# Distance Learning

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Online learning has continued to increase in the last decade across higher education and K-12 education. Covid-19 forced many instructors and teachers globally to teach and learn online. Research in online learning has been conducted at micro and macro levels. This chapter explores several research trends in distance learning in order to assess the state of distance learning and provide recommendations for designers.

Online learning has continued to increase in the last decade across higher education and K-12 education (NCES, 2021). Covid-19 forced many instructors and teachers globally to teach and learn online. Research in online learning has been conducted at micro and macro levels. Micro level research has been conducted at the course or individual case study level, investigating variables such as effective instructional strategies or demographic profiles of successful learners in these environments. Macro level research has been conducted at the national or global levels, investigating access to education via free online courses such as Massively Open Online Courses—otherwise known as MOOCs—and examining global standards for online learning.

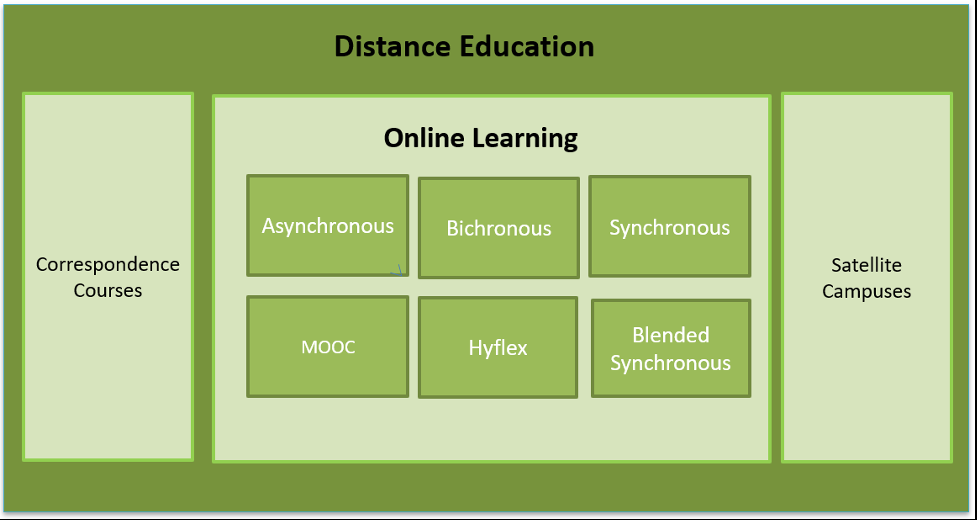
This chapter explores several research trends in order to assess the state of online learning and identify opportunities for future research. In order to better understand the research trends, definitions are presented first, followed by quality standards for online learning courses and the summary of programs developed by professional organizations. Student, faculty, and administrator perspectives of online learning research are reviewed in addition to best practices in design and facilitation in online learning. Best practices regarding faculty and learner support, as well as inclusive and equitable online learning, are also discussed. Finally, the chapter concludes with a list of academic journals dedicated to online learning research.

### Definitions of Delivery Methods

In this section, we briefly define the various terms involved with online delivery methods (Table 1).

|  |  |
| --- | --- |
| Asynchronous online learning | A course course where most of the content is delivA courseered online and students can participate in the online course from anywhere and anytime. There are no real-time online or face-to-face meetings. |
| Synchronous online learning | A course where most of the content is delivered online and students can participate in courses from anywhere. There are real-time online meetings and students login from anywhere—but at the same time—to participate in the course. |
| Bichronous online learning | A course that blends both asynchronous and synchronous online learning; students can participate in ‘anytime, anywhere’ learning during the asynchronous parts of the course but then participate in real-time activities for the synchronous sessions. |
| MOOC | These are Massive Open Online Courses where an unlimited number of students can access the open-source content free of cost. |
| Blended/Hybrid | A course with a combination of face-to-face and online delivery with a substantial portion of the course delivered online. |
| Blended Synchronous | A combination of face-to-face and synchronously online students in the course. |
| Hyflex | A flexible method providing students the option to attend class in person or online, asynchronously or synchronously. |

Distance education and online learning are terms that are often used interchangeably. However, online learning and its components is encompassed within distance education, which contains two components that are not representative of online learning: correspondence courses and satellite campuses. Figure 1 is a visual representation of the delivery methods of distance education.



