Project-Oriented Learning & Teaching: Expectations vs. Reality

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Abstract

An elementary-level content area reading course was redesigned using a project-based learning (PBL) model to improve undergraduate pre-service teacher course content instruction. The research question was, "What are college/ university students' perceptions of a project-oriented undergraduate course?" Six university pre-service teachers, enrolled in one of two courses, completed open-ended end-of-class questions over the eight-week study. Qualitative case study analysis revealed that while most students perceived the online content and project to be engaging and beneficial to content learning and application, students responded negatively to assignments and grade frequency. The findings of this study informed the instructors to adjust the course assignments in subsequent semesters to address students' concerns.

Keywords: project-based learning, teacher education, perceptions, cultural models

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Introduction

In the spring semester of 2017, an elementary-level content area reading course was redesigned in an effort to improve undergraduate pre-service teacher course content instruction. This course redesign provided an opportunity to offer practical instruction and application of instructional methods that pre-service teachers could implement in their future classrooms. The redesign also provided the authors the chance to explore and study the perceptions that undergraduate students had of this newly redesigned course. The purpose of this study was to examine the perceptions of students enrolled in a college course using a project-based learning model.

The teacher education course was designed to focus on a culminating end-of-course project using a project-based learning and teaching model. This case study focuses on the question: What are college/ university students' perceptions of a project-oriented undergraduate course?

Theoretical Frame: Cultural Models

Cultural models are defined as the every-day, commonly held beliefs of a particular social group (Quinn & Holland, 1987). Cultural

models can be expressed not only by what an individual says, but the actions observed by these individuals. Cultural models are a simplified way of viewing the world through an individual's experiences (Gee, 2008) and are internalized, and shapes the individual's sense of reality. These models are shared across specific cultural groups and are constantly changing over the course of time (Gee & Green, 1998), and shape how individuals identify themselves and others in particular contexts.

Review of the Literature

Project-based learning (PBL) is derived from a constructivist approach to teaching and learning. Thomas (2000) defines PBLs as instruction that incorporates

complex tasks … that involve students in design, problem-solving, decision making, or investigative activities; give students the opportunity to work relatively autonomously over extended periods of time; and culminate in realistic products or presentations (p. 1).

There are five criteria for PBLs: project-centered, focused on questions or problems, constructive inquiries, student-driven, and authentic. New learning is constructed via student-created projects, addressing questions and problems through real world applications.

The Buck Institute for Education (BIE) describes PBL as an instructional model that includes a focus on knowledge and skills, the identification of a problem or question for exploration, self-selected and focused inquiry, individual choice, peer- and self-critique and evaluation, and an authentic product that can be made available to an audience outside of the classroom setting (Buck Institute for Education, 2018). The new course design for this elementary content literacy course integrated these elements in an effort to support undergraduate student learning, and model ways that these future teachers can integrate PBL in their future classrooms.

PBL has been shown to support student learning in a variety of ways. Some benefits of PBL include an increase in student motivation (Blumenfeld et al., 1991; Ravitz & Mergendoller, 2005; Slåttsveen, Steinert, & Aasland, 2016; Verma, Dickerson, & McKinney, 2011), increase in students' ability to retain and apply new learning (Finkelstein, Hanson, Huang, Hirshman, & Huang, 2010; Strobel & van Barneveld, 2009), and help develop skills that support independent, out-of-school learning (Arboleya & Las-Heras, 2014; Strobel & van Barneveld, 2009). For these reasons, the lead instructor felt that redesigning the course using a PBL model of instruction would benefit pre-service teachers not only as learners, but as future K-12 classroom teachers.

Undergraduate students enter the college classroom with experiences and pre-conceived attitudes about what it means to be a college student and what it means to participate and learn in a college course. To learn these perceptions the lead instructor investigated students' beliefs in an effort to inform her instruction in later semesters. This study focused on pre-service students' perceptions of PBL as it applied to this redesigned undergraduate course in elementary content area reading.

The Study

Throughout the course of the Spring 2017 semester, data was collected from participating students enrolled in two university content area reading classrooms. Both classrooms received literacy instruction using the PBL oriented model as opposed to the traditional instructional model. For the purpose of this study, the traditional instructional model would have included text-based quizzes, a mid-term exam, and a final exam.

