

Doctoral Student Perceptions of a Project-Based Learning Approach in an Instructional Design Course

Madelon McCall 
Baylor University
madelon_mccall@baylor.edu

Ryann N. Shelton
Baylor University
ryann_shelton@baylor.edu

Brandy N. Crowley 
Emporia State University
bcrowley@emporia.edu

Kenley Ritter
Baylor University
kenley_ritter1@baylor.edu

ABSTRACT

The purpose of this single case study was to determine how a project-based learning approach to instructional design supported education doctorate students' acquisition of new knowledge and practical application of skills in their current and future professions. Participants included 58 students in an online EdD instructional design course. We found that 72% of students credited the design project for scaffolding their learning about instructional design and 80% saw an immediate application of the instructional design project to their current professional roles. Further, 93% of students could foresee the application of new knowledge and skills to future professional opportunities. This study has implications for those who teach EdD courses and are interested in providing a project-based approach to content acquisition and teaching skills students can apply in their professional organizations, both current and future.

KEYWORDS

Project-based learning, instructional design, EdD students, professional application

INTRODUCTION

University students often assume the role of receiver of knowledge due to lecture-style, teacher-centered instruction, which can create a gap between what students learn in class and what they need to learn as a professional (Alorda et al., 2011; Guo et al., 2020; Holmes, 2012). Doctoral students are typically older and may be accomplished professionals; therefore, the instruction requires a different approach from lecture style. Adult learners value their experiences and may view lecture-style teaching as "rigid, uncompromising requirements of authoritative, conventionalized instructions of teaching" (Knowles et al., 2011, p. 38). Adults learn best when they see a need for course content, can make a relevant application to their professional responsibilities, and have opportunities to socially construct new knowledge (Knowles, 1980; Kolb, 2015). Project-Based Learning (PjBL) is an active learning strategy that is student-centered and inquiry-based, a stark difference from lecture-focused instruction (Beier et al., 2019). PjBL allows learning opportunities in which students become active

participants inspired by constructing knowledge through the application of new knowledge and skills (Bereiter & Scardamalia, 1993). This constructivist-based approach to solving relevant problems is the foundation of PjBL (Barrows, 1986).

The decision to teach an online EdD instructional design course using PjBL, which was the focus of this study, was based on the effectiveness of using student-centered, non-traditional experiential learning with adults, including the application of course content to their professional roles. This instructional design course is completed in an online EdD in Learning and Organizational change program, which was designed using the Carnegie Project on the Education Doctorate (CPED) Framework (Perry, 2013). The inclusion of the instructional design course in the course sequence supports student understanding of first identifying a problem in their professional practice that can be resolved through the implementation of instruction. In the following literature review, we examine the difference between PjBL and problem-based learning (PBL), share research related to PjBL, and focus on PjBL in online higher education courses.



New articles in this journal are licensed under a Creative Commons Attribution 4.0 United States License.



This journal is published by Pitt Open Library Publishing.



This journal is supported by the Carnegie Project on the Education Doctorate: A Knowledge Forum on the EdD (CPED) cpedinitiative.org

impactinged.pitt.edu
Vol. 8 No. 3 (2023)

ISSN 2472-5889 (online)
DOI 10.5195/ie.2023.366

LITERATURE REVIEW

As an instructional method, PjBL has its roots in problem-based learning (PBL). PBL is based on work by Barrow (1986), who utilized real-world problems to promote experiential learning with medical students. PjBL and PBL are experiential learning models designed around identifying challenging real-world problems to construct solutions through investigation and critical thinking (Beier et al., 2019; Brundiers & Wiek, 2013; Savery, 2006; Thomas, 2000). This type of experiential learning engages students to cultivate their understanding of a topic by applying specific methods and principles (Thomas, 2000). In PBL, however, students focus on a pre-defined problem that may not reflect real-world or relevant challenges (Strobel & Barneveld, 2009; Walker & Leary, 2009). PjBL differs from PBL in that it culminates in a practical student-constructed product situated in a real-world problem (Blumenfeld et al., 1991; Brundiers & Wiek, 2013). Situated learning theory, or situated cognition, is an instructional approach that connects what students learn and how they apply the knowledge through interaction with a professional community (Lave & Wenger, 1991). According to Hung (2002), situated cognition in conjunction with problem-based learning can provide a different approach to support learning and instruction. Teacher-centered rote learning does not promote higher levels of thinking that are promoted in situational learning using PBL, “relating learning to authentic practices relevant to the students’ future pragmatic goals” (Hung, p. 411). The authentic and purposefully situated tasks used in PjBL allow students to independently research and problem-solve to produce realistic solutions to problems (Thomas, 2000).

In addition to promoting higher-level thinking, PjBL improves students’ understanding of content and can positively impact student efficacy (Beier et al., 2019; Thomas, 2000). Guo et al. (2020) highlighted how students process knowledge differently in PBL and PjBL. For PBL, knowledge is reflected in the application, while PjBL focuses on knowledge construction “that allows students to test and achieve their ideas in the way they want, which promotes their innovation competence” (Guo et al., 2020, p. 6). The differences between PBL and PjBL are important if the course goal is to construct knowledge and develop a practical solution to a real-world problem.

