Technology acceptance by university lecturers: a reflection on the future of online and hybrid teaching

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Abstract

Purpose – *Most research using extended unified theory of acceptance and use of technology (UTAUT2) and other technology acceptance models (TAM) are quantitative studies. This leaves room for interpretation when they are applied to university lecturers' acceptance of online teaching because the models were originally created for the consumer perspective. This study aims to bridge this gap by integrating existing (quantitative) research with (qualitative) reasoning.*

Design/methodology/approach – *This study reflects online and hybrid teaching acceptance by reviewing exemplary existing research using UTAUT2 as the conceptual framework.*

Findings – *UTAUT2 TAMs use a broad range of criteria that do not immediately agree with university lecturers' acceptance of online teaching. This study finds that existing research results are inconclusive and attempts to link criteria when suitable. Performance expectancy should not only encompass individual attitudes and skills but also the nature of the subject taught. Social influence is driven by recognition and student evaluations. Hedonic motivation best fits the elsewhere well-researched concept of intrinsic motivation. This study suggests that universities choose their online teaching technology wisely, promote its ease of use and offer training as well as continuous support to lecturers, especially when addressing future uncertainties.*

Originality/value – *This study explains the implications of using TAMs for research of higher education online teaching. Potential reasons and arguments for the inconclusiveness of the studies reviewed are discussed, and measures for university policy and communication improvement are suggested.*

Keywords *Online education, COVID-19, UTAUT2, Higher education, Technology acceptance, Hybrid class instruction*

Paper type *Literature review*

1. Introduction

A crucial factor in developing online courses and degree programs is the faculty acceptance of online education (Stewart *et al.*, 2010). Although 46% of university faculty in the USA, for example, have taught an online course (Jaschik and Lederman, 2019), this does not mean instructional staff have experience with a full range of online instruction. Moreover, it shows that most staff do not have any online instructional experience. However, COVID-19 pandemic mandated synchronous online and/or hybrid class formats gave instructional staff minimal alternative to digital instructional platforms and tools.

Whether student demand, new pandemic situations or the political situation in a country creates a continuing need for online or hybrid instructional methods remains to be seen but universities should be prepared. First, faculty must embrace a teaching method to be able to deliver excellence. However, instructors have not extensively adopted data-driven tools and techniques yet (Gagliardi *et al.*, 2018). Yet, education must anticipate, i.e. actively and critically reflect unknowable futures (Amsler and Facer, 2017). First, this concerns the
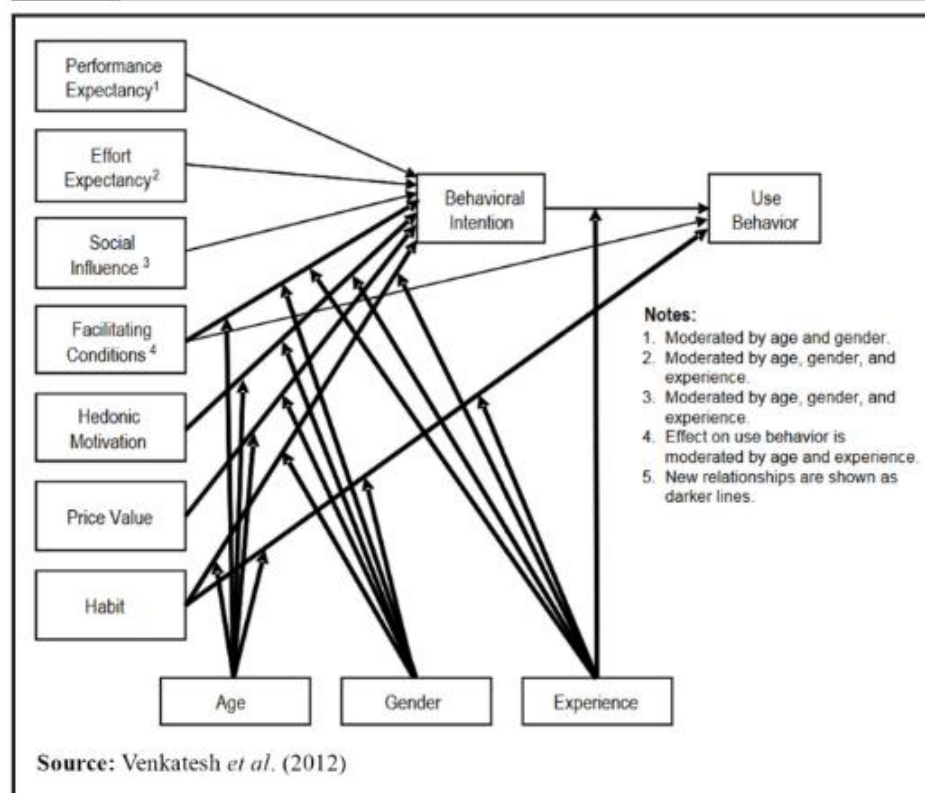
different skill sets students will need and educators will have to teach. Second, future technological advances, for example, in augmented reality and artificial intelligence, will offer new possibilities in education. Instructors should therefore be open to new content but also new technologies that may (or may not) improve student learning, particularly in changing societal circumstances.

