mullen & Tallent-Runnels, 2006). However, the time demands on teachers are often unrecognized in the institution's workload models and should be considered in course planning.

Curriculum, content, and delivery should be specifically designed for online education. These should be regular, structured contact and proactive program-

ming between the student and the institution, not only reactive responses to students' questions. Learning analytics can help personalize learning. The institution must facilitate collaboration between academics and other staff so that students can receive support when necessary (Stone, 2017).

The literature abounds with instances of inequitable online learning. For example, Chong (Chong, 2018) examined the question of equity for students who were underserved by their educational environments. To that end, the research rationalized a mode of inclusion among Finnish educators that is atypical in the field. Ethnicity and gender were also important factors that affected students' perception of online learning (Ashong & Commander, 2012). Particularly noteworthy were the varying attitudes toward asynchronicity by ethnicity, whereas gender affected attitudes toward teacher support, student interaction and collaboration, personal relevance, authentic learning, and student autonomy. When compared with synchronous online learning, asynchronous online instruction provides learners with the opportunity to work at their own pace (Lowenthal et al., 2017). However, although both genders were equally confident in using online learning environments, female students may be more willing than their male counterparts to engage in online discussions and value online learning for its opportunities to collaborate and communicate with other students from diverse backgrounds (Al Jahromi, 2019; Coldwell et al., 2007). This flexibility provided by technology can help students from low socioeconomic backgrounds succeed in their learning (Devlin & McKay, 2019).

3.3. Assessment within the UAE Context

In the local UAE context, educators have recognized that the qualities and characteristics of students involved in online learning may be critical but less important than the social and cognitive aspects (AlShamsi, 2021). This is in addition to teaching roles to support full access and presence in online learning environments (Parahoo et al., 2013). The sudden shift to online learning should not hinder the fulfillment of students' needs. Instead, each student should be assured the opportunity to learn and be assessed fairly, despite their performance level or personal and socioeconomic characteristics. WebQuests are posited to be the appropriate tool to facilitate this.

As a professional institution, the mission of the HCT is to provide comprehensive teaching and learning opportunities to ensure equitable access and evaluation for all students (Mullen & Tallent-Runnels, 2006). Online learning tasks can increase the equity of the measures of all students' intellectual development. Designing for equity requires a re-examination of what is measured, how it is performed, and how students are affected by the assessment design and its procedures. It also requires thorough attention to how assessment results are used to inform decisions about students and their programs. Although all students are assessed on important subject knowledge concepts and skills in agreement with course learning outcomes, equity implies that assessments must be sufficiently

flexible to enable all students to demonstrate their knowledge of the subject and be able to apply it in real-life scenarios.

3.4. Modeling within the UAE

The instructions given were to accommodate student needs when implementing online learning and assessment. Of course, this raised the problem of, on the one hand, having a high level of interactive learning experience using the available technologies and, on the other hand, having various learning needs in the classroom. Of course, this was for the benefit of diverse female students enrolled in one of the teacher education courses. In this scenario, it was decided to use WebQuest as a process or task-based process to highlight students' online learning practices and performance-based assessment using an IBL approach. Indeed, this led to further considerations: first, can integrate diverse evaluative approaches for learning by doing and continuous assessment help minimize inequity? Second, how can we know about the effectiveness of the process-based approach in performance-based assessment?

The HCT's transition to online learning using diverse digital platforms during COVID-19 resulted in thousands of students participating in various e-activities and programs (HCT, 2020). The HCT's Digi-campus online learning platform was constantly monitored and evaluated to ensure that it provided maximum benefits for students and staff (HCT, 2020). However, assessing students in online higher education courses has required a progressive approach since the pandemic. Assessments had three main goals: to support students' learning, achieve accountability, and provide certification, progress, and transfer (Archer, 2017). The question was: How can we ensure equitable assessment practices and ensure that all learners achieve learning objectives?