PjBL structures instruction around solutions to real-world problems through student-constructed projects (Brundiers & Wiek, 2013; Thomas, 2000). Holm (2011) described PjBL as “student-centered instruction that occurs over an extended period, during which students select, plan, investigate and produce a product, presentation or performance that answers a real-world question or responds to an authentic challenge” (p. 1). Thomas (2000) identified five distinguishing characteristics of PjBL: centrality, a driving question, constructive investigations, autonomy, and realism. First, in PjBL the projects are key to learning the curriculum and must be central to the content taught. Second, projects are structured around significant questions known as “driving questions” (Blumenfeld et al., 1991, p. 371) or poorly defined problems (Stepien & Gallagher, 1993). These questions or problems in PjBL encourage students to wrestle with the key concepts and develop an individualized understanding of the content and the identified problem. Third, PjBL requires students to investigate a problem by designing, problem-solving, or discovering solutions. Through the project, students should gain new understanding and skills and produce a final product such as a report, presentation, or model. Fourth, projects are

student-centered. Teachers guide students as they complete their projects, using strategic instruction as needed, therefore maximizing students’ autonomy (Holm, 2011; Moursund, 1999). Finally, PjBL projects are authentic efforts to explore real-world problems and investigate or solve those problems.

PjBL in higher education courses provides opportunities for students to engage with authentic projects within their current professional settings or to influence future career interests (Beier et al., 2019). Lucas and Goodman (2015) argued that PjBL “brings promise to deepening students learning about leadership and their leadership development while engaging them in examining and solving real problems that are relevant and important to them” (p. 148). Instructors who use PjBL in higher education support students in preparation for their professional careers (Shpeizer, 2019).

While researchers acknowledge the support of PjBL to promote professional preparation of students through higher education courses (Beier et al., 2019, Lucas & Goodman, 2015, Shpeizer, 2019), using PjBL through online learning is less researched. Online learning programs have experienced enormous growth in higher education, leaving educators to discover how to engage students in active learning in an online classroom (Çakiroğlu & Erdemir, 2019). Incorporating Dewey’s (2004) constructivist method, educators have turned to PjBL for a student-centered approach to online learning (Çakiroğlu & Erdemir, 2019). Scholarly practitioners have discovered that PjBL can be effective in an online learning environment with minimal teacher guidance (Morales et al., 2013). When Shih and Tsai (2016) examined students’ perceptions of an online PjBL flipped classroom, findings showed the implementation of PjBL increased students’ learning effectiveness, motivation, and interest.

According to Reiser and Dempsey (2007), instructional design is “a system of procedures for developing education and training programs in a consistent and reliable fashion. Instructional design is a complex process that is creative, active, and iterative” (p. 17). Using PjBL within an instructional design model enhances students’ creativity and encourages critical thinking and innovation (Lou et al., 2012). In the current study, we examined the use of PjBL to support student learning of instructional design in an online EdD instructional design course. We wanted to know how the doctoral student participants described their understanding of instructional design after completing the project and their perspectives on using the PjBL approach in an EdD course. The information was important to determine if situating the instructional design content in students’ professional contexts was an effective way for the students to learn course content. The following questions guided the study:

1. How do doctoral students in an EdD program describe their understanding of instructional design after completing an instructional design project?
2. How do doctoral students in an EdD program perceive that an instructional design project informs their present and future professional skills and responsibilities?
3. How do doctoral students in an EdD program describe their perspective on the use of project-based learning in a doctoral course?

METHODOLOGY

The purpose of this single case study was to determine how a PjBL approach to learning instructional design supported doctoral students’ understanding of the course content and provided opportunities for professional application in students’ current and



future professions. We chose a case study approach as it is well-suited for exploring a "real-life, contemporary bounded system" (Creswell & Poth, 2018, p. 96). As the course instructors, we wanted to know how the EdD students described their understanding of instructional design after completing the project and their perspectives on using the PjBL learning approach. This single case study was bounded by students completing a one-semester course in instructional design in an online EdD program in Learning and Organizational Change (EdD-LOC), which is a practitioner-based program with students from a variety of professional backgrounds and experiences. Doctoral students typically complete the instructional design course in the fourth trimester of the three-year program.

Participants

Fifty-eight doctoral students in a 54-hour EdD program consented and participated in the current study. Although the program was online, students engaged in required asynchronous tasks such as watching lecture videos, reading assigned articles, and responding to guided prompts each week to prepare for a 90-minute synchronous session with their instructor. The students in this study were enrolled in one of the four sections of an instructional design course, taught by the researchers. The participants had diverse professional roles (see Table 1), and many had little to no previous experience designing instruction.

Table 1. Participants' Professional Roles

Profession	Participants (n)	Percentage of Participants
PK-12 Education	23	39.7%
College/University	17	29.3%
Government/Military	8	13.8%
Corporate	5	8.6%
Agency/Consultancy	3	5.2%
Nonprofit	1	1.7%
Other	5	8.6%

Note. The number of participants appears greater than 58, as three participants noted more than one professional role.