We therefore explore faculty acceptance of online and hybrid teaching using the extended unified theory of acceptance and use of technology (UTAUT2) proposed by Venkatesh *et al.* (2012), which was developed for explaining consumers' technology usage and acceptance for a conceptual framework. UTAUT2 encompasses more factors compared to previous technology acceptance models (TAMs), and therefore offers ample opportunity for higher education instructors to identify arguments and reflect on their practical implications. UTAUT2 is compatible with online and hybrid instructional formats, as both require a base platform (e.g. MSTeams, Zoom, WebEx) in addition to applications for student engagement and comprehension. Only a limited amount of research regarding instructor acceptance of technology for online education during the pandemic exists. The most recent examples of such research are on video conferencing (Jain and Jain, 2021) and general online instruction adoption (Mittal *et al.*, 2021). However, these works do not fully encompass the adoption of online and hybrid higher education teaching during the COVID-19 pandemic.

2. Extended unified theory of acceptance and use of technology

Venkatesh *et al.*'s (2012) UTAUT2 model suggests that *behavioral intention* is explained by six factors, which in turn explains *use behavior* together with a seventh factor called *habit* (see Figure 1). Owing to forced usage during the pandemic, *habit* can be assumed, hence,

Figure 1 Conceptual framework of UTAUT2

Notes:
1. Moderated by age and gender.
2. Moderated by age, gender, and experience.
3. Moderated by age, gender, and experience.
4. Effect on use behavior is moderated by age and experience.
5. New relationships are shown as darker lines.

Source: Venkatesh *et al.* (2012)

the evaluation of the remaining factors becomes more insightful. The model suggests *age*, *gender* and *experience* to have a moderating effect.

2.1 Performance expectancy

Venkatesh *et al.* (2003) define *performance expectancy* as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance." This is generally understood as increased effectiveness.

However, substantial evidence suggests that "there is a perceptual disparity in academia that online education is inferior to traditional education" (Stewart *et al.*, 2010, p. 608). Although less recent, this study pinpoints a fundamental lack of *performance expectancy*. The results of the online survey conducted on faculty were "inconclusive related to faculty's perceptions of the merits of online instruction," suggesting that intrinsic motivation for teaching online or traditionally is responsible for the discrepancy (Stewart *et al.*, 2010). The findings are reasonable because educators' attitude to integrating new technology in teaching particularly matters if they have a choice.

More recently, Zarei and Kaur (2019) found that hybrid teaching enables a flexible approach for teaching languages because lecturers can use additional mediums like blogs, forums, Twitter and interactive whiteboards. This suggests that lecturers expect to use not only videoconference tools but also link various tools in teaching. The findings are suitable and viable in language teaching, but their applicability in numerical based subjects could differ.

