

Online Learning: What We Know and What We Don't Know

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ABSTRACT

The COVID-19 pandemic accelerated the trend to the use of online learning more extensively as well as our experience with many new, and often unusual, situational variations. This article reviews what we know about the important factors affecting effective online learning, summarizes the extensive research findings about online learning, reviews some of the overall gaps in the research in terms of moving the state-of-the-art forward, and provides a summary of types of initiatives that departments, colleges, and universities can take to upgrade their online teaching/learning offerings. It also provides a summary of complementary opportunities/strengths and challenges provided by online teaching. Challenges include additional skills to be learned by faculty, various challenges in implementing integrity tools, mode selection issues, lowered perceived learning experience, increased faculty workload, student choice “traps,” and faculty satisfaction conflicts.

KEYWORDS

Improving Online Education, Online Education, Online Learning, Online Teaching

INTRODUCTION

The field of online teaching and learning has been growing steadily since 2000 (Seaman, Allen, & Seaman, 2018), and explosively during the COVID-19 pandemic (Johnson, Veletsianos, & Seaman, 2020; Parker, 2021; Harangi-Rákos et al., 2022). While there will certainly be substantial retrenchment with the abatement of the pandemic, the long-term trajectory of growth of online learning will likely have been much accelerated (McKenzie, 2021; Ulum, 2022).

Online learning and teaching in higher education is a very broad and rapidly changing field. It is therefore difficult for experts, let alone specialists and practitioners to understand the state of the field. The COVID pandemic necessitated emergency measures in learning and teaching. The disruption caused by the pandemic has now catalyzed a ‘stock-taking’ of higher education. Efforts to create some stability in higher education learning and teaching must be informed by an up-to-date assessment of the current state. It is an opportune time to explore the field of online learning to identify weakness, and opportunities and formulate a strategy for contending with ongoing challenges.

This article reviews what we know about online teaching and learning, what we don't know (especially the more applied aspects of how to make online teaching more effective), and strategic opportunities for improvement by faculty and universities that are often overlooked or underutilized. It also provides a matrix of competing strengths and challenges.

Factors Affecting Online Quality Teaching and Types of Online Learning Outcomes

Online teaching is multifaceted involving a number of major factors that ultimately affect online learning. They are divided here into: direct course delivery, institutional support, faculty motivation, guidelines and standards, and student readiness (Van Wart et al., 2019).

Course Delivery

Course delivery is the most direct factor affecting online learning. It is a complex factor that includes competence in planning and execution of courses, as well as competence in subject matter (Marks, Sibley, & Arbaugh, 2005; Young, 2006; Ambrose et al., 2010). From a student's perspective, the planning and execution in online settings are influenced by seven empirically identified factors (Van Wart et al., 2020; Ni et al., 2021).

First, students expect instructor competence in using basic learning management systems (initial) functions. Can the instructor navigate and use the system effectively? For example, does the instructor use the grade book function well so that students can see their status in the course quickly and reliably? Second, students want good design built-in prior to the course. High-quality online courses take significant time to build in terms of pre-recorded lectures, rehearsal exercises, links, grading rubrics, etc. Third, students expect the course to have good structural implementation. This basic implementation element includes timely grading and responses, clear syllabus and directions, well-facilitated activities, realistic examinations and projects for the online environment, and so on (Kuo et al., 2013; Dennen, 2014; Johnson & Cooke, 2016). However, good implementation is insufficient for a course to be high quality from a student's perspective (Van Wart et al., 2020). Four additional elements distinguish good and very good courses.

One factor common to both face-to-face and online settings is the desire for courses to be "stimulating." This is sometimes conceptualized as intellectual stimulation or cognitive presence (Garrison & Cleveland-Innes, 2005). It is also related to the enthusiasm that the instructor exhibits (Brinthaupt et al., 2011) and to the ability to create a "transformative" learning community (Cranton & Torrisi-Steele, 2021).