### Standards and Frameworks for Online Learning

Various standards and frameworks have been established and made available for instructors and administrators to use when designing and implementing online learning. Shelton (2011) reviewed 13 paradigms for evaluating online learning and suggested a strong need for a common method for assessing the quality of online education programs. Shelton found that the institutional commitment, support, and leadership theme was frequently seen in these standards. At least 10 of the standards included institutional commitment, support, and leadership theme as a primary indicator of quality. Teaching and Learning was the second most-cited theme for indicating quality.

Daniel and Uvalic-Trumbic (2013), in their review of quality online learning standards, list institutional support (vision, planning, and infrastructure), course development, teaching and learning (instruction), course structure, student support, faculty support, technology, evaluation, student assessment and examination security as elements essential for quality online learning. They also add that to assure quality online learning in higher education, the most essential requirement is the institutional vision, commitment, leadership, and sound planning.

Martin, Polly et al. (2017) reviewed twelve different global standards for online learning found that the number of standards varied in these documents from 17 to 184 (Table 2). While instructional analysis, design, and development (N=164), student attributes, support, and satisfaction (N=115), and institutional Mission, structure, and support (N=102) were the top categories, course facilitation, implementation, and dissemination (N=40), policies and planning (N=33), and faculty support and satisfaction (N=27) were rated the lowest three.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Standard Name** | **Year** | **Sponsor** | **Number of Sections** | **Number of Standards** |
| Quality on the Line: Benchmarks for Success in Internet Based Distance Education | 2000 | Institute for Higher Ed Policy, supported by NEA and Blackboard | 7 | 24 |
| Open eQuality Learning Standards (Canada), http://www.eife-l.org/publications/quality/ oeqls/intro | 2004 | Canada | 4 | 25 |
| Online Learning Consortium (formerly Sloan-C) Quality Score Card | 2005 | OLC Consortium | 8 | 75 |
| Blackboard Exemplary Rubric | 2000 | Blackboard | 4 | 17 |
| Quality Matters | 2015, 5th edition | Quality Matters | 8 | 45 |
| CHEA Institute for Research and study of accreditation and Quality Assurance | 2002 revision 1 | Council for Higher Education Accreditation | 7 | 7 |
| NADEOSA (South Africa) | 2005 revision of 1996 document |  | 13 | 184 |
| ACODE (The Australasian Council on Open, Distance and e-learning) | 2014 | Australasian Council on Open, Distance and e-learning | 8 | 64 |
| AAOU (Asian Association of Open Universities) | no date | Asian Association of Open Universities | 10 | 54 |
| ECBCheck | 2012 |  | 13 | 46 |
| UNIQUe | 2011 |  | 10 | 71 |
| International Organization for Standardization (ISO) | 2005 |  | 7 | 38 |

These three analyses of the quality standards and frameworks over time echo similar results of study showing that institutional factors such as vision, support, and planning are important indicators of quality online learning.

### Student, Instructor and Organizational Perspectives of Online Learning Research

Several researchers have examined student, faculty, and organization or administrator-focused research on online learning. In the following section, we have categorized research studies on key online learning topics based on these perspectives.

#### Student Perspective

In Table 3, we summarize the key aspects of student-focused topics studied on online learning including benefits and challenges.

|  |  |
| --- | --- |
| Student Perspective | Example Research Studies |
| Readiness | Joosten & Cusatis (2020); Martin et al. (2020); Ranganathan et al. (2021); Wei & Chou (2020) |
| Self-Regulation and Motivation | Chiu et al. (2021); Landrum (2020); Su et al. (2018) |
| Flexibility and Convenience | Schwartzman (2007); Leasure, Davis, & Thievon (2000); Petrides (2002); Schrum (2002); Poole (2000), Karaman (2011) |
| Online discussion helps in providing thoughtful/supporting responses | Meyer (2003), Petrides (2002), Vonderwell (2003) |
| Belongingness in Online Learning Community | Lapointe & Reisette (2008); Peacock et al. (2020); Peterson et al. (2018) |
| Interaction and engagement | Martin, Parker & Deale (2012); Kaufmann et al., 2020; Martin & Bolliger, 2018 |
| Lack of immediacy | Petrides (2002); Vonderwell (2003) |
| Lack of sense of community/ feeling isolated | Lack of sense of community/ feeling isolated |
| Equity, Inclusion and Diversity | Chandler et al. (2021); Fussell et al. (2021); Sublett (2022) |

#### Faculty Perspective

In Table 4, we summarize faculty-focused research on online learning including benefits and challenges.

