

Enhancing business professional competencies in a virtual educational environment

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ABSTRACT

This paper provides an example of the successful incorporation of a virtual project-based learning (PBL) assignment as a significant component of two business courses during the COVID-19 pandemic. In these courses, undergraduate accounting and global business students worked with local nonprofits to solve real-world business problems in a virtual environment. This collaboration afforded students the opportunity to practice professional competency skills while growing in their understanding of business and of nonprofits. This paper discusses the challenges and successes that occurred during the implementation of the virtual project, encourages the use of PBL and other innovative teaching projects when teaching online, and facilitates faculty design and implementation of virtual learning programs.

1. Introduction

In 2020, the COVID-19 pandemic forced most universities around the globe to shift from an in-person format to partially or entirely online classes (Goldman & Karam, 2020; Marinoni et al., 2020). Faculty were unexpectedly presented with the task of converting the majority of their courses to an online format while simultaneously seeking to deliver quality educational experiences in this unprecedented and difficult environment. Administrations were required to formulate additional strategies to support online learning and to limit enrollment declines and financial losses. Prior to COVID-19, successful business educators already knew that it was imperative for business education to invest in innovative pedagogy (Albrecht & Sack, 2000; Blount et al., 2016), in order to meet employers' needs by addressing professional competencies (AICPA, 2020). One method used to cultivate business students' professional competencies is project-based learning (PBL) (Goltz et al., 2008; de Eyto et al., 2008). However, given its emphasis on real-world experiences including field trips, in-person meetings, and presentations, educators may find PBL a challenging approach when making the offline-to-online transition. For example, some students may feel working through problems are less rewarding, feel increased isolation, and increased disconnection when working on projects online rather than in person. (King, 2021).

The purpose of this paper is twofold: to showcase one way to engage online business students with a virtual project-based learning project and to discuss the challenges and successes that occurred in the conversion from an in-person to a virtual learning environment. The findings offered in this paper will assist faculty in the successful design and execution of virtual PBL assignments, contributing to the development of student readiness for employment in their chosen profession. The project was designed to cultivate specific

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professional competencies important to accounting practitioners, related to the areas of ethical conduct, professional behavior, decision-making, collaboration, leadership, communication, and project management (AICPA, 2020). We hope our experiences will encourage business educators to continue to develop innovative pedagogical methods to adapt to the changing learning environment.

2. Literature review

The following literature review discusses the importance of professional competencies and how project-based learning (PBL) can develop such skills.

2.1. Professional Competencies

Since the 1990s, the American Institute of Certified Public Accountants (AICPA) and other professional accounting bodies have suggested that professional accountants require accounting competencies, business competencies, and professional competencies (AICPA, 2020). Professional competencies relate to the skills, attitudes, and behaviors of accounting professionals, including ethical conduct, professional behavior, decision-making, collaboration, leadership, communication, and project management. Specifically, ethical conduct refers to the ethical principles and AICPA code of professional conduct. Professional behavior is related to work ethic, respect for diversity, and development of professional skills. Decision-making considers identifying and critically assessing issues and providing recommendations. Collaboration emphasizes working productively with diverse individuals to achieve optimal results. Leadership aims to develop attitudes and behaviors that recognize diversity, promote inclusion, and optimize individual and organizational performance. Communication requires actively listening and effectively delivering information in multiple formats. Project management deals with planning and managing individual and teamwork flow.

In practice, employers often find a gap between expected and perceived performance of accounting graduates (Bui & Porter, 2010). Studies indicate that academics primarily focus on technical skills in accounting courses, many of which can now be performed by computer programs (e.g., Armitage, 1991; Francis & Minchington, 1999). Practitioners, however, desire additional abilities that predominantly fall within the category of professional competencies. Hassall, Joyce, Montaña, and Anes (2005, December), for example, found that the most appreciated skills for accounting graduates were teamwork, organization, computing, communication, and time management. Drive and motivation were found to be the most desired attributes by Simons et al. (1995), followed by teamwork, oral communication and numeric skills, enthusiasm, and interpersonal sensitivity. Ahadiat and Smith (1994) found personality and social characteristics (e.g., reliability) to be rated the highest out of the twelve most important competencies. A survey also found that management accountant employers perceived new graduates to lack stress management skills, the ability to organize and delegate tasks, and knowledge of the accounting profession (Arquero et al., 2001).

Moreover, professional competency skills are also essential for students in other business majors. For example, McArthur et al. (2017) found that the most demanded attributes in an analysis of various job postings were motivation, time management, communication skills, and digital marketing experience. Hopkins et al. (2011) and Franco Valdez and Valdez Cervantes (2018) identified five key skill sets sought by employers, including teamwork, oral and written communication, leadership, time management, and organization. These studies suggest that besides core business knowledge, professional competency skills are critical to succeeding in business settings. Although there are differences among the sets of most critical competencies found in these studies due to the various research contexts and data sources, professional competencies are overwhelmingly emphasized. Academics need to facilitate student cultivation of professional competencies and non-technical skills to enhance student career development (Douglas & Gammie, 2019).

2.2. Using project-based learning to Foster professional Competencies

Traditional methods of learning and assessment that rely heavily on the lecture, as well as paper and pencil tests, may not achieve the desired education outcomes given the pragmatic nature of professional competencies (Gammie & Joyce, 2009). Project-based learning (PBL), a learning process based on the attempt to solve real business problems (Goltz et al., 2007; de Eyto et al., 2008), may provide an effective avenue for addressing the desired competencies. When utilizing PBL, students are required to identify and solve a problem by managing available resources and collecting information at the clients' location. Very often, PBL involves the development of partnerships with external organizations to create learning opportunities, which is known as cooperative education (Tonge & Willett, 2012). Both faculty members and managers participate in problem-defining and problem-solving activities inside and outside of class (Kleczeck et al., 2020).

