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The Effect of Technostress on the Motivation to Teach Online in Higher Education Before and During the COVID-19 Pandemic: Perceptions of Business Faculty

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ABSTRACT

This study investigated the relationships among technostress creators (techno-complexity, techno-insecurity, techno-invasion, techno-overload, and techno-uncertainty) on the motivation to teach online using the Motivation to Teach Online – Faculty Version scale. Data were collected from faculty members of the Management and Organizational Behavior Teaching Society (MOBTS), a member of the AACSB Business Education Alliance, and the American Society of Business and Behavioral Sciences (ASBBS), an interdisciplinary professional organization comprised of faculty teaching in accounting, finance, management, marketing, organizational behavior, and computer information systems early 2020 (N = 307). The findings indicated that techno-stressed faculty are less motivated to teach online. Techno-insecurity and techno-overload subconstructs were statistically significant pre-pandemic. Techno-insecurity was statistically significant during the pandemic. Gender and years of teaching online were not observed among faculty to modify online teaching motivations. Results are presented to supply institutions of higher learning with evidence to support faculty with online learning undertakings while leveraging opportunities to manage enrollment.

Keywords: University faculty, Higher education, Business education, Online teaching, Technology stress, Technostress creators, Motivation Orientation Scale, Scholarship of Teaching and Learning (SoTL)

Student demand for online learning is surging. Enrollment for hybrid and distance education-only learners at traditional universities has climbed by almost 40%, and nearly 60% of college students are enrolled in or have taken a distance education course (Integrated Postsecondary Education Data System, 2023; National Center for Education Statistics, 2022). Students taking online courses increase by 5 percent per year, with the four largest online institutions reporting an enrollment growth of 11%

(McKinsey & Co, 2022; National Center for Education Statistics, 2022). The global e-learning market's value is expected to reach $649 billion by 2030 (Beyond Market Insights, 2023). At the onset of the COVID-19 pandemic, 1.6 billion learners in 150 countries were forced out of in-person classrooms and into virtual ones (Barron et al., 2022). Remote learning during the lockdown fed the increasing appetite for online learning while stimulating a new one.

Enrollment management has become one of, if not the most important, strategic focus areas for colleges and universities nationwide. The traditional student pool continues to shrink. On average, the number of high school students matriculating into college after graduation has dropped by 7%, declining by one to two percent each year since 2016 (Bureau of Labor Statistics, 2023). Coupled with the U.S. birth rate decline, employers eliminating college degree requirements, the prevalence of nondegree and skills training programs, costs of attendance, and the aftermath of the COVID-19 pandemic, another 15% - 25% plunge in nationwide enrollment is expected beginning in 2025 (Grawe, 2018; National Student Clearinghouse Research Center, 2022; Schroeder, 2021).

Online learning has widened in popularity with students for several reasons. E-learning offers learners greater flexibility, particularly those with work, life, or family obligations and non-traditional students (Buelow et al., 2018; Devlin & McKay, 2018). Rural learners or those without dependable transportation may only have educational access because of online learning (Ren, 2023). Fully online programs at traditional institutions are often more affordable than those offered on physical campuses (Moore et al., 2011; Quality Matters & Eduventures Research, 2021).

With such unprecedented online learning demand combined with the anticipated steep drop off in brick-and-mortar programs, colleges and universities are investing billions of dollars in distance education programs, faculty lines, professional development, and educational technologies (EdTech) to compete (Carraher-Wolverton & Zhu, 2021). Paramount to achieving a return on these sizeable investments and yielding student learning outcomes and retention is faculty readiness to teach online. However, online teaching has not been received by faculty with the same level of interest or acceptance as students with online learning, as less than 10 percent of faculty favor traditional online asynchronous teaching, and over 70 percent of faculty prefer face-to-face teaching (Bauer-Wolf, 2019; Gallup & Inside HigherEd, 2019; Kebritchi et al., 2017). Yet, teaching online is becoming a faculty expectation (Belt & Lowenthal, 2020).

