Examining the impact of a quasi-virtual internship on undergraduate career preparedness and team dynamics

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Abstract

Purpose – Career preparedness is critical to successfully transitioning from college to a full-time work environment. Being prepared means students have the technical and non-technical skills to help an organization meet its strategic goals. In many instances, students lack the requisite career competencies and collaborative skills. This study proposes designing an instructor-led, career-driven quasi-virtual internship to address this issue and improve students' preparedness and teamwork.

Design/methodology/approach – Our research integrates and expands the four-step processes outlined in instructional and course redesign theories, including analysis, design and development, implementation and evaluation. In the evaluation phase, a survey is used to collect data, and natural language processing is applied to identify the emerging themes. The sample included 104 undergraduate students enrolled in an information systems degree program, which resulted in a digital corpus of 40,744 words for analysis.

Findings – Results indicate that the implementation of instructor-led quasi-virtual internships offered a comprehensive career experience comparable to an onsite or virtual company-sponsored internship in five notable areas: (1) application of technical knowledge, (2) critical thinking, (3) time management, (4) application of IT project management and (5) collaborative skills.

Research limitations/implications – Our study only evaluated participants in our treatment group. Future research should examine the differences between students who complete sponsored versus instructor-led quasi-virtual internships. Researchers can add a control group of students who receive a theoretically based capstone course. Future research can simulate randomized controlled trials (RCT) (Chalmers *et al.*, 1981) to measure the effectiveness of quasi-virtual internships. A benefit of this research is that an open-ended survey allows for collecting rich, multifaceted primary data. The second limitation is that the study included only single-item questions. Future authors can create and validate a survey instrument based on the themes and concepts emanating from our investigation. For example, they can operationalize team dynamics and career preparedness using a reflective model in which the underlying construct drives the indicators, requiring multiple items to examine each construct (Coltman *et al.*, 2008). Third, the sample size in the study was relatively small. We can increase the sample size using a time-series dataset with multiple measurement periods. The fourth limitation is context; this study was conducted at a public university; other institutions may have varied teaching approaches, student demographics and resources. By expanding our study using a multi-site approach (Ballantyne *et al.*, 2012), we can increase cross-sectional sample sizes and improve the generalizability of the study's results.

Practical implications – This study provides several practical insights for educators by examining quasi-virtual internships. Academic institutions that want to offer internships but struggle to establish industry

partners can implement the quasi-internship model as an alternative approach. The study highlights that students gain critical insight into their future careers during these internships by being familiar with industry concepts and tools. We also provide insights into engaging students in "meaningful collaboration." We suggest the instructor provide some time during the class sessions for group work to improve coordination and introduce industry-level tools that provide a more applied approach to IS education.

Social implications – The National Survey of College Internships (NSCI) 2021 indicates that underrepresented and first-generation students were less likely to participate in internships. Our research may positively impact diverse communities since the quasi-virtual internship allows all students to participate once they are enrolled in a capstone class.

Originality/value – To our knowledge, this study is the first to utilize latent semantic analysis to analyze students' feedback to improve course design, career preparedness and team dynamics.

Keywords Virtual internship, Career preparedness, Team dynamics, Capstone, Natural language processing, Course redesign

Paper type Research paper

Introduction

On average, the growth of computer and information technology (CIT) careers has outpaced all other occupations (Statistics, 2023). Public and private employers trust and depend on academic institutions to keep up with the pace of growing occupations by ensuring they produce career-ready college graduates who can seamlessly integrate into the workforce. Universities responded by creating applied degree programs, envisioning graduating students with the necessary passion and skills for the industry. Unfortunately, colleges and universities have grappled with sustaining academic degree programs that feature robust curricula and learning experiences tailored to meet employment and skillset demands (Ohei et al., 2019). Consequently, a significant difference exists between students' overconfident job skills assessment and employers' perception of student career readiness competencies (Bauer-Wolf, 2018).

Career preparedness is the attitudes, knowledge, competencies and behaviors necessary to deal with expected and unexpected career transitions and changes (Marciniak et al., 2022). The top four most essential competencies for career readiness are critical thinking/problem solving, teamwork/collaboration, professionalism/work ethic and oral/written communication (NACE, 2018). Additionally, employers in the CIT industry expect recruits to possess technical knowledge and a continuous learning mindset that promotes the ability to rapidly learn new tools and technology (Akman and Turhan, 2017; Hinchliffe and Jolly, 2011). CIT employees must be independent, exhibit a high degree of collegiality and develop soft skills and emotional maturity to be successful (Balamohan et al., 2015). Thus, this difference between employer perception of students' readiness and their actual career preparedness is cause for concern; it is a problem that academic institutions must address.

By embedding students into internship programs, academic institutions leverage experiential learning to close the gap between employer perceptions and student job skills. The National Survey of College Internships (NSCI) 2021 reports that less than 50% of college students participate in internship programs. The findings also indicate that underrepresented and first-generation students were less likely to participate in internships. To further exacerbate the problem, the internship application process in the information systems industry is very competitive due to the large number of tech employees transitioning between companies.