PBL helps students to develop professional competencies through the challenges of problem-solving, conducting in-depth investigations, and collaborating with other group members (Fortin & Legault, 2010). Opportunities to cooperate with external organizations can further strengthen the process by exposing students to industrial contexts. Students can learn the significance of business ethics, such as conducting work with integrity and with the issues related to confidentiality. They may also develop communication, leadership, problem-solving, and interpersonal skills, as well as strategic and critical thinking (Tonge & Willett, 2012).

2.3. Developing professional Competencies in the Post-COVID Era

Since March 2020, the COVID-19 pandemic has forced the majority of universities in the United States to shift from a traditional on-campus face-to-face format to either hybrid courses or completely online courses (Goldman & Karam, 2020). Marinoni et al. (2020)

conducted a global survey involving 424 universities from 109 countries, finding that the COVID-19 pandemic affected teaching and learning at almost all surveyed higher education institutions with only 2% reporting that teaching and learning were not affected. Sixty-seven (67%) of universities were able to move teaching online; 24% suspended most activities while working on solutions; 7% canceled all classes. Many educators identified a significant concern with the loss of in-person instruction, and this loss has made the development of professional competencies and the implementation of project-based learning more challenging for educators and students. For example, many interpersonal aspects of communication are absent in an online environment, such as non-verbal cues, facial expressions (turned off cameras), inflections and emphasis, and emotional tone, which can make it challenging when teaching professional competency skills and implementing project-based learning. Some students may experience difficulties with their home environment including household distractions and privacy concerns related to their living conditions (Neuwirth et al., 2020).

As businesses closed offices and moved workspace online due to the pandemic, professional competencies, such as collaboration and communication skills, became more critical in a virtual working environment (Einwiller et al., 2021). In this new environment, it is particularly valuable to identify educational approaches to facilitating the development in students of professional competencies that will be needed in working in a business world that increasingly relies of digital progress. A successful virtual PBL model needs to offer specific guidelines to overcome the challenges experienced by the stakeholders in the online process (students, faculty members, and managers and staff of external organizations).

3. Virtual project-based learning assignment

During the COVID-19 pandemic, we incorporated a virtual project-based learning (PBL) assignment as a significant component of two business courses. The project focused on two local, nonprofit organizations (Client A and Client B) who each desired to solve a business problem; see Exhibit 1 for a project description provided to students at the start of the execution phase. There were two teams (accounting and global business) of undergraduate students assigned to each local nonprofit for a total of four teams. The two accounting teams were subsets of eleven students who were in their third or fourth year of college. In contrast, the two global business teams were subsets of eleven students in the first or second year for a total of twenty-two students. The accounting team focused on the financial aspects of the analysis, while the global business team concentrated on the problem from a global business perspective. The accounting students in the course were enrolled in a Governmental Not for Profit course with a project-based learning designation, and the global business students were enrolled in a Global Business Perspective course. Because the Fall 2020 semester was moved online due to the COVID-19 pandemic, all classes, team meetings, and client meetings were held through the Zoom platform. Online tools, including the in-class breakout rooms, emails, text chats, Microsoft OneDrive, and Google Docs, were used by the team members to communicate and to complete the project work.

Table 1
Challenges, issues and recommendations for managing virtual project-based learning.

Challenges	Issues	Recommendations
Communication	Professionalism (quality and timeliness) • Emails • Interviewing Questions • Online Zoom Meetings	Professionalism Boot Camp as preparation • Demonstration and discussion of effective communication Quality enhancement throughout execution • Review by all team members prior to review by professor before delivery Timeliness enhancement • Clear generous due dates and protocol for reminders
Collaboration	Equitable productive involvement of all team members on all project phases • Online Zoom meetings • Google Docs • Implementation of client feedback	Professionalism Boot Camp • Discussion of collaboration effectiveness Quality enhancement throughout project execution • Regular team and professor assessment of collaboration effectiveness
Experience	Losing in-person learning experience • Regarding the clients' businesses and industries • With the client organizations' personnel	Professionalism Boot Camp as preparation, discussing • Basic information of the clients. • Industry analysis for the clients Zoom meetings directly with upper management of the client organizations • Understand the clients' businesses and problems directly • Access the most important information efficiently
Management	• Time management • Teamwork • Client expectations • Agreed upon deliverables • Professor involvement in project management	Professionalism Boot Camp as preparation • Use of workflow tools • Importance of manageable timetables and deliverables Emphasizing during project execution phase • Accountability of timely equitable productive involvement of all team members Real time assessment of and intervention by professor in team management concerns

The table above describes the challenges, issues, and recommendations for managing virtual project-based learning.

Throughout the project, the students attempted to apply professional competencies, as well as use information gathering, diagnostic problem solving, critical thinking, and written and verbal communication skills in the analysis and assessment of the selected nonprofit organization. Finally, the project was designed to enhance students' understanding of how decision-making in accounting and global business can contribute to the strategy and success of nonprofit organizations. Further discussion is provided below on the measurement of the students' understanding of the project based on the reflection assignments and surveys.

The accounting team analyzed and offered solutions to the client business problem, reviewed the financial aspects of the organization (qualitative and quantitative), evaluated the background of the organization, completed an analysis of financial statements and Form 990 (annual information returns required of tax-exempt organizations), performed a contribution and benchmark analysis, assessed the budget, and provided recommendations for the nonprofit. The global business team analyzed the client's business problem; completed a PESTLE examination (Political, Economic, Social, Technological, Legal, and Environmental), a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats), an analysis using various Integral Human Development models (based on the organization's assets, systems, and structures), a landscape or competitive analysis, a demographics study of beneficiaries, and fundraising research; and provided general business (including marketing) and fundraising strategy recommendations. After the analyses, all teams prepared a final report and conducted a 20-to-30-min PowerPoint presentation to the managers and staff of the organization via Zoom. The students were assessed based on the completion of each of the six (6) milestones (see Table 2). Before and after the project, the students were administered an electronic survey through Qualtrics to obtain information related to their experience and perception of knowledge gained as a result of the project. Student participation required on the project execution was approximately 30 h, and this occurred over the course of the semester (16 weeks). Students were taught the respective class content through project-based work, pre- and post-surveys, as well as in conjunction with the business modeling and concepts (both accounting and global business). During the project, we included 10 h for grading, feedback, coaching, etc. during this project. The external organizations did not contribute any additional time in the assessment phase of the project beyond attending the final presentations and providing immediate feedback.