Faculty skepticism for teaching online is often rooted in the technology used to design and deliver instruction. Tension with online teaching can be related to faculty experience with learning technologies; six in 10 faculty are uncomfortable and inexperienced with them, and 40 percent of faculty do not have adequate support or professional development to guide the design and delivery of online courses (Gallup & Inside HigherEd, 2019). Online course design is more time-consuming because of the technical proficiency required to operate it and the performance issues and outages that can occur with use (Limperos et al., 2015). Furthermore, faculty assert that more academic integrity issues occur in the online learning environment than in-person learning (Alessio & Messinger, 2021).

Over 90 percent of colleges and universities suddenly transitioned to remote learning during the pandemic (Marinoni et al., 2020). Some institutions and their faculty were already experts with online teaching and related EdTech well before the pandemic. Colleges and universities that lagged behind or did not previously deploy enough resources for remote learning were woefully unprepared for the abrupt shift, leading to a tumultuous and disjointed adoption of digital teaching technologies. Academics on the frontline faced phenomenal pressure, many without adequate knowledge of and preparation for effective online teaching. Battle scars ensued, and while some novice faculty grew to appreciate teaching online, many others were and continue to be frustrated with and more cynical of remote learning (Bao, 2020; Dhawan, 2020; Rapanta et al., 2020).

Notwithstanding the pandemic, faculty have competing priorities for their time, including teaching, research, and service activities, a balancing act with their personal priorities outside of the classroom (Osika et al., 2009; Sinclair & Aho, 2018). To effectively implement classroom technologies, faculty must spend significant time upgrading and maintaining their knowledge and skills, often impairing work-life equilibrium. With higher performance demands, role ambiguities, and subsequent role overload, faculty are systematically exposed to an increased risk of stress.

In order for institutions to design and deliver high-quality online programs to meet increasing student demands, improving faculty willingness to teach online is imperative. More research is vital to explore faculty motivation to teach online and the influences which inspire or the barriers that can inhibit online learning facilitation preferences. Thematically, various online teaching uncertainties relate to the use of technologies. Hence, this study will focus on exploring faculty motivation to teach online through the lens of information and communication technologies. Specifically, the study will examine the relationship between a faculty member's motivation to teach online and technostress.

Literature Review

Distance education originated nearly 150 years ago in the 1880s when the University of London launched postal correspondence courses (Moore & Kearsley, 2012). Now mainstream, with nearly 57 million learners expected by 2027, distance education is a method of teaching where faculty and students are separated from one another regarding physical location (Parker, 2023; Roffe, 2004). Online learning is a form of distance education, delivered via the Internet and using a host of information and communication technologies such as learning management systems, applications, audio and video conferencing, and virtual reality, to name a few (Dron & Anderson, 2014; Siddiqui et al., 2023). E-learning is universally categorized into synchronous learning (real-time) and asynchronous learning (any time and not in real-time), although other groupings include hybrid (a combination of real-time and any-time teaching and learning), and HyFlex (students choose the attendance mix) (Leijon & Lundgren, 2019).

In online teaching, the role of the faculty is to design quality course content to promote learner-learner, learner-instructor, and learner-content interactions to make connections to and bridge the gap between learning objectives and outcomes and facilitate learning (Quality Matters, 2018). Under routine conditions, online course design is a methodical process that includes learner needs analysis, creation of

course content and related course and module-level learning objectives and mapping interactive learning activities and content to learning objectives. Faculty carefully consider and provide learner support, accessibility, and usability during the course design phase. Course Technology fosters the learning environment and encourages student engagement. Online course development is often supported by learning design teams on college campuses.

The pandemic disrupted the typical instructional design process, and faculty had to improvise, often without the appropriate technical or pedagogical knowledge to create effective, engaging online courses in a matter of days versus months or even years (Hodges et al., 2020). While emergency teaching does not represent the norm, nearly all faculty were forced to teach online during COVID. During the pandemic, online teaching satisfaction plummeted, triggered by the accelerated pressure and stress from the immediate push to distance education, technical difficulties, and lack of training (Aperribai et al., 2020). Other studies indicated that online teaching satisfaction remained unchanged during the pandemic or improved (de la Fuente et al., 2021; Truzoli et al., 2021).