The previously proposed TAM is considered in this section, which is a foundation of UTAUT2, uses the factor *perceived usefulness* that is closely related to *performance expectancy* (Hamzat and Mabawonku, 2018). Gibson *et al.*'s (2008) survey conducted on faculty members from business and education colleges indicates that *perceived usefulness* is a strong indicator of faculty acceptance of online education. This finding is conclusive considering when the study was conducted (2008). At the time, online education was rather new, and only educators with a tech-oriented mind-set would engage in online teaching without being deterred by technological obstacles. However, unless educators perceive the usefulness of online teaching, they would not readily accept a new technology (Gibson *et al.*, 2008).

In contrast to most TAM research, *perceived usefulness* is found not to be related to *task performance* by higher education instructors using new virtual learning environments (Rienties *et al.*, 2016). This may be owing to the experimental nature of the research, in which participants had to complete common teaching tasks using a new technology, focusing more on the technology than its teaching effectiveness or efficiency.

A qualitative study on online nursing education found that student engagement and learning are connected, as well as "knowing students" and being able to support them (Smith and Crowe, 2017). This seems relevant to educators and subjects that employ interactive teaching. Educators' *performance expectancy* would be negatively influenced if they perceive that students engage less in online classes. In addition, they know students less well when using such education media. This seems plausible because online participants are prone to switch off their camera and may be more easily distracted as they do not feel monitored in-class.

Overall, *performance expectancy* seems to encompass both educators' individual attitudes and skills, as well as the nature of the subject taught, which underlines the inconclusive outcome of existing research.

2.2 Effort expectancy

Effort expectancy is determined by the ease of technology usage (Venkatesh *et al.*, 2003). We define efforts of educators regarding the creation of content and material delivery,

communication with students, grading and dealing with disruptions in-class as relevant to determining ease of usage. An instructor would view *effort expectancy* positively, if online or hybrid teaching increases efficiency, that is time savings. Research has demonstrated change in workload time for instructors. For example, no difference when assessment is excluded (Bender *et al.*, 2004) leads to a 14% increase (Tomei, 2006). Time involvement differences observed from research review underlines the differences based on course design, number of students, engagement outside of class, and which measurement factors were included/excluded.

"Interactive activities and content are designed with a view to collaborative learning" (Camacho *et al.*, 2016). Switching from traditional classroom teaching to online teaching requires substantial effort, because the approach to teaching and all related materials are subject to change. Hence, redesigning the instructional format for all classes taught requires greater preparation time than that required for traditional classes, for which experienced educators typically reuse at least the basic structure of established materials. In a study on technology adoption in STEM education by Shadle *et al.* (2017), "time constraints" was the largest barrier and was followed by "instructional challenges". The findings highlight the effort required of instructional staff and where universities need to focus in developing online and hybrid instructional offerings.

Camacho *et al.* (2016) suggest that educators need to become a mediator of knowledge; therefore, must acquire skills regarding the content format as well as the tools of the virtual learning environment. It may reasonably be assumed that for some educators, this concept is far from existing self-perception. Therefore, profound changes to teaching approach require long-term continuous effort.

For educators, ensuring the involvement of all students during online and/or hybrid education requires an extra effort because distractions in-class are less numerous and more visible than in an online environment. Moreover, if a class is not interactive, instructors may be less likely to notice online students being distracted or involved in other activities. To keep student concentration and interest up, educators may feel the need to introduce more apps for classroom entertainment, which is beneficial. Further research in this area could demonstrate a difference in *effort expectancy* between in-class, online and hybrid instructional methods.

2.3 Social influence

Venkatesh *et al.* (2003) defined *social influence* as "the degree to which an individual perceives that important others believe he or she should use the new system." The meaning of "important others" for an instructor would be the university as employer, other instructors and students. Earlier research by Collis (2001) on predicting educational use of media tested social influence according to friends, family and community. Furthermore, Klobas and Clyde (2001) stated that "the effect of family and friends, professional colleagues, the media, and in a general sense that, increasingly, 'everybody'" are *social influence* factors. Despite this, the prominent influence on instructional staff is students.