4. Virtual project-based learning framework

In this section, we provide an overview of the virtual environment and elaborate on the three PBL phases: preparation, execution, and assessment. Fig. 1 shows the virtual PBL framework that was conceptualized prior to the projects described in this paper and further refined based on our experience.

Although the main structure of the framework is applicable to face-to-face projects, we noticed that certain non-verbal cues that enhance communication such as body language, inflections and emphasis, and emotional tone and immersive experiences in field trips and client meetings were not present in the virtual learning environment. Thus, the virtual PBL framework highlights the four types of challenges faced by students and educators in the virtual learning environment: communication, collaboration, experience, and management. Communication challenges refer to the complication in the exchange of information among students, clients, and professors which solely depends on digital channels. Collaboration challenges represent the issues that occur in virtual teamwork between students. Experience challenges include the consequences of different learning and working experience with field projects in the virtual environment. Management challenges capture the increasing difficulties for students to manage their time and tasks virtually. These challenges increase the reliance on virtual tools and the importance of communication skills and etiquettes. Accordingly, we recommend including related training in a professionalism boot camp at the beginning of the project execution phase. In the sections below, we provide more detailed discussion on the proposed project.

4.1. Virtual Environment Challenges, issues and recommendations

When planning and executing this virtual project, we identified a number of specific issues related to communication, experience, collaboration, and management challenges that needed to be addressed. Many of these problems only exist in a virtual context, while others are inherent in PBL projects but are greatly magnified in a virtual context. Table 1 illustrates the challenges, issues and

Table 2
Six milestones of the virtual field project.

Milestone	Tasks
Project Milestone 1	Group planning meeting, list of questions for the client, list of requested items for a client, email draft, schedule client meeting (coordination between accounting/global business team), and written reflection.
Project Milestone 2	Client meeting, notes, and assessment from interviews and written reflection.
Project Milestone 3	Fieldwork (gathering of documents), analysis, scheduling of an interim meeting with the client (coordination with accounting/global business team), and written reflection.
Project Milestone 4	Interim client meeting, preliminary assessment and analysis, and written reflection.
Project Milestone 5	PowerPoint presentation, mock presentation and executive summary and reports, scheduling of final presentation (coordination with accounting/global business team), and written reflection.
Project Milestone 6	Final presentations, reports, and written reflection.

The table above describes the tasks covered within each project milestone.

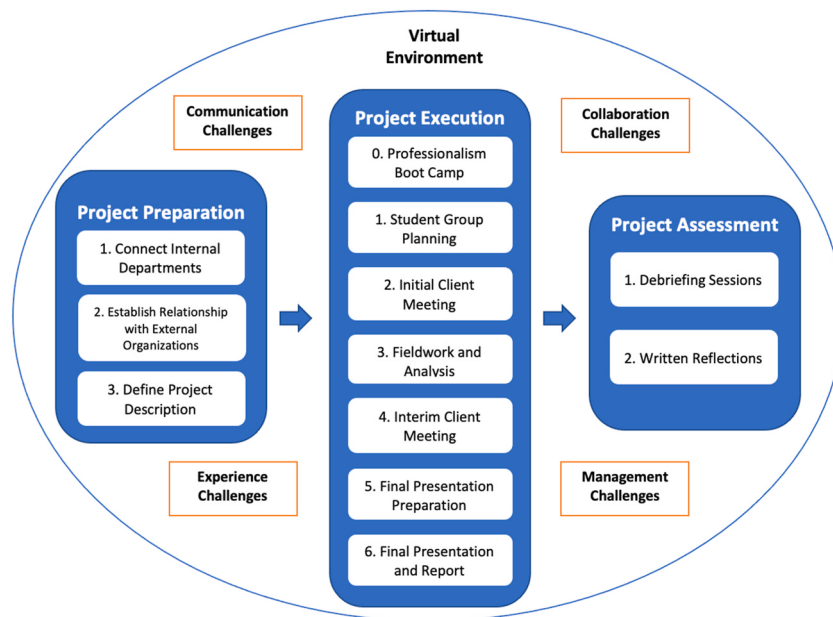


Fig. 1. Virtual Project-Based Learning Framework

The figure above displays the components for the virtual project-based learning framework.

recommendations that should be considered in planning a virtual project. The professors noted that due to the limited professional experience of some students, they needed additional guidance during the project. For example, it appeared that the students who needed more assistance with client interactions, obtaining client information, and general business protocol were those who did not have in-person internship experience before the pandemic. It is important to note that even though some third- and fourth-year students had prior internship experience, during class discussions they expressed that it was more difficult to connect with the client through email and on Zoom. For example, one student mentioned that if they were located at the client site, they could walk into the office of the client staff and ask questions to have inquiries answered more expeditiously.

Communication Challenge. Although we assumed that issues in communication would exist, we were provided specific examples during the execution of the project. For example, students found it difficult to identify how often to contact a client by email if they did not respond, what are the next steps if the client does not respond, and how to structure the questions to the client to ensure they obtain and understand all the information distributed. Furthermore, students inquired about the frequency with which to meet a client on Zoom. The professors guided the students through class discussion and feedback at each milestone to mitigate these concerns. For example, when the clients did not respond to the students, we asked the students to send two follow-up emails. If there was no response by the client, the professor reached out to the client. This taught students how to follow up on communications and how to escalate an issue to a manager (i.e., professor) when needed. Also, the students learned how to structure their questions by developing a list of questions for the client and then the professor would review the list and provide feedback (i.e., revisions) prior to the students sending the questions to the client or asking the questions in the meetings. In retrospect, we are convinced that many of the communication issues in the virtual PBL could have been minimized by addressing communication issues in a pre-project professionalism boot camp. While students may be familiar with the informal use of a wide variety of forms of communication, they are unlikely to be proficient or comfortable in meeting with the professionals they will be interacting with within the project. The need for professional training is even more apparent when the project is conducted virtually. For example, students may be familiar with the basic use of Zoom such as logging in, utilizing the chat tool, responding to polls, and sharing screens to virtually attend a class. However, students may be totally unprepared to exhibit professional Zoom dress attire, set up the Zoom meeting, invite participants, initiate the meeting, share the screen with other participants, gather feedback, and provide relevant documents and materials to their fellow participants in real time.