A case study designed was used for this study. Case study methodology provides detailed descriptions and allows the researcher to closely examine and describe the culture of common groups in a specific educational context (Creswell, 2013; Yin, 2014).

Participants

The participants in this study were six undergraduate students enrolled in the newly redesigned elementary content area reading courses during the spring 2017 semester, both of which were taught by the lead researcher. These undergraduate students were juniors and seniors enrolled in the elementary teacher education program. Three participants were randomly selected from each of the two classes. Students in both classes received the same instruction, assignments, and class-to-computer lab time ratio.

The PBL Oriented Course

The overall objective of the elementary content literacy course is to teach pre-service teachers in the teacher education program how to utilize a variety of texts to support content learning in content area classrooms. For the purpose of this course, "text" is broadly defined and can include traditional, digital, visual, and auditory modalities. These content areas include such disciplines as mathematics, science, social studies, and the arts. The course was redesigned around a final project that would be the culmination of the students' application of content area reading and literacy strategies throughout the course of the semester. Students identified a content area for the focus of their projects: mathematics, science, social studies, or art. They would then choose a grade level, or grade range, along with a specific topic within their chosen content area.

The students' projects were completed using Google Sites (sites.google.com), and students had in-class time each week to explore content and build webpages for their end-of-semester project. Each class meeting was a total of two and a half hours in duration. Before each class, students were assigned chapters from the course textbook, and new course content was covered during the first ninety minutes of class time. The remainder of class time was spent in the computer lab, where students would then explore texts and instructional content based on their project's topic, create content area activities using authentic text resources, and be allowed time to work on their own individual Google Sites webpage.

This course focuses on utilizing content literacy strategies within content are elementary classes, primarily mathematics, science, social studies, physical education, health, and the arts. As such, students learned literacy strategies that integrated the use of a variety of texts, vocabulary instruction and support, and supporting the literacy needs of a diverse study body. The culminating project was a student-created webpage that showcased the student's authentic application of strategies and content learned during the course of the semester. Each online content literacy project consisted of the following pages: Home page, Anchor Text, Nonfiction Text Feature, Text Set, Digital Text Features, Text Scaffolding Plan, and Inquiry Questions.

Home Page. The Home Page was an important page for this online project, as it provided the reader the purpose of the content literacy webpage project. On this page, the undergraduate student also explained in his or her own words why teachers should support content learning by utilizing content area strategies, as well as the importance of using a variety of texts in different modalities. Figure 1 shows a screenshot of a student Home Page. This student wrote about her project topic, the solar system. She provided a creative introduction to engage her elementary students. Students were encouraged to personalize their home pages to generate excitement and interest in the chosen topic.

Figure 1. Sample Home Page

Anchor Text Page. Each undergraduate student was required to identify a specific focal topic for their project, along with one text that they felt would be a good introduction to the topic. This text was referred to as an "anchor text" since this text was meant to be the introductory text that would familiarize students with the unit's topic. This anchor text was a focal text, read and referred to often throughout the duration of the student's content area project. This anchor text was intended to not only generate interest in the chosen topic, but also served as a model for teaching a variety of reading skills and strategies. On the Anchor Text page (figure 2), the student provided information such as a short summary, the focal grade level or range for the text, a rationale for the use of the book as their anchor text, an evaluation as a high-quality nonfiction text, and one before reading strategy.