Educators at HCT's education division endeavored to provide an interactive, authentic, and equitable experience for preservice teachers. The division operated through different Campus Program Team Leaders, who oversaw the curriculum and assessment implementation. These leaders were supported by System Course Team Leaders, who monitored the implementation of the curriculum closely and followed up with their team of instructors who taught the same course. Continuous and final assessments were consistently updated to ensure standardization. However, equity in assessment remained a challenge for many educators, including myself, especially during online learning. Advancements in technology do not eradicate the many challenges concerning online learning and assessment. For example, some learners found it difficult to maneuver the online learning space, and others had no access to the technological infrastructure necessary for learning (Salmi, 2021). Therefore, incorporating a teaching and learning methodology that adopts a process-based approach to assessment was an urgent need for the instructor and students.

The course presented in this chapter was considered suitable for IBL because the educational context in the UAE supported a particular research problem,

which is exploring the gap in parental involvement in children's learning. Because of the emphasis on family involvement in children's education, it was appropriate that preservice teachers discover its efficacy and the conditions under which it might be made more effective. Moreover, IBL allowed students to implement a scientific method to form questions, collect and analyze data, and reach conclusions. Preservice teachers needed to understand good research methodology because their ability to conduct action research was an increasingly important part of ensuring ongoing improvement in teaching. Moreover, the likelihood of benefiting from or being required to conduct action research in their teaching environments is continuously increasing in the knowledge-based environment. To ensure equity in practice, the instructor had to consider the validity measures in this context.

3.4.1. WebQuest and IBL in the UAE

WebQuests and IBL work best in an environment where learners are self-motivated and accept learner autonomy. When applied as a motivational approach to teaching and learning, WebQuest ensures rigor through IBL and process-based learning and assessment.

The restrictions arising from the pandemic affected students differently, from challenges to study to the impossibility of in-person assessments. Female students were more affected than male ones, which made it more difficult for them to achieve their former levels of attainment. This was due mainly to the imbalance between gender family responsibilities and other factors that more adversely affected female students in the UAE (AlShamsi, 2021). Consequently, a method of assessment that would prove equitable across the entire student cohort was necessary, without disadvantaging students who needed more flexible arrangements and support to cope with changes.

A key objective of the curriculum-refining process, undertaken in the education division, was to achieve both a curriculum and assessment suitable for an online learning environment. Effective assessment for different students must be developed with care to ensure proper scaffolding and maintain continuous improvement. This was especially necessary for students with low language proficiency or special needs. Conversely, high-achieving students should be provided with further scaffolding and enrichment activities that extend their learning to ensure that their capacity is fulfilled. The same rubric is used for all levels of students. Nevertheless, the process of continuous feedback and the two-way communication between the instructor and the students could create an environment of appropriately varied performance assessment.

3.4.2. Description of the Course

1) Course Background

Building Learning Communities is an early childhood education course offered at the HCT for preservice teachers in their sixth semester, within the Bachelor of Early Childhood Education program across all HCT campuses. This

course emphasizes the family as the child's foundation and framework for the transmission of culture, language, attitude, and values; identifies the impact of context and culture on the family's ability to function effectively as an institution; and generally, uses real-life experiences and direct contact with stakeholders to collect information for their tasks. This course has been taught using a remote learning model since the beginning of COVID-19, and WebQuest was consequently implemented in this course.

2) Procedures

A WebQuest was designed and supported by an IBL model to complete the first-course evaluation. The course, Building Learning Communities in Early Childhood Education, is delivered to students virtually. Using ecological system theory, students were intended to examine the role of Emirati families in children's education. They had to use WebQuest technology to conduct and present their research findings. Students were divided into groups of three and instructed to produce an oral presentation based on their findings. Students undertook two assessment tasks for this two-part presentation. First, the students had to present ecological system theory, including an introduction, a history of ecological system theory with three to four research studies on parental involvement (one on the UAE), and an explanation of all five ecological system levels: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. Second, the students had to use Bronfenbrenner's Ecological Systems Theory (Shelton, 2018) to respond to, "What is the impact of home life on the schooling for an Emirati child?" This involved conducting a survey or an interview and then explaining how the systems influenced the family's impact on education, with an assessment as to whether the impact was positive or negative and the reasons supporting that decision. Finally, the students had to highlight issues and challenges and provide suggestions. The students' presentations had to demonstrate an understanding of this theory, including knowledge of its history and explanations of its content. Their presentations included images, graphics, and tables with the presented data and conclusions. The students collected data through surveys and interviews with classroom teachers and families when they were out on their teaching practicum period. Three of the course's learning objectives were to be fulfilled by these presentations: 1) Implement various theories and/or frameworks describing the influence of family structure, culture, and socioeconomic status on children's education; 2) examine parental roles and various types of family involvement, including the challenges experienced and their impact on children's education and academic success; and 3) critique family involvement programs in terms of developmental appropriateness, cultural competence and awareness, sensitivity to family structure, and demographics. Students were required to fulfill certain HCT graduate outcomes to perform this task, namely, communication and information literacy, critical and creative thinking, global awareness and citizenship, technological literacy, self-management, independent learning, and teamwork and leadership.