Collaboration Challenges. Although students collaborated in online class meetings, through text messages, shared drives (Google and One Drive), emails, and Zoom, there were difficulties with internal team collaboration. These challenges included determining a convenient time for all team members to meet and “collaboration overload” where students were overwhelmed with a high volume of content provided through various sources. The collaboration obstacle and collaboration overload were mitigated by allowing students to meet with their groups during class time and the professor sharing information and feedback through one source, i.e., the Learning Management System platform, instead of multiple sources. Once again, in virtual settings, the pre-project preparation of students for the use of document sharing and the consideration of how and when to share, and how much to share becomes paramount. In face-to-face contact, we can easily see our fellow students roll their eyes when we hand them 100 pages of printed material to read by tomorrow. We may not be privy to the appropriate cues of dissatisfaction from our colleagues if we simply hit forward and send them the same 100 electronic pages that we found at midnight the night before our shared presentation.

Experience Challenges. We noticed the difference between virtual and in-person experiences was significant. Overall, the students lost valuable in-person experience with clients. With the virtual environment, there were decreased opportunities for students to connect with clients through impromptu conversations with the organizations' personnel to access a wealth of additional information. In the virtual environment, conversations must be scheduled and are constrained by predetermined time limits. Also in the virtual environment, observations about the clients' business and industry are lost. Researching information online and scheduling brief discussions about the industry does not replace the value of observing the clients' daily business practices. To properly assist students with preparing for these challenges, we recommend that prior to the start of class, the aforementioned professional bootcamp be utilized to discuss basic client information and to complete an initial industry analysis. Furthermore, the Zoom meetings should be held directly with upper management of the client organizations to understand the clients' businesses and problems directly and discuss how to access the most important information efficiently before the project begins.

Management Challenges. Students indicated that they faced many challenges with managing multiple facets of the virtual project. For example, students were required to administer the milestone deadlines, analyses, and client communications. The professor assisted with establishing the milestone deadlines, providing guidance, and answering inquiries with the analyses, and facilitating client communication if there were substantial delays with client responses. Preplanning and professor guidance of timelines and methodology becomes even more important in the virtual world where deadlines are easier to miss due to fellow students and clients seemingly disappearing or not responding, and it is sometimes difficult or impossible to ascertain the cause of the lack of communication. The management challenges may occur whether the project is online or in person, however it may be more difficult to communicate in an online setting because non-verbal cues may not be as apparent in virtual settings as they are in a face-to-face environment.

Finally, with students from a variety of majors, backgrounds, and levels of education, there was a great disparity in the degree of student frustration and anxiety. Students exhibited a wide range of ability or discipline to meet deadlines and to perform in the virtual world. Preparation of the students ahead of time in the course or a professional boot camp with the business, professional and electronic skills needed for a virtual project should reduce anxiety and improve student performance on the project. It is also important to remember that the four noted challenges interact. For instance, students with less experience have more communication, collaboration, and management issues. Intervening and addressing any one of the four challenges will frequently assist students in coping with the other three.

4.2. Project preparation

The project preparation phase included three steps: 1) connecting with university departments, 2) establishing a relationship with external organizations, and 3) defining project description. In the first step, faculty connected with internal university departments to evaluate available resources and requirements. For example, for this project, we connected with the Community Engagement Department to determine existing relationships with outside organizations to potentially partner with. In many universities, the Community Engagement Department would be called Community Outreach or Community Service.

With the assistance of the Community Engagement department, faculty identified the most appropriate external organizations based on several factors, such as the alignment of its mission with that of the university's, its relationship or history with the Community Engagement Department, the organization's previous experience working with students on a volunteer or project basis, its ability to dedicate staff and resources to the students and project, its tech savviness, and the clarity of its problem and timeframe. Once an organization was chosen by the professors, an introductory meeting was scheduled.

At this introductory meeting, Community Engagement staff, the professors, and the external organization's management discussed the scope of the external organization's business problem in more detail, identifying specific milestones, timeframes, and deliverables that the external organization could expect. Finally, after the discussion, the project description was developed through collaboration of the professors and the external organization (client). The project preparation phase involved the professor, Community Engagement, and the external organization; the time commitment of the three stakeholders in this phase was 5 h collectively.

4.3. Project execution

Once the preparation phase was complete, students became involved, completing six steps to execute the project successfully. These steps included the student group planning, initial student virtual meeting with the client, fieldwork and analysis, interim student/client meeting, final analysis, and the final presentation and report to the client. Table 2 lists the PBL milestones developed for the project. The milestones that included direct contact with the client such as the introductory meeting, the interim meeting and preliminary results, and the final report presentation meeting, were negotiated with the client. The project execution phase consisted of student, professor, and client interactions, and this phase of the project required in-class or out-of-class time from the students (approximately 30 h), in-class and out-of-class time from the professors (approximately 20 h), and approximately 10 h of time from the external organization. Throughout this phase, every milestone involved written student reflections which would later serve as a basis for assessment of the value to the student of the PBL virtual experience.

4.4. Project assessment

The project assessment includes debriefing sessions and written reflections. It is important to note that throughout this phase there were multiple milestones (see Table 2) that required written reflections and deliverables including draft or final reports and

presentations. During this phase, pre- and post-client meeting sessions were held between students and the professor to discuss the expectation of the meeting logistics, questions, topics, and thoughts on what went well and items to improve upon. The students indicated that these sessions helped them know what to expect during the upcoming meetings and in understanding how to prepare and conduct themselves in a project business meeting. After the actual client meetings, a debriefing session was conducted in class for students to discuss what they thought went well, what could be improved upon, and thoughts on how what they learned could be applied to the real world in business. At each milestone, a one-to-two-page reflection summarizing the students thoughts along with a copy of the draft or final report was submitted to the professor.