Figure 2. Sample Anchor Text Page

Nonfiction Access Features Page. To help illustrate the importance of supporting students' understanding of nonfiction access features, students created a page listing and describing these features present in their anchor text (figure 3). After covering nonfiction text structures in the first part of the elementary content reading class, the undergraduate students applied these content literacy understandings to their anchor texts. Students not only described the features present in their anchor text, but also considered and addressed the access features in their text that they felt might require direct instruction and guidance with students in their chosen grade level orange.
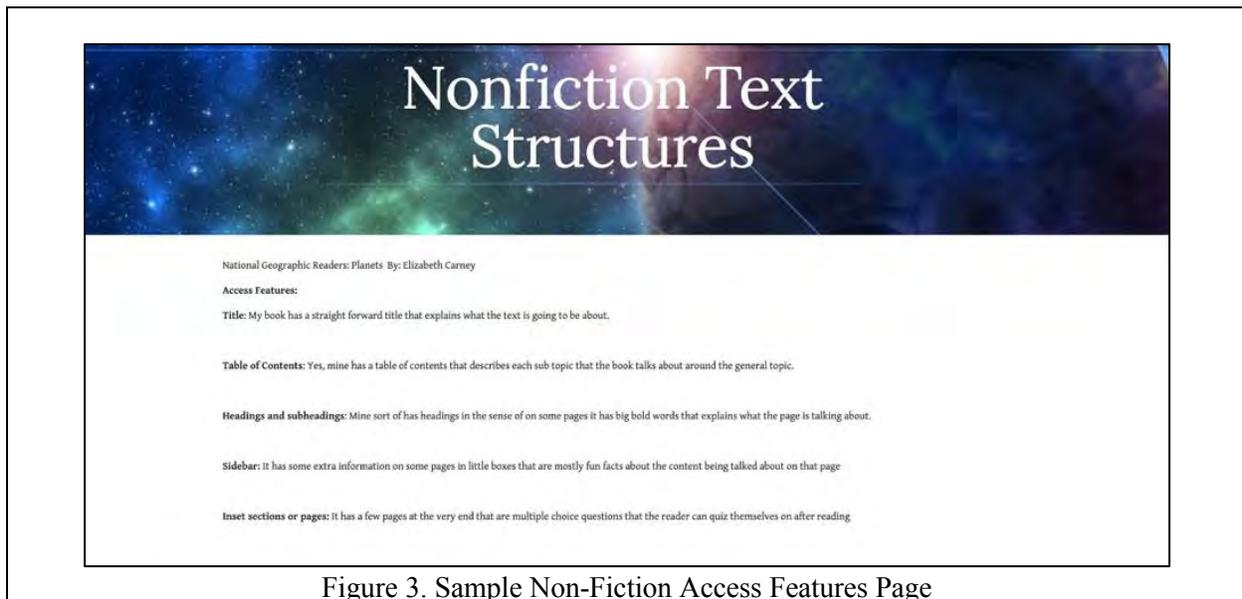

Figure 3. Sample Non-Fiction Access Features Page

Text Set Page. Students also created a set of texts to support their focus topics. Students were encouraged to provide resources and materials from a wide array of genre, media, and levels of reading difficulty. Students assembled materials including fiction, nonfiction, videos, maps, charts, articles, historical documents, photographs, songs, and paintings. Teachers were given the flexibility to add depth, voice, and perspective to the study of any concept, topic, or complex issue. On this page, students were required to select a minimum of ten sources. Students were required to include five traditional texts, with the remaining five chosen across media such as digital texts and other multimodal sources.

Each text on the text set page included the text's title, a short summary consisting of five or more sentences, and the source referenced in APA format to allow the reader to locate the text if they chose. While this page had the potential for being perceived as dull and uninviting, the students were free to organize and structure their Text Set pages however they felt best fit their needs or style.

Digital Text Features Page. Text features are parts of text that draw your attention to important information within a text. Text features in a traditional text may include titles, tables of content, headings, subtitles, bold print, glossaries, pictures, maps or diagrams, bibliographies, and appendices. Similarly, you may see these types of text features in digital text, which we referred to as digital access features. The Digital Text Features page could include such access features as hyperlinks, sidebars, pop-ups, drop-down menus, audio, video, interactive images, interactive questions,

comments, notes, definitions, and links to external resources.