Instructor evaluations are commonly used to assess student opinions on classes, and are a part of quality evaluations at universities (Serin, 2019). They impact promotions, contract renewals, awards and merits (Badri *et al.*, 2006). Students perceive instructors who use higher levels of technology as more competent (Frye and Dornisch, 2007). The importance of student evaluations combined with instructors' experiences of different technology instruments applies pressure to other instructors to learn and use more innovative technology in the classroom to be seen as competent.

In a closely related online instructional research, Tseng *et al.* (2019) found that *social influence* is strong among massive open online course (MOOC) educators and suggest that instructors may be concerned about obtaining rewards and avoiding discipline from

university management. This could be related to why instructors have quickly accepted online and hybrid format classes.

Because students, instructors and organizations have experienced online teaching during the COVID-19 pandemic, and return to in-class instruction, we believe that the continued use of technological teaching applications will remain. In the long run, this could mean that *social influence* increases teaching efforts for all teaching formats and creates demand for further development of technology. A long-term consequence of the COVID-19 situation may be an increased workload for instructors because on- and offline teaching requires similar skills and methods.

2.4 Facilitating conditions

Facilitating conditions denote the users' perception that the "organization and technical infrastructure exists to support use [...]" (Venkatesh *et al.*, 2003). In TAM, *facilitating conditions* determine and influence the *perceived ease of use* as well as instructors' intention to use a technology (Teo, 2011). Therefore, respective research findings are considered in this section. Ease of use has been long established as a valid criterion in earlier acceptance models (Collis *et al.*, 2001).

Perceived ease of use is found to be related to intentions and actual behavior when using new and unknown virtual learning environments (Rienties *et al.*, 2016). If instructors are offered the opportunity to apply various technological and online educational learning tools, students' active learning are improved and teaching and learning processes are facilitated (Zarei and Kaur, 2019). Subsequently, *facilitating conditions* are identified as a key prerequisite for technology adoption.

2.5 Hedonic motivation

Hedonic or intrinsic motivation is the enjoyment resulting from using a technology (Venkatesh, 2012). Most existing research focuses on student motivation rather than that of the educator. Hoffman (2013) found that faculty members' belief in the efficacy of online education in increasing student access to education and opportunities for professional growth are strongly correlated to students' willingness to participate in online education. The mentioned intrinsic factors do not match Venkatesh *et al.*'s (2012) notion of "enjoyment" because UTAUT2 focuses on consumer acceptance, while instructors use technology for hybrid and online teaching not private consumption. Nevertheless, teachers' development value, development level of teaching practice, as well as feeling of their development processes are found to influence the generation of intrinsic motivation (Liu *et al.*, 2019), thus, supporting *hedonic motivation* via job satisfaction and enjoyment of mastering new teaching methods. In addition, sharing and exchanging experiences with colleagues regarding new apps can be deemed enjoyable.

However, an online survey conducted on university faculty in Taiwan suggested that *hedonic motivation* does not drive university instructors' adoption of MOOCs because the technology aims to facilitate learning effectiveness and contains no element of fun and pleasure (Tseng *et al.*, 2019). Furthermore, if instructors are intrinsically motivated to adopt traditional teaching, they are found to be resistant to online education (Stewart *et al.*, 2010).

The reason for the inconsistent findings may be related to the specific MOOC topic versus online teaching in general, as well as respondents' perception of "enjoyment" versus "intrinsic motivation," or intrinsic motivation being in favor of traditional teaching.

2.6 Price value

In the UTAUT2 model, *price value* was included with the goal of examining consumer technology usage, and not that of an organization (Venkatesh *et al.*, 2012). Although

universities commonly finance technology costs, these costs are normally only covered once instructional staff has presented need and cost justification. Meaning, instructional staff function as a gatekeeper for the presentation of nonplatform technology needs but must invest personal funds into researching available technology. Therefore, we define *price value* more broadly to incorporate a wider range of financial implications for instructional staff. These costs include technology research time, travel time to and from the university, transportation costs, additional lunch costs (at home vs at university), nonscheduled time for co-workers and home office set-up costs for instructional purposes.