|  |  |
| --- | --- |
| Faculty Perspective | Example Research Studies |
| Readiness | Cuitri & Mena, 2020; Dimaculangan et al. (2021); Martin et al. (2019) |
| Flexibility and Convenience | Hiltz et al. (2010); Luongo (2018) |
| Accessibility | Dolamore (2021); Guilbaud et al. (2021); Nambiar (2020) |
| Technological difficulties | Bolliger and Wasilik (2009), Lieblein (2000), Hunt et al. (2014) |
| Workload issues | Bolliger and Wasilik (2009), Mandernach et al. (2013) |
| Institutional Support | Gaytan (2015), Martin and Parker (2014), Kumar et al. (2022) |
| Mentoring and Supervision | Byrnes et al. (2019); Kumar & Johnson (2019); Pollard & Kumar (2021) |

#### Organization Perspective

In Table 5, we summarize the key aspects of organization or administrator-focused research on online learning including benefits and challenges.

|  |  |
| --- | --- |
| **Organization Perspective** | **Example Research Studies** |
| Advocacy for online education, staying informed and learning about online education, collaborating with faculty, procedural changes, changes in schemas and roles | Garza (2009) |
| Securing the necessary resources, developing the organizational structures, influencing organizational culture | Barefield & Mayer (2013) |
| Sufficient resources for training, technology, and course design/development | Alexander (2015) |
| Local, state, federal laws, digital divide, technology diffusion, student income | Palvia et al. (2018) |
| Evaluation of Online Teaching | Lowenthal et al. (2015); Reyes-Fournier et al. (2020); Schwanenberger et al. (2021) |

### Best Practices for Online Teaching

Martin and Kumar (2021) categorized barriers into institutional, technology and technical, pedagogical, and interpersonal barriers. Research in online teaching has tried to address these issues by focusing on course design, course engagement, course facilitation, learner and instructor support, and inclusion and equity.

In this video (<https://www.youtube.com/watch?v=jobEenvgqv0>), Dr. Florence Martin discusses several best practices to teach online.

#### Course Design

Lister (2014) conducted an analysis of online learning literature to identify patterns and themes for the design of online courses. Four themes emerged: course structure, content presentation, collaboration and interaction, and timely feedback. Similarly, Mayes et al. (2011) conducted a literature review around six themes to identify specific recommendations for designing quality online courses. The themes used were learners and instructors, medium, community and discourse, pedagogy, assessment, and content. Recommendations identified included structuring courses, developing student-centered interactive learning activities, building collaboration through group projects, incorporating frequent assessments and strategies for equitable scoring such as rubrics, and providing sufficient detail and solicit student feedback.

Jaggers (2016) developed a course design rubric that assessed organization/orientation, objectives/assessments, interpersonal interaction, and the use of technology for their effects on student achievement. The results showed that well organized courses with specific objectives were more desirable but may not have an impact on student achievement. However, the quality of interpersonal interaction within the courses positively correlated with student grades. The following sections explore research in course design trends in more depth.

Instructors may have various levels of control over the design of the course structure depending on organizational philosophies. Lee et al. (2012) defined three approaches to faculty control of course structure: fully autonomous, basic guidelines, and highly specified. When faculty have less control of their course design, the courses are designed by the institution with instructors serving more as facilitators. Regardless of the amount of faculty control, there are basic elements to course structure that research has shown to be effective, such as a having a consistent course structure throughout the course (Swan, 2001).

Gamification and the use of games, virtual worlds, and simulations have also gained traction in the online learning research. Gamification is defined as the application of game design elements, such as digital badges, in non-game contexts. Hamari et al. (2014) conducted a literature review of gamification studies and found that gamification can have positive effects, but those effects depended on the context in which the strategies were implemented and the audience. For example, in the context of applying gamification in an educational setting, learners experienced increased motivation and engagement. However, some negative outcomes were also identified such as increased levels of competition. Applying the same gamification strategies in such as health and exercise increased levels of competition may not be considered a negative outcome. Similarly, the different qualities of the users may also have effects on levels if motivation and engagements. Merchant et al. (2014) conducted a meta-analysis to examine the effects of games, virtual worlds, and simulations as instructional methods. The results showed that students had higher learning gains with games over virtual worlds and simulations. Clark et al. (2016) found similar results when investigating the literature for effects of games on learning outcomes. The effectiveness of the content delivery method depends on the effectiveness of the design of the instruction and the suitability method for the context of instruction.