Motivation to Teach Online

Faculty perceptions of online teaching and learning (OTL) shape their pedagogy and how they accept and use technology in their teaching (Joo et al., 2016). Many studies suggest that faculty perceptions of OTL significantly influence their willingness to teach online (Kim et al., 2005; Lucas & Vicente, 2022; van Wart et al., 2020; Wandler & Imbriale, 2017). The Deci and Ryan (1985) self-determination theory comprises a standardized measure of intrinsic and extrinsic motivation to predict behavior. In 2010, Stewart et al. expanded upon the Deci and Ryan study to consider measures specific to the motivation to teach. In 2013, Johnson et al. built out the Motivation to Teach scale to include a standardized measure to predict online teaching motivation.

The Motivation to Teach online instrument measures overall motivation to teach online and intrinsic and extrinsic motivator subconstructs (Johnson et al., 2013). Intrinsic motivators are the perceptions of fulfillment and gratification for teaching itself, with no other reinforcement or reward (Davis, 1989). In distance education, intrinsic motivators include the opportunity to use new technologies and develop innovative ideas and curricula, improved student learning, reaching student audiences unable to come to campus, and professional satisfaction (Cook & Steinert, 2013). Intrinsic motivation inhibitors concern online course quality and student learning outcomes (Schifter, 2002). Extrinsic motivators are monetary rewards and prestige, along with the benefits and flexibility afforded by teaching online (McKenzie et al., 2000). Extrinsic motivation inhibitors are lack of university support for online teaching, insufficient incentives such as merit pay, workload and release time concerns, lack of university support for online teaching, and infrastructure and technology challenges (Maguire, 2005). This study used the Johnson et al. (2013) Motivation to Teach Online scale to measure faculty distance education teaching preferences.

Technostress

Technostress, also known as computer stress, technological stress, and technophobia, is a psychosomatic disorder that originates from and is intensified by an inability to adapt to or cope with new technologies

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in a healthy way (Brod, 1984; Fuglseth & Sorebo, 2014). Technostress has been organized into five categories, which are: 1) techno-complexity, 2) techno-insecurity, 3) techno-invasion, 4) techno-overload, and 5) techno-uncertainty (Ragu-Nathan et al., 2008). Techno-complexity is a stressor imposed on faculty compelled to constantly learn about and keep pace with increasingly sophisticated evolving technologies (Marchiori et al., 2019; Ragu-Nathan et al., 2008). Techno-insecurity refers to faculty feeling inadequate when comparing themselves to others with more ICT skills and capabilities and the fear of being replaced by them or teaching and learning technologies. Techno-invasion occurs when ICTs infringe upon and upset the work-life balance and compel faculty to stay connected during non-teaching, research, and service hours. Techno-overload is described as a condition in which university faculty are forced to work more and faster due to ICT demands. Techno-uncertainty is the apprehension that can perpetuate from and the indeterminate future outcomes that can result from the use of technology, the fear of the unknown.

Technostress research is framed through the person-environment (P-E) fit theory (Ayyagari, Grover, & Purvis, 2011). The P-E theory centers on the alignment between a person and the environment in which they interact. With this theory, stress does not originate from the person or the environment in isolation; rather, stress materializes when a misalignment occurs between the person and their complex multidimensional environment (Chuang et al., 2016).

Technostress can intensify role overload or the conflict between work demands and the resources available to fulfill them (Tarafdar & Tu, 2011). Role overload is an antecedent of inferior work performance, linked to decreased productivity, job satisfaction, organizational commitment, innovation, and creativity (Hung et al., 2011; Muir, 2008; Ragu-Nathan et al., 2008; Shropshire & Kadlec, 2012; Tarafdar et al., 2007, 2010, 2011). With prolonged exposure to technostress, faculty can burn out (Shropshire & Kadlec, 2012). Job burnout is evidenced to have a direct relationship with demotivation, performance problems, and job turnover (Simmons, 2009).