Experiential learning techniques like internships show promise but have limited opportunities. This study proposes a solution and assesses the impact of an instructor-led quasi-virtual internship on students' career preparedness and team dynamics. The faculty support offered in our study enhances academic performance by increasing engagement

(Wilson *et al.*, 2020). Further, emerging research indicates our approach is promising as participating students hone social-emotional learning practices like mindsets, dispositions and behaviors that can advance outcomes such as career success (Allbright *et al.*, 2019).

This paper briefly describes how we designed the course and focuses on assessing students' overall experience, lessons learned and team dynamics while participating in the quasi-virtual internship. By analyzing students' reflections, we can examine engagement and enhancements in transferable skills (Gonzalez, 2022) to determine whether students' career preparedness increased post-quasi-virtual internships.

Literature review

Academic programs should help students hone and develop necessary skills (Teng *et al.*, 2019), prepare for interviews and gain initial experience to start their careers (D'Eloia and Fulthorp, 2016). For example, learning time management skills helps students prepare for their initial job (Khiat, 2022). Further, to better help prepare graduates for the transition to work, a study suggests that "fostering the growth of methodological and practical competencies, together with career-related experience (García-Aracil *et al.*, 2021)" are essential for success. Students should also learn oral and written communication, teamwork, personal organization, self-motivation and subject knowledge (Shah *et al.*, 2004). However, "there is always a gap between what the job market expects from undergraduates and graduates and what academic education provides (Vladiou *et al.*, 2019)." Minimizing this expectation gap requires academic programs to consider several factors, such as the changing nature of work. "Consulting practicum (CP) has become a popular way to help students acquire the essential practical skills and experience to enhance career readiness (Akpan, 2016)". While beneficial, many economically challenged students cannot afford these unpaid internships (Smith *et al.*, 2015).

In this study, we propose a virtual or remote quasi-internship. A quasi-internship is akin to experiential learning, allowing students to learn through trial and error while applying theoretical concepts to real-world scenarios (Gentry, 1990). A remote quasi-internship is a simulated internship program conducted in a classroom setting using information and communication technology (ICT) and facilitated by faculty. This form of simulated experiential learning can lead to cognitive enhancement, higher-order thinking (Laverie *et al.*, 2022) and improved decision-making (Kuczera, 2021). These skills are essential for career preparedness and effective teamwork (Bradberry and De Maio, 2019).

Remote or virtual work is achievable due to web access, speed, virtual document libraries and technology that supports video and teleconferencing (Van Der Lippe and Lippényi, 2020). The benefits of remote work include a flexible schedule, improved time management and reduced travel time (Parajuli, 2020). Full-time information systems careers are suited for remote work; they rely heavily on interacting with computers and are prime candidates for conversion (Lund *et al.*, 2020). Likewise, company-sponsored virtual internships allow students to improve their time and project management skills. However, students highlight a lack of interaction with other employees (Howard, 2007); this is one of the main disadvantages of a remote environment.

One facet of successful virtual internships was that faculty facilitated communication between the host company and the students (Dent and Jo White, 2020). Other studies reported that the advantages of virtual internships include improved telecommuting soft skills and technical skills (Teng *et al.*, 2021). Virtual internships have also increased opportunities with international companies (Doyle *et al.*, 2022); having experiences with other cultures leads to more well-rounded future team members. These international virtual internships have showed positive results; because students gained an enriching experience and overcame challenges arising from lack of access, the inability to change work hours and family commitments (Briant and Crowther, 2020).

Employers seek to hire students who can work in groups because teamwork often provides competitive advantages for organizations (Casper, 2017). Schools promote group work because team-based learning improves students' classroom engagement and allows for a deeper understanding of the course materials (Swanson *et al.*, 2019). However, studies have shown that assigning group work in higher education faces many challenges, including student engagement, teaching modalities and group dynamics issues such as "free-riders" who make group work an unpleasant experience (Hall and Buzwell, 2013). One of the techniques to mitigate the free-rider problem is to teach students to manage the teamwork processes by taking ownership of managing conflict and team dynamics (Scott-Ladd and Chan, 2008).

The online environment can lower student ratings of team trust, team satisfaction and team identity compared to face-to-face courses (Mayfield and Valenti, 2022). In addition team dynamics, specifically, participation behaviors and learning performance differ significantly between small and larger groups (Yang *et al.*, 2022). This study describes a quasi-virtual internship as a simulated career-based experiential learning project delivered using information and communications technology (ICT).

Theoretical framework

We propose our theoretical framework based on instructional design theory (Reigeluth, 1983, 2013) developed based on other learning theories, such as behaviorism, cognitivism and constructivism. The instructional design theory offers insights on how people learn, and thus, how instruction can be optimized to meet learners' needs (Seel *et al.*, 2017). The instructional design seeks to enhance the effectiveness and efficiency of education and training programs by promoting clear information, thoughtful practice, information feedback and intrinsic motivation (Reigeluth, 2013).

