

REVIEW OF DISTANCE EDUCATION RESEARCH: AN UPDATE

Michael Simonson

Nova Southeastern University

SETTING A FOUNDATION

Three quotes are central to the development and growth of the field of distance education. These statements represented the themes of classic articles written by leaders in education and remain today as guides for the field (Simonson, 2009).

The first was by James Finn, one of the founders of the modern educational technology field. In 1953, in the introductory issue of *Audio-Visual Communication Review*, he wrote:

Finally, the most fundamental and most important characteristic of a profession is that the skills involved are founded upon a body of intellectual theory and research. Furthermore, this systematic theory is constantly being expanded by research and thinking within the profession. As Whitehead says, “the practice of a profession cannot be disjoined from its theoretical understanding and *vice versa*. ... The antithesis to a profession is an avocation based upon customary activities

and modified by the trial and error of individual practice. Such an avocation is a Craft ...” (Smith et al., 1951, p. 557). The difference between the bricklayer and the architect lies right here. (p. 8)

The second quote is by Campbell and Stanley, who, in their classic 1963 monograph, described the experiment:

as the only means for settling disputes regarding educational practice, as the only way of verifying educational improvements, and as the only way of establishing a cumulative tradition in which improvements can be introduced without the danger of a faddish discard of old wisdom in favor of inferior novelties. (p. 2)

The final quote is the controversial and critically important statement from the *Review of Educational Research* made by Richard Clark in 1983 and 2012 and quoted often in this book:

The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more

• Correspondence concerning this article should be addressed to: Michael Simonson, simsmich@nova.edu

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than the truck that delivers our groceries causes changes in nutrition ... only the content of the vehicle can influence achievement. (p. 445)

Finn attempted to encourage those in the audio-visual field to take a more professional view of themselves and their discipline by basing decisions on theory supported by research. Campbell and Stanley formalized what previously had been unclear to many—the need for the rigorous application of the scientific method to the study of education. Twenty years later in 1983, Richard Clark identified why Campbell and Stanley's admonition was so important. His article, centering around his famous "mere vehicles" statement, documented the failure of many educational researchers to "verify educational improvements, as demanded by Campbell and Stanley" (p. 2). Clark's article was not popular. However, it clearly and precisely showed how researchers had violated basic guidelines for rigorous research, which had led many educators to adopt "inferior novelties" at the expense of scientifically validated "wisdom."

Each of these scholars had a message of critical importance to distance education—scientific inquiry, conducted with rigorous attention to correct procedures, is the key to success of our field. Research and theory are at the foundation of credibility and quality.

THE FOCUS OF DISTANCE EDUCATION RESEARCH

Emerging technologies have forced a redefinition of distance education. At the same time, the distance education research agenda has also evolved (Bozkurt & Zawacki-Richter, 2021). The focus has shifted to a more learner-centered approach. Researchers are not merely looking at achievement but are examining learner attributes and perceptions as well as interaction patterns and how these contribute to the overall learning environment. Although there is continued interest in the tech-

nology, the focus is not on which medium is best, but on what attributes of the medium can contribute to a positive, equivalent learning experience. This chapter will provide a review of distance education research literature. In his 1987 landmark article "The Development of Distance Education Research," Börje Holmberg, a leading distance education theorist and researcher, suggested that the structure of distance education research should include:

- Philosophy and theory of distance education
- Distance students and their milieu, conditions, and study motivations
- Subject-matter presentation
- Communication and interaction between students and their supporting organization (tutors, counselors, administrators, other students)
- Administration and organization
- Economics
- Systems (comparative distance education, typologies, evaluation, etc.)
- History of distance education

For several decades, a number of researchers have reviewed the literature on distance education and provided support for the effectiveness of instruction delivered to distant learners and guidelines for teaching and learning at a distance (Howell & Baker, 2006; Martin et al., 2020; Orellana et al., 2009; Simonson et al., 2011; Sorensen & Baylen, 2004; Tallent-Runnels et al., 2005). Research dealing with various aspects of distance education, once characterized as anecdotal, is now more likely to be theory based and methodologically sound. Thus, research results are beginning to have a positive impact on the practice of distance education (Simonson, 2008).