The students received, through the WebQuest platform, introductory and motivational material as an introduction to the research task. They received information on the ecological system theory and how the UAE education system invests in and encourages the development of the whole child, which is why research into the efficacy of families in this endeavor is important. The second section of the WebQuest provided information on the task the students were required to complete. It provided a schematic of Bronfenbrenner's ecological model of child development and described the steps for students to conduct and present their research. Links to other educational resources were provided and organized online. The students had to create research tools (e.g., interviews and/or questionnaires) and received instructions on how to use Bronfenbrenner's ecological systems theory. The final presentation was outlined, including a list of topics to be covered in the presentation and its format. A pro forma table, for instance, was provided as an example of how to organize data. This provided the students with extensive guidance and encouragement, as well as the freedom to develop research tools. To ensure that students understood the activities, they were encouraged to ask questions at all stages. The assessment criteria and feedback rubrics were also presented to the students and clearly communicated to them. Students were given the chance to critically reflect on their experience before, during, and after the WebQuest. This data was collected and analyzed to determine the extent to which WebQuest achieved the desired objective of equity in learning. To ensure preservice teachers' achievement of the CLOs, several validity and reliability measures had to be considered.

3.4.3. Maintaining Validity and Reliability in Online Assessment

Validity describes the adequacy or appropriateness of interpretations and uses of assessment results. Considering the current calls for performance-based assessments, validity involves consequences, fairness, transfer and generalizability, cognitive complexity, content quality, and content coverage. To ensure reliability in online performance assessments of inquiry, I had to ensure students' performance was an indicator of their true competency level, as highlighted by the CLOs. Therefore, the scoring criteria were revised and established by a group of professionals and showed the consistency of raters during a series of moderation sessions. The following aspects of validity were applied when teaching this course in this new environment:

1) Link Course's Learning Outcomes with Classwork and Assessment

Discussions with the course leader and alignment of the CLOs with classwork and assessment were essential tasks that instructors addressed to ensure valid assessment results during online learning. Every week, the instructor designed the classwork assignments and instructional activities to align with the CLOs of the week. At this stage, the assessments have been discussed with the STL to ensure alignment with the CLOs and program learning objectives (PLOs). All course materials were selected to be aligned with the CLOs and PLOs and were carefully geared to serve the weekly online sessions. For instance, assessments

were planned to measure proficiency in the material and concepts covered in the online session, ensuring the quality and coverage of the content of the curriculum.

To ensure alignment and to increase the validity of an online assessment, STLs and the course team based their work on backward design when planning for the course material delivery, instructional activities, classwork assignments, and assessments. CLOs undergo curriculum refinement procedures to ensure that they serve the main goals of the course and the PLOs. Subsequently, materials and textbooks were selected to create online lessons to achieve the CLOs and PLOs. Course assessments were stated in the course literature before the course started. Nevertheless, transforming to online learning encouraged me to adopt inquiry-based instructional activities to implement performance assessments, paving the way to the final course assessment. This type of learning helped me to ensure constructive alignment between the CLOs, instructional activities, performance-based assessment, and the final assessment (Biggs & Tang, 2011).

2) Cognitive Domains in the Assessment

During the curriculum-refinement process, STLs ensure that different cognitive levels of Bloom's taxonomy are included in the course's CLOs. Consequently, these CLOs are closely linked to the assessments of the course. Each assessment task evaluated the level of the student's abilities.