A fifth factor in online classes that is perceived as an added benefit beyond sound planning and structure in online instruction is the use of higher-end functionalities such as highly structured and monitored small groups (Lancellotti, Thomas, & Kohli, 2016; Hernandez-Lara, & Serradell-Lopez, 2018). It also includes higher quality video lectures (Draus, Curran, & Trempus, 2014), lectures that are time consuming to build because of specialty features such as embedded quizzes, or rehearsal materials that use branching techniques to customize the experience for students.

A sixth distinct element that students find valuable is student-to-student learning interaction (Community of Inquiry, n.d.; Kehrwald, 2008; Jaggars & Xu, 2016; Kordrostami & Seitz, 2021). This can be through full-class discussions, course blogs, small group activities, etc. The factor includes both the emotional connection that students get from interacting with each other as well as the significance of working in an interactive learning community. The importance of student-to-student learning interaction varies significantly by discipline and sometimes even by content area (Means et al., 2009; Arbaugh, 2013).

The last distinct element is online social comfort. Online social comfort reflects a student's comfort level in a class based on either degree of difficulty or social integration (Van Wart et al., 2020). This element tends to be quite important for underrepresented minority students (Xu & Jaggars, 2014; Jaggars & Xu, 2016), but less so for academically strong students (Bawa, 2016).

Important but Indirect Factors Affecting Online Learning

While course delivery is the most important and direct factor affecting online teaching and learning, there are other important factors that are antecedent or have a moderating effect on course delivery. Institutional support includes the technical support, faculty and staff training in online teaching technology and effectiveness, and institutional leadership regarding system maintenance and support (Orr, William, & Pennington, 2009; Frazer et al. 2017; Etzkorn, 2018; Castro & Tumibay, 2021). Faculty motivation to teach online and strive for high-quality instruction is affected by institutional support (e.g., training, incentives and scheduling requirements), perceptions of online teaching workload in comparison to face-to-face teaching, the importance of flexibility to the faculty member, and faculty empowerment (Tomei, 2006; Baran, Correia, & Thompson, 2011; Porter & Graham, 2015; Bawa, 2016). Guidelines and standards include departmental/college expectations, university standards, accreditation body requirements, and the adoption of national or international online teaching standards (Friedman, 2016; Van Wart et al., 2021). Student readiness is the degree to which students are emotionally and technologically capable of handling online learning effectively (Rooij, & Zirkle, 2016; Carter et al., 2020).

Outcomes of Online Teaching

Different studies on online teaching and learning focus on different outcomes. Learning achievement is the degree to which students master the content of a course. It is generally a concrete measure derived from tests, behavioral exercises, or grades. Student perceptions are quite varied, but the two most common are perceptions of overall satisfaction (enjoyment, quality and convenience of learning experience) and self-perceptions of learning achievement (e.g., perceptions of how long the content will be retained). Faculty perceptions are also varied and parallel those of students. One faculty outcome is their satisfaction with online teaching (e.g., enjoyment of online lecture formats and overall teaching experience, and the “value” of flexibility of online learning) and their perceptions of student learning achievement. Finally, there are institutional outcomes related to the number of students online (e.g., recruitment and critical mass), retention, reputation, and quality control. While there is often modest covariance among some of the outcomes, on occasion outcomes will vary or even seem to be at cross purposes, e.g., students’ desire for more online instruction and faculty’s concern for more direct physical interaction. For example, Ebner and Gegenfurtner (2019) note in a metaanalysis of face-to-face, synchronous online and asynchronous online courses that fully online courses that there was not significant correlation between learning achievement outcomes and satisfaction.

METHODS

This is a traditional or narrative review of online teaching and learning. Because of the breadth of the review and the size of the literature, no attempt is made to conduct a scoping or systematic review which are more practical and effective with a narrower research focus. The author’s previous taxonomic work assisted in the review (Van Wart et al., 2019), as did a variety of specialized studies on student learning preferences (Van Wart et al., 2020; Ni et al., 2021), faculty adoption patterns (Dumont et al., 2021), accreditation issues (Van Wart et al., 2021), disciplinary difference affecting STEM (Hou et al., 2021), etc. Google Scholar was the primary search engine, but basic Google was used to gather some descriptive data from government sources, newspapers, and non-academic sources or “gray literature.” Approximately 300 abstracts were specifically examined for initial consideration, out of which approximate 175 were reviewed in depth for possible inclusion, in order to cull about 125 sources actually referenced herein. Once included, there was a preference for citing sources for different points when applicable to keep the reference list from becoming unwieldy. Dozens of search terms included not only basic phrases such as online learning and online teaching, but numerous terms to qualify and narrow searches for types of research (“meta-analysis,” “review”) and topic for each area