Assessment affects how learners approach learning and the content as well as how learners engage with one another and the instructor (Kolomitro & MacKenzie, 2017). Students access course content based upon the belief that the course will help them learn and have better outcomes (Murray et al., 2012). Therefore, the design of online assessments should promote active learning and ensure that success depends on retaining course content. Martin and Ndoye (2016) examined learner-centered assessment in online learning and how instructors can uselearning analytics to improve the design and delivery of instruction to make it more meaningful. They demonstrate several data analytic techniques that instructors can apply to provide feedback to students and to make informed data driven decisions during instruction as opposed to after the instruction. Applying such techniques can increase retention of online students.

### Course Design

Martin et al. (2021) identified the Online Course Design Elements (OCDE) based on six areas that can guide design in online courses:

* overview
* content presentation
* assessment and evaluation
* interaction and communication
* assessment and evaluation
* support

#### Course Engagement

Transactional distance theory defined the feeling of isolation or psychological distance that online learners often experience (Moore, 1989). To lesson transactional distance, Moore defined three types of interaction: (a) learner-to-learner, (b) learner-to-instructor, and (c) learner-to-content to guide faculty to create quality distance education experiences. Bernard et al. (2009) conducted a meta-analysis on 74 distance education studies on the effects of Moore’s three types of interaction and found support for their importance for achievement.

The Community of Inquiry framework built upon these types of interaction and defined a quality education experience for an online learner in terms of three overlapping presences: cognitive, social, and teaching (Garrison et al., 1999). This framework provides guidelines for faculty and designers to create meaningful interactive learning experiences that increase the level of social interaction. However, the Community of Inquiry framework’s ability to create deep and meaningful learning experiences has come into question due to much of the research using self-reporting, achievement, and perception measures (Rourke and Kanuka, 2009; Annand, 2011). Community-building in online classes has received more attention in recent years. Social presence refers to "the strength of the social relationships and emotional connection among the members of a class or learning community" (Rubin, 2013, p. 119). On an individual level, social presence refers to how involved and engaged each individual student is in the community and their motivation and drive to share, interact, and learn from others. On a community level, social presence refers to the shared sense of belonging of the students in the classroom. Teachers can influence social presence by designing group assignments, creating discussion forums, rewarding community building behaviors, and modeling openness and sharing (Rubin, 2013). Teacher presence refers to designing learning experiences, guiding and leading students' work, providing feedback and facilitating interaction and community-building (Rubin, 2013).

Another research lens used to address online learner isolation is learner engagement. Engagement in any learning is important. However, in online learning, engagement is essential because online learners have fewer chances to interact with each other, the instructor, and the institution. Redmond et al. (2018) used a constant comparative method to establish a conceptual framework of online engagement. The framework identifies five key elements for online engagement to guide research in this area: social engagement, cognitive engagement, behavioral engagement, collaborative engagement, and emotional engagement.

Dixon (2010) created and validated a scale to measure online learner engagement. The instrument was used to survey 186 online learners from six different campuses. Results showed that multiple communication channels or meaningful and multiple ways of interaction may result in higher learner engagement. However, more research should be conducted to validate these results.

Research on all of these frameworks echo the importance of collaborative or cooperative learning to increase interaction. Borokhovski et al. (2012) conducted a follow-up study to the Bernard (2009) meta-analysis investigating the effects of online collaborative learning on achievement. The results indicated that collaborative learning activities had higher effects on student achievement. Conversely, Oyarzun and Morrison (2013) conducted a quasi-experimental study investigating the effects of cooperative online learning on achievement and found no significant difference in achievement between students who completed the assignment individually or cooperatively.  However, more experimental research is needed to validate the effects of collaborative learning and to identify effective methods of online collaborative learning.

### Course Engagement

Bolliger and Martin (2021) designed Online Engagement Strategies Questionnaire (OESQ) and validated it with students and instructors. Based on the exploratory factor analysis, four engagement constructs emerged which are critical in online courses. These include:

* peer engagement
* multimodal engagement
* instructor engagement
* self-directed engagement

#### Course Facilitation

Muilenburg and Berge (2007) identified several issues related to online learning implementation from the student perspective, including course materials that are not always delivered on time, instructors not knowing how to teach online, lack of timely feedback, and lack of access to the instructor. Three of these issues deal specifically with instructor immediacy or responsiveness. Bodie and Michel (2014) conducted an experimental study manipulating immediacy strategies for 576 participants in an introductory psychology course. Results revealed that learners in the high immediacy group showed greater learning gains and retention. Martin, Wang et al. (2017) investigated the effects of 12 different facilitation strategies on instructor presence, connection, learning, and engagement. They found that students perceived timely responses to questions and feedback on assignments from instructors helpful. It was also noted that instructors’ use of video aided in building a connection with the instructor. Timeliness and immediacy are common themes in the research. Again, more experimental research should be conducted to identify specific strategies for faculty.