5. Methods

Empirical analyses were both qualitative (reflections) and quantitative (surveys). We conducted qualitative content analysis on the student reflections required in the six project milestones (Kassarjian, 1977; White & Marsh, 2006). In qualitative content analysis, data are categorized using categories that are generated, at least in part, inductively (i.e., derived from the data), and in most cases applied to the data through close reading (Morgan, 1993). Following this methodology, we closely read through students' reflections and identified themes (e.g., teamwork) through related phrases (e.g., "group meeting", "teammates", "work together"). In addition, we also captured students' various attitudes towards each theme that can be positive (e.g., "exciting") or negative (e.g., "scared").¹ Table 5 summarized themes mentioned by 30% of responses or above in each milestone and associated sentiments. Moreover, students voluntarily participated in the pre- and post-project surveys administered on Qualtrics.com. Two sets of closed-ended questions were adopted in the survey questionnaires to measure students' personal information and experiences. The results from the pre- and post-project surveys are aggregated and presented in Table 3 and Table 4, respectively. The following section discusses the results from the reflections and the surveys.

6. Results

6.1. Milestone reflections (qualitative)

We conducted a qualitative content analysis on student reflections to systematically detect the common themes and their associated sentiments (Kassarjian, 1977; White & Marsh, 2006). Table 5 illustrates common themes and sentiments captured by the student reflections. Sentiments are noted for each milestone, as well as positive and negative sentiments where applicable. In Milestones 1–6, some of the positive sentiments included students responding that they had been eager, excited, productive, and had felt the experience was beneficial. Alternatively, students expressed some negative reactions including uncertainty and nervousness. It is important to note that students have concerns about embarking upon a real-life project involving clients; therefore, it is important for professors to communicate often with students to answer questions, boost their confidence levels, and minimize any concerns.

Milestone 1. In Milestone 1, with a 91% response rate, 80% of the respondents mentioned teamwork/group meeting in their reflections. Students felt "great," "amazed," "excited," and "successful" about the group planning meetings. In-group communication was considered "extremely important" and "productive." Seventy (70%) mentioned the real-life project. Although some felt "uncertain," "overwhelmed," or even "scared," the more general sentiments reflected are "eager," "looking forward," "exciting," "grateful," and "fulfilling."

Milestone 2. In Milestone 2, with a 91% response rate, 100% of the respondents discussed the initial meeting with their clients. Before the meeting, students felt "uncertain," "nervous," and "difficult," but as the meetings went "smooth[ly]," they became "relieved," "excited," and "thrilled." They also learned the importance of being "respectful" and "professional" when communicating with clients. One respondent who missed the meeting felt "very disappointed" at losing the valuable opportunity. Seventy (70%) of the respondents mentioned teamwork. They describe their project group as "collaborative" and "effective," which makes them feel "grateful," "pleased," "happy," and "comfortable." However, 50% of the respondents, who were in the group working with client B, experienced difficulties in accessing some documents from the client, which made them feel "unfortunate" and "sad."

Milestone 3. In Milestone 3, with a 91% response rate, 100% of the respondents discussed the analysis of clients' documents. The process was "important," "crucial," "tough," and "strenuous," but "insightful," "helpful," "interesting," and "successful." Students also feel more "confident" and "prepared" to use analytical tools. Thirty (30%) responded that teamwork was "very helpful," "efficient," "cohesive," and "extremely pleasing."

Milestone 4. In Milestone 4, with a 100% response rate, 82% of the responses are related to the preparation of the upcoming interim client meeting. Students felt "anxious," "worried," "stressful," yet "fun" and "look forward" to the meeting. Fifty-five (55%) responded positively regarding their teamwork, which had been "productive," "extremely supportive," "super understanding," "responsive and informative."

Milestone 5. In Milestone 5, with a 100% response rate, 64% discussed the interim meeting with the client, and felt the meeting was "very beneficial," "went very well," and "helped tremendously." Nevertheless, 36% of the respondents, who are in the group working with client A, experienced issues of communication and document retrieval with the client, which made the students feel "stress[ed]" and a "sense of urgency," although they were still able to be "calm and collected" as a team.

¹ During the analysis, we captured positive or negative attitudes, neutral attitudes were not considered in this analysis.

Table 3
Survey Descriptive Statistics
 The pre-project survey.

	Count (Percentage)
Major	
Accounting	11 (52.4%)
Biology	3 (14.3%)
Computer Science	2 (9.5%)
Finance & Risk Management	2 (9.5%)
International Business	1 (4.8%)
Criminology	1 (4.8%)
Industrial Engineers	1 (4.8%)
Class project experience	19 (90.5%)
Online class project experience	10 (47.6%)
Teamwork experience	20 (95.2%)
Work experience	8 (38.1%)

Total respondents = 21.

The table above provides descriptive statistics at the beginning of the project.

Table 4
Survey Descriptive Statistics
 The post-project survey.

Question	Scale	Mean (S.D.)
Improvement on the understanding of business concept and principles	Five-category interval scale 1 = strongly disagree, 5 = strongly agree	4.52 (0.51)
Application of business concepts and principles		4.47 (0.51)
Improvement on research skills		4.31 (0.79)
Improvement on teamwork skills		4.59 (0.62)
Prefer a virtual or a live project	Binary scale 0 = live, 1 = virtual	0.47 (0.44)

Total respondents = 17.

The table above provides descriptive statistics at the end of the project.

Table 5
 Themes and key sentiment-related phrases identified in milestone reflections.