A prominent theoretical model within instructional design theory is ADDIE, an acronym for Analysis, Design and Development, Implementation and Evaluation. This model provides a phased approach to creating instructional content, ensuring that all critical aspects of the learning process are addressed (Branch, 2009). The central tenets of instructional design theories are to facilitate learning by providing clear, measurable objectives, using appropriate teaching strategies and incorporating assessments to gauge learner progress (Dean and Hubbell, 2012).

Figure 1 shows the adapted ADDIE model; it aligns with course redesign concepts, highlighted in blue. According to Nomme and Birol (2014), course redesign consists of four elements: gathering information, reinvention of the curriculum, implementation and evaluation of the effectiveness of the revisions (Nomme and Birol, 2014). The following sections demonstrate the application of the ADDIE phases from the theoretical model to our research; the adaptations are indicated in green in the conceptual model.

The analysis phase focuses on information gathering. Implementing authentic disciplinary practices by using traditional research findings (Ragland, 2008) and incorporating expert advice can enhance student engagement (Casagrand and Semsar, 2017). We used the model IS curriculum as an example of expert advice because it is developed by experts in IS education (Fee *et al.*, 2019).

The objectives of the design phase include specifying learning activities based on instructional or pedagogical strategies (Dousay and Logan, 2011). For our research, this phase involves reinventing the curriculum through an information systems competency-based design. This approach aligns with work-integrated learning, providing practical applications relevant to student's career goals (Jackson, 2015, 2017). Harvard Business Cases encompass a broad spectrum of topics and industries, offering readers insights into real-world scenarios across multiple disciplines (Christensen, 2017; Rebeiz, 2011). By utilizing
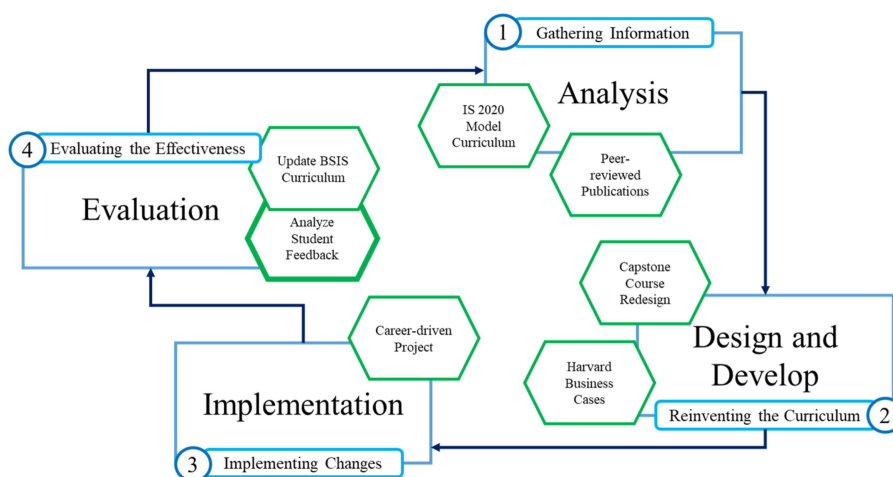
Source(s): Figure Adapted from Reigeluth (1983, 2013), Nomme and Birol (2014)

Harvard Business Cases, we operationalize work-integrated learning as they are known to equip students with employability skills.

The goal of the implementation phase is to set up the learning environment to engage the students. During this phase, the design strategies are transitioned to the actual learning environment, allowing students to start building the new knowledge and skills needed to bridge the performance gap (Branch, 2009). The implementation phase for our research focuses on careers in computer and information technology (CIT); this career trajectory allows graduates to engage with diverse fields, such as marketing, finance, healthcare and manufacturing. Consequently, the use of Harvard Business Cases can effectively simulate real-world scenarios relevant to CIT graduates.

The evaluation phase closes the feedback loop, resulting in a holistic approach to course redesign (Rexeisen and Garrison, 2013). Evaluating effectiveness is a crucial part of the redesign progress in which students play an essential role in engaging in active dialogue, feeling responsible and collaborating with instructors (Dochy *et al.*, 1999). While we provide descriptions of all phases of the theoretical model, our research focus is examining the effectiveness of career-driven projects by analyzing the student feedback.

Methodology

The methodology sections consist of study design, data collection and data analysis approach using natural language processing.

Study design

We redesigned the capstone course to focus on "subject-specific practical skills and offer support with career advice and guidance (Shah *et al.*, 2004)." Two major themes emerge from initiating this process: 1. course redesign and 2. the impact of that course redesign on student outcomes. Although we will introduce and outline the concept of course redesign, our focus in this paper is to assess the impact of the redesign on undergraduate career preparedness and team dynamics.

During the analysis phase we modified the existing degree program objectives to be aligned with the information systems model curriculum. In addition, we evaluated peer-

reviewed publications to select a format for the class. The design and development phase involved redesigning the theoretically driven capstone course into a hybrid career-driven/discipline-specific class to include information systems job titles, including project management/IT consultant, systems analyst, data analyst, cyber security analyst, database or network administrator.