discussed (learning achievement, student satisfaction, faculty satisfaction, institutional support, etc.). Preference was given to meta-analyses and literature reviews where available in line with “umbrella” reviews. Also, better cited academic literature was given priority when applicable, except for recent publications where citation counts may not have accumulated. However, in numerous cases references to specific aspects of online teaching were from less cited sources, and in some cases such as trend data, non-academic sources were included. Because of the size of the literature, some of the citations are representative rather than comprehensive. The author attempted to portray the relative balance of support when the literature had heterogenous findings, but avoided describing detailed methodological debates regarding sampling, boundary conditions, variable definitions, statistical techniques, etc. for lack of space and suitability for the type of overview that was the purpose of this piece.

WHAT WE KNOW

Capacity

Course delivery. On average, learning achievement (instrumental learning outcomes) of online and face-to-face teaching modes are roughly equivalent (Bernard et al., 2004; Tallent-Runnels et al., 2006; Means et al., 2009; Ni, 2013; Dolan, Hancock, & Wareing, 2015; Nguyen, 2015; Pei & Wu, 2019; Ulum, 2022; Martin et al., 2021). Of course, in different concrete settings, online learning achievement may either be superior (with good instructional practice) or inferior. There are indications that everything “was-not-equal” during the pandemic and learning achievement suffered (e.g., Motz et al., 2021)

Research demonstrates that most student needs can be addressed in online courses at a comparable level with face-to-face courses with sufficient instructor planning, diligence, and online competence (Wyatt, 2005; Seok et al., 2010; Nguyen, 2015; Castro & Tumibay, 2021). However, to meet the expectations of the bulk of students taking online classes, the level of faculty effort may need to be quite extensive, and for some faculty, unrealistically demanding (Tomei et al., 2006; Bollinger & Wasilik, 2009; Otter et al., 2013; Mansbach & Austin, 2018; Frazer et al., 2017; Dumont et al., 2021).

Many students have concerns about online teaching effectiveness and enjoyment/satisfaction. Some concerns are typical of nearly all students, generally related to low-quality instructional practices such as slow responsiveness (Jung, 2011; Martin, Wang & Sadaf, 2018) and lack of engagement (Ziegler, Paulus & Woodside, 2006; Draus, P. Curran, & Trempus, 2014; Burke & Fedorek, 2017). Reducing low-quality instructor practices mitigates or eliminates this type of concern. However, many concerns are more personal for students or related to individual preferences such as insufficient live interaction, loneliness, finding a good space to use at home, unreliable internet access, lack of stimulation, motivation issues, etc. These issues were much in play in the pandemic with the sudden and intensive utilization of online modes (Aini et al., 2020; Ulum, 2022), but not consistently across all students (Lee et al., 2021). Some of these issues are reduced with increased voluntariness of online or face-to-face. However, complicating decision making for instructors is the fact that many other students may not perceive a problem, or feel very differently (Joyes & Frize, 2005; Cheng & Chau, 2016). Therefore, addressing students’ personal concerns can be complex. On the other hand, the desire of many students for flexibility and convenience mitigates or outweighs their concerns about the quality of experience (Song et al., 2004; Boling et al., 2012; Ulum, 2022)

Different modes (fully face-to-face versus hybrid versus fully online) have their strengths and weaknesses (Agosto, Copeland, Zach, 2013). One is not necessarily better than the other, depending on the preferences of instructors and students (Arbaugh, 2014a). Face-to-face classes are strong in the overall richness of the learning experience (Ebner & Gegenfurtner, 2019), but weak in flexibility and convenience. Asynchronous courses are strong in flexibility and convenience but more susceptible to weaker learning experiences and alienation (Martin et al., 2021). Hybrid courses maintain high levels of perceived learning experience (Poirier, 2010), but limit flexibility and convenience and

incur scheduling challenges (Price, Arthur, & Pauli, 2016). On one hand, the pandemic required more experimentation with online modes of teaching from many instructors unfamiliar with using virtual teaching strategies. However, both the hurried nature of transition and the almost total omission of hybrid modes during the pandemic led to numerous negative experiences that may not have been representative of the potentialities of hybrid and online teaching (Adedoyin & Soykan, 2020; Rasheed, Kamsin, A. & Abdullah, 2020; Bashir et al., 2021; Singh, Steele & Singh, 2021).