Course and Project Description

Most students complete the instructional design course in the fourth term of the nine-term program. This program uses a cohort model with a three-year time to completion. The instructional design course in term four immediately precedes courses focused on the literature review and methodology chapters of the research-based problem of practice dissertation, which are typically completed in term five.

The course in this study was designed to support the examination of issues related to instructional design in many different professional contexts, including PK-12 education, post-secondary education, corporate, military, and health care. Given that our doctoral program is based on the CPED Framework (Perry, 2013), this course "prepares leaders who can construct and apply knowledge to make a positive difference in the lives of individuals, families, organizations, and communities" and integrate "practical and research knowledge, that links theory with systemic and systematic inquiry" (p. 1). Taking together, the Instructional Design Plan (see Morrison et al., 2019, p. 14) in conjunction with students' professional experiences and content expertise, we guided students

using instructional design and PjBL to identify a problem in their professional context and propose an instruction-based resolution in support of improvement in their institutional and company structures.

After identifying a professional problem, students engaged in PjBL to design instruction to address the problem. The PjBL approach provided the format for students to learn the course content and apply their knowledge and skills to resolve a current and relevant problem situated in their professional context, thereby connecting theory and practice (Lave & Wenger, 1991). It is important to note that while students had a choice about the problem which becomes the focus of their instructional design project, some students chose to focus on the same problem they planned to examine in their research-based problem of practice dissertation. The students applied the content to their identified professional problem while meeting weekly with classmates and instructors to discuss their projects and receive feedback.

The project consisted of six components: professional context, needs assessment, learner analysis, task analysis, objectives and sequencing, and instructional strategies. The students engaged in required asynchronous content and reading related to each component every week. For the first component, students completed the asynchronous tasks and readings, including a case study from Ertmer et al. (2019), drafted the first component for the instructional design project based on the project instructions, and submitted it to their instructor for review. The instructor provided feedback, typically in a 24-hour timeframe, so that students received the feedback before the synchronous session. During the synchronous session, the instructor and students discussed the content, and students engaged in peer discussions to revise and improve their projects. In the next week, the students made revisions based on instructor feedback and course discussions, engaged in the course content related to the second component, and added that component to the project for instructor review. This process repeated until all six components were included in one continuous document.

In addition to weekly instructor feedback, each synchronous session included two breakout rooms, one of which was dedicated time for students to provide peer feedback related to their projects. During breakout rooms, we gave the students prompts related to the required weekly readings to discuss the information and apply it to their projects. Each week, we purposefully organized the breakout room groups so that some weeks students worked with peers in similar professional roles, and in others, they worked with peers in different professional roles. This allowed students to learn about one another's projects and provide peer feedback in the context of their professional expertise and in other contexts. The instruction in the synchronous sessions was flipped so that students engaged with the content, completed the required weekly project component, and prepared to engage in continued discussion about the course topics during class. This PjBL approach provided a format in which students applied the course content about instructional design to a project situated in their professional context, thereby connecting theory and practice to address a current and relevant problem. Students were informed that this was a project-based course, but the instructors did not provide information defining PjBL.

Data Collection and Analysis

The data source for this study was a final reflection questionnaire (see Table 2) administered during the last week of the course. We crafted the questions to learn more about students'

experiences with PjBL in the EdD instructional design course as it related to their professional roles. We aligned the research questions in this study with the questionnaire.

Table 2.

Question	Research Question (RQ) Alignment
1. Provide your name and email.	–
2. What is your present job title?	RQ 2
3. In which professional sector do you currently work? PK–12 Education College/University Corporate Nonprofit Government/Military Agency/Consultancy Other (leave blank)	RQ 2
4. Have you designed instruction in your previous or present profession? If yes, explain.	–
5. How has the ID project in [this course] supported your understanding of instructional design?	RQ 1, RQ 2, RQ 3
6. How does the ID project in [this course] inform your present professional responsibilities?	RQ 2
7. How does the ID project in [this course] inform your future professional responsibilities?	RQ 2
8. The instructors in [this course] implemented a project-based learning (PjBL) approach to teaching instructional design. Provide your perspective on the use of PjBL in a doctoral course.	RQ 3

To analyze the final reflection questionnaire data and to address qualitative reliability, each researcher reviewed the data related to one of the three research questions (Creswell & Poth, 2018). First, we individually coded the responses using in vivo coding to develop emerging themes (Creswell & Poth, 2018). Second, we discussed each reviewer’s coding to confirm or disconfirm the codes for all three questions. We discussed the codes until we were in 100% agreement with the coding for each question. Third, we collapsed the codes into categories and determined the final themes as part of a thematic analysis. To address qualitative validity, we used thick, rich descriptions to present our findings (Creswell & Poth, 2018).

FINDINGS

The data collected from the questionnaire provided evidence for how a PjBL approach to learning instructional design supported EdD students’ understanding of the course content and provided opportunities for professional application in students’ current and future professions. There were four findings determined from responses to the questionnaire related to the three research questions. First, the study revealed that all students gained knowledge of instructional design during the course and 72% credited the project for scaffolding their learning. Second, 80% could see an immediate application of the project to their current professional roles, and 93% saw an application to future professions. Third, students’ perspectives on the use of an instructional design project in a doctoral-level course indicated that students valued the

opportunity to apply what they were learning to their professional roles. Finally, the students appreciated that the project approach allowed the course content to be addressed by mastering individual instructional design components sequentially. In the following sections, we share these findings by providing evidence for each research question.