In the implementation phase, we integrate Harvard business cases as simulation host companies to improve students' experiential learning opportunities. Students request a quasi-virtual internship at one of the Fortune 500 companies outlined in the instructor's list of Harvard Business cases. Students with similar job titles are grouped into teams of interns. Each team develops an IT artifact, creates a business continuity plan and project charter or analyzes data to help their selected company meet its strategic goals. Over the semester, students complete tasks, resulting in a detailed project report comprising six milestones. In the evaluation phase, we assess students' career-driven project feedback to evaluate the capstone's impact on student career preparedness and team dynamics, facilitating the design improvement for future graduates.

Data collection
We collected structured and unstructured data using various tools, including the learning management software – Canvas, Poll Everywhere, and Qualtrics. The participants were students in the undergraduate capstone class in information systems between Spring 2021 and Fall 2021. The Institutional Review Board (IRB) approved the data usage. The sample included 104 participants 18 years old or older.

Student survey: quasi-internship self-reflection
To evaluate the impact of the course on students, we used (1) self-assessment, (2) peer assessment, and (3) self-and peer assessment. The objective of the redesign process is to improve student outcomes. Analyzing student feedback plays a crucial role in informing this process (Nomme and Birol, 2014). When students are aware of their participation in the evaluation process, they tend to be more responsive and reflective (Dochy *et al.*, 1999), which subsequently influences their approaches to learning and studying (Gibbs and Simpson, 2005; Struyven *et al.*, 2005). Self-evaluation fosters evaluative judgment, a critical skill that extends beyond the classroom setting (Tai *et al.*, 2018). Students who engage in peer assessment demonstrate a marked increase in their performance compared to those who do not. Incorporating self-and peer assessment has been shown to enhance the validity of self-assessment due to the inclusion of social comparison (Mabe and West, 1982).

We developed a four-item survey after reviewing the literature and interviewing subject matter experts. Item 1: "*Discuss what you learned: Include in your discussion whether you feel more prepared for the career you chose at the beginning of the semester*" requires self-assessment: the involvement of learners in making judgments about their learning, particularly about their achievements and outcomes of learning (Dochy *et al.*, 1999). Research results show that students are adept at self-evaluating (Longhurst and Norton, 1997; Zoller and Ben-Chaim, 1998) therefore, we believe this study's results will accurately reflect what students learned.

Item 2: "*Write an overview of your team project experience*" is a peer assessment question where groups of individuals rate their peers. Although research has found variations between student and instructor assessments of peers (Orsmond *et al.*, 1996; Rushton, 1993), any discrepancies identified are used to redesign the capstone course. Item 3: "*Discuss how the team was successful or unsuccessful*" is a team-based question for self and peer assessment that elicits students' experience as team members. Researchers suggest that students can

accurately assess themselves and their peers as part of a team (Falchikov, 1993; Oldfield and Macalpine, 1995). Item 4 asked for student recommendations. Item 4: "*What are your recommendations on how to improve the experience of future students? (optional)*."

A corpus is a collection of authentic text organized into a dataset (Atkins *et al.*, 1992). Responses to self-assessment, item 1, were divided into two corpora – *Overall Experience* and *Career Preparedness*. Responses to assessment questions 2 and 3 were combined to form the *Team Dynamics* corpus. Since item 4 was optional, it was excluded from the analysis due to low response.

Natural language processing (NLP) of student feedback

The student survey regarding quasi-virtual internship was analyzed using semantic analysis, a subfield of Natural Language Processing (NLP), defined as determining the meaning of character sequences or word sequences (Hardeniya *et al.*, 2016). Semantic analysis is used in multiple contexts, such as cyber security (Peng *et al.*, 2018) and social media (Aziz *et al.*, 2015). The methodology is particularly beneficial for our analysis since it allows us to interpret all the unstructured text in each student's response document.

We use Leximancer, software that conducts thematic and semantic analysis using a machine learning technique. Leximancer provides word frequency counts and co-occurrence counts of concepts present in a document (Smith and Humphreys, 2006; Ward *et al.*, 2014) following these four steps: (1) Document Preparation, (2) Document Matrix, (3) Dimension Reduction and (4) Data Visualization. The document preparation steps include creating a Word file for the student's project reflection. Once the input files are identified, we transform words that contain many spelling variants (e.g. organize, organization, organizing and organized) into "word stems" – so that various grammatical and spelling variations are recognized as having the same meaning. In the second step, the software creates a document matrix vector comprised of two elements: words and documents being analyzed (see Table 1).

The third step in latent semantic analysis (LSA) is dimension reduction, where a large vector is reduced to smaller sets of meaningful concepts analyzing the frequency count and co-occurrences. Frequency count is how often words are found in a document, which helps find the apparent patterns and trends within the document matrix. Co-occurrences measure how frequently words appear nearby (known as *co-occurrences*). The combination of frequency count with the Co-occurrence identifies patterns in a document that are presented as concepts (Merchant and Pande, 2018).