Miles- tones	Response Rate	Themes	Mentioned	Positive Sentiment Phrases	Negative Sentiment Phrases
1	91%	Teamwork/Group meeting	80%	Great, Amazed, Excited, Successful, Extremely important, Productive	
		Real-life project	70%	Eager, Looking forward, Exiting, Grateful, Fulfilling	Uncertain, Overwhelmed, Scared
2	91%	Initial client meeting	100%	Smooth, Relieved, Excited, Thrilled, Respectful, Professional	Uncertain, Nervous, Difficult
		Teamwork	70%	Collaborative, Effective, Grateful, Pleased, Happy, Comfortable	
3	91%	Accessing client documents	50%		Unfortunate, Sad
		Analysis of clients' documents	100%	Important, Crucial, Insightful, Helpful, Interesting, Successful, Confident, Prepared	Tough, Strenuous
		Teamwork	30%	Very helpful, Efficient, Cohesive, Extremely pleasing	
4	100%	Interim client meeting preparation	82%	Fun, Look forward	Anxious, Worried, Stressful
		Teamwork	55%	Productive, Extremely supportive, Super understanding, Responsive, Informative	
5	100%	Interim client meeting	64%	Very beneficial, Went very well, Helped tremendously	
		Communication and document retrieval	36%	Calm, Collected	Stress, Sense of urgency
6	91%	Completing the project	100%	Eye-opening, Highlight, Enjoyed, Extremely rewarding, Liked, Definitely helpful	Different, Out of comfort zone, Nerve-wracking

The table above illustrates the findings of the qualitative content analysis on milestone reflections.

Milestone 6. In Milestone 6, with a 91% response rate, 100% mentioned completing the project. The students consider the project “eye-opening” and “very different” from other projects, and the “highlight of the class.” Although it pushed the students “out of [their] comfort zone” and could be “nerve-wracking at times,” they, in the end, felt “relieved,” “enjoyed,” and “extremely rewarding.”

Students also “liked” the milestones and found the project-based learning experience “definitely helpful” for their future careers.

The milestones illustrated in Table 5 and the selected quotes presented in the Appendix (Exhibit 2) demonstrate that although students were slightly uncomfortable approaching a real-life project, they learned various communication, leadership, research, and critical thinking skills. Based on the professors’ observation and the reflection analysis, it appeared that the virtual environment created more challenges for the professors and the students. If a student was absent from class where valuable project information was shared, the professor could only send a message to the student through an email. If the project were in person, the professor could connect with the student face to face to answer questions and notice body language cues as to whether the student was understanding the information or possessed additional questions. A best practice we would recommend in the future is to connect face to face with students who missed client-related meetings or classes to ensure they have all available information to be successful. We encouraged team members to share information if there was an absence, but in some cases, we observed that all information was not shared with team members. In a situation where the classes are conducted virtually, a Zoom meeting will suffice for face-to-face interaction. As we analyze the sentiments of students’ reflections from Milestone 1 to 6, we observe that students went from nervous, to excited, to challenged, then feeling rewarded at the end of the project. Although some of the sentiments would be similar, whether in person or a virtual environment, it appeared that there were more issues noted by the Professors with student sentiments regarding the challenges faced when a client does not respond timely to an email. Based on authors previous personal and professional experiences/observations, in a face-to-face atmosphere, typically the client can be accessed in person by walking over to their office to obtain the answers to inquiries, as well as through email. The challenges faced during the project were due to the virtual setting versus an in-person setting and were further exacerbated by the pandemic. Overall, the qualitative analysis expressed general sentiments of student thoughts about the project as they progressed from one milestone to the next which provided the context on how students felt about the completion of the client deliverables.

6.2. Survey (quantitative)

The pre-project survey was completed by 21 students for a response rate of 95% (21/22), and the post-project survey response rate was 77% (17/22). The survey descriptive statistics are illustrated in Table 3. The pre-project survey showed that 52.4% of the respondents were accounting majors, 14.3% biology, 9.5% computer, 9.5% finance and risk management, 4.8% international business, 4.8% criminology, and 4.8% industrial engineering majors. While 90.5% had experience in working on projects in a class setting, only 47.6% of the students had experience with virtual projects. The majority (95.2%) of the students had prior experience working on a team, while 38.1% of the students possessed previous work experience.

In the post-project survey, a five-category interval scale was used which allowed responses of Strongly Agree, Agree, Neutral, Disagree, or Strongly Disagree. Students responded positively on the effectiveness of the virtual project, in terms of improving their understanding of business concepts and principles (52.9% “Strongly agree”, 47.1% “Agree”), application of business concepts and principles (47.1% “Strongly agree”, 52.9% “Agree”), improving research skills (47.1% “Strongly agree”, 29.4% “Agree”, 17.6% “Neutral”, 5.9% no response), improving teamwork skills (64.7% “Strongly agree”, 29.4% “Agree”, 5.9% “Neutral”). When students were asked the question, “Do you prefer a virtual or a live project?” 47.1% stated that they preferred a virtual project compared to 52.9% favoring a live project.

The quantitative results highlight that over half (52.4%) of the students were accounting majors and less than half had experience working in an in-person work setting with a client. Then students gained important business skills (improving understanding, application, research, teamwork), however, over half (52.9%) preferred a live project over a virtual one. We surmise that this result might be attributable to the challenges that were faced due to the virtual setting versus an in-person setting.

6.3. Professional Competency skill reflection

One additional reflection was assigned at the end of the semester, which asked students to share how they have gained professional competency skills in the areas of ethical conduct, professional behavior, decision-making, collaboration, leadership, communication, and project management. Below are examples of student quotes on the seven dimensions of professional competency skills. These quotes share information on how the students learned to apply their knowledge and gained the professional competency skills that employers seek. This course project’s value is supported by students’ positive evaluation of their overall project experience that connects practice with theory.

6.3.1. Ethical conduct

The students provided insight into how they gained ethical conduct skills by learning how to keep confidential information safeguarded that was provided to them by clients and some students expressed how they learned to use discretion in discussions related to client information. The quotes below highlight the students’ thoughts about ethical conduct.