The literature is sparse with respect to technostress experienced by university faculty and the negative consequences imposed upon them and the universities in which they teach (Joo et al., 2016). Of the studies available, few emphasize technology stress in higher education where information and communication technologies (ICTs) incorporated as tools of the trade are precipitously emerging and perpetually changing (Ortagus et al., 2018). The latest teaching technologies include flipped classrooms, artificial intelligence, virtual and augmented reality, Chat GPT, cloud computing, application, and game-based learning, all more complicated than sage on the stage teaching and learning (Hatlevik & Hatlevik, 2018). Learning new complex technologies with a constantly evolving job can lead to feeling overwhelmed and overworked (Skaalvik & Skaalvik, 2017).

Technostress is a faculty well-being concern and an administrative issue in higher education. During the pandemic, faculty were more techno-stressed (Boyer-Davis, 2020; Boyer-Davis & Berry, 2022). Technostress has been identified as a prime catalyst for faculty to leave the teaching profession, especially when ICTs and virtual learning environments lack support and reliability (Roberts, 2016). With greater demand for ICT use in higher education, technostress will continue. This study examines the

relationship between technology stress and the motivation to teach online. The study will try and answer the following research questions:

Research Questions
RQ1:   What effect does technostress have on the motivation to teach online experienced by faculty teaching in higher education, pre-pandemic?
RQ2:   What effect does technostress have on the motivation to teach online experienced by faculty teaching in higher education during the pandemic?
RQ3:   What effect do technostress creators (techno-complexity, techno-insecurity, techno-invasion, techno-overload, and techno-uncertainty), have on the motivation to teach online experienced by faculty teaching in higher education, pre-pandemic?
RQ4:   What effect do technostress creators (techno-complexity, techno-insecurity, techno-invasion, techno-overload, and techno-uncertainty), have on the motivation to teach online experienced by faculty teaching in higher education during the pandemic?

Research Methodology

A survey was administered during the 2020 academic year to the members of the American Society of Business and Behavioral Sciences (ASBBS), an interdisciplinary professional organization comprised of faculty members in business and behavioral sciences disciplines including, but not limited to, accounting, finance, management, marketing, organizational behavior, and computer information systems. The same survey was distributed to the Management and Organizational Behavior Teaching Society (MOBTS). Both professional organizations are well-known and highly respected within the social sciences' academic arena. In addition, the survey was channeled through another educational panel, one with a wider disciplinary net. The survey instrument was circulated electronically to thousands of college and university professors and instructors currently teaching in undergraduate or graduate programs with 307 respondents completing the survey. Faculty completed an online survey via a Qualtrics weblink and an informed consent form, followed by a series of demographic questions along with the Motivation Orientation Scale-Faculty Version (MOS-FV), Technostress Creators scale and Unified Theory of Acceptance and Use of Technology (UTAUT) instruments, to contribute their pre-COVID and pandemic perceptions.

Measures

Motivation Orientation Scale – Faculty Version (MO-FV). A 10-item version of the Motivation Orientation Scale – Faculty Version (MO-FV) was used to study the motivation to teach online. Participants responded using a 4-point Likert scale ranging from 1 *(Not Motivated)* to 4 *(Very Motivated)*. Reliability for online teaching intrinsic and extrinsic motivation measures are $\alpha \geq .92$ and $\alpha \geq .75$, respectively.

Technostress. The original survey instrument consisted of eight subconstructs with 36 items organized in a 6-point Likert scale, with 1 *(Strongly Disagree)*, 5 *(Strongly Agree),* and 6 *(Don't Know or Not Applicable)*. The five technostress creators (techno-complexity, techno-insecurity, techno-invasion,

techno-overload, techno-uncertainty) were independently analyzed from the original technostress instrument (Ragu-Nathan et al., 2008). Reliability for these constructs ranges from α = .77 to .87.

Unified Theory of Acceptance and Use of Technology (UTAUT). **Unified Theory of Acceptance and Use of Technology (UTAUT).** Various theories have been developed to explain the adoption of technological innovations. One of the most established and cited is the Unified Theory of Acceptance and Use of Technology (UTAUT) theory (Venkatesh et al., 2003). Based on the Technology Acceptance Model (TAM) and updated to encompass human and social constructs, the UTAUT predicts user acceptance of information and communication technology innovations (Davis, 1989). The TAM and UTAUT stem from the Social Cognitive Theory (SCT), the central tenet of which is individual interactions and decision-making are influenced by cognitive, behavioral, and environmental factors (Bandura 1977, 1986).