The final step is Data Visualization. Leximancer produces visual diagrams with specific key terms appearing in different-sized circles. Not only is the size of the key term important, but the circle's color encasing it is also essential. Specifically, the "hot" colors (hues including red, orange and yellow) depict that the theme has a stronger relationship with the concepts (many or similar concepts clustering to make a theme). Figure 2 shows the creation of visualizations after the semantic analysis is performed.

| Word frequency | Documents | | | |
	D1	D2	D3…	D_N
Word 1				
Word 2				
..				
Word $_N$				

Source(s): Table by authors

Results

Overall experience, career preparedness and team dynamics spring vs fall

In this section, we report the findings from the semantic analysis of the research data. The student responses were converted to a structured format using Microsoft Excel. The responses for overall experience, career preparedness and team dynamics were all separated into six different corpora for analysis – 3 corpora and two files for each semester. Of the 104 students enrolled between Spring and Fall 2021, 95 responses were included in the final analysis after the data was cleaned and structured, as displayed in Table 2. Each theme's results include 1 or 2 sample student responses that generated that concept.

Overall experience

The student responses in the overall experience corpus found 142 text references to success vs 26 – unsuccess. Within these references for the Spring cohort for overall experience, the top three most important themes are *project, time and communication*. The three themes for the Fall semester cohort are *project, team and communication*.

The Spring data visualization in Figure 3 indicates that the theme *project* relates to the team, *working, experience* and *milestones*. In the Fall section of Figure 3, the theme project relates to *team, working, communication, time* and *learn* concepts. The following quotes illustrate examples of these themes in Spring. *"I really appreciated the template that was provided because without that I think I would be lost. However, the teamwork and communication are what made the experience not so well."* Each team was given a template to help define the scope of each quasi-virtual internship. Some students expressed how the project management structure helped them focus and better manage their team. *". . . thankfully for this project my team was always there. So many milestones and deliverables that needed to be turned in with various dates ensured that I had to be on top of my work and my team making sure we would meet our deadlines."*

In the Fall, some students found the project to be complex and daunting at times *"My team project experience had lots of ups and downs. The three words I would use to describe my experience is demanding, complex, and rigorous."* However, they overcame the challenges. *"I thought the project would be intimidating if we didn't learn it beforehand. However, we learned as we went along so nothing was too difficult to manage."*
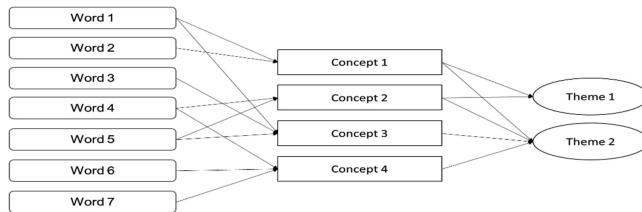
Figure 2.
Model demonstrating data visualization after semantic analysis

Source(s): Figure by authors

Semester	# of students	Wordcount
Spring	46	18,089
Fall	49	22,655
Total	95	40,744
Source(s): Table by authors		

Table 2.
Number of students and wordcount by semester

Source(s): Figure by authors
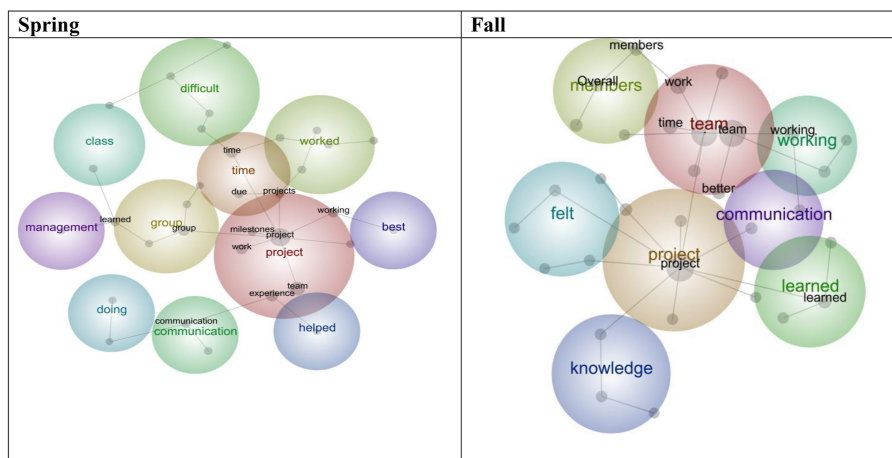
The theme *team* relates to *experience* and *time, better, semester* and *working* in the Fall. The students experienced the importance of effort and time estimation when completing a project. *"Overall, the team project was interesting and very eye-opening. It really showed me how much works goes into be accountable and working on a big project with timed deadlines."*

In Spring, the theme of *communication* was composed of concepts such as *group, teammates* and *"learn"* where the importance of team communication technologies and the team-building process were highlighted. Students utilize collaborative information communication technology (ICT) such as Microsoft Teams and Slack as part of the quasi-virtual internship. *"The methods and resources utilized were Gantt charts for scheduling, Teams for communication and Microsoft Azure as the platform to build and launch the network"*. The students also emphasize team communication: *"The fact that we had to meet with each other at least twice a week presented many opportunities for the group to become more organized and have constant communication."* In the Fall, the theme of *communication* was composed of the concepts *business, work, team, better* and *stressful.* "*From the beginning, we've been in contact, and communication is always open with them."*