Also of importance is a publication by Lou et al. (2006). They reported that "218 independent findings from 103 studies representing 25,320 students were analyzed in the undergraduate dataset in this meta-analysis. On average, undergraduate students achieved similarly, whether they learned in [distance education] courses or in the traditional classrooms"

(p. 161). Lou et al. went on to say “there is consistent and reliable evidence that undergraduate students achieved equally, whether they learned at the remote site or the host site,” and “In synchronous instructor-directed undergraduate DE, when media are used to deliver the same instruction simultaneously by the same instructor and with the same course activities and materials, there is little reason to expect undergraduate students to learn differently in the remote sites than at the host site” (p. 162).

Trends in Distance Education Research

Zawacki-Richter and Naidu (2016; Bozkurt & Zawacki-Richter, 2021) identified trends in distance education research over the last 35 years. The first theme of research dealt with the consolidation of distance education institutions. Next there was research focusing on quality assurance and student support, and finally the research emphasized the virtual university and online learning. These phases of research show a maturation of distance education. They ended their review by emphasizing that online technologies will play an important role in education and training.

Bozhurt, et al. (2015) reported that the most studied variables studied in distance education research were perception, satisfaction, gender interaction and motivation. Academic performance was a key variable in fewer studies, possibly because achievement is difficult to isolate as an independent variable, but more likely because previous literature has made it clear that there is no significant differences found when comparing distance to traditional education. Health science researchers, more recent entrants to the study of distance education, find a no significant difference also (He et al., 2020).

Mishra et al. (2021) reported that technologies, psychological issues, satisfaction and social distancing were themes studied during the recent pandemic. It was also apparent that an

expanded collection of researchers were studying some aspect of distance education.

In 2021 Castro et al. reported that convenience was particularly important to adult learners. Workforce development was considered a reason why online learning was expanding. Martin et al. (2020) reported that engagement was the important research theme as reported by students. Quality assurance was an important instructor variable, and the support of the institution was most studied about organizations and distance education.

Distance education research studies almost universally identified design, quality assurance and use of instructional technology as critical themes in the literature of the field (Bozkurt & Zawacki-Richter, 2021). It is safe to summarize that for the previous several decades these variables have been critically important research themes (Anderson & Rivera-Vargas, 2020). One student scholar made an interesting summary when it was concluded that “gone are the days of combining all online learners into one category” (Agostineli, 2019).

LEARNING OUTCOMES

It is likely that when different media treatments of the same informational content to the same students yield similar learning results, the cause of the results can be found in a method which the two treatments share in common ‘*give up your enthusiasm*’ for the belief that media attributes cause learning (Clark, 1994, 2012, p. 28).

Hundreds of media comparison studies indicate, unequivocally, that no inherent significant difference exists in the achievement effectiveness of media (Clark, 1983, 2012). These results support Clark’s position summarized in the previous quote: The specific medium does not matter. That being the case, the focus of future research should be on instruction itself since it is the truly critical factor in determining student achievement (Whittington, 1987).

Unfortunately, much of the research in distance education is still of the media compari-

son type. This is to be expected given the rapid development of distance education technology, especially in the area of two-way interactive video systems. With each technological advance, the temptation is to conduct media comparison research on the off chance that the new technology might truly bring about higher student achievement.

Summary of the Research—A Starting Point

Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies (U.S. Department of Education, 2009) is must reading for anyone involved in education generally, and distance education specifically. This report is a comprehensive review of 51 studies that:

- contrasted an online to a face-to-face condition,
- measured student learning outcomes,
- used a rigorous research design, and
- provided adequate information to calculate an effect size (p. ix).

The report's most quoted conclusion is printed in italics in its abstract and states,

The meta-analysis found that, on average, students in online learning conditions performed better than those receiving face-to-face instruction. (p. ix)

The 70-page report is well-written, informative, and scholarly. It is an important document that attempts to provide a state-of-the-research report on the effectiveness of online/distance education. Unfortunately, unless carefully read, the report can be misleading.

On page 51, the report's authors, staffers from SRI International's Center for Technology in Learning under contract to the U.S. Department of Education (USDE), clearly state what *should be* the most quoted outcome of this meta-analysis where they write:

Clark (1983) has cautioned against interpreting studies of instruction in different media

as demonstrating an effect for a given medium inasmuch as conditions may vary with respect to a whole set of instructor and content variables. That caution applies well to the findings of this meta-analysis, which should not be construed as demonstrating that online learning is superior as a medium. Rather, it is the combination of elements in the treatment conditions, which are likely to include additional learning time and materials as well as additional opportunities for collaboration that has proven effective. (p. 51)

Learning Time, Materials, and Collaboration—The Big 3. Apparently online students spent more time, had access to more materials, and collaborated differently than did the traditionally taught comparison students—no wonder online students tended to achieve better. The “time studying” phenomenon is apparently pervasive. The *Chronicle of Higher Education* recently summarized the results of the 2012 National Survey of Student Engagement (NSSE) and reported that students taking online courses spent slightly more time on their course work than did students with no online courses (Berrett & Sander, 2013).