In separate studies, Bellaaj et al. (2015) and Tandon (2020) used the UTAUT to assess the undercurrents affecting a transition to online learning. Performance expectancy (PE) and effort expectancy (EE) supported the acceptance of online teaching initiatives. Cao et al. (2021) concluded that social influence (SI) encourages e-learning acceptance.

The 21-item scale measured performance expectancy (PE), behavioral intention (BI), social influence (SI), and facilitating conditions (FC) using a 6-point Likert scale, with *1 (Strongly Disagree)*, 5 *(Strongly Agree)* and 6 *(Don't Know or Not Applicable)* (Venkatesh et al., 2003). Reliability for the UTAUT to measure the extent that faculty accept technology, which could influence their behavioral intent to teach online is instrument is α ≥ .70. UTAUT was incorporated as a control variable.

Demographics. The study also controlled for faculty gender and years of teaching online.

Participants. Table 1 provides detailed demographic information by quantity and percentage for the sample collected during 2020.

Table 1
Frequency and Percentages of Demographic Variables

Gender	Quantity 2020 (N=307)	Percentage
Female	95	30.9%
Male	208	67.8%
Gender-fluid	1	0.3%
Gender-Neutral	1	0.3%
Not reported	2	0.7%
Age (in years)		
25 to 34	167	54.4%
35 to 44	66	21.5%
45 to 54	48	15.6%
55 to 64	17	5.5%
Greater than 65	4	1.3%
Not reported	5	1.6%
Teaching Online (in years)		
0 to 5	211	68.7%
6 to 10	70	22.8%
11 to 15	17	5.5%
Greater than 15	7	2.3%
Not reported	2	0.7%
Rank		
Assistant Professor	102	33.2%
Associate Professor	74	24.1%
Full Professor	70	22.8%
Clinical Professor	8	2.6%
Instructor/Lecturer	51	16.6%
Other	0	0
Not reported	2	0.7%

Faculty self-reported their gender as 68% male, 31% female, or 1% gender neutral, gender fluid, or no gender category selection was made. The sample included faculty that had taught online for 0-5 years (69%), 6-10 years (23%), 11-15 years (6%), and greater than 15 years (1%), with two faculty not reporting. Faculty conveyed their age (in years) as follows: 25-34 (54%), 35-44 (22%), 45-54 (16%), 55-64 (5%), or 65 and older (1%). Faculty identified their academic rank as instructor/lecturer (17%), assistant professor (33%), associate professor (24%), full professor (23%), clinical professor (2%), or no response (<1%). Table 1 provides detailed information with respect to sample demographics.

Data Analysis

The research methodology consisted of estimating two regression models using a sample of faculty. All assumptions were tested including normality, linearity, homoscedasticity, independence of errors, and multicollinearity (Tabachnick & Fidell, 2007). IBM SPSS Statistics version 28.0.0.0 was used for the data analysis.

Models

Regression Model 1, used to examine research questions RQ1 (pre-pandemic) and RQ3 (during the pandemic), was estimated as follows:

$$MOS - FV_i = B_0 + B_1 GENDER_i + B_2 YONLINE_i + B_3 UTAUT_i + B_4 \text{TECH} + e_i$$

The dependent variable was the Motivation Orientation Scale – Faculty Version (*MOS-FV*). The test variable in Model 1, used to answer the first and third research questions, was technostress (*TECH*). Control variables for this regression included gender (*GENDER*), 1 if male 0 otherwise, years of experience teaching online (*ONLINE*), 1 if 0 to 5 years of teaching online and 0 otherwise, and the Unified Theory of Acceptance and Use of Technology (*UTAUT*).

