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## **Preparing undergraduate IT students for the virtual workplace: development of a virtual workplace strategies and technical communications course**

**Loreen Marie Powell**, *Bloomsburg University of Pennsylvania*, [lpowell@bloomu.edu](mailto:lpowell@bloomu.edu)

**Carl M. Rebman**, *University of San Diego*, [carlr@sandiego.edu](mailto:carlr@sandiego.edu)

**Queen E. Booker**, *Metropolitan State University*, [queen.booker@metrostate.edu](mailto:queen.booker@metrostate.edu)

### **Abstract**

The health pandemic pushed organizations to work virtually. As a result, virtual workplace has become the new norm for many people, especially those in the technology field. Working in a virtual workplace is different from the traditional workplace. It requires a different skill set. Yet, there are very few undergraduate courses teaching virtual workplace strategies and technical communications. This paper utilized an online content analysis of online websites to examine the status of remote IT jobs in the United States, and to examine the status of the number of undergraduate courses with a virtual workplace focus. Results reveal 38% of the IT jobs advertisements posting in the United States were for a remote, virtual or hybrid environment. Additionally, the research did not find a single course that entirely focused on virtual workplace strategies and technical communications. Finally, a proposed framework for a virtual strategies and technical communications course was constructed.

**Keywords:** Virtual, Remote, Hybrid Workforce, Work from home, and Technical communications

### **Introduction**

COVID-19 has pushed many organizations to seek remote working opportunities within their company. While many companies originally shifted to a remote workforce due to COVID-19, they also prepared and invested in long-term plans to continue and sustain this type of environment permanently (Forbes Business Council, 2021; Courtney, 2022). Thus, the push towards remote working is not going away. According to Ozimek (2021), who examined and summarized the findings of the Future Workforce Report by Uwork, it is forecasted that 40.7 million Americans will be working entirely online/remote by 2025. More importantly, among those working remotely, there is a strong demand for information technology (IT) professionals. Thus, the need to prepare IT students for this new virtual workplace is essential (Loucks and Ozogul, 2020). There are several ways to address this challenge. The best way to address career needs and trends is through education and training (Loucks and Ozogul, 2020; Powell et al. 2018). However, despite the widespread of undergraduate course offerings, there is a limited number of courses entirely devoted to virtual workplace technologies and communications. This study seeks to conduct a content analysis of IT job advertisement within the United States that are for a remote, virtual, or hybrid workplace environment. Additionally, this study will utilize a content analysis to examine fourteen state university's course catalogues for course titles or course descriptions that focus on the virtual workplace. Finally, this study

constructs a curriculum framework for creating an undergraduate course which addresses virtual workplace strategies and technical communications.

This work has practical implications for higher education institutions, faculty, and IT degree programs interested in preparing students for a virtual workplace. The remainder of this paper is structured as follows: a brief review of the literature, methodology, results, and conclusion.

### Literature

According to Smith (2022), there is a noticeable increase the number of remote job posts within the last year. Specifically, FlexJobs ([www.flexjobs.com](http://www.flexjobs.com)) reported a 12% increase within the number of remote job posts on their website within the 2021 year. This increase may be a result of the COVID-19 pandemic.

In a theoretical piece by Winchester-Seeto and Piggot (2020), they discuss the twenty-first century, disrupted workplace and how it needs to be separate from what one learned or expected. Through literature it is explained that the workplace and employment patterns changed, and organizations adapted to global shortages and economic uncertainty. As a result, today's workplace is dynamic (Tytler et al. 2019; Winchester-Seeto & Piggot, 2020). Thus, they conclude that this new disrupted economy and every so dynamic workplace requires new types of authentic learning and skills. It is important to note that Winchester-Seeto and Piggot conclusion aligns with previous a previous literature study by Oliver (2015) which also suggested that students need to realize and understand that the traditional concepts of a physical workplace may not exist, and they will need to adapt to new virtual technology and communications skills in order to easily cope and succeed in this new dynamic workplace. Three of the new skills that are mentioned are communication, critical thinking, and emotional intelligence.