“I have acquired the competency of ethical conduct by safeguarding confidential information presented to me as a consultant. I have ensured not to discuss or disclose sensitive information that I have learned about the client. Their financial statements, policies, and procedures, budget information is extremely sensitive and confidential, as they’re not publicly disclosed on their website. Therefore, safeguarding the information [is] acting ethically. Apart from my team, I have not discussed any of the confidential matters with anyone else, as it could even spread to the competitors of the client. By being diligent to lock my laptop and by being conscientious of my access to confidential information, I have been able to utilize my ethical conduct competency.”

“I gained skills in ethical conduct by partnering [with] [Client A] by supporting a non-profit organization that aligns with my

personal values ... the organization provides many services for those in the surrounding community. An example of upholding my ethical behavior was being honest and transparent when disclosing which problems or opportunities the accounting team would be addressing. By doing this, we were letting the [Client A] team have a certain level of expectations in the areas we planned to address."

6.3.2. Professional behavior

The following quotes discuss the professional behavior skills learned by students such as interacting and communicating with clients, time management, and prioritization. The following quotes summarize how students felt they learned professional behavior skills.

"The experiences I have had working on this project are like no other. I have gained experience interacting with executives and key players at the client's organization. For example, I had to work on my emailing skills. Additionally, I learned about the importance of detail. I had to reach out to three different individuals that worked in separate sectors of the organization. I had to double-check and make sure I was sending the email to the person in charge of the specific program. If I were to email the wrong person, I feel like it would have shown a lack of attention. I also had to make sure that they had no grammatical or spelling errors and sounded professional. There was a point when days had passed, and there was still no response. Although we needed the information and documents, I also had to understand that they were a part of the "real world" and had a lot of other work responsibilities."

"I have matured in my professional behavior, especially when working with the representatives of [Client A]. By supporting a common mission, I am respectful and appreciative of them taking time out of their work days to be able to collaborate with my peers. By seeing how professors moderated and introduced the teams during the initial Zoom call, I was able to experience how a professional meeting should be handled and executed. In the interest of time in a Zoom call, especially with a large number of participants, I have to be aware of the amount of time I am taking during a meeting. In other words, I have to prioritize what I need to have discussed during any meeting to not take away time from others."

6.3.3. Decision-making

An excerpt of the student quotes below indicates that the students learned a variety of decision-making skills such as analyzing tasks, conflict resolution, and respecting as well as listening to different group members' opinions.

"As a group, we dealt a lot with decision-making. In the beginning, we were presented with various tasks, but we had to analyze and choose which ones we were able to work on and use our level of expertise to complete the tasks to the best of our ability. Every time I meet with my group, we are making decisions that we think are best for our project."

"In terms of decision making, the improvements made were related to [the] group decision making process ... The biggest lesson that I got from this process is that everyone might have different angles on how to solve an issue, and that the different perspectives might bring to light something else that wasn't previously considered. As so, this helped me improve on my listening skills and thinking on how I can complement my ideas to other people's ideas."

6.3.4. Collaboration

Since the students worked in groups, they gained collaboration skills. The quotes below indicate that students learned to work and collaborate with other team members.

"Working with a team is not easy because you each have your way of doing things and how fast or how slow you want to get things done so you cannot just do things your way so every time I work in a team, there're things about me I learn and can approve on each time."

"The biggest lesson that I got from this process is that everyone might have different angles on how to solve an issue and that the different perspectives might bring to light something else that was not previously considered. As so, this helped me improve on my listening skills and thinking about how I can [complement] my ideas to other people's ideas."

6.3.5. Leadership

During a student's academic career, they may not have a multitude of opportunities to practice or learn leadership skills. This project assisted students with learning leadership skills. The quotes below indicate how students learned leadership attributes such as allowing others in the group to lead.

"Leadership is not always taking the lead and doing things the way you see fit but sometimes to be a good leader. You have to do what is best for the team even if that means you have to take a backseat."

"I have been able to use my leadership skills in various ways. I was the representative for the initial client meeting, asking questions for the team and representing the Accounting [Client A] team professionally. I have also been able to lead my team to think about the project in different ways when there is an obstacle or limitation in the information gathered from the client. I have also been able to lead the team to not stray away from the main goal when the team is clouded by a wealth of information provided by the client, thus paving a way solidified in clarity."

6.3.6. Communication

During the project, students had the opportunity to communicate with each other and with clients. This experience is helpful because while working in a business setting, communication within and outside of the group is important. The quotes below indicate that communication skills were enhanced such as group chats, email, and Zoom conversations.

“As a group, we are constantly communicating. I learned that it is crucial to communicate to stay up to date and work together effectively. It would not be fair to my group if I never attended the meetings, never offered to work, or never have any input on the various decisions we have to take. I have to be empathetic, be respectful, not forget that this is a group project, and everyone has to take part.”

“My communication skills have been used extensively in my internal team and with my external client. Communication is the key in a team because it raises concerns, helps meet deadlines, formulates solutions, adds to clarity, and contributes to overall cohesiveness. Our team has created a group chat as the main source of communication channels that is easily accessible for everyone. Additionally, communicating with the client is extremely critical as it adds to how one conducts [oneself] professionally. By using email as the main source of the communication channel, the team was able to communicate with the client efficiently and obtain the needed information.”

6.3.7. Project management

Whether a student is working on an audit, a consulting project, or an academic project, the ability to be well versed in project management skills is critical to success. In this project, students gained project management skills as highlighted in the quotes below such as the importance of project milestones and advance preparation. The quotes listed below share some student insights into how they gained project management skills.

“... my biggest project management takeaway is on the importance of defining and structuring milestones for a project. Milestones allow for planning and keeping track of the progress of the project. It ensures that the project is not done at the last minute and that provides the project manager with an idea of possible obstacles and the overall organization and timing of the project.”

“As far as project management, I have learned to prepare in advance. Effective planning helps minimize stress and cramming. In addition, to the time allotted to us in class, my team members and I communicate via group chat. In that chat, we discuss deadlines and project milestones. We also split responsibilities and address any questions that we have regarding the project.”