Tseng *et al.* (2019) validated the usage of UTAUT2 *price value* construct while researching MOOCs. They concluded that the knowledge sharing and/or global influence created through offering a MOOC course provided instructors a great sense of achievement justifying the high time and mental investment warranted for such courses.

2.7 Habit

UTAUT2 suggests that *habit* has both direct and indirect effect on *use behavior* (Venkatesh *et al.*, 2012). The COVID-19 pandemic has mandated online and hybrid classes for many instructors rapidly compared to their much longer experience. However, for pupils and students, existing research on preservice teachers' acceptance of Moodle suggests that *habit* has no influence; it may be less suitable in educational settings (Raman and Don, 2013). Despite the required online training, instructors may have performed enough online and/or hybrid classes that technology usage is now habit.

3. Moderating factors: age, gender and experience

Original UTAUT testing verified that both *performance expectancy* and *effort expectancy* are influenced by gender, age and experience. The newest UTAUT2 research on instructor acceptance of technology eliminated the original *moderating factors*, and included *regulators' support, project team capability* and *facilitating leadership* (Mittal *et al.*, 2021), which are not reviewed here.

A qualitative study on Chinese English as a foreign language, university instructors found that both age and experience influenced reliance on technology, arguing that digital natives use technology more competently and confidently, whereas older and more experienced instructors believed that their content knowledge and pedagogical skills outweigh lack of digital application (Huang *et al.*, 2017).

A meta-analysis on technology acceptance in general suggested that although age is negatively correlated to technology acceptance, predominantly because of lower *perceived ease of use*, it diminishes for technology aimed at older adults (Hauk *et al.*, 2018). Furthermore, the lack of technology acceptance of older adults cannot be explained by mere cohort effects because it remains stable over time (Hauk *et al.*, 2018). This seemingly contradicts their findings but allows the conclusion that online and hybrid teaching technology should be designed to suit older instructors' needs to eliminate the negative effect of age.

Teo *et al.* (2015) found that female preservice teachers score lower on *perceived ease of use* (TAM-factor reviewed in the *facilitating conditions* section) but not on *intention to use*, having established in a previous study that *gender* does not influence TAM (Teo, 2010). Yuen and Ma (2002) also used TAM as a conceptual framework and identified significant *gender* differences in computer acceptance by preservice teachers. Both *perceived usefulness* and *perceived ease of use* influence *intention to use* more strongly amongst females, while males' *perceived ease of use* influences *perceived usefulness* more strongly. This suggests that females are put off more easily than males from using computers

altogether; whereas males doubt the usefulness of computers if they do not find them easy to use.

Farooq *et al.*'s (2017) UTAUT3 model replaced the above mentioned moderating factors with *personal innovativeness*, which proved a not-significant contributor in Gunasinghe *et al.*'s (2019) study on academicians' adoption of e-learning.

Existing research is quite contradictory, suggesting that effects are potentially weak and dependent upon the exact type of technology applied. Because several applications can be used in online and hybrid teaching, a conclusive general assessment seems impossible.

4. Suggestions for further research and conclusion

Many researchers either examine portions of the UTAUT2 model or modify it. This complicates the process of conducting a consistent analysis of instructor adoption. Modified versions of UTAUT2 have often eliminated moderating factors rendering a transparent comparison of studies unlikely (Gunasinghe *et al.*, 2019; Mittal *et al.*, 2021; Sitar-Taut and Mican, 2021), similar to studies using the related TAM model (Gibson *et al.*, 2008; Rienties *et al.*, 2016; Teo, 2010; Yuen and Ma, 2002).

UTAUT2 research regarding higher education instructors is still developing, and researchers are analyzing model adoptions to assess technology acceptance more accurately. Although existing research is not always conclusive regarding higher education instructors' technology acceptance, we draw conclusions from several arguments regarding universities when establishing online and hybrid teaching.

Regarding *performance expectancy*, universities need to overcome instructors' perception that traditional teaching is superior to online classes by means of providing training and communicating the benefits of online teaching including best-practice examples. To maintain credibility, information should also be given on subject-related suitability.

