Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Perception of online teacher self-efficacy: A multi-state study of nursing faculty pivoting courses during COVID-19☆,☆☆

Amanda Culp-Roche a,*, Fran Hardin-Fanning b, Todd Tartavoulle c, Debra Hampton d, Angie Hensley e, Jessica L. Wilson e, Amanda Thaxton Wiggins e

a College of Health and Human Services, University of North Carolina Wilmington, United States of America
b University of Louisville, Louisville, KY, United States of America
c Clinical Nursing at Louisiana State University Health New Orleans School of Nursing, New Orleans, LA, United States of America
d University of Kentucky College of Nursing, Lexington, KY, United States of America
e University of Kentucky College of Nursing, United States of America

ARTICLE INFO

Keywords:
COVID-19
Online teacher self-efficacy
Nursing faculty

ABSTRACT

Background: COVID-19 forced many colleges and schools of nursing to abruptly pivot face-to-face learning to online formats. Online teaching is not new, but some faculty have not taught in a virtual environment and rapidly transitioning courses online was challenging. It is not known if teacher self-efficacy was impacted by these circumstances.

Objectives: We aimed to assess online teacher self-efficacy of nursing faculty who transitioned at least one face-to-face course to an online format. We hypothesized that faculty with previous online teaching experience and greater self-rated instructional support would demonstrate higher online teacher self-efficacy scores compared to faculty who had little or no online teaching experience or reported less satisfaction with instructional support.

Design: A cross-sectional, descriptive design was used.

Setting: Faculty from ten universities across the United States were recruited.

Participants: Nursing faculty (N = 84) who transitioned at least one face-to-face course to an online format during COVID-19 were included in the study.

Methods: Participants completed the 32-item Michigan Nurse Educators Sense of Efficacy for Online Teaching (MNESEOT) instrument and a demographic questionnaire which included items about prior online teaching experience and instructional support.

Results: Participants scored overall teacher self-efficacy high (75th percentile). “Computer skills” were scored highest while “student engagement” scored lowest. Prior online teaching was a predictor of higher online teacher self-efficacy; however, instructional support was not a predictor of higher online teacher self-efficacy.

Conclusion: Nursing faculty reported a high level of online teacher self-efficacy during an abrupt pivot from face-to-face teaching to a virtual format. Pre-emptive opportunities to teach online can build self-efficacy for novice faculty. Faculty and students will benefit from improving student engagement skills, especially during isolating and overwhelming events such as the COVID-19 pandemic.

1. Introduction

At the onset of the COVID-19 pandemic, colleges and universities abruptly suspended face-to-face teaching and pivoted to nearly exclusive online methods of teaching (Aydemir and Ulusu, 2020; Evans et al., 2020). Online teaching and learning are not new; however, the abrupt shift posed challenges that some colleges and universities were not ready to face. In a recent study conducted among graduate schools...
within the United States, researchers found that the vast majority of the institutions surveyed were not fully capable of providing online teaching prior to the pandemic (Stewart et al., 2021). In addition, many universities expressed significant concerns about the quality of education, accessibility of education, and student success after the abrupt pivot (Marinoni and van’t Land, 2020). Although these concerns are valid, characteristics that are unique to individual faculty such as ‘teacher self-efficacy’ may mitigate some of these challenges to providing effective online teaching.

1.1. Background/literature

Teacher self-efficacy, in general, is defined as one’s belief that their methods of teaching are effective in producing positive student learning outcomes (Perera et al., 2019). Teacher self-efficacy is characteristic of faculty who are successful in meeting challenges and providing effective teaching. Bandura (1977) theorized that individuals who have high levels of self-efficacy demonstrate confidence in their belief that they have control over their success. Individuals with higher levels of self-efficacy are able to cope with difficult situations, maintain motivation to overcome past barriers, and persist in achieving their goals. Higher levels of general teacher self-efficacy have a negative effect on job burnout (β = -0.495, p = 0.001; Savas et al., 2014) and have a positive relationship with student learning outcomes (Cohen’s d = 0.21, p < 0.001; Klassen and Tze, 2014). Online teacher self-efficacy is the belief that the faculty can effectively manage the online classroom, provide effective teaching, select appropriate technology, and build a sense of community in the online course (Ali et al., 2017). As one would expect, greater levels of online teacher self-efficacy are correlated with greater teaching satisfaction (r = 0.64, p < 0.001; Hampton et al., 2020).