The variation of teaching/learning preferences across disciplines is small but significant (Arbaugh, 2013; Arbaugh 2014a; Arbaugh; 2014b). For example, some disciplines, such as those in science, technology, engineering and math (STEM), have expectations of longer lectures by faculty and students so that highly detailed data can be mastered with multiple exposures, while shorter lectures in other disciplines are adequate when balanced with discussions, activities, and direct practice (Kuo et al., 2013). Labs and clinicals are vital for some disciplines, requiring special technology and teaching considerations (McCutcheon et al. 2014; Hou et al., 2021), but are altogether absent in other disciplines.

Institutional support and technological reliability. Technology reliability and support is not as significant a concern as it once was less than a decade or so ago in countries that had embraced it as an alternative strategy (Li & Irby, 2008; Lee, 2010; but see Yessenov et al. 2020 and Motz, 2021 as comparisons). While various aspects of the technology were cited as concerns and liabilities in the earlier studies of online learning (Tallent-Runnels et al., 2006; Bollinger & Waslik, 2009), they have been less reported in the last decade. For example, institutional help systems seem to be better and more responsive, and technological outages and glitches more uncommon. While many institutional support systems were overwhelmed in the short term by the enormous surge and expansion of online education in the pandemic (Aini et al., 2020; Johnson, Veletsianos, & Seaman, 2020; Hou et al., 2021; Harangi-Rákos et al., 2022), there are signs that this has boosted long-term capacity (Lee et al., 2021; Salta et al., 2022).

Technology innovations in the last fifteen years have been impressive in LMS integration, lecture variety, videoconference capacity, test integrity, and other areas. Two areas of exceptional improvement have been videoconference access, convenience, and performance (Stefanile, 2020), as well as enhanced prerecorded lecture alternatives such as PlayPosit (Abobaker, & Ali, 2022), VoiceThread (Mejia, 2020), and Camtasia (Silva, 2012).

There is some evidence that universities that have taken comprehensive approaches to training have been reported as better in terms of instructor and student satisfaction (McGowan & Graham, 2009; Swan et al., 2014; Etzkorn, 2018; Owens et al., 2019).

Because of the pandemic, (a) exposure to online teaching/learning soared, and (b) many instructors and institutions rose to the occasion with a surge of effort and resources (e.g., Langegård et al., 2021; Harangi-Rákos et al., 2022).

The use of LMS for “class maintenance” activities such as the posting of the syllabus and various documents and supplemental videos, grades, and announcements has become very common in face-to-face classes even for part-time teaching personnel and is well received by students (Stone & Perumean-Chaney, 2011). There are some studies that report that online teaching has led to the improvement face-to-face teaching in terms of both teaching practice and creation of useful teaching artifacts (Joyes & Frize, 2005; Kearns, 2016).

Faculty motivation. Putting the average faculty opinion aside for a moment, it is important to remember that some faculty actually prefer online teaching—especially hybrid formats—as a style and modality. This is especially true for faculty who enjoy the flipped classroom—generally placing interaction with the material after reading but before some or all of the lecture which is then more about advancing learning than establishing baseline learning (McGivney-Burnelle, 2013; Burke & Fedorek, 2017; Maycock, 2018).

Most, but certainly not all, faculty now appreciate the flexibility and convenience online teaching can offer (Dumont et al., 2021). In the early days of online teaching there were many faculty who entirely dismissed anything to do with online teaching as unnecessary, awkward, and inconvenient

for their instructional routines (Allen & Seaman, 2007). Such sweeping negative assessments are less common outside courses and programs in which labs play a large element. That is not to say that many faculty still do not object to extensive use of online teaching but it is to say that most faculty have now been acclimated to use of some limited online formats as an asset after pandemic (Ulum, 2022).