Literature is inconclusive for *effort expectancy*, ranging from no to significantly increased effort required for developing new teaching materials and methods. The aforementioned best-practice communication may overstrain faculty because they may feel overwhelmed by technology options for online teaching. Therefore, universities should ensure a balance between performance and necessary extra effort. Universities planning further online/hybrid instruction should address the largest issues, time constraints and instructional challenges. Furthermore, developing instructor satisfaction in online and hybrid adoption could lead to improved benefits and is an area warranting further research.

Social influence affects instructors' adoption significantly, although not comprising social pressures in classic terms. Research supports recognition and student evaluations as a primary technology adoption driver. How universities can best apply these to further adoption methods, or mandate technology usage as a term of employment, requires further observation, particularly regarding hybrid instruction. Further, we agree with McConnell *et al.* (2020) that research on the relationship between instructional staff information exchange and technology adoption is needed. Results would allow universities to better develop future decision making and adoption processes, particularly as higher education enters the metaverse.

Facilitating conditions are deemed crucial in existing research because they encompass *perceived ease of use*. To support instructors, universities need to opt for online teaching applications that promote ease of use and offer hands-on support.

At first glance, *hedonic motivation* seems more applicable to consumer technology than to job-related technology acceptance. However, when extended to intrinsic motivation, it fits well. Instructors can derive satisfaction from believing that they add value and facilitate access to education, as well as having mastered a new technology. Intrinsic motivation can

be enhanced by universities through an atmosphere/culture of respect, appreciation and knowledge exchange.

Because instructors do not pay for the technology adopted by the university, *price value* in the original sense is not applicable. However, teaching online from home can provide certain benefits to instructors, namely, avoiding time and commuting costs. While this aspect is an individual topic, as to what creates an optimal situation, it is recommended to consider and communicate scheduling from both student and instructor viewpoints to minimize any future misunderstandings.

Because many of today's higher education instructors have spent most of their own education and career in traditional classrooms, the duration of the COVID-19 pandemic encompasses a relatively small portion of their life. However, more than a year of online teaching is likely to have created a certain level of habit. Universities can foster *habit* by continuing to encourage instructors to conduct at least a part of their teaching online.

The moderating factors age, gender and experience do not seem to have consistent effects. Older instructors who are typically more experienced tend to be more skeptical, as well as females. To provide support, universities could purchase technology that is designed to suit not only digital natives' requirements but also those of older instructors, namely, by involving them in the purchase and communication process. Communication should engage female and older instructors, without alienating the remainder of the faculty. Future studies looking into moderating factors could look into the role of the instructor in online/hybrid education and if the new role is different across moderating factors.

Our arguments create a platform for both quantitative and qualitative future research and provide assessment for further model clarity. As researchers debate factors for UTAUT adoption, universities wishing to encourage online teaching acceptance should pay attention to a range of aspects to ensure that faculty keeps offering competitive online teaching. Our paper also endeavors to provide instructors, researchers and university program developers with a framework for critical reflection on their own situation and methods to evolve in an unforeseeable future.

References

Amsler, S. and Facer, K. (2017), "Introduction to 'learning the future otherwise: emerging approaches to critical anticipation in education'", *Futures*, Vol. 94, pp. 1-5, doi: 10.1016/j.futures.2017.09.004.

Badri, M.A., Abdulla, M., Kamali, M.A. and Dodeen, H. (2006), "Identifying potential biasing variables in student evaluation of teaching in a newly accredited business program in the UAE", *International Journal of Educational Management*, Vol. 20 No. 1, pp. 43-59, doi: 10.1108/09513540610639585.

Bender, D.M., Wood, B.J. and Vredevoogd, J.D. (2004), "Teaching time: distance education versus classroom instruction", *American Journal of Distance Education*, Vol. 18 No. 2, pp. 103-114, doi: 10.1207/s15389286ajde1802_4.

Camacho, A.C.L.F., Feliciano, G.D. and Leite, B.S. (2016), "Tutoring in nursing through distance education: a reflective approach", *Journal of Nursing*, Vol. 10 No. 4, pp. 3682-3687, doi: 10.5205/reuol.9681-89824-1-ED.1004sup201621.