7. Discussion

7.1. Implications

The implications of the study are significant for student teams working in a virtual environment. From this study, we learned that there are various challenges that occur while conducting business in a virtual environment and contributed to the extant literature related to project-based learning, e-learning, and professional competency development. Overcoming the challenges related to communication, collaboration, experience, and management is beneficial when remote projects, meetings, interviews, or internships are conducted. As presented in [Table 1](#), we identify various challenges, related issues, and recommendations for projects in remote business settings. For example, it is helpful to provide appropriate feedback and ensure that all parties are on the same page as it relates to communication distribution. Tools such as Google Docs for a team, discussing meeting agendas in advance, and weekly project findings can enhance the collaboration aspect of the project. For experience disparities within a team or in business, more coaching of less experienced team members, conducting competitive and market research, and reviewing information prior to team members receiving the information can bring forth opportunities to enhance project/business experience. For management, coaching and implementing measures for time management, enhancing teamwork, and managing client expectations and deliverables can be valuable.

This paper provides insight into planning, executing, and evaluating a virtual field project while overcoming challenges associated with conducting remote projects, meetings, interviews, and internships. Educators can view this study as a model in developing innovative educational strategies to teach skills employers desire, such as the professional competencies of ethical conduct, professional behavior, decision-making, collaboration, leadership, communication, and project management. Challenges and related issues were addressed while working in the virtual environment, and students indicated that they learned from real-world experience, which will enable them to become better leaders and more vital critical thinkers.

Specifically, the professors of the project provided the following observations and suggestions.

1. Students with more relevant education experienced a much shorter learning curve before contributing to the project with crucial business knowledge and skills. Thus, virtual courses which emphasize a collaborative real-world project-based learning component may be most effective for juniors, seniors, and by extension, graduate students. Additionally, business majors may find such courses of greater intuitive interest than non-business majors. A well-designed peer review component may help address differences in experience and interest by communicating expectations common to all students.

2. It is recommended that the course design include a professionalism boot camp to overcome the identified challenges in the virtual learning environment. These topics include appropriate professional attire and behavior (virtual and in-person), technology troubleshooting, business writing, standards for informal communication and formal presentations, guidelines for planning meeting agenda, and project milestones. Such a boot camp can shape student expectations and comfort level in working with outside organizations' management.
3. Students appreciated the predeveloped milestones; however, increased real-world learning can be enhanced if the students create the milestones and if the milestones allow more time for review and feedback. For the purpose of developing professional competencies, we noted that the students could have gained more hands-on planning experience if they developed their own milestones. During the project, we had a short turnaround time (one to two days) to review student progress and provide feedback. We encourage professors to allow more time so that they can have more flexibility managing their time and resolving issues that may arise. Furthermore, real-world experience can be introduced to students through role-playing and scenarios.
4. Online communication challenges can be ameliorated by holding more professor/team sessions to provide further guidance and discuss the submitted milestone reports. Based on the experience gained during the project, we recommend holding such a session at least once a week lasting 20 min or more so that students may ask additional questions to expand their knowledge. The additional emphasis on direct communication will enhance the motivational aspect of the milestones.

5. Finally, there was feedback from the clients and from students. At the conclusion of the project, clients mentioned that they were pleased with the results and that it would have been helpful to have had more time to gather the requested documents. In the future, administering a survey to the client would be helpful to gain additional feedback. Students mentioned more one-on-one meetings with the professors would be helpful, and they felt nervous before client meetings. Conducting more structured one-on-one meetings with the professor and sharing some strategies with students on how to handle stressful situations would assist in enhancing project communication and student experience. Also, follow-up meetings after an official client meeting would be beneficial for the success of the virtual project. During this project, each client meeting was followed by a short debriefing session, but additional time would add value and allow for a more enhanced meeting analysis.

7.2. Contributions

This study contributes to the limited body of research in online business education with PBL. It discusses and provides innovative ways to teach a course virtually while integrating real-world experience and achieving learning objectives. The proposed virtual PBL framework includes three main phases (preparation, execution, and assessment) and detailed steps and milestones, which illustrates the procedures to integrate project-based learning for the common good and to enhance professional competencies in an online environment. The strategies we developed to overcome the challenges of virtual environment are beneficial to implement a virtual project in a work environment or educational setting. The lessons learned in this project also identify that virtual business projects may require more structured communication from professors to assist team members with inquiries and guidance and there might be an increased chance of difficulty obtaining information from clients, therefore measures should be put in place to address this issue.

7.3. Future research

The current study is limited by the small sample size but can lead to future innovations in business pedagogy. Future studies can explore the differences between virtual and in-person PBL and find ways to combine the two to create a hybrid version. Researchers can also compare employees with an educational experience of virtual projects to those without any to determine whether educational online project experience results in higher employer evaluations. Another research idea is to conduct a survey of alumni to inquire about their current work experience and if their involvement with PBL positively contributed to their success in business and which skills they specifically gained during the project(s). Furthermore, future studies can include the students' grades to analyze whether prior preparation and or experience impacted students' grade performance on the project.

8. Conclusion

This virtual project involved two local nonprofits and undergraduate students who were enrolled in an accounting and in a global business course. All work was completed online due to the COVID-19 crisis, which changed the modality of the course delivery, teamwork, and client interactions. Project-based learning proved to be an exceptional tool for helping students learn and develop skills while assisting nonprofits with business problems. Although students did not prefer virtual projects, they felt the experience was valuable and could assist them in the real world.

Educators can apply the proposed virtual PBL framework in creating their innovative educational strategies to teach skills employers desire beyond professional competencies, such as accounting competencies (technical accounting expertise) and business competencies (a broad business perspective and general business skills). Amidst the challenges inherent in the virtual learning environment, overall, students indicated that they learned from this real-world experience, which should enable them to become better leaders, to enhance critical thinking, and to serve the common good.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijme.2022.100700>.

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