Additionally, Dubey et al (2020) explained that current health pandemic has pushed organizations to rapidly move to a new dynamic workplace that is remote, hybrid, working from home (WFH), and/or virtual. Thus, employees were forced to WFH or virtually. As a result, their attitudes changed towards a WFH or virtual environment. Specifically, they reported a 47% change in attitude toward working remotely which indicated that employees who were once reluctant to this new type of work environment were now favorable. Pixelmax ([www.pixelmax.com](http://www.pixelmax.com)) (2021) also found a similar trend within their organization. They report that prior to COVID-19, approximately 85% of employees worked everyday in the office. Post COVID-19, they report 84% of their employees now want a hybrid model. As a result, Pixelmax is immersing in innovative technologies to embrace this new dynamic hybrid workplace. Thus, higher education organizations and institutions should also begin to update curriculum to embrace the new hybrid workplace.

More importantly, research by Gottlieb et al (2020) stated that IT organizations and jobs tend to lend themselves to a long-term remote, virtual, WFH workplace environment. It is likely that IT jobs will remain remote, virtual, WFH or hybrid long into the future as this new type or workplace environment has saved organizations millions of dollars annually by reducing the expense of office space (Gottlieb et al, 2020; Chordas, 2021). However, WFH, virtually, remotely, and hybrid workplaces often have barriers, limitations, and issues. Gandhi et al (2020) investigated the pros and cons of the WFH concept. They list communication, demotivation, reliability and accountability, ergonomic issues, and many other issues as the barriers to the WFH concept.

Similarly, an opinion piece by Redfern (2021) explains that within United Kingdom's workforce, the demand for IT employees is at an all -time high as a direct result of organizations deploying technology solutions as part of their new onboarding plan for a new dynamic virtual, remote, hybrid or WFH workplace. Redfern further explained four suggestions to equip new employees for the virtual workplace. Specifically, he cites utilization and comfort in using videoconferencing software for formal and unformal meeting,

understanding of virtual security audits, utilization of technical collaboration tools to effectively communicate with a team, and deploying and maintaining a positive wellbeing strategies. As such, it is important to provide future IT employees with the proper skills to succeed in a WFH, remotely, virtual or hybrid workplace.

A recent law review by Singh (2021) addressed the basis of targeting employer wishes to satisfy student demand for teaching virtual intelligence to law students in an effort to provide a more markable and effective lawyer. It is stated that virtual intelligence is needed. Virtual intelligence is often explained as having project management and technical skills, social engagement skills, stress management skills, and emotional intelligent skills for building relational trust, providing open communication, and maintaining professionalism, and a healthy work-life balance within a virtual environment (Larson & Makarius, 2021). However, it is important to note that while virtual intelligence is needed, it is rarely taught as an entire formalized course.

Often, virtual workplace skills have been added as a section within existing courses. Loucks and Ozogul (2020) strongly believe that students need to learn in an authentic real-world environment. Thus, they argued that the real world contains some compacity of a remote or global environment which involves working remotely in teams. They conducted an empirical research study using descriptive case studies to examine a cascading strategy for providing an authentic or real word, virtual environment. Loucks and Ozogul investigated 363 undergraduate student students enrolled in a business course taught by multiple instructors. In an effort to acquire virtual leadership skills, students were divided into virtual teams which each attended and watched instructor level meeting and then student conducted of their own synchronous virtual team meetings on the Zoom platform. Additionally, a 21 questions survey was utilized to gather student perception data about their learning experience in virtual teams. Results from the examined student group's zoom sessions indicated technology skills, organizational skills, and communication issues present obstacles to virtual team effectiveness. They found students talking over each other, awkward silence existed, or a lack of engagement occurred. However, students responded to the survey indicating that they felt they were successful in leading their team virtually. Thus, one can conclude that embedding virtual learning strategies into an existing course is not enough. There is a need for an entire course devoted to virtual workplace strategies and technical communication.