Quality control. Numerous national and regional groups have made extensive efforts at quality standards and control. For example, one common system is Quality Matters which provides professional development, a set of rubrics, and a course peer review process that work together to support faculty in improving the quality of online and blended courses (Shattuck, 2015).

There is some evidence that universities that have taken comprehensive approaches to standards are better in terms of instructor satisfaction (McGowan & Graham, 2009; Swan et al., 2014; Owens et al., 2018).

Student readiness. For all intents and purposes, technology self-confidence related to online learning has ceased to be a major concern for students as it was only a decade ago (e.g., Shen et al., 2013; versus Artino, 2010) in all but remote areas (e.g., Yessenova et al., 2020). Part of the reason for this is the increased computer and virtual literacy of the population in general. By necessity, the pandemic boosted “academic” computer literacy considerably.

Numerous instructor-level techniques can help mitigate poor student readiness. Instructors can be made sensitive to and trained in raising student readiness by providing initial tips, use of automatic assignment reminders, carefully paced assignments starting early in the term, videos, and even assessments and quizzes (Lim, 2016; Rooij, & Zirkle, 2016)). Some research indicates that more problematic than students being “ready” is students taking on too many courses relative to their other life demands, which can exacerbate online learning liabilities such as loneliness, procrastination, disaffection, and “lurking” (Beaudoin, 2002; Amichai-Hamburger et al., 2016).

Challenges

Course delivery. On average, students report satisfaction and/or enjoyment as somewhat lower in online learning contexts; this finding has been relatively consistent over time (Johnson, Aragon, & Shaik, 2000; Paechter & Maier, 2010; Young, & Duncan, 2014; Ebner & Gegenfurtner, 2019). Overall, lower student satisfaction based on teaching quality is largely because of a perception of a less “rich” and evocative learning experience, and actual poor instructional design/implementation. Specific, common, student-complaint clusters include: (1) difficulty focusing and staying motivated, (2) inadequate lectures, (3) excessive busywork, (4) poorly structured classes, (5) slow instructor responsiveness, and (6) diluted sense of human interaction (Paechter & Maier, 2010; Martin, Wang, & Sadaf, 2018; Motz et al., 2021).

The sudden thrust to online education during the pandemic caused a great deal of the educational dissatisfaction with the quality of education, despite appreciation for the faculty efforts and continuance of educational programs. (e.g., Salta et al., 2022; Langegård et al., 2021).

Relatedly, on average, online students think that they are “teaching themselves” more because of the common flipped-classroom approach (Otter et al., 2013; Young, & Duncan, 2014). This sense of self-teaching was exacerbated during the pandemic (Aguilera-Hermida, 2020).

At the same time that students feel that they are teaching themselves, faculty feel they are spending much more time and energy teaching when they are instructors in online courses versus face-to-face courses (Tomei, 2006). This overall perception has not diminished during the perception about there is increased acceptance, or resignation, to this new reality after the pandemic Dumont et al., 2021).

Institutional support and technological reliability. There was little interest at many institutions on the part of faculty or administration to do strategic planning in the past regarding online learning (Tallent-Runnels et al., 2006; Kushnir & Berry, 2014; Miller & Ribble, 2010; Prinsloo, 2016; Chow & Croxton, 2017). This has been especially true in many developing countries (e.g., Yessenova et al., 2020; Motz et al., 2021). Those faculty that had experimented with online teaching were more likely to continue teaching online, increase in competence, and be more satisfied with online teaching

over time (Horvitz et al., 2015). However, those universities and faculty with little experience were relatively unprepared for the fully online experience that occurred around March 2020 (Parker, 2021).

Universities and accrediting bodies have been struggling with how to create meaningful norms and standards given the range of institutional and teaching practices, the rapidly evolving technology, and different and shifting public expectations about the nature of quality higher education (Van Wart et al. 2021; Alam, & Asimiran, 2021).

Faculty motivation. On average, faculty report personal satisfaction as significantly lower in online learning (Phillip & Cain, 2015; Asarta & Schmidt, 2017; Wingo, Ivankova & Moss, 2017; Mansbach & Austin, 2018).