Many studies related to online teaching of nursing content were conducted prior to the onset of COVID-19 (Gazza, 2017; Richter and Idlemen, 2017; Farmer and Ramsdale, 2016; Richter and Ware, 2016; Wingo et al., 2016). These studies illustrate the complexity of online teaching and factors that influence online teacher self-efficacy. Online teaching has inherent challenges such as how to promote active student engagement, foster community in a virtual environment, and facilitate student comfort with the use of required technology (Wingo et al., 2016; Farmer and Ramsdale, 2016). Effective online teaching includes competencies such as active course facilitation, instructional design skills, comfort choosing and using technology, engagement with online students, and communicating expectations (Bigat et al., 2012).

Simply taking traditional course work and presenting it in an online format is not an effective strategy for online teaching. Effective transition of face-to-face course work to a virtual format requires extensive planning, implementation, and reflection strategies (Chiaisson et al., 2015). The premise that online course development and implementation requires more work than traditional face-to-face courses was supported by nursing faculty who taught the majority of their course work online (Gazza, 2017). Participants in this study discussed the time required to develop an online course, the ongoing process of learning new technology and best practices, the need to support and engage online students, and the “blessing and curse” related to the flexibility of online teaching (Gazza, 2017).

Teaching experience, specifically, years of online teaching was associated with higher levels of online teacher self-efficacy (Hampton et al., 2020). Additionally, nursing faculty who taught more than three online courses rated their online teacher self-efficacy higher than faculty who taught fewer online courses (Robinia and Anderson, 2010; Hampton et al., 2020). Although a correlation between previous online teaching experience and greater online teacher self-efficacy has been demonstrated, the relationship between online teacher self-efficacy and years of general teaching experience is not as clear. Ali et al. (2017) found that years of general teaching resulted in higher levels of online teacher self-efficacy, but results from other studies (Robinia, 2008; Hampton et al., 2020) did not support this finding.

Institutional support of online teaching activities is another factor that impacts online teacher self-efficacy. Instructional design assistance is one such support. Instructional designers help faculty choose and implement appropriate online instructional technologies and create engaging, interactive courses (Kumar and Ritzhaupt, 2017). Instructional design support is associated with greater levels of online teacher self-efficacy (Robinia and Anderson, 2010; Chiaisson et al., 2015; Richter and Idlemen, 2017). Other institutional supports associated with higher ratings of online teacher self-efficacy include pairing experienced online faculty with novice online faculty as a form of peer mentoring, providing or paying for faculty development courses specific to online teaching (Robinia and Anderson, 2010; Richter and Idlemen, 2017), and reductions in teaching workload to develop online courses (Richter and Idlemen, 2017).

Finally, some aspects of online teacher self-efficacy are perceived differently than others. For example, online teacher self-efficacy related to the faculty’s perception of their computer skills, online classroom management, and instructional strategies was rated higher than student engagement (Horvitz et al., 2015; Richter and Idlemen, 2017; Hampton et al., 2020). Overall, self-efficacy of online teaching is influenced more by these perceptions than other characteristics such as demographics, institutional support, and compensation (Horvitz et al., 2015).

This multi-site, multi-state faculty study was conducted across several undergraduate and graduate nursing programs (associate in nursing [ADN], baccalaureate [BSN], registered nurse-BSN [RN-BSN], masters of nursing [MSN], doctorate of nursing [DNP], and doctorate of philosophy [PhD]) in order to explore the level of online teacher self-efficacy during an abrupt pivot from face-to-face teaching to an online format. The specific aim of this study was to determine the impact of multiple factors (i.e., demographics, prior online teaching experience, years of teaching, institutional support, and nursing degree program) on online teacher self-efficacy. We hypothesized that nursing faculty with previous online teaching experience and institutional support (i.e. instructional design, IT assistance) would report higher online teacher self-efficacy scores than faculty who had never taught online and/or had little to no institutional support.

2. Methods

2.1. Recruitment

Nursing faculty (N = 84) from ten universities located in the Southern, Midwestern, and Western regions of the United States were recruited to participate in this cross-sectional, descriptive study. This study, using a standardized demographic questionnaire and the Michigan Nurse Educators Sense of Efficacy for Online Teaching (MNESEOT) instrument, was conducted between August 2020 and November 2020. The sample represented nine public and one private school/college of nursing. Each of the schools/colleges of nursing in the sample offer both undergraduate and graduate level nursing programs.