            In addition, Oncu and Cankir (2011) identified four main research goals for course design and implementation to address achievement, engagement, and retention issues in online learning. The four goals are: (a) learner engagement & collaboration; (b) effective facilitation; (c) assessment techniques; and (d) designing faculty development. They further recommended experimental research be conducted to identify effective practices in these areas. Thus, there are many frameworks and principles for effective design and implementation of online learning but still a lack of research validating many of these ideas or providing effective cases.

### Course Facilitation

Martin et al. (2018) identified facilitation strategies for online course categorized as Pedagogical, Social, Managerial, Technical. Based on this study, online students perceived the following:

* Instructors’ timely response to questions/feedback on assignments were helpful.
* Video-based introduction was helpful in building instructor connection.
* Instructors’ response to reflections helped establish connection with instructor.

### Faculty and Learner Support

#### Faculty Support

Several universities that offer online courses are providing online course planning and development support and technology support to their faculty along with institutional support.

Online teaching can be very demanding on faculty. One study found that online teaching demanded 14% more time than traditional teaching and fluctuated considerably during times of advising and assessment (Tomei, 2006). With the spread on online teaching practices in higher education, many academic staff are faced with technological and pedagogical demands that require skills they don't necessarily possess (Weaver et al., 2008). The quality of online programs depends upon the pedagogical practices of online teachers; therefore, faculty support in online programs is very important (Baran & Correia, 2014).

Some believe that the success of online teaching depends upon the support of faculty on three main levels: teaching, community, and organization (Baran & Correia, 2014). The teaching level includes assistance with technology, pedagogy and content through workshops, training programs, and one-on-one assistance. The challenge here is often the fact that academic staff find it hard to adapt to changes in their teaching or allow someone else to tell them how to teach, therefore individuals who design online programs need to first establish themselves as experts and be viewed as such by faculty (Weaver et al., 2008).

The community level includes collegial learning groups, peer support programs, peer observation, peer evaluation and mentoring programs. Some have highlighted the importance of creating a supportive community for online instructors who often feel isolated (Eib & Miller, 2006). Building learning communities and communities of practice for online teachers as well as providing opportunities for students and online faculty helps combat feelings of isolation (Eib & Miller, 2006; Top, 2012).

The institutional level of support consists of rewards and recognition and the promotion of a positive organizational culture towards online education (Baran & Correia, 2014). Institutional support is seen as supremely important (Baran & Correia, 2014; Weaver et al., 2008). On one hand, if the Deans and Department Heads do not support online teaching, the faculty who do may feel marginalized, unsupported within their discipline, and isolated. On the other hand, if upper management adopts online teaching and pushes for too many changes too quickly, planned implementation and adequate training can be grossly neglected, resulting in dissatisfaction among academic staff (Weaver et al., 2008).

#### Learner Support

Online education is supported by technology-assisted methods of communication, instruction, and assessment. The methods of communication in online learning are very important since feedback given to students depends on them. For some students, synchronous communication helps with receiving direct feedback, whereas for others, asynchronous communication methods allow for more control on the part of the students to process feedback and respond at their own pace (Gold, 2004). Some have stressed the importance of not simply creating online interaction but rather developing high-quality, technology-assisted communication to promote student outcomes (Gold, 2004). Students report that the most common negative aspects of online classes are technology problems and feeling lost in cyberspace. On the other hand, they appreciate the flexibility of online classes and find instructor availability and a sense of community to be positive aspects of online learning (El Mansour & Mupinga, 2007).

Technology characteristics in online learning are important considerations. Some have suggested that interface design, function, and medium richness play a key role in student satisfaction. The medium should accommodate both synchronous and asynchronous communication and the interface should be appealing, well structured, easy to use, allow for different mediums such as text, graphics, audio and video messages, and have the capability of providing prompt feedback to students (Volery & Lord, 2000). Ice et al. (2010), Merry and Orsmond (2007) and Philips and Wells (2007) found that students responded positively to audio feedback.

Within the context of learner support, providing accommodations and support for students with disabilities is also an important consideration in online education. In particular, for students with cognitive impairments, navigating an online course can be particularly challenging, as existing platforms typically do not support such learners (Grabinger et al., 2008).