What we do not know from either the USDE or NSSE reports is *why* some students spent more time, accessed different materials, and had more collaboration opportunities. It is somewhat unfortunate that these important outcomes were not stressed instead of the misleading conclusion that “*students in online learning conditions performed better*” (U.S. Department of Education, 2009, p. ix). Certainly, research on student engagement in distance education is needed.

Certainly, the USDE Report is important. It represents a review of the best studies available. The Study's authors made every attempt to be methodologically and conceptually rigorous—perhaps the author of the abstract was a marketing adviser rather than a researcher. At any rate, this report should be read and analyzed by all distance educators.

And finally, as George Washington said over 230 years ago, “facts are stubborn things: and whatever may be our wishes, our inclina-

tions, or the dictates of our passions, they cannot alter the state of facts and evidence.”

Research Reported

Mary K. Tallent-Runnels and a team of other scholars published an interesting review that summarized the research on online teaching and learning (Tallent-Runnels et al., 2006). This publication has become another benchmark summary of research on distance education. More recent summaries usually start this publication. More recently, Martin et al. (2020) updated the Tallent-Runnels report.

These reviews were organized into categories, most often:

- Course environment
- Learner outcomes
- Learner characteristics
- Institutional and administrative characteristics
- Engagement

Tallent-Runnels examined 68 published papers and drew a number of interesting conclusions. First, they identified the failure of authors to use standardized terms and to clarify the definitions of key ideas, in this case the types of courses taught—traditional, blended, and online. Tallent-Runnels and her coauthors suggest that these three terms be used when research is conducted and reported.

The review also found that there did not seem to be a comprehensive theory guiding the design of courses taught online and used when research is conducted. This is a critical weakness of the field.

The article goes on to identify conceptual and methodological problems with the research dealing with online teaching and learning. Apparently, the problems of early research on distance education have not yet been corrected—problems related to lack of a theory base, the ad hoc nature of studies, and the difficulty of generalizing results from one study to other similar situations.

One important conclusion reported in this review is the research finding that students have positive attitudes about online learning, and that computer anxiety is not a problem for most students. Well-designed online courses were reported to produce more positive learning outcomes and to be related to overall student satisfaction. Design and quality are important.

Ronsisvalle and Watkins (2005) reviewed the literature dealing with K–12 student success in online learning. They reported that online K–12 learning is growing and “here to stay.” They reported that completion rates of online students in virtual K–12 schools were increasing; most online students received grades of B or better; and that student, teacher, parent, and administrator levels of satisfaction with online instruction was high (Ronsisvalle & Watkins, 2005).

In 2004, Allen et al. conducted a meta-analysis of the effectiveness of distance learning and reported that students in distance education classes performed slightly better than did traditionally taught students. They concluded that “the current findings suggest that distance education technologies do not necessarily create a less effective learning environment and, in some instances, may enhance effectiveness” (p. 415).

It seems quite apparent, that well designed, competently taught distance education classes are as effective as more traditionally taught and designed classes. Distance education works well if designed well, and taught well.

LEARNER PERCEPTIONS

Perception, the way in which something is regarded or understood, has long been a concern of distance educators. It was a general thought that distance education was somehow less effective, less credible, and less important than traditional education (Tallent-Runnels et al., 2006). Thus, studies of student satisfaction in online courses were numerous in early distance education research; more recently, satisfaction

research has evolved from general perceptions of distance education to more targeted research about specific courses and approaches.

Sun et al. (2008) attempted to determine the critical factors influencing student perceptions and satisfaction. Results revealed that the instructor's attitudes toward distance education, course quality, perceptions of content usefulness, course flexibility, and student computer anxiety were the most important factors affecting perceptions and satisfaction. Two hundred and ninety-five surveys were returned. A relatively low return rate of 46% was a concern identified by the research team who conducted post hoc analyses of nonrespondents to give greater confidence in the generalizability of results. The finding that "course quality" was one of the most important factors influencing satisfaction is important.

The results of a similar study conducted by Ozkan and Koseler (2009) supported the Sun et al. (2008) findings. The quality of the instructor, system quality, and content quality were found to be related to student satisfaction.