The core research team was comprised of faculty who have an ongoing program of nursing education research. Faculty from the participating schools/colleges were invited to be part of the research team based on prior work, collaboration, or research relationships with members and faculty of the core research team. Members of the core research team communicated with potential faculty research team members at each institution to discuss the study and determine interest in participation. Faculty research members at each participating university sent invitations to potential participants via institutional listserv email. All nursing faculty received the email invitations; however, only those faculty who met the inclusion criteria were included in the study. The only inclusion criterion was nursing faculty who transitioned at least one face-to-face undergraduate or graduate degree nursing course to an online format during the COVID-19 pandemic.
2.2. Data collection

Demographic data included age, gender, race, years of teaching, and type of nursing program (i.e., undergraduate, graduate, or both). Participants were also asked how many months/years of online teaching experience each participant had and whether or not participants had taught online courses prior to COVID-19 (yes or no).

The Michigan Nurse Educators Sense of Efficacy for Online Teaching (MNESEOT) instrument, a 32-item scale, was used to measure teaching efficacy in an online environment (Robinia and Anderson, 2010). Example items from this scale include “How well can you respond to difficult questions from online students?” and “How well can you craft questions or assignments that require students to think by relating ideas to previous knowledge and experience?” Response options were based on a 5-point Likert-type scale ranging from 1 (nothing) to 5 (a great deal), yielding a summative total score with the potential range of 32–160. The instrument includes four subscales, student engagement, management of online teaching strategies, management of online classes, and comfort with use of computers, that are calculated as mean scores. Construct validity was previously established by expert analysis (Robina, 2008; Robinia and Anderson, 2010). This instrument has strong reliability as reflected by a Cronbach’s alpha of 0.95 in previous studies (Robinia and Anderson, 2010; Robina, 2008). Cronbach’s alpha for this sample ranged from 0.83–0.86 for subscales and the Cronbach alpha for the total score was 0.94. Permission was obtained from scale developers to use the instrument.

Following study protocol approval for ethical human subject research from the affiliated university’s Institutional Review Board, investigators from each of the 10 schools/colleges of nursing sent an introductory email to nursing faculty at their respective schools. The email included the purpose of the study, consent to participate, and a Research Electronic Data Capture (REDCap) link to the survey. The survey was anonymous; surveys were numbered automatically using the sequential numbering feature of REDCap (Harris et al., 2009) and data was not associated with a computer identification number, name, or email address. Participants were given two weeks to complete the survey and were then emailed a reminder related to the survey.

2.3. Data analysis

Descriptive statistics including means and standard deviations, or frequency distributions were used to summarize faculty characteristics and online teacher self-efficacy. Multiple linear regression was used to assess predictors of online teacher self-efficacy for faculty who transitioned a face-to-face course to an online format. Only complete data was used in the multiple linear regression model. Variance inflation factors (VIFs) were used to determine whether multicollinearity was distorting parameter estimates. Data analysis was conducted using SAS version 9.4 (SAS Institute Inc., Cary, North Carolina), with an α level of 0.05.

2.4. Data/results

Of the 84 participants who completed the survey, the majority (87%, see Table 1) were female and most (90%) reported their race as Caucasian. The average age of faculty in this sample was 51.2 (±1.5), ranging from 29 to 70 years of age. Faculty in the sample taught over a range of degree programs. Less than half (43%) taught in undergraduate programs only, nearly one-third (32%) taught in a graduate program only, and one-quarter (25%) taught in both programs. Faculty had taught an average of 11 years (±8.5), ranging from 0 to 36 total years of teaching. Almost two-thirds (64%) reported prior online teaching experience.

2.5. Online teacher self-efficacy (MNESEOT)

The average overall online teacher self-efficacy score on the MNESEOT instrument for the sample was 126.2 (SD = 15.7; potential range 32–160; see Table 1). The highest subscale mean score on the MNESEOT instrument (range 1–5) was online teacher self-efficacy related to computer skills (M = 4.1, SD = 0.6), followed by classroom management (M = 4.0, SD = 0.6). Online teacher self-efficacy was slightly lower for instructional strategies (M = 3.9, SD = 0.5) and lowest for student engagement (M = 3.7, SD = 0.5) on the MNESEOT instrument (see Table 2).