Regression Model 2, used to examine research question RQ2(pre-pandemic) and RQ4 (during the pandemic) was estimated as follows:

$$MOS - FV_i = B_0 + B_1 GENDER_i + B_2 YONLINE_i + B_3 UTAUT_i + B_4 TCOM_i + B_5 TINS_i + B_6 TINV_i$$
$$+ B_7 TOVR_i + B_8 TUNC_i + e_i$$

The dependent variable was the Motivation Orientation Scale – Faculty Version (*MOS-FV*). The test variables in Model 2 used to examine the second and fourth research questions were techno-complexity *(TCOM)*, techno-insecurity *(TINS)*, techno-invasion *(TINV)*, techno-overload (*TOVR*), and techno-uncertainty (*TUNC*). Control variables for this regression included gender (*GENDER*), 1 if male 0 otherwise, years of experience teaching online (*ONLINE*), 1 if 0 to 5 years of teaching online and 0 otherwise, and the Unified Theory of Acceptance and Use of Technology (*UTAUT*).

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Table 2
Regression Analysis MOS-FV, Pre-Pandemic

Variable	Model 1		Model 2	
	Coefficient	t-value	Coefficient	t-value
Intercept	40.008	26.732***	40.117	26.475***
Gender	.835	1.347	.729	1.175
Years Online	-.662	-1.059	- .658	1.056
UTAUT	-.164	-5.601***	- .159	-5.287***
Technostress (TECH)	-.112	-6.333***		
Techno-Complexity (TCOM)			.014	.148
Techno-Insecurity (TINS)			-.175	-1.696*
Techno-Invasion (TINV)			.116	1.040
Techno-Overload (TOVR)			-.300	-3.207***
Techno-Uncertainty (TUNC)			.030	-306
R-Square	.319		.333	
*Note. * p < .10, ** p < .05, *** p < .01.*				

Table 3
Regression Analysis MOS-FV, During Pandemic

Variable	Model 1		Model 2	
	Coefficient	t-value	Coefficient	t-value
Intercept	37.985	24.160***	37.677	23.579***
Gender	-.910	-1.464	-.911	-1.463
Years Online	-177	.284	.121	.194
UTAUT	-.194	-6.649***	-.192	-6.232***
Technostress (TECH)	-.053	-2.850***		
Techno-Complexity (TCOM)			-.003	-.038
Techno-Insecurity (TINS)			-.214	2.166**
Techno-Invasion (TINV)			.059	.510
Techno-Overload (TOVR)			-.077	-.846
Techno-Uncertainty (TUNC)			.016	.153
R-Square	0.242		0.251	
*Note. * p < .10, ** p < .05, *** p < .01.*				

Tables 2 and 3 present the result for regression models. The tables include the results for pre-pandemic measures, Table 1, and for during the pandemic measures, Table2. Listed are the coefficients and their respective t-values. The R-square is also given for each model.

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Model 1

For the relationships between online teaching motivation and technostress, technostress was associated with online teaching motivation both pre-pandemic (β = -.112, t = -6.333, p < .01) and during the pandemic (β = -.053, t = -2.850, p < .01). UTAUT was associated with the motivation to teach online both pre-pandemic (β = -.164, t = -5.601, p < .01) and during the pandemic (β = -.194, t = -6.646, p < .01). Gender (male=1) and years online teaching (0 to 5 years = 1) were not associated with motivation to teach online.

Model 2

The result for Model 2 found Techno-insecurity (TINS) to be marginally significant pre-pandemic (β = -.175, t = -1.696, p < .10) and significant during the pandemic (β = -.214, t = 2.168, p < .05). Techno-overload (TOVR) was significant pre-pandemic (β = -.300, t= -3.207, p < .01) and was not significant during the pandemic. The control variable UTAUT was again found to be highly significant pre-pandemic (β = -.159, t = -5.287, p < .01) and during the pandemic (β = .-192, t = -6.232, p < .01). Again, gender (male=1) and years online teaching (0 to 5 years = 1) were not associated with motivation to teach online.

Discussion

This study investigated online teaching motivation among college and university teachers in higher education, teaching in various disciplines and areas of study, both pre-pandemic and during the pandemic. Specifically, four questions were investigated regarding how Technostress Creators influence faculty motivation to teach in the e-learning environment.