Career preparedness
The student responses included in this corpus centered on their career preparedness. There were 86 mentions of prepared, of which 79 were qualified with – more, better, definitely or fully – prepared. The Spring cohort for career preparedness indicated that the top themes are *project, feel* and *learn.* The three most important themes for the Fall semester are *career, project* and *work.*

The concept map for Spring in Figure 4 illustrates that the theme *project* relates to *data, analysis, business, work* and *process* concepts. In the fall, the theme project was associated with team, process and working concepts. Comments in the project theme highlight job tasks related to the six career-driven quasi-virtual internships. In Spring, students who chose the data analyst quasi-virtual internship wrote*: "Working with data is a very diverse area because nothing is ever going to be the same. Every project is going to be different in some form of capacity."* A network administrator in Spring describes the importance of technical tools in managing projects: *"That learning process is beneficial when it comes to Microsoft Azure cloud learning. Somethings I learned from this project was how to make a contingency plan and the different types of attacks that can be used on a database/business."*
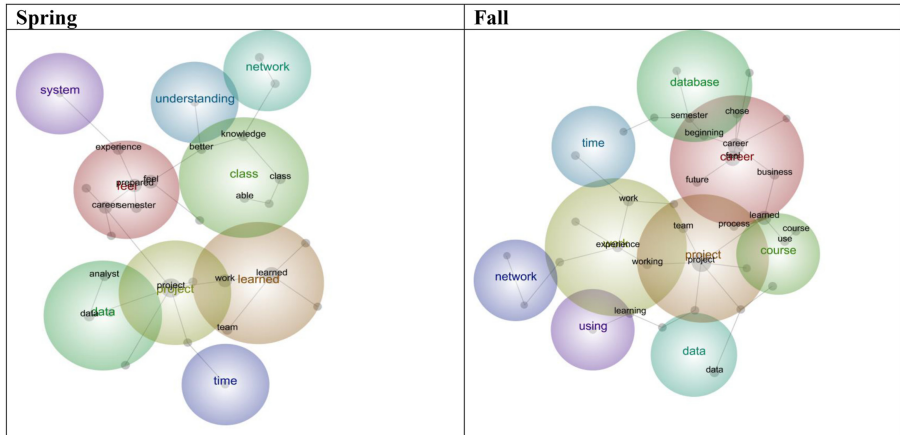
Source(s): Figure by authors

In the Fall, the student's comment illustrated the role of an information systems professional as a bridge between the technological world and the business functions in an organization. *"I also learned a little more about the business side of things, I jogged my memory on the creation of a business process model . . ."* Another data analyst in the Fall learned the full-development cycle of business intelligence procedures. *"I'm more familiar using tableau, ... Learning how to start a project and all the charts and documentations needed throughout the process was informative."*

The career preparedness theme "*feel*" relates to the *concepts of prepared, career and experience.* A data analyst from Spring expressed how the quasi-virtual internship had prepared them for their career trajectory. *"After this experience, I would say I wouldn't mind being a data analyst, . . . After completing this course, I definitely feel more prepared to enter this profession than I was at the beginning of the semester."*

The theme "*learn*" from Spring comprises concepts such as *work* and *team highlighting* one the experience of real-world industry challenges in the quasi-virtual internship. *". . . I learned a fair bit on team building and assigning work based off a person's strengths. The project felt like and actual task that can be carried out at a company."* One student who chose the systems analyst career trajectory expressed their ability to apply theoretical concepts. *". . . we had to design and develop some idea (software and its features) for a company . . . I learned what it was like to truly work in a SAD team and gave me some insight into what I would be doing out in the workforce."* In the Fall section of Figure 4, the theme "*career*" relates to the concepts of *feel, learn, business* and *future.* Students expressed greater preparedness for their careers; it would be interesting to quantify the degree of students' readiness in future studies. *"I do feel more prepared for the career I chose . . . which was business intelligence."* Similarly, other students expressed, *"Seeing how in depth everything needs to be I do feel a bit more prepared for the career I chose . . . Junior Business Analyst. . . . I learned a more in depth understanding of the tech and processes . . ."*

The theme *work* comprises *experience* and *learning* expressing that the quasi-virtual internship experience was realistic *". . . tasks given in an internship environment, it allowed me to see how some of the things we did in this project would translate into the professional setting."*

Team dynamics
The team dynamics corpus consisted of responses related to team success and overall experience in the team. We found 200 text mentions of the project, 100 mentions of time and 81

mentions of success. In analyzing team dynamics, we observed that the three most important themes are *team, time and project, for the Spring*. The three most important themes for the Fall semester are *team, success and time*.