The appreciation of online teaching by faculty as a quality medium of instruction is significantly less pronounced than are their concerns on average. Workload is the single biggest issue for faculty (Tomei 2006; Bollinger & Wasilik, 2009; Windes & Lesht, 2014). Other faculty concerns are numerous (Phillip & Cain, 2015). Such negative perceptions can be mitigated, to a greater or lesser degree, but frequently only with a commitment of substantial resources and coordinated planning on the part of both faculty and the administration (Castro & Tumibay, 2021).

Quality control. Online test and student work integrity is a major concern for faculty (Wilkinson, 2009; Cerimagic & Hasan, 2019; Butler-Henderson & Crawford, 2020) and this continues to be the case despite new technologies (Dumont et al., 2021). In many disciplines test and assignment integrity can be improved without technological solutions by requiring customized responses or answers, changing assignments and tests with each new course, using narrower time windows in online testing, randomizing questions and answers in objective testing, and/or using tight testing timelines to enhance the importance of prior learning to complete the test within time restraints. Reliance on objective testing as is common in STEM and some other disciplines often relies on technological solutions. Verification of test takers can be enhanced by auto authentication (verification with photos), live authentication (a proctor does a visual scan after the virtual check in), normally accompanied by challenge questions (Ullah, Xiao, Lilley & Barker, 2012). In disciplines in which testing is overwhelmingly objective in introductory classes especially, locking down the search function with live and record-and-review monitoring of students is frequent. Automatic monitoring can accompany either function with tagging of questionable movements or sounds during exams (Dendir & Maxwell, 2020). The overall effectiveness of these measures by some researchers suggests that evidence “supports the rate is lower in online courses than in face-to-face” (Tolman, 2017). However, such measures have not been without technical difficulties and discomfort to students (Dimeo, 2017).

Student readiness. Students with weak self-regulation behaviors (i.e., procrastinating students) perform more poorly in online courses, and thus instructors must pace regular assignments and do more consistent nudging for such students to be successful (Lim, 2016; Rooij, & Zirkle, 2016; Carter et al., 2020). Weaker students are at greater risk in online settings and need more interpersonal support (Xu & Jaggars, 2014; Hachey et al., 2015; Bawa, 2016; Jaggars & Xu, 2016). Online social comfort is more important for underrepresented minority students (URM) students than non-URM students (Motz, 2021).

WHAT WE DON'T KNOW

Course Delivery

While there is a great deal of information available for those improving at the level of individual instructors, there is little research that focuses on group and organizational initiatives to improve online instruction. Therefore, more research is needed to understand how best to foster shared online teaching improvement initiatives that are tailored to the needs of specific departments and colleges. How can chairs, deans, and online teaching champions make a bigger difference in encouraging continuous online instructional improvement?

Laboratory settings are notoriously difficult to conduct online and the types of technology customization are more extensive (McCutcheon et al. 2014; Dolan, Hancock, and Wareing, 2015; Hou et al., 2021). Not surprisingly, there has been little comprehensive research about the multitude of different lab settings because those technologies are still rapidly evolving since the temporary usage spike during the pandemic.

Numerous researchers are looking at the possible uses of handheld mobile technology in learning and its benefits to the online classroom (Hu, Laxman, & Lee, 2020). However, the liabilities of small screens and functional capabilities of hand-held technology need further investigation prior to promotion of the most flexible technology currently in use.

Building software programs into LMS platforms has enhanced efficiency to some degree, but much needs to be done to streamline the time it takes faculty to develop online courses while maintaining or increasing quality. Additional research about the ways to train and support faculty development in a post-pandemic world would enhance the field a great deal.

Institutional Support and Technological Reliability

Poor administrative leadership of online systems has been a common complaint for decades. The pandemic required significantly more administrative leadership due to the radical shift required by the crisis caused. Research about the effects of the pandemic on long-term administrative mindsets and focus on online learning would be helpful in understanding the most effective means for getting administrators to be accountable for high-quality online education.