Technostress. The findings indicate that technostress influenced faculty motivation to teach online pre- and during the pandemic. Therefore, the greater a faculty member is techno-stressed, the more unmotivated they are to teach online. This result is similar to the Mushtaque et al. (2022) study that identified a negative association between technostress and faculty willingness to employ online teaching modalities. One reason could be that the perceptions of or previous experiences with teaching online induce feelings of stress with the use of technology, the increased skills and proficiencies needed to operate the technology on an ongoing basis, or the work-life balance upset that can teeter into non-work designated hours.

This finding is informative to higher education as college and university administrators consider expanding online learning to manage enrollment. The administration must consider the technostress levels of their faculty. By ignoring this research outcome, institutions of higher learning are not poised to support their faculty and promote their health and well-being. Likewise, without buy-in from the faculty to teach online, online programs could stagnate, perpetuating a culture of distrust between administration and faculty and further enrollment erosion. If institutions invest in OTL programs, they must be prepared to provide faculty with the appropriate tools and training to be successful in this learning environment.

One option to support faculty involves adopting reliable and well-maintained technologies. Institutions should also budget to staff online teaching and learning support teams such as instructional designers to provide faculty with professional development and technology support. These undertakings can empower faculty to build their self-efficacy and the self-assurance that they can complete the tasks and meet the obligations of online teaching using technology. Improving faculty self-efficacy with respect to technology use and reshaping attitudes towards technology use can moderate technostress and improve online teaching motivation (Elstad & Christophersen 2017).

Institutions of higher learning must modify faculty workloads to accommodate online teaching assignments. A significant investment of time is required to design a high-quality online course that fosters engagement. Moreover, time must be invested to learn and relearn the management system and incorporate other online teaching technologies and strategies. Faculty are further stressed, techno-stressed, and demotivated to teach online without adequate time and support. Faculty demotivation is amplified if basic workplace hygiene factors are not met (Firdaus et al., 2021; Herzberg, 1968).

Another recommendation to reduce technostress in higher education to promote online teaching motivation is to develop faculty and administrative champions of institutional technology (Suleimen, 2019). These online teaching advocates should be given sufficient time and remuneration to work with faculty to guide them in using technology and building expertise with online teaching pedagogies (Leong et al., 2017). Faculty committed to building technology expertise and advancing online teaching should be recognized and rewarded for their additional efforts.

Techno-Complexity. No statistical significance between techno-complexity and motivation to teach online was identified. This finding is unsurprising as nearly all university faculty surveyed had online teaching experience because of the pandemic. Faculty may inherently expect technology to be complex or have experience using teaching and learning technologies. The time demands to cultivate the necessary skills and proficiencies with technology use are factored by faculty into their workload.

Despite a lack of statistical significance with the techno-complexity subconstruct, institutions of higher learning must be cautious. For example, transitioning to a new learning management system, upgrading the faculty or advising services databases, or adopting augmented online teaching quality standards demand more skills and time from faculty to get up to speed. Techno-complexity may be thrown off balance which can increase overall technostress.

Techno-Insecurity. Techno-insecurity was statistically significant both pre- and during the pandemic in predicting online teaching motivation. As techno-insecurity increases, faculty are more unmotivated to teach online. This observation is meaningful as faculty are highly educated, experienced leaders and experts in their areas of study. To be anything but an expert may drive faculty insecurity. However, faculty may feel pressure to be experts because of their academic rank, and therefore being challenged by technology may fracture or impede their self-efficacy. Faculty are responsible for teaching students who may have greater expertise with technology than they do, further exposing their insecurities with technology and possibly demotivating them to teach online. Insecurities may also manifest due to

insufficient support from institutions for professional development to further their technological skills and proficiencies.