Instructors should also ensure that assignments and assessments are aligned with the various styles in which students learn and that they avoid questions that examine lower thinking skills. For instance, if assessment questions measure the lower levels of Bloom's taxonomy (e.g., by calling for students' retrieval of facts), the students will depend on working around these lower levels of learning abilities (e.g., through memorization and retrieval of facts). There are multiple authentic assessment approaches used to achieve the higher levels of Bloom's taxonomy (e.g., using rubrics designed to evaluate authentic projects) that can be adapted to online learning and online IBL e-formats instead of depending on multiple-choice quizzes. In many HEIs, test security is often considered a challenge associated with online assessment, which is expected to measure learning at the higher levels of Bloom's taxonomy (HCT, 2020). Measures are implemented to discourage cheating because more authentic assessment approaches increase the difficulty for students to provide the same response as their partners. This ensures the appropriate cognitive complexity of the task.

For assessment results to be valid, all students must have adequate opportunities to learn the material and prepare for assessments. The pandemic highlighted the persistent achievement disparities across income levels because students without access to digital technology or internet service had difficulty completing their work. Faculty and university leaders must intervene to determine appropriate accommodations to ensure that all students can learn.

Additional changes to the assessment are imminent in response to the pan-

ademic or any other crises. Issues of quality, such as validity, reliability, and fairness, should be constantly considered and never compromised.

3) Measures Implemented to Ensure Assessment Equity

The following procedures were undertaken to achieve more equitable assessments during online learning:

1) The assessment was aligned with the class content taught weekly and vice versa. Balance was created between the CLOs and PLOs by using performance assessment to divide the final summative assessment task into smaller activities to be completed after constructive feedback. Rubrics and evaluation criteria were shared and discussed with the students before the assessment to improve their abilities.

2) To reduce the focus on the screen, some students received extra activities and readings to be completed, while other students' needs were accommodated. This ensured fairness in practice.

3) At the beginning of each session, I communicated the CLOs to students. For the assessment, I shared the CLOs and the rubric used for the assessment with their students (Suskie, 2018). The task description was explained in detail, and online comments, as well as the session recordings, were provided. All goals, expectations, and task instructions were provided in the same file as the final rubric. These documents helped increase students' self-confidence as their performance was evaluated in various steps. Platforms such as Blackboard, used in the HCT, presented a well-established methodology that incorporates tools for authoring online assessments and provides solutions to support the effective integration of online assessment and other platforms such as WebQuests. These solutions engage students and ensure effective information organization and delivery (Meyer et al., 2016).

4) Various measures were applied to achieve the final task that the students were required to submit by the end of the course. For example, the students were involved in their research in addition to discussions, debates, group work, problem-solving, data collection, analysis, and presentations.

5) I provided examples and models for the student's assessment. Besides the appropriate scaffolding, they were provided with examples of tasks that would fulfill the expectations. This was followed by a discussion surrounding the example's strengths and how it could be improved. The more support, guidance, feedback, and scaffolding provided to the students throughout the inquiry, task, or process, the more likely they will be to fulfill the CLOs.

6) While students worked within their groups during the Blackboard breakout sessions, the instructor continuously joined them to respond to questions and provide immediate feedback.

7) To widen the learning opportunity and reduce assessment anxiety, informal meetings were scheduled after or during each task to provide detailed feedback for students. Furthermore, scheduled formal meetings for individuals or groups of students are held to evaluate each stage, considering the accommodated needs of individual students and ensuring that the learning objectives are fulfilled.