EdD Students’ Description of Their Understanding of Instructional Design

Questionnaire item five provided evidence of the EdD students’ perceived understanding of instructional design after completing an instructional design project, which was related to the first research question in this study. Many students described their understanding as new knowledge gained about the instructional design process using a PjBL method and appreciated the course structure in scaffolding the learning. All students responded positively to the question, yet there may have been some misunderstanding, as the question asked “how,” and several students responded as if the question asked “if” the project approach supported their understanding of the course content.

Of the 58 students, 42 (72%) identified an increased understanding of the components, vocabulary, or process of instructional design. Responses provided evidence of their broader understanding. For example, students referred to their “better understanding of the components” and understanding of “the essential steps needed to create effective instruction,” recognizing that the experience “helped [them] understand the process needed to design instruction.” One student shared, “In the past, I have created content to present to others without a true instructional design process. This project has guided me into a new understanding of instructional design for future projects.” Other student responses provided evidence of their understanding of specific components of the instructional design process. Seven students referred to their understanding of learner analysis. One student recognized the importance of developing training that “aligns with the needs of the learner.” Similarly, another student “learned to format instruction to meet the needs of a variety of learners.” Other students recognized their new awareness of the need for a learner analysis or recognized the analysis as part of a strong instructional design.

Four students mentioned the importance of evaluation to the instructional design process. Two students provided evidence of their understanding using evaluation to improve the design or to assess its effect. In listing the instructional design process steps, one student referred to evaluation as “follow-up” and recognized that evaluation was used for “modifications or changes” to instruction. Another student described their new awareness of “the different types of evaluations that are necessary to capture the effectiveness of a program.” Two students used the term evaluation without context to their understanding of that term. A few students also referred to the problem, needs assessment, and task analysis components of instructional design. The two students who specifically referred to the problem discussed how the project helped them “be more analytical and thoughtful in identifying a problem” and “clearly identify[ing] the problem.” One student recognized the “amount of energy that needs to be spent” on components such as the needs assessment and tasks analysis. The students chose to discuss specific components they considered important to their project.



EdD Students' Perceptions of Instructional Design Informing Professional Roles

Questionnaire items six and seven provided most of the data related to the second research question in this study, which focused on how EdD students perceived an instructional design project informed their present and future professional skills and responsibilities. Of the 58 students, two were retired and had no present professional responsibilities. Of the remaining 56 students employed at the time of the study, 45 (80%) indicated that the project informed their present professional responsibilities, yet the students provided various reasons. One reason was that the design project provided a framework or systematic approach to designing instruction for the professional development of employees, students, or colleagues. Several students suggested that the framework provided the correct terminology, steps to identify learner needs, and a plan for both design and delivery of the instruction. One student suggested the project prepared her to better fulfill her professional roles by expanding her training abilities:

It helps significantly because now I can design training in a systematic way that makes sense. Prior to taking this class, anytime, I had to train others, I either outsourced the function or guessed at what I should be doing.

Another student suggested:

I have done similar trainings for groups of people but this class was helpful to see the process that takes place prior to the training and provides context and terms for things I do in my role. It also provided context to the steps so that I am able to move about the process with intentionality.

The project allowed students to work purposefully through the steps for designing instruction in their professional context and they could see the value of working systematically through the process.

A second reason that completing a project specific to their professional context supported students' professional skills and responsibilities was that it provided them with the confidence and experience to identify workplace training needs and tackle the instructional design to address those needs. Students indicated that before taking the course they did not feel they had the expertise to confidently contribute to workplace discussions of instructional design. One student indicated that the project they designed for the course supported how they would propose new training at work:

It really is a mission of mine to expand our student trainings, so I will be able to use my instructional design as a part of my proposal to leadership. I want to make all incoming first-year students at my university required to take a dating violence workshop, so designing a training for additional workshop facilitators will help make my proposal a realistic goal.

Several students directly applied what they learned from the project to their current professional roles. One student stated,

As an instructor and program director, I need to be able to create training for college students and faculty. I am also the curriculum analyst for all CTE [Career and Technology Education] departments at the college, this course has helped me in my knowledge to look at new course development.

The identification of a need specific to their present professional context allowed the students to learn the instructional design process through the design of a project to address that need and support their individual professional growth.

While 80% of the students indicated that the requirement of a professional context-specific project informed their professional roles, some students did not see a present application. One student stated, "It was difficult as the ID [instructional design] project was focused on a process skills/knowledge. All of our employees come with the knowledge necessary for their jobs or they wouldn't be hired." Other students indicated that they were not in a professional role that would allow them to design instruction. Of the 11 students who stated the project did not support their professional roles, five indicated that completing the project supported learning the course content and possibly informed future professional roles. One student explained, "This project helped me apply what I learned in class. I won't be implementing my project in my place of employment, but I now know how to apply the steps I learned for future potential projects at work." Another suggested that the content learned could be applied to areas outside of instructional design:

The connection isn't strong for my current role, BUT I think this course will be very helpful for the career I am working for. I think that the focus on learners, context, and problem are transferable to areas outside of instructional design as well.