### **Research goals and questions**

The goal of this research is to investigate the current workforce environment for IT professionals by examining online job advertisements within the United States for virtual, remote, online, or hybrid. This research seeks to answer the following question:

1. What percentage of IT job advertisements in the United States are remote, virtual, online, or hybrid?

Additionally, this research seeks to examine online course catalogues for IT courses devoted to virtual workplace knowledge, skills, and abilities. This research also seeks to answer the following research question:

2. What percentage of IT courses within the Pennsylvania State System of Higher Education (PASSHE) universities have a virtual workplace focus?

Finally, this research seeks to build upon the literature to construct a curriculum framework and curriculum model for creating an undergraduate course to address virtual workplace strategies and technical communications.

## Method

To assess the need for virtual workplace skills, a three-week (Feb. 7, 2022 – Feb 28, 2022) content analysis on the job advertisements for IT professionals within Pennsylvania were queried and reviewed from Indeed (Indeed.com). Additionally, the dataset from Indeed was further queried to list job advertisements that had at least one of the following key terms: hybrid, online, remote, or virtual.

The authors chose to utilize Indeed.com to query, review and analyze data for this study because the website is popular and well regarded as a place for IT professionals to find employment (Powell et al., 2017). A three-week time period was selected because it was after the new year where many professionals are likely to search for a job as well as organizations are likely to post a new job.

To assess the status of IT courses devoted entirely to virtual workplace strategies and technical communications, a content analysis of the fourteen PASSHE university's online course catalogue with course names and course descriptions was conducted. The authored selected the PASSHE universities because their course catalogues are online and available to the public.

Finally, a framework for a virtual workplace strategies and technical communications course for IT majors is proposed. The framework is based upon the existing literature.

## Results

### IT job postings for hybrid, remote, virtual employment

This study found that over 38% of IT job advertisements posted for in the United States have some mention of remote, hybrid or virtual workplace. Specifically, from Feb 7-Feb 28, 2022, there were an approximate 360,613 IT jobs in the United States posted on indeed.com. Out of the those jobs a total of 137,889 jobs were found to have at least one of the following criteria: hybrid, remote, or virtual. Figure 1 provides a visual summary of the result.

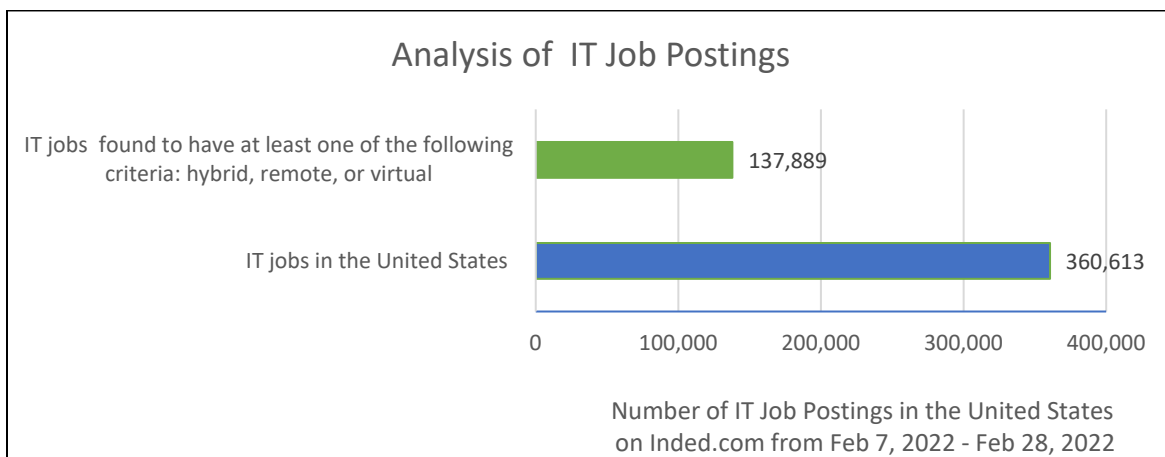


Figure 1. Analysis of IT Job Postings

### IT courses with a hybrid, remote, and virtual focus

This study also found that 0% of IT courses within the fourteen PASSHE universities have a course with a virtual workplace focus. Additional content analysis was also performed on general communication course titles and descriptions. Similarly, nothing was found.