Implementing IBL helped in engaging and encouraging students to complete the performance assessment steps that are required. Showing trust in their abilities influences their confidence and ability to succeed (Anderson, 1988). Positive communication with instructors helped students reach their learning potential (Fleming, 1998). Therefore, I communicated assessment results to students with full transparency and provided feedback based on a rubric, and under each rubric criterion, specific comments were given. The students were not compared with their colleagues or other students studying the same course on other campuses; instead, feedback was individually tailored and designed to encourage the student. I reminded the students of the important skills that they were expected to develop during the course to prepare for their upcoming semester. These included research skills, data collection, analysis, and the ability to interpret results. This practice is necessary to prepare the students for success in future semesters and educate them on the value of transferable skills. Students were involved in ongoing decisions during the assessment process, such as deciding on a specific subtask to complete the final assessment. Moreover, I had to seek students' opinions on how the assessment was implemented. For example, when planning the IBL process, I would assess its appropriateness by using online class polls and other methods. I would then provide sufficiently detailed comments while discussing the assessment instructions with the students. All these steps were implemented to ensure that all students could be successful in their particular tasks. Student feedback enabled me to revise the course assessment tools, pedagogy, or both and increase confidence in administering equitable assessments (Suskie, 2018). This ensured the transferability of results and reduced the consequences for students.

3.4.4. Design of the WebQuest

To achieve equity in assessment, differences among students are considered, especially when designing the WebQuest and the task page. Methods of accommodating differences between students allow different types of submissions in an assessment or allow students to respond in different ways to the same question. This is to reflect their different levels of content knowledge or complexity. Such design features are crucial to ensuring the best content knowledge possible for the individual student, as well as the achievement of CLOs. All my students were female students, whose context of an inequitable burden of household chores and other aspects often made their study situation more difficult than that of their male counterparts. WebQuest allowed for this type of flexibility following a model developed by Alshamsi (Alshamsi, 2022) and AlShamsi (AlShamsi, 2023) that integrates WebQuest's main parts, IBL, and cognitive aspects of learning:

Part 1: The WebQuest task is introduced to students with encouraging and motivating words. It sets the stage and provides background information. In this case, the student's enthusiasm and commitment to best practices are acknowledged, as well as their study of ecological system theory. In the UAE, students are told that the Emirati family and the government "place great efforts in sup-

porting and developing the whole child” (Create a WebQuest, 2004). However, families differ, and children within the same family can be uniquely affected by different systems. This information prepares the students for the specific, forthcoming task.

Part 2: WebQuest focuses the students on the task. In this case, the task is collaborative. Students are to create a presentation in groups of three on ecological system theory and the impact that home life has on Emirati students’ schooling. A schema of Bronfenbrenner’s ecological model of the child’s changes over time is provided. The following process was implemented: Appropriate scaffolding is provided with the necessary support, such as including links to resources as well as a record of the specific topics covered in the demonstration. This promotes the learning, concepts, and skills necessary for the students to complete the task. The students need to create research tools to answer the question, “What is the impact of home life on schooling for an Emirati child?” How they are to use Bronfenbrenner’s ecological systems theory is specified, as well as the form of their final presentation.

Part 3: Specific instructions are provided for each stage of the final performance task; thus, the students understand how to prepare and present their information. A spreadsheet is provided as an example of how students might organize their data coherently. The students have to perform their research and provide answers to the questions, but they must understand how to perform this task. In this way, the assessment can adjudicate the particular abilities and content mastery of students according to their effort, without situational inequities affecting the final assessment. Additionally, students have the framework for querying specific parts of the instruction should they deem anything unclear.

Part 4: The criteria according to which the students will be evaluated, as well as the feedback rubrics, are presented to the students. The weighting, due date, and length of presentation are specified. This helps the students understand which aspects of the presentation require the most attention, depending on what the instructor will evaluate.

Part 5: WebQuest concludes by providing students with an opportunity to reflect on their work. The purpose of the assessment task is explained as follows: to practice and learn research skills, add value to teaching best practices in the UAE, and participate in fulfilling the priorities of the UAE’s National Agenda. By placing the assessment task in this broader context, students can appreciate that their work is more than an arbitrary process necessary to pass a course but is instrumental in their future careers and their country’s overall efforts to improve education.

4. Implications and Recommendations for Future Research

Future of Assessment Equity through WebQuests as IBL Tool

This chapter demonstrated that to ensure equity, educators must use multiple sources of evidence appropriate for the students to appreciate and act based on

the students' perspectives. Maintaining a high level of transparency in the assessment results and actions implemented based on productive feedback is a targeted practice. Educators must provide evidence-based changes that address context-specific equity issues, and institutions must empower faculty, administrators, and staff to explore the equity gaps affecting students during online learning. Assessment data can then be used to close these gaps and leverage the students' voices and experiences.