Two students did not provide reasoning for responding "no" to the questionnaire item regarding application to their current professional role. Only 13% of the students who were employed at the time of the study could not see a correlation between the course content and their current professional roles.

Specific to questionnaire item seven, 54 (93%) of the students indicated that the instructional design project would inform their future professional responsibilities, even when they were unsure of that next professional step. The data provided supporting evidence through statements such as, "The project has given me tangible experience in designing instruction, and that experience will be helpful to me in future projects that I do in this position and beyond." The students felt that the project provided the background knowledge and tools to design instruction for future professional training, as summed up by one student,

This entire project has taught me the basics on how to create an instructional program which I believe I will need to know in my future professional responsibilities. Knowing the basics will provide a great foundation for creating training programs and instruction for students and staff members.

Students shared how the successful design of a project provided them the confidence to pursue future responsibilities. For example, "I feel more confident not only in leading initiatives but in asking the right questions and ensuring that each phase will be executed efficiently and effectively," and "I feel confident I can be an instructional designer at a big corporation." The design of a project as a course requirement that addressed the students' present professional context provided the background knowledge and confidence for those students to see the application of that process to possible future professional responsibilities.

Of the four students who did not see an application to their future professional responsibilities, one provided insight into why that might have occurred, "There is little to no correlation between the ID project and my professional responsibilities. Everything I created for my ID project was made up for this class, and it will not be used in any capacity professionally." This student did not see an application of the content or project to any future professional responsibilities.

EdD Student Perspectives About Project-Based Learning

Questionnaire item eight provided most of the data related to the third research question for this study, which focused on exploring how EdD students describe their perspective on the use of PjBL in a doctoral-level instructional design course. We identified two responses from students: students valued the opportunity to apply what they were learning to their professional roles, and they appreciated how the project was organized into components.

First, students valued the opportunity to connect the course content in the instructional design course to their professional roles and responsibilities. Of the 58 students, 27 (47%) positively noted their ability to apply the learning to real-world contexts. One student wrote,

I enjoyed having a project to focus on and made sure to select one that I can apply to my workplace. If I had not selected a topic or project that needed to be addressed it may have felt frustrating to spend so much time on such a “problem.” However, I am excited to share this project with my administration and better support our staff with adequate training moving into the 2022–23 school year.

Another student explained,

Using a project based learning approach allowed me to take on new information and apply it to a relevant issue in my own area. Although I may not be using the project right now, it helps solidify the new information I was learning.

In response to questionnaire item five, one student recognized that this method allowed them to have a “better understanding of each step” because it was “manageable information” that was “applied instantaneously” to their real-world problem. By offering students an opportunity to connect their learning to their profession, they engaged with the content of the course, as they considered how they could address a problem in their workplace in a timely manner.

Second, students indicated that because the project was broken into components, it was manageable, allowing them to receive ongoing feedback. Of the 58 students, 15 (26%) pointed to benefits related to these components and instructor feedback. One student, who noted the ability to apply the content and the project components, described it in this way,

The project based learning was an excellent strategy in this course. We had an opportunity to focus our work on a topic of our own choosing (which addresses the needs of adult learners for choice/autonomy and immediate application of learning). The material was chunked it into formative steps resulting in a final project at the end. This made the work feel “do-able” and less stressful... We got good individual feedback at each stage of the ID project, which was also encouraging and motivating as we went along (there’s no big surprises as to your progress or overall grade this way). Overall, my experiences with project based learning stretch me to think about how I might integrate them into my own courses.

Similarly, in response to questionnaire item five, students described their understanding of instructional design by situating it in the context of the course structure. Four students reflected on the impact addressing each component separately had on their understanding of the instructional design process. Whether they were referring to this method as “chunk[ing] throughout the term” or “working on the

instructional design in parts throughout the course,” these students identified their success with this approach. One student reflected on the time they had to “delve into each section and obtain a more thorough understanding of each section.” Similarly, another student described their ability to “focus on particular steps and components” making them “more meaningful and important.” The responses provided by these students provide evidence that the structure of the course impacted their understanding of instructional design. As part of a scaffolded structure, we provided feedback for each project component so that students could strengthen their projects, which students perceived to be valuable.

However, 6 of the 58 students (10%) did not seem to value the PjBL approach or gave short questionnaire responses that appeared neutral. Although students selected their project topic, one student wished the project was more relevant to their profession and professional aspirations, while two others wished it was more closely connected with their dissertation topic. One wished they were in the same breakout discussion group for the entire term while another student shared, “Most [PjBL] is done in groups. Some people are not willing to work in groups.” While most students valued the opportunity to apply what they were learning to their professional roles and appreciated how the project was organized into components, not all students perceived the project to be valuable. We discuss these findings in the following section.

DISCUSSION

The purpose of this study was to determine how a PjBL approach to learning instructional design supported EdD students’ understanding of the course content and provided opportunities for application in students’ current and future professions. The analysis of the questionnaire data in application to the three research questions resulted in findings in support of using PjBL as an instructional method in doctoral-level coursework. These findings contribute to the research on the efficacy of using PjBL in higher education and contribute to the ongoing improvement of the instructional design course on which this research is based.