Collis, B., Peters, O. and Pals, N. (2001), "A model for predicting the educational use of information and communication technologies", *Instructional Science*, Vol. 29 No. 2, pp. 95-125.

Farooq, M.C., Salam, M., Jaafar, N., Fayolle, A., Ayupp, K., Radovic-Markovic, M. and Sajid, A. (2017), "Acceptance and use of lecture capture system (LCS) in executive business studies: Extending UTAUT2", *Interactive Technology and Smart Education*, Vol. 14 No. 4, pp. 329-348, doi: https://doi.org/10.1108/ITSE-06-2016-0015

Frye, N. and Dornisch, M. (2007), "Teacher technology use and student evaluations: the moderating role of content area", *Journal of Educational Technology Systems*, Vol. 36 No. 3, pp. 305-317, doi: 10.2190/ET.36.3.g.

Gagliardi, J., Parnell, A. and Carpenter-Hubin, J. (2018), "The analytics revolution in higher education", *Change: The Magazine of Higher Learning*, Vol. 50 No. 2, pp. 22-29, doi: 10.1080/00091383.2018.1483174.

Gibson, S.G., Harris, M.L. and Colaric, S.M. (2008), "Technology acceptance in an academic context: faculty acceptance of online education", *Journal of Education for Business*, Vol. 83 No. 6, pp. 355-359, doi: 10.3200/JOEB.83.6.355-359.

Gunasinghe, A., Hamid, J.A., Khatibi, A. and Azam, S.M.F. (2019), "The adequacy of UTAUT-3 in interpreting academician's adoption to e-learning in higher education environments", *Interactive Technology and Smart Education*, Vol. 17 No. 1, pp. 86-106, doi: 10.1108/ITSE-05-2019-0020.

Hamzat, S.A. and Mabawonku, I. (2018), "Influence of performance expectancy and facilitating conditions on use of digital library by engineering lecturers in universities in South-west, Nigeria", *Library Philosophy and Practice (e-Journal)*.

Hauk, N., Hüffmeier, J. and Krumm, S. (2018), "Ready to be a silver surfer? A meta-analysis on the relationship between chronological age and technology acceptance", *Computers in Human Behavior*, Vol. 84, pp. 304-319, doi: 10.1016/j.chb.2018.01.020.

Hoffman, M. (2013), "An examination of motivating factors on faculty participation in online higher education [Northeastern University]", available at: https://repository.library.northeastern.edu/files/neu:1071/fulltext.pdf

Huang, F., Teo, T. and Zhou, M. (2017), "Factors affecting Chinese English as a foreign language teachers' technology acceptance: a qualitative study", *Journal of Educational Computing Research*, Vol. 57 No. 1, pp. 83-105, doi: 10.1177/0735633117746168.

Jain, V. and Jain, P. (2021), "From industry 4.0 to education 4.0: acceptance and use of videoconferencing applications in higher education of Oman", *Journal of Applied Research in Higher Education*, ahead-of-print(ahead-of-print), https://doi.org/10.1108/JARHE-10-2020-0378.

Jaschik, S. and Lederman, D. (2019), "2019 survey of faculty attitudes on technology: a study by inside higher education and Gallup", available at: www.insidehighered.com/system/files/media/IHE_2019_Faculty_Tech_Survey_20191030.pdf

Klobas, J.E. and Clyde, L.A. (2001), "Social influence and internet use", *Library Management*, Vol. 22 Nos 1/2, pp. 61-68.

Liu, W., Li, X.-W. and Zou, Y. (2019), "The formation of teachers' intrinsic motivation in professional development", *Integrative Psychological and Behavioral Science*, Vol. 53 No. 3, pp. 418-430, doi: 10.1007/s12124-018-9465-3.

McConnell, M., Montplaisir, L. and Offerdahl, E.G. (2020), "A model of peer effects on instructor innovation adoption", *International Journal of STEM Education*, Vol. 7 No. 1, pp. 1-11, doi: 10.1186/s40594-020-00255-y.