Faculty Motivation

The shift to online teaching during the pandemic certainly accelerated the pace of understanding and adoption. However, how much good, versus how much damage, was done to faculty perceptions about online teaching due to the involuntary online teaching mandate during the pandemic (e.g., Dumont et al., 2021)?

Faculty are often key to decisions about quality and standards. Monitoring faculty standards in face-to-face settings with its carefully prescribed “seat time” requirements are more difficult in online settings where faculty are often instructed to make lectures shorter in order to provide more rehearsal time. Yet this provides a scenario that is ripe for misuse by less conscientious instructors. Therefore, it is important to provide research about the most effective means for getting faculty-supported quality control in a context more susceptible to violations of standard quality control.

Quality Control

An enormous concern of faculty is educational integrity in an age in which inappropriate copy-and-paste and split-second internet access are realities that are nearly irresistible for many students in open book settings (Stuber-McEwen, Wiseley, & Hoggatt, 2009; Tatum, & Schwartz, 2017). Likewise, the best technology and practices to use to ensure test integrity in objective testing such as Respondus or ProctorU, but with minimal invasiveness, need additional research as the technology and its use continues to evolve (Hylton, Levy & Dringus, 2016; Butler-Henderson & Crawford, 2020).

Table 1 provides a brief overview of some of the issues to be addressed and balanced in online teaching.

SOME OPPORTUNITIES FOR SUBSTANTIAL IMPROVEMENT AT THE UNIVERSITY/SYSTEM LEVEL

Institutional Support in Technology, Reliability, Faculty Training, and Leadership

Most universities have ad hoc training and/or more substantial, but voluntary, training. However, in most universities training can be much better organized with programs that promote best-practices,

Table 1. Some of the contemporary opportunities and strengths, and concomitant challenges of teaching online in higher education

Some of the Contemporary Opportunities in Teaching Online in Higher Education	Some of the Concomitant Challenges of Teaching Online in Higher Education
<i>Online teaching tools availability:</i> the number of high-quality online teaching tools available, often embedded in LMS systems, has increased enormously.	<i>New skills to be learned:</i> online teaching requires nearly all of the skills used in F2F teaching but adds a new layer of skills to be learned and mastered, and training for faculty to take.
<i>Online test integrity tools availability:</i> there are numerous test tools now available for authentication and monitoring that can be quite effective.	<i>Online test integrity tools installation by students, student concerns, and faculty training:</i> installation of monitoring equipment may cause some students problems, students may have privacy concerns about being monitored in a home setting, and faculty need to learn how to use authentication and monitoring programs effectively.
<i>Availability of different teaching modes:</i> Being able to provide teaching in F2F, hybrid, synchronous online, and asynchronous online modes can provide enormous flexibility for students and faculty.	<i>Tough decisions and confusion about which modes to use when:</i> students, faculty, and administrators have different interests in different modes making for tough decisions about resources, scheduling, and expectations management.
<i>Equivalent achievement:</i> Quantitative achievement levels, even in courses evaluated by students as average, are generally comparable to F2F.	<i>Learning experience:</i> students tend to perceive the overall learning experience as somewhat inferior in online courses that are not exceptional (e.g., perceptions that learning will last longer in F2F classes).
<i>Student satisfaction:</i> Well-taught online courses can achieve equivalent or even better satisfaction ratings than F2F classes.	<i>Faculty workload:</i> Most faculty perceive increased workloads in online teaching in general, and often perceive the effort needed to provide what students perceive as equally satisfactory online course experiences as excessive (e.g., providing alternative lecture types for all classes)
<i>Customization of learning:</i> online courses offer the opportunity to give extensive customized instruction, especially in flipped classroom settings	<i>Faculty workload:</i> mechanized customization of rehearsal activities is time consuming to build, and weekly instructor customization of student learning activities is laborious.
<i>Optimizing student choice:</i> various modes of online learning can provide more choice in terms of preferences and scheduling.	<i>Student choice “traps”:</i> some students may use enhanced choice to take unrealistic course loads and others may overestimate the flexibility provided by online courses.
<i>Optimizing faculty choice:</i> various modes of online teaching can provide more choice in terms of preferences and scheduling.	<i>Managing faculty satisfaction:</i> individual faculty interests can run counter to departmental consistency and student demand.

systemwide improvements, cohesive curriculum models sensitive to online strengths and weaknesses, and customized university-level implementation programs (Orr, William, & Pennington, 2009; Bawa, 2016; Etzkorn, 2018). Additionally, universities can do more to encourage research and critical thinking about online learning to ensure ongoing progress (Wang & Torrisi-Steele, 2015).