Student Descriptions on the Application of PjBL to Course Content Understanding

The finding related to the first research question focused on the doctoral students’ perceptions of the use of PjBL to increase their understanding of instructional design. While every student responded positively concerning their improved understanding of instructional design, 72% of the students recognized that completing the instructional design course using PjBL provided them with an increased understanding of instructional design. These student-driven, realistic projects that were the focus of the course and curriculum provided the students with a positive experience in which to increase their understanding of instructional design. Similarly, Thomas (2000) found that PjBL improves the quality of students’ understanding.

The doctoral students’ responses to the questionnaire signaled their differentiated understanding of the instructional design process. In choosing their own “driving question” (Blumenfeld et al., 1991; Stepien & Gallagher, 1993), these students developed an individualized understanding of the content (Thomas, 2000). This understanding was evident in the varied aspects of the project that the students described in their responses. The specific focus on

various aspects of instructional design is evidence that PjBL differentiated their learning, heightening their knowledge of specific aspects of the instructional design process.

Student Perceptions on How PjBL Informs Professional Skills and Responsibilities

The findings related to the second research question focus on how the use of PjBL informed students' current and future professional responsibilities. Beier et al. (2019) and Shpeizer (2019) indicated that PjBL in higher education was beneficial in providing opportunities for students to engage with real-world projects both in current professional contexts and as an influence on future career possibilities. The situated cognition approach of allowing students to connect what they learn and then apply that knowledge to a project within their professional community supports the PjBL instructional method. The findings of this research indicated that most students supported that using PjBL informed both their current and future professional responsibilities. Eighty percent of the students indicated that the project informed their present professional responsibilities, and 93% indicated that it informed their future professional responsibilities. The students who could see a future application can be explained in part because students could envision the use of instructional design in their next professional role, even though they may not have the opportunity in their present role. The students referenced that mastering the systematic approach to instructional design through the application of a professionally situated project provided them with the framework and the confidence to identify and address workplace training needs. This finding concerning support for a PjBL approach to solving real-world problems through student-constructive investigations echoes Brundeirs and Wiek (2013) and Thomas (2000), who identified that experiential learning models designed around student-identified challenging problems promote student understanding of specific topics. The participants in this study identified a problem in their workplace and engaged in experiential learning to learn about instructional design to address that problem with instruction. In line with Lucas and Goodman (2015), the students in this study could envision themselves as leaders of projects in both present and future professions due to the application of PjBL.

A small percentage (7%) of students indicated that the project supported their understanding of the course content, but they could see no future professional application. While this is a small percentage, it is important to higher education instructors that students complete their coursework with a deep understanding of the content. It is important that we, the instructors of the course, determine how to better scaffold the learning experience for students who may not be presently employed or those who cannot see a future need to understand the instructional design process.

Student Perceptions on the Use of PjBL in an EdD Course

There were two findings related to the third research question, which was focused on EdD student perspectives about PjBL. First, students valued the opportunity to connect the course content in this instructional design course to their professional roles and responsibilities. This finding is interesting because as part of the ID project, we addressed Knowles's (1980) principles of andragogy. In the same way that we ask students to consider the principles of need to know, self-concept, experience, readiness to learn, orientation to

learning, and motivation when they are designing instruction for their own learners, they seemed to appreciate that they could apply their work in this class to their professional settings almost immediately. Because students selected the problem in their present professional context and because they were able to make connections between the instructional design and their workplace, they became invested in their project. Students in Beier et al.'s (2019) study "engaged in real-world, client-centered problems within the courses, and these experiences provided them with valuable insight into jobs and job tasks in natural science and engineering fields" (p. 18). Similarly, the students in this study pointed to the value of being able to connect the course content to their professional roles. The PjBL approach oriented students' application of the new content related to instructional design to their familiar professional role, as they worked to address a real problem in their workplace. This finding aligns with previous studies highlighting the importance of an authentic, relevant project in a PjBL (Beier et al., 2019; Lucas & Goodman, 2015; Moursund, 1999; Thomas, 2000).

Second, because the project was organized into components, students reported that it was manageable, allowing them to receive timely feedback. Again, this relates to Knowles's (1980) principles of andragogy and particularly readiness to learn. Because the feedback was ongoing, timely, and related to the professional roles, the students could address instructor feedback before moving to the next component of the project. Maor (2010) pointed to the importance of instructors' pedagogical role in online settings "providing feedback and instruction, probing, asking questions, stimulating the discussion, synthesizing students' comments, and referring to outside resources or experts in the field" (p. 135). The ongoing feedback in this study supported students' successful completion of their projects.

In this study, we uncovered that students valued timely feedback and saw merit in the structure of the project and the process to complete it with iterative feedback. The students mastered the instructional design content through the development of the project, and many saw immediate and future applications in their professions. The positive student perceptions of using PjBL as a course requirement support prior research concerning the use of a constructivist approach to active learning in an online classroom to promote student learning, motivation, and interest (Çakiroğlu & Erdemir, 2019; Shih & Tsai, 2016). It is interesting to note that all of the 58 participants in this study passed the course. The structured approach, timely and iterative feedback, and the relevance of the project to students' professional context contributed to the students' success. In the following section, we discuss the implications of our findings.