Mittal, A., Mantri, A., Tandon, U. and Dwivedi, Y.K. (2021), "A unified perspective on the adoption of online teaching in higher education during the COVID-19 pandemic", *Information Discovery and Delivery*, ahead-of-print(ahead-of-print), https://doi.org/10.1108/IDD-09-2020-0114

Raman, A. and Don, Y. (2013), "Preservice teachers' acceptance of learning management software: an application of the UTAUT2 model", *International Education Studies*, Vol. 6 No. 7, p. 157, doi: 10.5539/ies.v6n7p157.

Rienties, B., Giesbers, B., Lygo-Baker, S., Ma, H.W.S. and Rees, R. (2016), "Why some teachers easily learn to use a new virtual learning environment: a technology acceptance perspective", *Interactive Learning Environments*, Vol. 24 No. 3, pp. 539-552.

Serin, H. (2019), "Student evaluations of teaching effectiveness: an instrument to increase teaching quality in higher education", *Educational Studies*, Vol. 5 No. 4, pp. 168-173, doi: 10.23918/ijsses.v5i4p168.

Shadle, S.E., Marker, A. and Earl, B. (2017), "Faculty drivers and barriers: laying the groundwork for undergraduate STEM education reform in academic departments", *International Journal of STEM Education*, Vol. 4 No. 1, p. 8, doi: 10.1186/s40594-017-0062-7.

Sitar-Taut, D.-A. and Mican, D. (2021), "Mobile learning acceptance and use in higher education during social distancing circumstances: an expansion and customization of UTAUT2", *Online Information Review*, Vol. 45 No. 5, pp. 1000-1019, doi: 10.1108/OIR-01-2021-0017.

Smith, Y.M. and Crowe, A.R. (2017), "Nurse educator perceptions of the importance of relationship in online teaching and learning", *Journal of Professional Nursing*, Vol. 33 No. 1, pp. 11-19, doi: 10.1016/j.profnurs.2016.06.004.

Stewart, C., Bachman, C. and Johnson, R. (2010), "Predictors of faculty acceptance of online education", *MERLOT Journal of Online Learning and Teaching*, Vol. 6 No. 3, pp. 597-616.

Teo, T. (2010), "Establishing gender structural invariance of technology acceptance model (TAM)", *The Asia-Pacific Education Researcher*, Vol. 19 No. 2, pp. 311-320, doi: 10.3860/taper.v19i2.1599.

Teo, T. (2011), "Factors influencing teachers' intention to use technology: model development and test", *Computers & Education*, Vol. 57 No. 4, pp. 2432-2440.

Teo, T., Fan, X. and Du, J. (2015), "Technology acceptance among pre-service teachers: does gender matter?", *Australasian Journal of Educational Technology*, Vol. 31 No. 3, pp. 235-251, doi: 10.14742/ajet.1672, Article 3.

Tomei, L.A. (2006), "The impact of online teaching on faculty load: computing the ideal class size for online courses", *Journal of Technology and Teacher Education*, Vol. 14 No. 3, pp. 531-541.

Tseng, T.H., Lin, S., Wang, Y.-S. and Liu, H.-X. (2019), "Investigating teachers' adoption of MOOCs: the perspective of UTAUT2", *Interactive Learning Environments*, pp. 1-16, https://doi.org/10.1080/10494820.2019.1674888

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003), "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Vol. 27 No. 3, p. 425, doi: 10.2307/30036540.

Venkatesh, V., Thong, J.Y. and Xu, X. (2012), "Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology", *MIS Quarterly*, Vol. 36 No. 1, p. 157, doi: 10.2307/41410412.

Zarei, N. and Kaur, H. (2019), "Lecturers' perceptions towards hybrid teaching approach", *Alford Council of International English & Literature Journal*, Vol. 2 No. 3.

Yuen, A.H.K. and Ma, W.W.K. (2002), "Gender differences in teacher computer acceptance", *Journal of Technology and Teacher Education*, Vol. 10 No. 3, pp. 365-382.

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