The concept map in Figure 5 depicts that the theme *team* relates to the concepts *successful, milestone, communication* and *feel in* Spring. In the Fall, the theme *team* was associated with the concepts *project, task, completion, learn* and *creating*. In the spring, a student expressed that differences in the speed at which team members completed work were factors that affected team dynamics. *"I feel that the team was not as collaborative as it could be. Whenever a new milestone was inputted, I read up on the requirements and tried to deliver my portion of the milestone as soon as possible.".* In the Fall, another student experienced the team-building process as they came together with a specific purpose: *"We were able to navigate through the tasks and divide the work efficiently. We really came together in the end, to check all work and hold each other accountable."*

The theme *"project"* is composed of *parts, time* and *success*. The themes are tightly connected to project success. One student commented on the challenges of scheduling meetings. *"We made sure to submit our parts as early as possible to ensure everyone could read what each other wrote and adjust accordingly. The only things that felt unsuccessful at times was scheduling a meet with everyone ..."* As students interacted throughout the semester, their collaborative skills improved, allowing them to complete the project milestones. *"At the beginning of the semester, we definitely did not communicate well but eventually we all focused more on this project and worked together. My teammates were very good at completely their parts of the project and made the entire process easier."*

The theme *"success"* relates to the concepts *doing, felt, analysis* and *system*. The students explained that their success as a team was tied to achieving the project goal. *"I believe our work achieved our goals. Based on our end results and presentation, I feel that our team project is more on the successful end of the spectrum."* Student responses reflect struggles with team dynamics. We note significant growth over time when team members understand the project goals more deeply. *"... there were times where we were successful and unsuccessful. The beginning part of the project was the part where we struggled the most because it was difficult for us to translate our ideas and create a solid project".*

In Spring, the theme *time* relates to *work, group, member* and *difficult*. The theme *time* comprises *free, milestone, chart, using* and *resources in the Fall*. Students expressed shortcomings due to time management in Spring. *"Completing the deliverables was difficult*

Source(s): Figure by authors

when the group waited until the last week before each milestone due date to begin working on it." Another respondent pointed out the challenges of having a team member who did not follow the appropriate timelines. "One member in particular was extremely difficult to work with and would often ignore communication, would submit his work either last minute or late, would submit subpar work." In Fall, time management continued to be an issue for some teams. "Our team was able to overcome the misaligned scheduling by committing to doing well in the class, ... Had the time been distributed more evenly has it was intended via the Gantt chart, the quality of the work would have greatly increased." The students also realized they must take responsibility for completing the tasks; this builds their collaborative skills, frequently included in job descriptions. "At first it felt like I was the one everyone depended on to tell them how to do everything, but somewhere during the semester that shifted, and others decided to share the roll with me. As a team we met every milestone deadline on time.". In the example above, the team had a de facto leader because one individual had greater knowledge of career-driven tasks. However, as students become more confident in their abilities, they share the responsibilities.

Discussion

This research aims to improve student career preparedness and team dynamics by redesigning a theoretically based capstone course into one using a quasi-virtual internship learning process. This course was redesigned at a pivotal point during the pandemic when students had limited access to in-person internships. Even though the pandemic is abating, our model is still valuable for meeting the supply and demand issues with internships for information systems students, which plays a vital role in career preparedness. Using information communication technology (ICT) to mimic an onsite face-to-face internship, the instructor assumed the primary sponsor and project champion. To examine whether the study aims were accomplished, we analyzed students' self, peer and self-and peer assessments focusing on three main areas: overall experience, career preparedness and team dynamics.

The overall themes represent the experience described by students during the quasi-virtual internship and indicate whether the course design was successful or unsuccessful. The CIO of GE describes a successful internship as one in which participants hone their technical, communication, presentation and teamwork skills (Florentine, 2019). Our results indicate that students felt the overall quasi-internship experience was successful. Analyzing the prominent recurring themes – communication and teamwork – in the students' feedback aligns with what the GE CIO describes as a successful face-to-face internship. This result shows that positive outcomes can be achieved in a simulated environment. It is interesting to note that time was identified as one of the major themes. Students indicated that how they manage time directly affected the project's success. In other words, if the team managed the time effectively, their projects were deemed successful. Improvements in time management are another critical outcome of our redesign, as many IT projects lose thousands of dollars annually due to time mismanagement (Flyvbjerg and Budzier, 2011).

In addition, planning and organization were identified as pillars for success. These themes emanating from the students' feedback revealed further alignment with IT project management; for example, students' reflections on time and scope are associated with the triple constraints. Another success criterion was task delegation, where teams separated the big project into pieces and designated members. These concepts point to students finding "meaningful collaboration" as a success factor. Most careers in information systems involve working with a project team; practitioners and scholars agree that collaboration is essential to the success of IT projects (Caniëls et al., 2019).

The quasi-internship model enables career preparedness by giving students the experience of completing job tasks. Before the quasi-virtual internship, our survey showed

that students struggled to anticipate how their major would fit into the practice. After participating in the quasi-virtual internships, we observed that students could identify business roles and responsibilities and articulate their readiness for them. Additional analysis is needed to fully understand and quantify the impact's magnitude. Students mentioned the CIT skills they learned and the relevancy of business topics to the practice, often highlighting how their quasi-virtual internship project aligned with meeting each organization's strategic goals. Our findings converge with previous research that internships can facilitate the transition for college students from the academic to the professional world (Cuseo, 1998).