2.6. Variables influencing online teacher self-efficacy

The multiple linear regression model was significant overall (F = 2.8, p = 0.009), and predictors in the model explained 27% of the variability in online teacher self-efficacy scores. The only significant predictor of online teacher self-efficacy was prior online teaching experience, those with prior online teaching experience scored an average of 16.5 points higher than those without prior online teaching experience (b = 16.5, SE = 4.1, p < 0.001). Institutional support and years of teaching experience, which were found to influence online teacher self-efficacy previously, did not predict online teacher self-efficacy in the regression model and possible confounding demographic variables including age, sex, race, teaching program, and years of teaching experience also did not influence online teacher self-efficacy (see Table 3). The distribution of online teacher self-efficacy scores was bell-shaped with an equal mean and median, suggesting no concerns regarding normality and there were no violations with respect to fit diagnostics for the linear regression model. All variance inflation factors (VIFs) were less than 2, suggesting multicollinearity was not distorting parameter estimates.

3. Discussion

Self-efficacy toward teaching regardless of the environment is an

| Table 1 | Descriptive summary of faculty characteristics (N = 84). |
|---------|----------------------------------------------------------|
| Age     | 51.2 (1.5); 29–70                                       |
| Gender  |                                                        |
| Male    | 11 (13.1%)                                              |
| Female  | 73 (86.9%)                                              |
| Race    |                                                        |
| White   | 75 (90.4%)                                              |
| Other   | 8 (9.6%)                                                |
| Teaching program |                                    |
| Undergraduate only | 36 (42.9%)                      |
| Graduate only     | 27 (32.1%)                                               |
| Both undergraduate and graduate | 21 (25.0%)   |
| Total years teaching | 11.0 (8.5); 0–36                     |
| Prior online teaching experience | Yes 54 (64.3%); No 30 (35.7%) |
| Institutional support satisfaction | 8–56 32.8 (10.2); 12–56   |

| Table 2 | Minnesota Nurse Educators Sense of Efficacy for Online Teaching (MNESEOT). |
|---------|----------------------------------------------------------------------------|
| Self-efficacy total score | 32–160 126.2 (15.7); 87–156 0.94 |
| Sub scores |                                                              |
| Student engagement | 1–5 3.7 (0.5); 2.5–5 0.82 |
| Classroom | 1–5 4.0 (0.6); 2.5–5 0.86 |
| management | 1–5 3.9 (0.5); 2.6–5 0.82 |
| Instructional strategies | 1–5 4.1 (0.6); 1.8–5 0.83 |
| Computer skills |                                                  |
important concept in higher education. However, it is even more important for faculty in an online course because cues present in a face-to-face course (i.e. students’ body language and facial expressions) are less likely to be captured in both synchronous and asynchronous sessions. Therefore, online nursing faculty must feel confident that they are able to relate learning material in a way that students can understand and apply to practice. The focus of this study was to assess nursing faculty’s online teacher self-efficacy during the sudden conversion of in-person teaching to an online teaching model.

The overall online teacher self-efficacy score, measured using the MNSEOT instrument, in a recent pre-COVID study of online nursing faculty was 124 (Hampton et al., 2020). This score was similar to the findings in this study in which the overall online teaching self-efficacy score was 126. Scores in both studies were in the 75th percentile, indicating relatively high online teacher self-efficacy for these participants. Additionally, mean subscale scores for the MNSEOT were similar to the Hampton et al. (2020) study. In both this study and the Hampton et al. (2020) study, nurse faculty had the highest level of online teacher self-efficacy in relation to computer skills, followed by classroom management, and instructional strategies. As in other studies (Hampton et al., 2020; Richter and Ware, 2016; Robinia and Anderson, 2010), faculty in this study rated online teacher self-efficacy related to student engagement lowest on the subscales. Scores for this study in each of these areas of online teacher self-efficacy indicate there is room for improvement as the average score for each subscale hover near 4.0 (scale 1–5).

The similarities of scores both pre-COVID and during the pandemic indicate that instructors who teach online need more resources that help them engage students in online learning. Disruptions such as the pandemic present a unique challenge to online teaching and learning. Students may feel lonely, anxious, or experience poor mental health (Stewart et al., 2021; Liu et al., 2020; Van Bortel et al., 2016) which can make learning more difficult (Shah and Cheng, 2019). Therefore, the ability to effectively interact with students in an online teaching environment is an increasingly important skill for online instructors to develop.