There is also a widespread need and an opportunity for administrative leaders to take a far greater leadership role in what has become a major aspect of the institutional endeavor (Roby et al., 2013; Castro & Tumibay, 2021; Ulum, 2022).

Faculty Motivation

Most universities can do a much better job at providing a range of recognition initiatives, build in a targeted and accountable reassign time framework for online teaching functions, and divert resources to provide financial incentives (Van Wart et al., 2021).

Most universities can do a much better job at finding ways to incentivize faculty champions in departments and colleges and utilize faculty learning communities (Bolisani et al., 2021).

Faculty senates can be encouraged to take a positive leadership role in enhancing the amount and quality of online instruction. Faculty unions can be encouraged to take a positive leadership role in enhancing the amount and quality of online instruction (Maitland, Rhoades, & Smith, 2009).

Guidelines Directed at Online Course Quality and Administrative Support/Standards

Concerted efforts can be made by shared governance groups to provide minimum threshold standards to reduce instances of gross instructional incompetence or abuse. Efforts can also be made to recommend solid standardized practices that do not unnecessarily impinge on faculty creativity, innovation, and preferences. The provision of best practice models would also help boost online quality (Martin, Ritzhaupt, Kumar, & Budhrani, 2019).

Student Readiness

Research about and plans to curb online student enrollment excesses, that is, taking too many classes at one time, can be encouraged (Bawa, 2016).

Faculty can be strongly encouraged to ensure that explanations about software and assignments are detailed, and, at the beginning of the term, oversight of students is enhanced to forestall wasted student effort (Quality Matters, 2018).

CONCLUSION

In some ways online education in higher education has made impressive strides. Faculty capacity to teach online courses has skyrocketed with the pandemic-induced lockdowns forcing global education to go online globally (Yessenova et al., 2020; Salta et al., 2022). Likewise, student technological readiness is much more widespread (Parker, 2021), with more mature graduate students often outperforming younger students. The reliability of LMS systems is far better and the array of built-in features is a far cry from what online learning was twenty years ago (e.g., Stefanile, 2020). Finally, the increase in online learning as a percentage of all teaching has continued to increase (McKenzie, 2021; Smalley, 2021).

In other ways online education in higher education has not improved significantly (Xu & Jaggars, 2014; Alam & Asimiran, 2021). Increased demand by students seems to be more a function of improved technology and emphasis on flexibility than student satisfaction or perceptions about better learning experience outcomes (e.g., Wang et al., 2019; Stead, 2019). This may be in part because student expectations have increased over time as technological capacity has improved. It may also be because a significant number of faculty migrate to online without sufficient training, trying to make direct transfer of the face-to-face class to online, rather than reconceptualizing the teaching process to take advantage of the strengths of online learning. Or it may be that the improvements in technology have yet to reduce teaching workload which leads to underperformance (Baran Correia, & Thompson, 2011).

It is clear that the best online instructors produce results and student satisfaction equal to excellent face-to-face instructors (Cranton & Torrisi-Steele, 2021). It remains to be seen how much weaker online faculty can be aided and are motivated to meet the demand of high-quality online teaching. It is also clear that numerous faculty report that becoming a good online instructor also makes them a better instructor overall, and that products from online classes can be used in face-to-face classes (Joyes & Frize, 2005; Kearns, 2016).

A number of study limitations can be identified. Because this is a narrative review rather than systematic review, it relies more heavily on researcher integration of the literature, literature selection, and interpretation of importance. While not ignored, the literature cited and the issues relayed tended to focus on areas and regions in which technology access and online education have not been

uncommon. Due to the breadth of the review, coverage of topics is relatively brief and representative rather than detailed and comprehensive.

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All authors of this article declare there are no competing interest.

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