As with the Nonfiction Access Features page, students listed and described the features present on a digital text from their text set and identified one digital text feature that they felt may require explicit instruction for the students in their target grade level. Figure 4 shows a screenshot of one student's digital text features page.
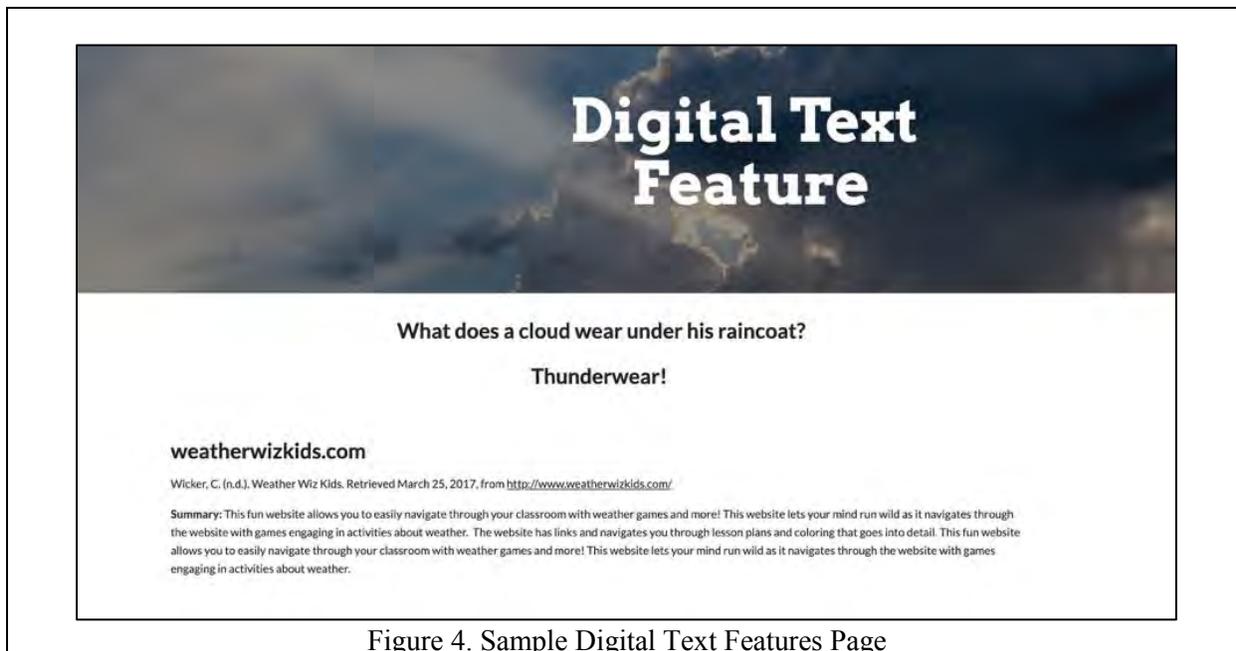
Figure 4. Sample Digital Text Features Page

Text Scaffolding Plan. Providing text support is important at any grade level. The pre-service teachers in this undergraduate class learned a variety of strategies to help support and scaffold instruction in the content area classroom. On the Text Scaffolding page of the student project, students provided one content area reading strategy for each text from their text set, a rationale for the appropriateness of the strategy, a visual or sample of the strategy or activity if applicable, and a list of instructional steps for the strategy or activity. In this way, students flexibly applied instructional strategies related to an authentic text to support student learning. Figure 5 illustrates a sample of student work from the Text Scaffolding page.

Figure 5. Sample Text Scaffolding Page

Inquiry Questions. Inquiry-based learning is an approach to learning whereby students locate sources of information to increase their understanding of a problem, topic, or issue. Students are more involved in the construction of knowledge through active engagement and inquiry. The more interested and engaged students are by a subject or project, the easier it will be for them to construct in-depth knowledge of it. For the last page of the student's online project, students were asked to create ten inquiry questions, also referred as Higher Order Thinking (HOT) questions, for their content area. This page allowed the undergraduate students to demonstrate their understanding of the types of questions that elementary students may ask and could possibly be answered through exploring the texts in the unit's text set.

Higher order questioning is often difficult to teach undergraduate students to generate but can be of the great value for students once this skill is mastered. Encouraging students to think and ask deep questions becomes easier when higher order thinking (HOT) questions and activities are incorporated into a lesson or topic.