Contrary to previous findings (Robinia and Anderson, 2010; Chiasson et al., 2015; Richter and Idleman, 2017), a relationship between institutional support (i.e. instructional design and information technology) and online teacher self-efficacy was not found in this study. One possible reason for this finding is that many of these participants had previous online teaching experience and may have felt less need for these services. Although peer mentoring and education related to online teaching have been reported as supports that increase online teacher self-efficacy, these supports were not specifically addressed in this study due to the time-intensive nature of these services and the abrupt nature of the pivot to online instruction.

The findings from this study were similar to others that demonstrated prior online teaching experience was predictive of greater online teacher self-efficacy (Hampton et al., 2020; Horvitz et al., 2015; Robinia and Anderson, 2010). In contrast, total years of teaching was not predictive of higher ratings of online teaching self-efficacy in this study or others (Robinia and Anderson, 2010; Wise, 2019; Hampton et al., 2020). This is not surprising knowing that online teaching requires a unique set of teaching considerations compared to traditional in-person teaching and that one method is not better than the other (Gazza, 2017). However, it is important for nursing academic leadership to realize that in order to provide high quality online courses, nurse faculty need continual institutional support to develop and improve online teaching skills.

### 3.1. Implications for nurse faculty

Teacher self-efficacy represents the teacher’s confidence in their ability to facilitate student development, including knowledge, skills, and values (Horvitz et al., 2015). Higher levels of online teacher self-efficacy lead to increased persistence in overcoming challenges and dealing with work issues, including how to help students succeed. Educational outcomes and academic adjustment of students are associated with the faculty’s level of online teacher self-efficacy (Corry and Stella, 2019; Türkoglu et al., 2017). Additionally, greater online teacher self-efficacy leads to more motivation, increased accomplishments, job satisfaction, and a higher level of commitment as an educator. “Teachers with high levels of self-efficacy have strong communication in the workplace which leads to job satisfaction” (Türkoglu et al., 2017, p. 767).

The ability to effectively address student issues and concerns related to course materials and class access is an important online classroom management skill that can influence online teacher self-efficacy. Students in online nursing programs tend to complete coursework on the weekend, at night, or during times when it is convenient to their schedule. They may expect faculty in an online course to be available to answer questions at all hours and may become frustrated when they do not receive an immediate answer. Students’ frustration can be mitigated by establishing clear expectations for the course and providing detailed course directions and rubrics (Bollinger and Martin, 2018). In addition, faculty may offer virtual open office hours or scheduled virtual meetings after “business hours” to meet the needs of working students. Providing additional resources such as the contact details for the information technology (IT) and learning management system (LMS) helpdesks can alleviate students’ anxiety concerning computer and technology issues as these services are available to students well beyond traditional work hours.

Institutional support can influence faculty computer skills and instructional strategies, both important aspects of online teacher self-efficacy (Robinia and Anderson, 2010; Chiasson et al., 2015; Richter and Idleman, 2017). Institutional support can be provided in various formats including instructional design assistance, training related to teaching in and developing online courses, and assigning structured peer or mentor support. Regardless of the amount of experience or the type of program, nurse faculty who receive more institutional support have greater levels of teacher self-efficacy (Richter and Idleman, 2017). However, institutional support activities often require significant faculty time and preparation; therefore, they are most effective when planned and faculty are given adequate participation time and opportunities to use their new skill sets.

Engaging students in an online environment is an aspect of online teacher self-efficacy that some faculty struggle to master (Hampton et al., 2020; Wingo et al., 2016; Farmer and Ramsdale, 2016). This skill is especially important as students who must rapidly acclimate to an online learning environment can experience social isolation, uncertainty about their success in an online environment, and feelings of loss related to separation from their classmates (Besser et al., 2020; Labor et al., 2021). Building and maintaining a sense of “community” within the online course improves students’ success and feeling of belonging (Bollinger and Martin, 2018). Examples of creative modalities to engage

### Table 3

Predictors of online teaching self-efficacy among faculty transitioning courses to the online learning environment due to COVID-19 (n = 72).

| Predictors                                      | Estimated b (SE) | p    |
|------------------------------------------------|------------------|------|
| Age                                            | −0.24 (0.19)     | 0.21 |
| Female gender                                  | 2.66 (5.86)      | 0.65 |
| White race                                     | −2.11 (5.70)     | 0.71 |
| Teaching program                               |                  |      |
| Graduate only vs. undergraduate                | −4.67(4.41)      | 0.29 |
| Both undergraduate and graduate vs. undergraduate | −2.74 (4.37)     | 0.53 |
| Total years teaching                           | 0.09 (0.29)      | 0.74 |
| Institutional support satisfaction              | 0.14 (0.18)      | 0.44 |
| Prior online teaching experience               | 16.49 (4.14)     | 0.001|

* Only those with complete data on all variables were retained in the regression model.
students include interactive virtual class meetings, collaborative activities, weekly video check-ins, and encouragement of student-led social support such as group texts, private groups on social media, and live group chats within the learning management system.