Based on this practice, the suggestions for best practices in online learning are as follows:

1) Ensure internet access for students is available during online learning. This is an essential requirement for full online engagement. Many students have access to the internet through their mobile phones, but full learning engagement and completing classwork are difficult when using the small screens on phones. Moreover, some online learning platforms, such as Microsoft Teams, Zoom, and Blackboard, are inaccessible daily through a mobile phone.

2) Teachers must provide asynchronous versions of the learning activity. Online lessons scheduled at a specific time may be difficult for students to attend regularly because of various family environments. Creating asynchronous versions enables students to access material at any time through the recorded version and review material not originally understood.

3) The entire activity, task, or project should not be immediately moved to an online environment. Replicating the entire learning task online may be problematic for students with low English proficiency or special needs. Specifically, exposing students to more screen time after class may be unproductive when students are already expected to spend hours after the scheduled classes in front of the computer screen.

4) Reduce the amount of reading time. Instructors should be selective when deciding on a task or setting project reading materials. Selecting only those that focus on the skill or competency that the students are expected to master is important. Additionally, instructors must provide high-interest opportunities such as including students in IBL or incorporating social media to teach certain topics and have students express their mastery of the topic. Here, personalizing the learning experience is important. In online learning, students are expected to lead their learning through assignment completion, participation, active learning, and class engagement (Hanover Research, 2015), and they must be appropriately motivated to do so.

5) Educators should create and find diverse resources appropriate to students' various needs. Lessons and activities should match the students' requirements. Helpful strategies include creating enlarged PowerPoint presentations for students with visual issues, creating podcasts for main lessons, and employing appropriate resources to facilitate the learning of both high-achieving students and those with low English proficiency. The individual tailoring of courses may be an overwhelming task for one lecturer; consequently, creating communities for the

curriculum and resource developers might be necessary.

6) Multiple opportunities for students should be created for guidance and assistance online, using live chats, conferencing, and social media. A recorded version of the activity should be created, and students who need additional instruction or support should be supplied with a choice of multiple communication events. It might be instructive to document student-teacher interactions for other students who might have the same questions while using multimedia such as WhatsApp or other online chats. The proper permissions and consent should be acquired.

7) Instructors should not assume that students can immediately transfer their skills to coursework activities. For instance, many students are highly adept at using social media to view advertisements and for social purposes. However, this does not mean they should be expected to use their social media apps to create coursework tasks. Presenting online and completing assessment tasks can be intimidating for students with language proficiency issues or different needs.

8) Finally, to fulfil equity and fairness in online learning environments, tasks must be designed to provide students with a sense of achievement, challenge higher-order thinking skills, and provide a window into each student's content knowledge and understanding. Just as professional instruction accommodates differences in how students construct knowledge, good assessments must also accommodate differences in how students think about these.

5. Conclusion

The shift to online teaching and learning because of the pandemic is likely to continue despite the regression of the phenomenon. The inequities among underserved groups will sadly continue, although the pandemic made the challenges more apparent. Accordingly, educators must continue to focus on issues that strengthen equity in the evaluation and assessment processes.

This chapter highlighted the use of WebQuest for IBL in an early childhood education course in the UAE and demonstrated the benefits and availability of useful tools and strategies to promote equity. WebQuest enabled students to connect outside the classroom and create opportunities to learn implementable inquiry skills. The tool allowed students to continue the discussion about the parts of the tasks provided on the WebQuest page and refer to specific sections. To date, student performance appears to be better than that observed in the system-wide results of the same course. Thus far, it appears that WebQuest as part of IBL is highly effective for ensuring equity in online learning when used intelligently. However, such efforts to ensure equity require more time and effort from instructors than is currently provided. Clearly, this approach requires constant vigilance on the part of the lecturers based on the considerable time and effort required to implement the course design and ongoing feedback. If anything, the move to online learning may require that students receive more individual attention than in the traditional classroom. Moreover, there may be im-

plications for future staffing and organizational requirements. However, if students are to receive the best and most equitable education and provide quality service in their careers, these limitations must be overcome.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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