Selim (2007) reported that instructor attitudes toward the technology, instructor teaching style, student computer competency, use of interactive collaboration, course content, and effectiveness of the technology system were critical success factors for distance education courses. These results were obtained from surveys completed by over 500 college-age students.

LEARNER ATTRIBUTES

Sense of community has become an important research area in distance education (Carabajal et al., 2007; Ouzts, 2006). Ouzts (2006) found that student perceptions of community related to increased satisfaction toward online learning.

Wang et al. (2003) found that the dropout rate for distance education courses they studied was about 26%. Laube (1992) examined the relationship between academic and social integration variables and the persistence of stu-

dents in a secondary distance education program. Students were divided into two groups based on persistence. Completers/persisters were those who completed or still persisted in coursework 1 year after enrollment, whereas dropouts/nonstarters had dropped out during the same time.

Out of 351 surveys mailed, 181 surveys were returned, 124 in the completer/persister group and 57 in the dropout/nonstarter group. The nonreturned surveys were comprised of 44 completer/persisters and 126 dropout/nonstarters. Two variables showed important differences between the groups. Completers/persisters were more likely than dropouts/nonstarters (1) to have higher educational goals and (2) to study more than 10 hours a week.

Three variables related to social integration were studied: self-initiated contact with the school, student attitudes toward their tutors, and student attitudes toward missing peer socialization. The two groups differed significantly only in their attitudes toward their tutors, with completers/persisters indicating a more positive attitude. Both groups indicated a positive attitude toward their tutors, but a large percentage of dropouts/nonstarters selected "undecided" as a response, which contributed to the significant results obtained.

Sun et al. (2008) reported that learner computer anxiety, perceptions of course quality, flexibility, ease of use, and usefulness of content were characteristics of students that were related to satisfaction. Whether satisfaction was related to learning was not investigated in this study (Sun et al., 2008) but measuring satisfaction has long been a research outcome, and is related to retention (Levy, 2007).

Tallent-Runnels et al. (2006) reported in a review of the research that:

- Web-based learning environments take into account the cognitive style of learners.
- Learners favor their ability to control their learning environment, and think this control is more than a convenience but influences satisfaction and engagement.

- Learning style relates to the use of on-line teaching and learning tools.
- And, ultimately, Tallent-Runnels et al. (2006) reported that one approach is not best for everyone so a variety of approaches should be considered by instructional designers.

Selim (2007) reported that the learner characteristics of computer competence, degree of collaboration in the class, and opinions about course content and design are critical learning factors. Selim's (2007) results support those of Sun et al. (2008).

INTERACTION

Interaction is one of the most discussed topics in distance education (Anderson & Kuski, 2007; Berge, 2013; Moore, 2007; Sammons, 2007). Mahle (2007) reviewed literature on interaction in distance education and concluded that interaction is a primary component of any effective distance education program. Wanstreet (2006) reviewed the literature dealing with interaction in online learning and reported on the various definitions of interaction, including an instructional exchange, computer-mediated communication, and social/psychological connections.

Researchers have attempted to determine what types and amounts of interaction in online classes are most effective (May, 1993). Bernard et al. (2009) has provided important information about interaction. In the meta-analysis of 74 studies dealing with interaction it was reported that overall, the strength of interactive treatments was associated with increased achievement outcomes. More specifically, it was reported that student-to-student, and student-to-content interactions had greater impact than student to teacher interaction.

Orellana (2006) reported on an interesting study that related class size to interaction. This study reported that the optimal class size for an online college course taught by a single instructor was approximately 20. However, it

was reported that for optimal levels of interaction, as defined by Orellana, a class size of about 16 was best. Online instructors indicated that smaller class sizes (15 students) would produce more and higher-level interaction (Orellana, 2006). It was also found that classes can be too small and too large for optimum levels of interaction.

Research regarding interaction and distance education technologies indicates that different technologies allow differing degrees of interaction. However, similar to comparison studies examining achievement, research comparing differing amounts of interaction showed that interaction had little effect on achievement (Anderson & Kuski, 2007; Beare, 1989; Souder, 1993).

Berge (2013) reported that more interaction, more thoughtful interaction, inclusion, and sense of community were important when students were asked about interaction.