IMPLICATIONS

This study has implications for those who plan and teach instructional design courses, particularly for those with a problem-based focus in EdD programs. For those who teach EdD courses, this study informs the choice of instructional methods for courses intended to inform professional responsibilities. A PjBL approach is often more time-consuming and more difficult to implement than traditional models such as lecture (Holm, 2011), yet that approach will provide a relevant application of the course content. The data from this study provide evidence that it was the PjBL approach to teaching instructional design and the timely approach to feedback that supported student understanding of the content and application to their professional context.

Students noted that components of the instructional design project supported multiple areas of professional growth. One step in the instructional design process was to complete a needs assessment. A student noted that the project “gives me the ability to see what areas may need to be approved through needs assessment” while another indicated that they were unsure of how the project would apply but that learning the process “will help in any position at the college where I work.” The students noted that the content and process were important and applicable in their professional context regardless of whether they were involved in designing instruction or training. Only four students (7%) in this study did not see a connection between the course project and either their present or future professional roles. It is important to note that students got to choose their instructional design problem to address in the project. The inability of some students to apply the course content and project to their professional context presents an opportunity for instructors to remind students of ways each can instruct others in their professional context, including new hires or in mentoring. For example, as one student shared that they did not engage in instructional design, it may be worth exploring if that student provided instruction to others in the context of supporting new hires or mentoring, or if they manage those who do. Purposeful discussion of professional roles may allow students to see connections between their roles and the course content.

The instructional design course offered for this research was part of a sequence of courses that prepare EdD students to support learning and organizational change in both their current and future professional roles. Because the program is practitioner-based, students must understand the role of each course in preparing them for professional opportunities. The students begin a research-based problem of practice dissertation early in the EdD program and most students address a problem in their professional context. It is imperative that students understand that their coursework is relevant and applicable to them currently and in the future. PjBL provides the instructional method for conveying course content in a relevant format. In an instructional design course, PjBL enables students to master the content, understand the process of developing instruction, and understand how people learn through the construction of their knowledge in a situated context (Lave & Wenger, 1991). Many students in the instructional design course connected components of their project to their problem of practice dissertation topic. While students develop their dissertation research around a problem in their workplace, the instructional design project has the potential to help them think about post-graduation plans and how to solve that problem using instruction. Understanding how knowledge is constructed is key to promoting learning and organizational change. As stated by one student, “I think problem-based learning is the entire point of our program and problem of practice. If we truly want to be change makers in our fields, we have to be able to identify problems and work through solutions that are best for everyone involved.” While this student misidentified the course project as PBL rather than PjBL, the student perceived a possible application of the PjBL approach for those who want to catalyze organizational change. We found that student responses in this study were meaningful for us as instructors as we considered the possibilities for our course to support EdD students in making connections to their learning and their professional practice, particularly in thinking about how we could encourage them to create change with instruction based on their problem of practice findings in their post-graduation plans.

CONCLUSION AND NEXT STEPS

Instructors of instructional design courses in higher education may want to consider the PjBL approach, particularly if they teach EdD students from varied professional contexts. One limitation of this study was that not all students agreed to participate in the study. However, of the 71 students enrolled in the course, 58 students (82%) participated in the study. As such, the instructors of the course in this study are continuing our use of this approach and the related research because of the positive student responses related to PjBL in this course. We embedded the final reflection questionnaire in the required asynchronous work so that we can continue to help students make connections between this course and their professional roles. A delimitation of the study was that our analysis focused on one data source, the final reflection questionnaire, which reflected one term of this course. Although student responses were confidential, the final reflection questionnaire responses were self-reported, which may have impacted students’ responses. To mitigate this concern, we did not review student responses until after we published course grades. In the future, we will collect additional data sources such as following up with additional interviews to see how students are applying what they have learned from the course in their professional roles. We might further explore student responses according to specific professional roles. Additionally, we can explore how students connect instructional design concepts to the distribution of findings section we require in their problem of practice dissertations, particularly given that many students focus on a problem related to their problem of practice. This research will help us to further examine the use of PjBL in doctoral-level courses such as our instructional design course in an online EdD program.