## Proposed framework of a virtual workplace strategies and technical communications course for IT majors

Based upon the results and the literature, there is a need for virtual workplace strategies and technical communications course in the undergraduate IT curriculum. The proposed new undergraduate IT course titled Virtual Workplace Strategies and Technical Communications responds to the rapid and dynamic changes and challenges that businesses encountered over the last two years. The proposed course focus on the practical theories (knowledge), skills, and abilities to effectively cope, communicate, adapt, and succeed in a dynamic virtual, remote, online, environment. Hence, the goal this course is to produce an IT professional who knows how to effectively communicate in a global and dynamic remote environment. Table 1.1 lists a course description for the proposed new course.

<b>Course Title</b>	<b>Course Description</b>
Virtual Workplace Strategies and Technical Communications	Addresses and applies virtual/remote workplace strategies, theories, barriers, and principles of effective technical communications. Topics covered include, but are not limited to, Virtual Workplace Cultural Diversity, Equity, and Inclusion (DEI) Awareness, Work from Home (WFH) Ergonomics, Emotional Intelligence (EI), Organizational Citizenship Behaviors (OCB), Technostress, Work-Life Balance, Critical Thinking Technical Communications and Writing, and Digital ADA Compliance. This course is a 300 Business elective course for ITA Majors and may be an elective for other majors. This course may be offered via distance education

The proposed course is unlike many existing communication courses with include virtual workplace topics. This course is entirely focused on virtual workplace strategies. Specifically, the course aims to implement best practices consistent with current communication metrics and decomposition model. As shown in figure 2, the proposed course design approach is driven, by design, to focus on leveraging virtual/remote/strategies and technical communication skills. As such, the proposed course, Virtual Workplace Strategies and Technical Communications, will have a motivational and personal impact, as well as a global and organizational, impact. Specifically, virtual strategies will aim to focus on awareness of how to cope, manage, organize, and maintain a healthy work-life balance when working virtually. The technical communications focus will aim to aid in the understanding of how to effectively utilize technologies to communicate virtually for all.

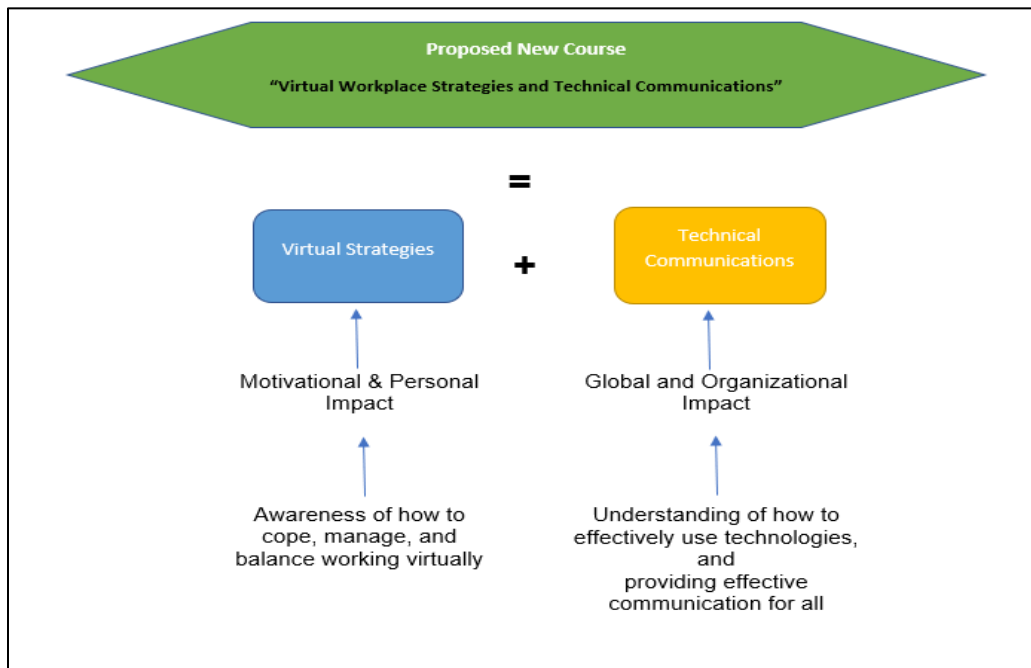


Figure 2. Proposed course design approach

Table 2 further expands upon the focus of the proposed course by providing specific student learning objectives (SLO) to assess competency for each SLO.