One recurring, and difficult to answer, question about distance education is the time commitment expected of the student in an online course. Traditionally, student time in a class has been measured by face-to-face class sessions. For example, a three-semester credit, college course, meets three times a week for the 15 weeks of the semester. Class sessions are normally 50 minutes long. Thus, a traditional course syllabus would list the topics covered in each of the 45, or so, class sessions in the semester. It is also typical for students to be expected to allocate a couple of hours outside of class studying and completing assignments for every face-to-face session. Thus, for typical three semester credit college-level classes a student would be expected to go to class 45 hours and study 2 hours for each class session: 90 hours.

Some call this the Carnegie Unit, or more appropriately at the college level, the course unit (Berrett, 2012). One Carnegie/Course unit (one semester credit) requires the typical student to attend class, study, read, view, write, produce, and discuss for approximately 45 hours for one semester credit. (These are usually 50-minute hours, so for one credit the

expectation is for a student to allocate about 2,250 minutes).

Distance educators have adopted the same formula. When distance education courses are planned, the designer attempts to produce teaching and learning experiences that in general requires the student to devote 2,250 minutes of study for each semester credit (Lipka, 2010; Orellana et al., 2009; Simonson, 2008). Certainly, a little math is required, but this formula will work, especially when courses are designed by experienced distance educators.

BARRIERS TO DISTANCE EDUCATION

Berge (2013) and Berge and Muilenburg (2000) reviewed the literature and identified potential barriers to the implementation of distance education. They surveyed several thousand people involved in distance education, instructional technology, and training. Of those responding, 1,150 were teachers or trainers, 648 were managers, 167 were administrators in higher education, and the remaining responders were researchers and students.

When the data were analyzed, the strongest barriers to distance education were identified. Their rank order is:

1. Increased time commitment
2. Lack of money to implement distance education programs.
3. Organizational resistance to change.
4. Lack of shared vision for distance education in the organization
5. Lack of support staff to help course development.
6. Lack of strategic planning for distance education
7. Slow pace of implementation
8. Faculty compensation/incentives
9. Difficulty keeping up with technological changes.
10. Lack of technology-enhanced classrooms, labs, or infrastructure

Additionally, Berge and Muilenburg identified the least important barriers to implementation. They were (in rank order):

54. Competition with on-campus courses
55. Lack of personal technological expertise
56. Lack of acceptable use policy
57. Lack of transferability of credits
58. Problems with vast distances and time zones
59. Technology fee
60. Tuition rate
61. Local, state, or federal regulations
62. Ethical issues
63. Existing union contracts
64. Lack of parental involvement

In 2009, Chen reported that the three primary barriers that prevent institutions from offering distance education are program development costs, faculty workload concerns, and the need for faculty rewards for offering courses at a distance. Effective incorporation of new technologies was considered to be one way to reduce barriers.

MYTHS REGARDING DISTANCE EDUCATION RESEARCH

A myth is an invented story, and it does not always begin with "Once upon a time." In any field, including distance education, ideas and approaches quickly emerge that seem to gain a life of their own, even though there is little, if any, factual support for them. The myth of the media effect has been discussed for decades, making the rounds every time a new instructional technology is introduced. It implies that merely using media for instruction somehow has an impact on learning. This myth has been widely discussed and soundly rebuked (Clark, 1983). Three more myths about distance education deserve the same fate.

Myth 1: The more interaction there is in a distance education class, the better.

This myth is also easy to trace to its roots. Early research on distance education demonstrated clearly that the *provision* for interaction was critical. In other words, some early forms of distance education were one way, or had interaction that was so delayed that students had little if any feeling of involvement with their instructors. Students need to be able to interact with their teacher, at least to ask questions.

Interaction is *needed and should be available and should be regular and substantive*. This is a rule adopted by the U.S. Department of Education (2020: <https://nc-sara.org/news-events/us-department-education-issues-final-rules-distance-education-and-innovation>)

However, interaction is not the “end all and be all” of learning. It is only necessary to look at a few research studies, such as Bernard et al. (2009) to discover that interaction is not a magic potion that miraculously improves distance learning. Interaction is important, and the potential for all involved in teaching and training to be able to confer is essential.

However, forced interaction can be as strong a detriment to effective learning as its absence. Student to student, student to content have been reported to be the most important categories of interaction with student to instructor interaction of less impact, but still important.

Myth 2: Instructor training is required for anyone planning to teach at a distance.

Naturally, the more training a person has, the more likely it is that he or she will learn, assuming education works. Instructor and student training to be effective in online environments has been reported to be important (Paechter et al., 2010; Sun et al., 2008). However, training in how to teach distant learners is only one of a collection of interrelated competencies needed by an effective teacher.