4. Conclusions

Online teacher self-efficacy impacts faculty and student outcomes in online course delivery. Authors of this study provided evidence that nursing faculty from ten universities reported a high degree of online teacher self-efficacy while abruptly pivoting a face-to-face course to a virtual format during a stressful event. These findings were similar to previous studies of nursing faculty who taught online prior to the pandemic. Considering that previous online teaching experience was the only variable that predicted higher levels of online teacher self-efficacy, it would be advantageous for nursing faculty to have ongoing opportunities to teach online to further develop their online teaching skills, thus enhancing their sense of online teacher self-efficacy.

CRediT authorship contribution statement

Amanda Culp-Roche: Conceptualization, Investigation, Original draft preparation, reviewing, editing. Fran Hardin-Fanning: Conceptualization, Methodology, Writing, reviewing, editing. Todd Tartavoulle: Data analysis, Writing. Debra Hampton: Conceptualization, Investigation, Writing and reviewing. Angie Hensley: Conceptualization, Investigation, Reviewing. Jessica L. Wilson: Conceptualization, Investigation, Reviewing. Amanda Thaxton Wiggins: Data analysis, Writing and reviewing.

Declaration of competing interest

None.

References

Ali, N., Ali, O., Jones, J., 2017. High level of emotional intelligence is related to high level of online teaching self-efficacy among academic nurse educators. Int. J. High. Educ. 6 (5), 122–130.

Aydemir, D., Ulus, N.N., 2020. Commentary: challenges for PhD students during COVID-19 turning crisis into an opportunity. Biochem Mol. Biol. Educ. 48 (5), 428–429. https://doi.org/10.1002/bmb.21551.

Bandura, A., 1977. Self-efficacy: toward a unifying theory of behavioral change. Psychol. Rev. 84 (2), 191–215.

Besser, A., Flett, G.L., Zeigler-Hill, V., 2020. Adaptability to a sudden transition to online learning during the COVID-19 pandemic: understanding the challenges for students. In: Scholarship of Teaching and Learning in Psychology. Advance Online Publication. https://doi.org/10.1037/stl0000198.

Bigatel, P.M., Ragan, I.C., Kennan, S., May, J., Redmond, B.F., 2012. The identification of competencies for online teaching success. J. Asynchronous Learn. Netw. 16 (1), 59–77.

Bollinger, D.U., Martin, F., 2018. Instructor and student perceptions of online student engagement strategies. Dist. Learn. 39 (4), 568–583. https://doi.org/10.1080/01580791.2018.1529041.

Chiaisson, K., Terras, K., Smart, K., 2015. Faculty perception of moving a face-to-face course to online instruction. J. Coll. Teach. Learn. 12 (4), 231–240.

Corry, M., Stella, J., 2018. Teacher self-efficacy in online education: a review of the literature. Res. Learn. Technol. 26, 1–12.

Evans, D.J.R., Bay, B.H., Wilson, T.D., Smith, C.F., Lachman, N., Pawlina, W., 2020. Going virtual to support anatomy education: a STOP GAP in the midst of the Covid-19 pandemic. Anat. Sci. Educ. 13 (4), 279–283. https://doi.org/10.1002/ase.1963.

Farmer, H.M., Ramsdale, J., 2016. Teaching competencies for the online environment. Can. J. Learn. Technol. 42 (3). https://doi.org/10.21432/T2V32J.

Gazza, E.A., 2017. The experience of teaching online in nursing education. J. Nurs. Educ. 56 (6), 343–349. https://doi.org/10.3928/01484834-20170518-03.

Hampton, D., Culp-Roche, A., Hensley, A., Wilson, J.L., Otts, J.A., Thaxton-Wiggins, A., Fruh, S., Moser, D.K., 2020. Self-efficacy and satisfaction with teaching in online courses. Nurse Educ. 45 (6), 302–306. https://doi.org/10.1097/ NNE.0000000000000805.