Table 2. Student Learning objectives and assessments	
Student Learning Objectives (SLOs)	Student Assessment
Knowledge, skills, and applications that students will be able to demonstrate upon completion of the course.	Standard, items applied to assess competency for each SLO.
1. Appraise and develop an understanding of the virtual workplace (VWP) technical communication strategies, theories, and concepts from multiple perspectives/users	<ul style="list-style-type: none"> <li>Exam items</li> <li>Group discussion</li> <li>Case analysis</li> </ul>
2. Analyze and identify current technical and non-technical communication barriers in the virtual workplace.	<ul style="list-style-type: none"> <li>Case analysis</li> <li>Critical thinking exercises</li> <li>Activities</li> <li>Exam items</li> </ul>
3. Critique, evaluate, examine, and use current virtual workplace technical communications tools.	<ul style="list-style-type: none"> <li>Activities</li> <li>Reflection report</li> <li>Research report section</li> </ul>
4. Develop and compile technical documents and writings to be used in the virtual workplace	<ul style="list-style-type: none"> <li>Writing Assignments and reports</li> </ul>

Table 3 provides a list of essential topics to be included within the proposed course. However, individual instructors may add other topics they consider necessary.

<b>Table 3. Essential topics to be covered in the proposed course</b>	
<b>Topic</b>	<b>Subtopics</b>
Different Environments, Similar Responsibilities	
	Global Online, Remote, Hybrid, Fully Virtual, and Work from home (WFH)
Virtual Workplace Environment for Business & IT	
	Cultural Diversity, Equity, and Inclusion (DEI) Awareness in the Virtual Workplace Work from Home (WFH) Ergonomics Strategies for a Healthy WFH Set-up
Virtual Workplace Communication	
	Virtual Presentations, Meetings, Trainings, Collaboration/Networks, & Communication Emotional Intelligence (EI) in the Virtual Workplace Organizational Citizenship Behaviors (OCB) in the Virtual Workplace
Technostress & Other Virtual Workplace Communication Barriers	
	Awareness of Technostress Strategies for Avoiding Technostress Work-Life Balance Strategies for Establishing and Maintaining a Healthy Work-Life Balance
Digital ADA Compliance	Critical Thinking, and Creation of Business and Executive Documents Critical Thinking via Reviewing to Reports, Data, and Visuals to Identify the Problem Executive Summaries, Reports, Training Manuals, and Other Documents Including Cost Saving and Business Value Revising and Edition for Usability Data Wrangling Embedded Data Data Visualization Basic Data Analysis in the Risk Assessment Process Evidence Accumulation Annotative Bibliographies Elements of Quality Research Survey Set-up Fundamentals Quick Examination of Appropriate Analytics and Tests

### **Conclusion**

The results from this study verified the need for a Virtual Workplace Strategies and Technical Communications course for IT majors. The proposed framework for a course provides educators with a foundation to alter their existing IT curriculum for the creation of this type of course.

This research is not without limitations. First, the study is limited to data found on Indeed.com. Second, it is limited to IT jobs within the United States. Third, it is limited to 14 PASSHE University online data regarding course title and description. Thus, additional information may have been provided within the syllabus that address virtual workplace environments. Finally, there is a the need to conduct a survey among employers to better establish what their needs are about the proposed course description. Future research

should address these limitations. Implications of this research include providing higher education institutions and IT educators with a framework for using a Virtual Workplace Strategies and Technical Communications course as part of their undergraduate curriculum.

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