Techno-Invasion. Techno-invasion was not statistically significant in predicting online teaching motivation in either period studied. One explanation is that technology has already invaded faculty calendar years ago. Technology is not only a teaching tool used for work but one relied on for nearly everything in life from ordering groceries to virtual doctor appointments and staying connected with family and friends. On average, 120 or more emails are received per day (Lynkova, 2023). The average time spent on a cell phone per day is over 5 hours; users check their phones approximately 100 times per day or once every 10 minutes (Georgiev, 2023). Being that over 85% of U.S. adults own a smartphone, the work/life balance has already blurred the lines and desensitized faculty to techno-invasion. Because most faculty are incredibly student-centered, they often answer emails at lightning speed, no matter the time of day. The assumed norm may be that technology is not an intrusion but accepted as a way of work and life.

Techno-invasion does not motivate or demotivate online teaching. Faculty who teach online often send announcements, provide feedback, post lectures, forward emails, grade assessments, respond to discussions at all times of the day or night. A structured workday is not necessary for online asynchronous teaching. Faculty are afforded flexibility to teach when they want and how they want within quality standards for online teaching and the given constraints of the technology used for the courses. Faculty can customize their work and life because of the use of technology with asynchronous teaching. Therefore, techno-invasion may not be a perceived negative consequence that influences motivation to teach online.

Techno-Overload. Techno-overload was determined to be statistically significant in online teaching motivation pre-pandemic. Prior to COVID-19, as techno-overload increased, faculty were more unmotivated to teach online. Conversely, during the pandemic, techno-overload was no longer significant in influencing motivation to teach online. Pre-pandemic, far fewer faculty were teaching online. For those who were not teaching online, the work required to do so may have been perceived as an enormous lift, a burden too difficult to carry given their other expectations. To teach online, faculty need to be proficient with technologies, intentional with course design, and be skillful with online teaching strategies to promote engagement and achievement of student learning outcomes. These competencies are not formed overnight or in a semester.

Once the pandemic uprooted higher education, faculty were forced to teach online, meaning that they had no choice but to acquire the skills and proficiencies necessary to use technologies, design and deliver online courses, and motivate virtual students. The more time faculty spent teaching online and learning about how best to do so, the less overload they perceived. This scenario can be described using Lewin's (1958) change management model. Prior to the pandemic, faculty were in a freeze state with their current workloads, meaning that their status quo was the norm. Once in a freeze stage, faculty may be resistant to change.

The pandemic melted the status quo freeze; faculty were driven out of their current state and into another state (online teaching), many without the appropriate preparation. Faculty were in a state of shock from the pandemic, the impact on their lives and work. In the unfreeze state, a disruption to the freeze state, they jumped in and served their students, learning and building their online teaching skills. Over time, faculty became more proficient and comfortable with the teaching tools and delivery methods. Once an online teaching routine was established and faculty confidence acquired, a refreeze state became the new norm. Hence, techno-overload or the new refreeze state was no longer statistically significant to online teaching motivation.

Techno-Uncertainty. Techno-uncertainty was not statistically significant in predicting online teaching motivation in either period studied. Technologies commonly have updates and upgrades, changes to functionalities, and reliability issues. Similar to techno-invasion, faculty have become habituated to uncertainty with technologies. They may feel supported in the use of the technologies with the help staff on campus and are not stressed by the unknown. Faculty have become more secure with the unfamiliar.

Limitations

One of the major limitations of this research study is that qualitative responses were not collected so that faculty could explain their rankings. Future research may consider gathering these insights from faculty to enrich the results. Additional studies could be conducted to further validate the findings. Another limitation is that findings may not be generalizable to all faculty, academic disciplines, or colleges and universities. Finally, the literature is limited with respect to technology stress in higher education. More research is requisite in this arena to determine the impacts of technostress on faculty, students, and institutions of higher learning.

Conclusion

This unique research study captured faculty online teaching observations both before and during the pandemic. Theoretically based, the results contribute to the understanding of online teaching motivation in higher education and build upon the slim availability of research related to university faculty. Results are presented to equip institutions of higher learning with evidence to support faculty with online learning undertakings while leveraging opportunities to manage enrollment. Most studies evaluate online teaching and learning through the point of view of students and not faculty. A deeper understanding of the factors that influence the motivation of faculty to teach online will benefit practice and educators alike.

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