Students generated ten HOT questions, using Blooms Taxonomy as their guide, and based on the topic of their online project. Figure 6 shows an example of the Inquiry Questions page for the solar system example.
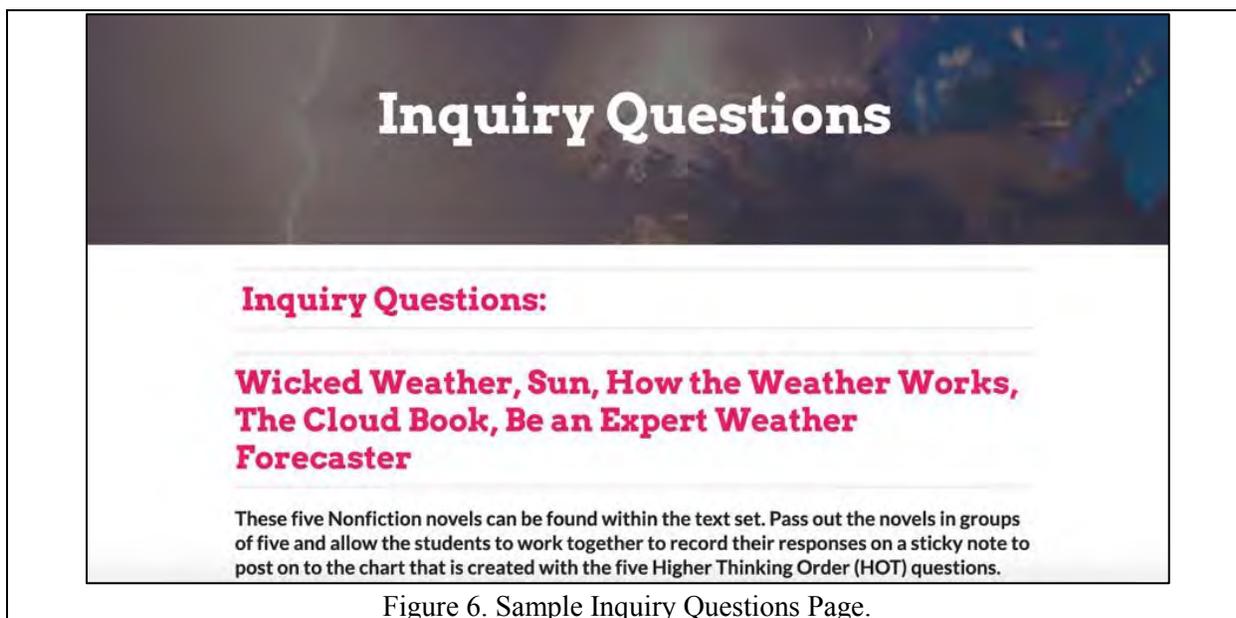
Figure 6. Sample Inquiry Questions Page.

At the end of the semester, students submitted and presented their online projects to their classes. The lead instructor provided the class with a web link that listed additional hyperlinks to each of the student's project webpages. This was intended to provide the class with a collection of resources for teaching content area literacy at a variety of levels, in a variety of disciplines.

Data Collection & Analysis

In an effort to collect genuine responses and ensure confidentiality and anonymity of responses from study participants, all students in both elementary content-area classrooms received open-ended questions in the form of exit tickets at the end of each class. These responses were left by students as they exited the classroom room at the end of each class meeting, which were collected by the lead instructor. The six participant students were directed to mark their exit tickets by checking a box located at the top left-hand corner of the exit ticket to indicate that their exit tickets be pulled aside for analysis. No additional identifiers were provided by participants on the exit tickets. The exit ticket questions were designed to elicit responses that would provide data reflecting the students' perceptions and attitudes toward the

redesigned content are literacy course. The weekly exit tickets consisted of at least one of the following questions:

- What did you find interesting about this week's class?
- What did you find challenging about this week's class?
- If I could change one thing, I would change…
- Did anything surprise you about this week's class?
- What did you find confusing or difficult?

Participant's exit ticket responses were collected throughout the semester and transcribed into an Excel spreadsheet for analysis. Responses that indicated no code-able response, such as "no response" or "N/A" were eliminated. This resulted in a total of fifty codable responses. Values coding was used to "reflect a participant's values, attitudes, and beliefs, representing his or her perspectives or worldview" (Saldaña, 2016, p. 131). The codes were then merged into three overarching themes relating to students' perceptions: technology and online project, course organization, and course assignments and grades.