### Instructor Support

Kumar et al. (2022) developed the Online Instructor Support Survey (OISS) consisting of five sections that are various supports that online instructors need for effective online teaching:

* Technology and technical support
* Pedagogical (Course Development and Teaching) support
* Online Education Academic Support Services
* Institutional Policies for Online Education
* Online Instructor Recognition, Rewards, and Incentives

### Inclusive and Equitable Online Learning

When creating online courses, it is essential to create inclusive and equitable online content to meet the needs of diverse learners. The online course can be made more inclusive and equitable through various aspects of online teaching and learning, such as (a) online instructor self-awareness and commitment to inclusive and equitable online teaching, (b) getting to know the online learners, (c) designing the course, and (d) during course facilitation and evaluation.

Instructor self-awareness. Some of the strategies that the instructor can use includes reflecting on the students and their needs; examining your own assumptions about student behavior; including a Diversity, Equity, and Inclusion statement in the syllabus; and reviewing the syllabus to identify changes, such as course policies that need to be updated, to make it equitable.

Getting to know the online learners. Some of the strategies the instructors can use include surveying the students at the beginning of the semester to understand student needs and their readiness, ensuring all students have access to the devices they need as well as reliable internet for online learning, advocating for students who have greater needs and fewer resources, and supporting students who need specialized instruction and services (e.g., students with disabilities and English language learners).

Course Design. During course design, some of the strategies instructors can use to make the course inclusive and equitable include creating a welcoming online environment, including materials that are accessible to all learners, ensuring that instructional materials include a diverse representation of individuals, including multiple low and high stakes assessments throughout the course, and including resources necessary to support their learning.

**Course Facilitation and Evaluation.** During course facilitation and evaluation, some of the strategies instructors can use to make the course inclusive and equitable include ensuring equitable participation in asynchronous and synchronous discussions, recording lectures and virtual meetings so that students who are unable to attend can view it later, being available to support students through virtual office hours and providing timely response to questions, providing opportunities for students to engage in smaller group settings, grading anonymously to reduce bias, and collecting feedback anonymously from students for course improvement.

### Additional Resources

Table 7 includes a list of journals that publishes research focusing on online learning and distance education.

|  |  |
| --- | --- |
| American Journal of Distance Education | <https://www.tandfonline.com/journals/hajd20> |
| Distance Education | <https://www.tandfonline.com/journals/cdie20> |
| Distance Education: An International Journal | <https://teachonline.ca/tools-trends/journals/distance-education-international-journal> |
| Distance Learning | <https://www.infoagepub.com/distance-learning.html> |
| European Journal of Open and Distance Learning (EURDL) | <http://www.eurodl.org/> |
| International Journal of Instructional Technology & Distance Learning | <http://www.itdl.org/index.htm> |
| International Journal on E-Learning | <http://www.aace.org/pubs/ijel/default.htm> |
| International Journal of E-Learning and Distance Education | <http://www.ijede.ca/index.php/jde/index> |
| International Journal of Online Pedagogy and Course Design | <http://www.igi-global.com/journal/international-journal-online-pedagogy-course/1183> |
| International Review of Research in Open and Distance Learning (IRRODL) | <http://www.irrodl.org/> |
| Journal of Interactive Online Learning | <http://www.ncolr.org/jiol/> |
| Journal of Online Learning Research | <https://www.learntechlib.org/j/JOLR/> |
| Online Journal of Distance Learning Administration | <http://www.westga.edu/~distance/ojdla/browsearticles.php> |
| Online Learning Journal | <https://onlinelearningconsortium.org/read/online-learning-journal/> |
| Open Learning: The Journal of Open and Distance Learning | <https://www.tandfonline.com/journals/copl20> |
| Quarterly Review of Distance Education | <https://www.infoagepub.com/Quarterly-Review-of-Distance-Education.html> |
| The Journal of Distance Education (Formerly the Journal of Distance Education) | <https://www.learntechlib.org/j/JDE/> |
| Turkish Online Journal of Distance Education | <http://tojde.anadolu.edu.tr/index.htm> |

### Learning Check

A course that blends both asynchronous and synchronous online learning, and where students can participate in anytime, anywhere learning is called: (Select one answer)

1. Hyflex
2. Blended
3. Bichronous
4. MOOC

Which of the following are important aspects of online teaching? (Check all that apply)

1. Course design
2. Course facilitation
3. Course engagement
4. Inclusion and Equity

### Editor's Note

To read more on this topic, see the chapter titled "[Distance Learning](https://edtechbooks.org/lidtfoundations/distance_learning)" published in the first edition of this textbook.

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