By far the most important competency of any teacher is content knowledge. Understanding a subject and the ability to break down the topic into meaningful and manageable concepts is fundamental for any effective teacher. In some distance education systems, the course delivery specialist may not need to know much about content, notably the industrialized systems of Europe where an assembly-line approach and division of labor are typical, and where different people prepare courses and course content. If there is only one person, the teacher, who is responsible for the entire process—from course design and course delivery to course evaluation—then knowledge of content is essential.

Myth 3: Using instructional technology in teaching is e-learning, and this is the same as distance education.

A report by Zemsky and Massy (2004) titled *Thwarted Innovation: What Happened to e-Learning and Why* presents this myth. *Thwarted Innovation* presents research that exposes the failures of e-learning. A careful reading of this monograph shows that the idea of e-learning discussed is really a review of the use of technology in education. Distance education should not be confused with e-learning, and *e-learning* is considered an outdated term by some (Cole, 2004).

Myth 4: Instructional Design is easy.

A careful review of Chapter 8 clearly demonstrates that instructional design is much more complex than many think. Instructional design is based on instructional systems theory, and even general systems theory. In other words, the correct practice of instructional design mandates that the designer be properly educated in the theories and research that support this practical profession. Instructional design is the intellectual technique of the field of instructional/educational technology (Finn, 1953).

The definition of distance education presented in Chapters 1 and 2 clarifies what is meant by distance education. When research on the field is conducted, a clearness of definitions of terms is critical.

SUMMARY

Although it is always perilous to summarize research in a few sentences, it is also the obligation of those who have studied the literature extensively to provide others with their best estimates of what has been reported. It is probably more perilous to provide a top 22 list of research findings, but that is what follows. This list of what some might call best practices is supported by the research literature. However, each should continue to be investigated.

Best Practices in Distance Education: A Summary of Findings Reported in This Chapter

A careful and comprehensive review of the research on the theory and practice of distance education reveals 22 practices and approaches that seem clearly supported by the literature. We will call these Top Twenty Best Practices.

1. Distance education works: the literature clearly indicates that students learning in some type of distance learning environment will learn as much and as effectively as students learning in traditional, face-to-face environments. Advocates who say distance education students learning more are as suspect as those who assert that distance education students learning less.
2. Instructional design, the formal process of applying systems theory to course planning is the critical element in course effectiveness.
3. Student retention in distance education courses and programs is often lower than in traditional environments.
4. An instructor's attitude toward teaching and learning at a distance is an important component of effectiveness.
5. Course quality is strongly related to student satisfaction and to effectiveness.
6. A student's computer anxiety must be low, or effectiveness suffers.
7. Course flexibility is an important characteristic of an effective distance delivered course.
8. Learning communities are important in distance education—instructors should encourage, even facilitate the development of learning communities.
9. Interaction in distance education is important—student to student and student to content interaction are most important, followed by student to instructor and instructor to student interaction.
10. Learner control and involvement in distance delivered instruction is important.
11. Training of students and instructors learning and teaching at a distance is related to effectiveness and satisfaction.
12. Technical support for students and instructors is critical.
13. Distance education is important because of the convenience afforded and the autonomy provided to learners.
14. Instructor expertise in distance education and instructor support are strong predictors of student learning and satisfaction.
15. Quality instruction delivered at a distance should be equivalent but not identical to instruction delivered traditionally in a classroom when learning and satisfaction are measured.
16. Computer competency is related to student success in distance education.
17. Retention is related to student satisfaction in distance education courses and programs.

18. Frequency and quality of interaction is a key to effectiveness in distance education.
19. What works effectively in traditional education is a starting point for what works in distance education; equivalency should be the goal.
20. Content is king, but context is queen (Minnium, 2019)
21. Class size for one instructor in a distance education class should be about 20 students, plus or minus five, if effectiveness and satisfaction are desired outcome measures (Orellana, 2006).
22. A one semester credit, college-level course delivered at a distance should require approximately 2,250 minutes of time for the typical student— This time would be allocated to studying, reading, viewing, listening, writing, interacting, and producing.
23. Online students report they spend more time on their coursework than traditionally taught students.

The research clearly shows that distance education is an effective method for teaching and learning. Future research needs to focus on different populations, particularly K–12 students; psychological and social attributes of the learner; the impact of distance education on the organization; and the contributions of different media attributes to learning outcomes.

One striking summary of distance education research is summarized by the statement that “it is not different education, it is distance education,” which implies that what we know about best practices in education is directly applicable to distance education.

NOTE

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