Findings

Based on the data collected from student feedback, student perceptions of the course centered on three major themes: attitudes toward technology or online project, attitudes toward the course organization, and attitudes toward course assignments. See table 1 for an overall summary of the findings.

	Positive perception	Negative perception
Technology & Online Project	88%	12%
Course Organization	65%	35%
Course Assignments	28.5%	71.5%
Table 1. Summary of student perceptions		

Technology and Online Project

Sixteen of the fifty responses focused on technology or the online project. Overall responses to the technology and online project reflected positive perceptions. While fourteen of the sixteen coded data indicated positive attitudes, two responses showed negative attitudes toward the technology and/or project. Some students remarked that they "loved working on the website," and that it was "fun" and helped them "understand the topics." However, two participant responses indicated that they believed that the projects were "long and boring," and requested that we "not do that project again." While most participants found value in creating a webpage based on their application of concepts learned in the course, this was not universal.

Course Organization

Of the fifty responses, twenty centered on the course's organization; classroom versus computer lab time, face-to-face classroom time, online opportunities, and general course structure issues were some of the topics discussed in these responses. Attitudes toward the course's organization were mixed. Thirteen of twenty participant responses reflected positive reactions to the course organization. Comments related to student's positive responses to "hands on projects and lessons," and how these helped students "understand the topics that we were covering" contradicted the seven negative responses, such as the "lack of organization" of the course," and that the class lacked structure. While approximately two-thirds of student responses indicated positive attitudes toward the course organization, the remaining responses revealed decidedly negative perceptions.

Course Assignments

Of the fourteen codes related to course assignments and grades, only four of the coded responses reflected positive perceptions; ten participant responses indicated negative attitudes toward course assignments. While the positive responses about the course assignments reflected on the perceived usefulness of authentic application teaching strategies and techniques, as well as feeling that assignment instructions were straightforward and easy to follow, many more of responses expressed concerns for the limited number of grading opportunities and uncertainty of their progress throughout the semester. This signified an ongoing concern among some students; the expectations of receiving incremental assignment grades may not have been met due to the fact that a major percentage of the redesigned course was based on an end-of-semester online project.

Conclusions

Illustrating a cultural model that would describe the beliefs and attitudes that exist among students at this particular institution, it was difficult to identify specific patterns across the

participants. The strongest pattern existed when students described their perceptions of the use of technology and online project. However, students' perceptions of course assignments were more strongly negative (71% negative), perceptions were not as clearly positive or negative in regard to course organization (65% positive). This case study analysis provides a limited picture of how college students perceive a PBL course. With these students, there was much variability in perceptions of what satisfies their expectations for technology use, course organization, assignments, and grades. More research on the topic of cultural models and PBL is needed, along with a larger participant group.

Based on the data collected in this study, students perceived that one benefit of the PBL designed course provide students with opportunities to apply new concepts and learning to real-world contexts. Participant responses support overall positive attitudes toward the online projects. Students found the course to be not only highly enjoyable, but also aided them in understanding and applying content materials in authentic contexts.

Challenges attributed to the course centered on the students' discomfort with fewer grade opportunities across the semester, as well as the perception that the course seemed in their view as unorganized and unstructured. As much of the time during the second half of each class was spent independently working on the students'

individual projects, the lack of direct instruction and specific guidelines for which texts and content to integrate into the students' websites may have conflicted with their existing cultural models surrounding classroom teaching and learning.

Implications for Instruction

Conclusions from this study informed the lead instructor to make changes to the course assignments and grading in subsequent semesters. While students still created end-of-semester online projects, students also receive individual grades throughout the semester based on individual project website pages, such as the Anchor Text page, along with bi-weekly quizzes to provide students with additional grade opportunities. Additionally, students presented major portions of their projects to the class at mid-term to allow the instructor to provide feedback on the student's progress.

PBL gives students the chance to engage with content area strategies, and creatively integrate content area reading activities into a final product that can potentially be utilized in the student's future classrooms. By considering students' perceptions, and meeting some of their expectations and needs, teacher educators can still model innovative instructional models that students will be better prepared to integrate into their own classrooms.

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