Like traditional internships, the quasi-virtual internship provides insights into different career paths, assesses career fit and engages in career building (Attri and Kushwaha, 2018; Bilsland *et al.*, 2019; Nghia and Duyen, 2019). The students gained experience with industry-relevant tools such as Python, NoSQL databases, Microsoft Azure and Tableau, as well as experience with project management tools such as Microsoft Project and Gantt Chats. Overall, the benefits of career preparedness were twofold, firstly by honing technical expertise and secondly by acquiring competencies, such as problem-solving skills and improved collaboration. Our findings are consistent with the previous studies suggesting that experiential education encourages reflection about the experience to develop new skills, attitudes or ways of thinking (Lewis and Williams, 1994).

Team dynamics define the relationship in a group (Maznevski and Chudoba, 2000). Teamwork within organizations is a salient construct evaluated by academics and employers. Like most enterprise-level analyses of teams, students in both Spring and Fall described challenges and successes within their teams. Students described how collaboration in these quasi-virtual internships differed from "typical" class projects. The team dynamics themes were highly correlated with the themes and concepts from students' overall experience and career preparedness. The improvement in collaborative skills was often associated with the project management methodologies integrated throughout the quasi-virtual internship.

Redesigning a theoretically based capstone course into a quasi-virtual internship is challenging yet rewarding. We described the challenges of selecting, conducting and assessing these quasi-internships. We also analyzed the perceived benefits from the students' perspectives. Next, we provide recommendations for educators and state the limitations of our study.

Implications for educators
This study offers several practical insights for educators creating an experiential learning environment by implementing quasi-virtual internships. Academic institutions may be unable to establish industry partners to offer internships due to resource scarcity. Our recommendation is to redesign the theoretically driven capstone course into a hybrid career-driven/discipline-specific class to alleviate the resource concerns.

Our study identified that students were engaged in "meaningful collaboration." However, due to the pressure to perform or coordination constraints, many students could still tune out the team-based activities. We suggest the instructor provide some time during the class sessions for group work to improve coordination. The result of our study highlights that students gain critical insight into their future careers during these internships by being familiar with industry concepts and tools. Educators can further facilitate this by introducing industry-level tools that provide a more applied approach to IS education.

Finally, educators can analyze students' feedback from the quasi-virtual internships to continuously improve course design. The feedback provides insights for instructors to implement new ways to overcome issues with team dynamics, such as implementing other

collaborative ICT. Another consideration for improving course design could be dividing the capstone over two semesters to increase student interactions with peers and instructors. Our research can be extended to investigate the impact of virtual internships in diverse communities since our model allows for analyzing the significance of the quasi-virtual internship in underserved populations. Prior research findings indicate that "virtual internship programs remain the exception and are often not connected with diversity initiatives, nor are virtual internships well known among student services (Kraft *et al.*, 2019)".

Limitations

Our study only evaluated participants in our treatment group. Future research should examine the differences between students who complete sponsored versus instructor-led quasi-virtual internships. Researchers can add a control group of students who receive a theoretically based capstone course. Future research can simulate randomized controlled trials (RCT) (Chalmers *et al.*, 1981) to measure the effectiveness of quasi-virtual internships. A benefit of this research is that an open-ended survey allows for collecting rich, multifaceted primary data.

The second limitation is that the study included only single-item questions. Future authors can create and validate a survey instrument based on the themes and concepts emanating from our investigation. For example, they can operationalize team dynamics and career preparedness using a reflective model in which the underlying construct drives the indicators, requiring multiple items to examine each construct (Coltman *et al.*, 2008).

Third, the sample size in the study was relatively small. We can increase the sample size using a time-series dataset with multiple measurement periods. The fourth limitation is context; this study was conducted at a public university; other institutions may have varied teaching approaches, student demographics and resources. By expanding our study using a multi-site approach (Ballantyne *et al.*, 2012), we can increase cross-sectional sample sizes and improve the generalizability of the study's results.

Conclusion

Entry-level team members who possess the skills required to complete job tasks when hired are highly desirable. Research has shown that not all students are prepared for a successful career in information systems after completing their degrees. In this research, we attempt to improve student career preparedness and team dynamics by creating an instructor-led quasi-virtual internship experience in the capstone class. The results of our analysis show that quasi-virtual internships in the classroom environment positively affect student perceptions of career preparedness across multiple dimensions. For example, students improved their project management and communication skills by leveraging collaborative ICT like Microsoft Teams and Slack to enhance synchronous and asynchronous communication. Students learned it was necessary to manage their time and work proactively to meet project deadlines, similar to managing triple constraints of project management. A limitation of this study is that it does not measure employers' perception of student career readiness. Future research will analyze whether the quasi-virtual internship improved employers' perception of student readiness.

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