Harris, P.A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., Conde, J.G., 2009. Research electronic data capture (REDCap): a metadata-driven methodology and workflow process for providing translational research informatics support. J. Biomed. Inform. 42 (2), 377–381.

Horvitz, B.S., Beach, A.L., Anderson, M.L., Xia, J., 2015. Examination of faculty self-efficacy related to online teaching. Improv. High. Educ. 40 (4), 305–316.

Klassen, R., Tre, V., 2014. Teachers’ self-efficacy, personality, and teaching effectiveness: a meta-analysis. Educ. Res. Rev. 12 https://doi.org/10.1016/j.edurev.2014.06.001.

Kumar, S., Ritzhaupt, A., 2017. What do instructional designers in higher education really do? Int. J. E-Learn. 16 (4), 371–392.

Lahe, S., Bain, K., Bemath, N., de Andrade, V., Hasem, T., 2021. Undergraduate psychology student experiences during COVID-19: challenges encountered and lessons learnt. S. Afr. J. Psychol. https://doi.org/10.1177/0081246321950595.

Liu, N., Zhang, F., Wei, C., Jia, Y., Yang, S., Lin, L., Liu, S., Zhou, Y., Wang, Y., Liu, W., 2020. Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: gender differences matter. Psychiatry Res. 287, 119291. https://doi.org/10.1016/j.psychres.2020.11.2921.

Marinoni, G., van’t Land, H., 2020. The impact of COVID-19 on global higher education. Int. High. Educ. 102 https://doi.org/10.36197/ihwe.2020.102.03.

Perera, H., Calkins, C., Part, R., 2019. Teacher self-efficacy profiles: determinants, outcomes, and generalizability across teaching level. Contemp. Educ. Psychol. 58, 186–203. https://doi.org/10.1016/j.cedpsych.2019.02.006.

Richter, S., Edelman, T., 2017. Online teaching efficacy: a product of professional development and ongoing support. Int. J. Nurs. Educ. Scholarsh. 3 (3), 80–87. https://doi.org/10.1515/ijnes-2016-0033.

Richter, S.L., Ware, I.J., 2016. Nurse Educator Self-Assessed Technology Competence and Online Teaching Efficacy: A Pilot Study, Addressing the Challenges Facing Nurse Educators [sessions], Sigma Theta Tau International, Nursing Education Research Conference 2016.

Robina, K.A., 2008. Online teaching self-efficacy of nurse faculty teaching in public, accredited nursing programs in the state of Michigan. In: Dissertations. Western Michigan University, p. 811.

Robina, K.A., Anderson, M.L., 2010. Online teaching efficacy of nurse faculty. J. Prof. Nurs. 26 (3), 168–175.

Savas, A.C., Bosevik, E., Eser, I., 2014. A study on the relationship between teacher self-efficacy and burnout. Eurasian J. Educ. Res. 3 (4), 159–166.

Shah, M., Cheng, M., 2019. Exploring factors impacting student engagement in open access courses. Open Learn. 34 (2), 187–202. https://doi.org/10.1080/02680513.2018.1508357.

Stewart, D.W., Davoren, A.K., Neumeister, J.R., Knepler, E., Grigorian, K., Greene, A., 2021. Graduate Schools Respond to COVID-19: Promising Pathways to Innovation and Sustainability in STEM Education. NORC at the University of Chicago. https://www.norc.org/PDFS/Graduate%20Students%20%20COVID%2019%20Executive%20Summary.pdf.

Türköglü, M.E., Canoy, R., Parlar, H., 2017. Examining relationship between teachers’ self-efficacy and student satisfaction. Turk J. Educ. 44 (3), 1220–1244. https://doi.org/10.2471/BLT.15.18543.

Wingo, N.P., Peters, G.B., Ivanova, N.V., Garley, D.K., 2016. Benefits and challenges of teaching nursing online: exploring perspectives of different stakeholders. J. Nurs. Educ. 55 (8), 433–440. https://doi.org/10.3928/01484834-20160715-03.

Woo, S.H., 2019. A Quantitative Correlational Study of Faculty Sense of Efficacy in Online Introductory Courses (Doctoral Dissertation). ProQuest LLC, Ann Arbor, MI, p. 2019.