REFERENCES

- Alorda, B., Suenaga, K., & Pons, P. (2011). Design and evaluation of a microprocessor course combining three cooperative methods: SDLA, PBL and CnBL. *Computers & Education*, 57(3), 1876–1884. <https://doi.org/10.1016/j.compedu.2011.04.004>
- Barrows, H. S. (1986). A taxonomy of problem - based learning methods. *Medical Education*, 20(6), 481–486. <https://doi.org/10.1111/j.1365-2923.1986.tb01386.x>
- Beier, M. E., Kim, M. H., Saterbak, A., Leautaud, V., Bishnoi, S., & Gilberto, J. M. (2019). The effect of authentic project-based learning on attitudes and career aspirations in STEM. *Journal of Research in Science Teaching*, 56(1), 3–23. <https://doi.org/10.1002/tea.21465>
- Bereiter, C., & Scardamalia, M. (1993). *Surpassing ourselves: An inquiry into the nature and implications of expertise*. Open Court Publishing.
- Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist*, 26(3-4), 369–398. <https://doi.org/10.1080/00461520.1991.9653139>
- Brundiers, K., & Wiek, A. (2013). Do we teach what we preach? An international comparison of problem- and project-based learning courses in sustainability. *Sustainability*, 5(4), 1725–1746. <https://doi.org/10.3390/su5041725>
- Çakiroğlu, Ü., & Erdemir, T. (2019). Online project based learning via cloud computing: Exploring roles of instructor and students. *Interactive Learning Environments*, 27(4), 547–566. <https://doi.org/10.1080/10494820.2018.1489855>
- Creswell, J. W., & Poth, C. (2018). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE.
- Dewey, J. (2004). My pedagogic creed. In *Curriculum Studies Reader E2* (2nd ed.). Routledge.
- Ertmer, P. A., Quinn, J. A., & Glazewski, K. D. (2019) *The ID casebook: Case studies in instructional design* (5th ed.). Routledge. <https://doi.org/10.4324/9781315148083>



- Guo, P., Saab, N., Post, L. S., & Admiraal, W. (2020). A review of project-based learning in higher education: Student outcomes and measures. *International Journal of Educational Research*, 102, 101586. <https://doi.org/10.1016/j.ijer.2020.101586>
- Holm, M. (2011). Project-based instruction: A review of the literature on effectiveness in prekindergarten through 12th grade classrooms. *Rivier Academic Journal*, 7(2), 1–13.
- Holmes, L. M. (2012). *The effects of project based learning on 21st century skills and no child left behind accountability standards*. (Publication No. 3569441) [Doctoral Dissertation, University of Florida]. ProQuest Dissertations and Theses Global.
- Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Cambridge Adult Education.
- Knowles, M. S., Holton, E. F., & Swanson, R. A. (2011). *The adult learner* (7th ed.). Gulf. <https://doi.org/10.4324/9780080964249>
- Kolb (2015). *Experiential learning: Experience as the source of learning and development* (2nd ed.). Pearson Education, Inc.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511815355>
- Lou, S.-J., Chung, C.-C., Dzan, W.-Y., Shih, R.-C. (2012). Construction of a creative instructional design model using blended, project-based learning for college students. *Creative Education*, 3(7), 1281–1290. <http://dx.doi.org/10.4236/ce.2012.37187>
- Lucas, N., & Goodman, F. (2015). Well-being, leadership, and positive organizational scholarship: A case study of project-based learning in higher education. *The Journal of Leadership Education*, 14(4), 138–152. <https://doi.org/10.12806/N14/I4/T2>
- Maor, D. (2010). The teacher's role in developing interaction and reflection in an online learning community. *Educational Media International*, 40(1-2), 127–138. <https://doi.org/10.1080/0952398032000092170>
- Morales, T. M., Bang, E., & Andre, T. (2013). A one-year case study: Understanding the rich potential of project-based learning in a virtual reality class for high school students. *Journal of Science Education and Technology*, 22, 791–806. <https://doi.org/10.1007/s10956-012-9431-7>
- Morrison, G. R., Ross, S. M., Morrison, J. R., & Kalman, H. K. (2019). *Designing effective instruction* (8th ed.). Wiley.
- Moursund, D. (1999). *Project-based learning using information technology*. Information Age
- Perry, J. A. (2013). Carnegie Project on the Education Doctorate: The education doctorate—a degree for our time. *Planning & Changing*, 44(3/4), 113–126.
- Reiser, R., & Dempsey, J. (2007). *Trends and issues in instructional design and technology*. (2nd ed.). Pearson.
- Savery, J. S. (2006). Overview of PBL: Definitions and distinctions. *Interdisciplinary Journal of Problem-based Learning*, 1(1), 9–20. <http://dx.doi.org/10.7771/1541-5015.1002>
- Shih, W.-L., & Tsai, C.-Y. (2016). Students' perception of a flipped classroom approach to facilitating online project-based learning in marketing research courses. *Australasian Journal of Educational Technology*, 33(5), 101–117. <https://doi.org/10.14742/ajet.2884>
- Shpeizer, R. (2019). Towards a successful integration of project-based learning in higher education: Challenges, technologies and methods of implementation. *Universal Journal of Educational Research*, 7(8), 1765–1771. <https://doi.org/10.13189/ujer.2019.070815>
- Stepien, W. & Gallagher, S. (1993). Problem-based learning: As authentic as it gets. *Educational Leadership*, 51, 25–28.
- Strobel, J., & van Barneveld, A. (2009). When is PBL more effective? A meta-synthesis of meta-analyses comparing PBL to conventional classrooms. *Interdisciplinary Journal of Problem-Based Learning*, 3(1), 44–58. <https://doi.org/10.7771/1541-5015.1046>
- Thomas, J. W. (2000). *A review of research on project-based learning*. Autodesk Foundation.
- Walker, A., & Leary, H. (2009). A problem based learning meta analysis: Differences across problem types, implementation types, disciplines, and assessment levels. *Interdisciplinary Journal of Problem-Based Learning*, 3(1), 12–43. <https://doi.org/10.7771/1541-5015.1061>