

Online Education in Secondary Schools: An Unmined Field

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“All of the books in the world contain no more information than is broadcast as video in a single large America city in a single year. [However]...not all bits have equal value.” Carl Sagan

Although hailed as education’s newest fad and a new approach to learning (Hannafin & Land, 1997; Schlosser & Anderson, 1993), distance education has actually been around in many forms for quite some time (Snell, 2001). Distance education, today often in the form of asynchronous online learning, has gained in acceptance and use as the number of older learners returning to school has increased (Walker, 2000). Distance education is generally defined as a situation in which “...a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner.” (Perraton, 1988, p. 34). Online instruction is fast becoming a mainstream instructional delivery system for post secondary courses and degree programs (Robyler, 1999). Although not as common in secondary education, H-Net Humanities and Social Services Online (High Schools Online, 2000) lists 76 online high schools in 19 different states already in operation. These schools include public high schools that offer a few online courses to hospital-homebound students, schools that offer a complete high school diploma program online, and online schools formed by a consortium of public school systems in different states that offer a wide variety of subjects.

There is a definite danger in assuming that simply replacing traditional teaching techniques with new technologies will result in a significant improvement in education (Dede, 1996; Moore, 1996), but distance education has become the latest patch applied to a leaking educational system.

Online learning represents a significant shift in educational management (Christensen, Anakwe, & Kessler, 2001), however, research has not kept pace with this change. Keegan (1986) noted and reaffirmed (1988) that distance education has been weakened by a lack of application of appropriate educational theory. Holmberg (1989) suggested that instead of being based on sound

educational theory and research, distance education has been characterized by a trial and error approach. Additionally, distance education and online learning have their own unique set of problems related to the technological nature and methods of delivery. However, with its broadened communication horizons and almost limitless potential, distance education has begun to push the educational system into the 21st century using the driving force of business today – digital communications (Nobles, 1998; Offir & Lev, 2000).

Perhaps because of the relative infancy of online instruction and practice significant gaps in the research and literature indicate current and future needs for research in several areas. Little research has been done concerning students' perceptions of their online educational experiences. Although there has been a call to remove emphasis from student-level data and place it on course-level data (Dominguez & Ridley, 2001), students' attitudes and frustrations with distance education have not been fully explored, especially at the secondary level. Hara and Kling (1999) have also noted that students may not have had opportunities to express their frustration with distance education courses. And while it has been tentatively concluded that online courses appear to be more rigorous (Snell & Mekies, 1999), there are few actual studies of comparison of academic achievement of online students versus traditional, face-to-face students. The research that has been conducted concerning distance education has mostly been at the post-secondary level, and while some of the conclusions and results found in this research are appropriate for secondary learners (CORD, 2001), research in the above areas is paramount to the success and future development of distance education at the secondary level.

In this literature review, some of the major advantages and problems associated with online education are identified and discussed through a study of relevant research and literature. Topics include design of instructional materials and courses, relevant educational theories, the unique needs and benefits associated with online education, and the perceptions of those associated with online education.

Characteristics of Students Who Choose Distance Education

As with all educational strategies, the characteristics of the target learners must be considered when designing the instruction. Online learners have been seen to exhibit different learning styles than those associated with traditional learners. Collectivist learners, concerned with building relationships, tend to prefer traditional, face-to-face instruction, while individualist learners will often choose distance education courses (Anakwe, 1999). Students who choose online courses have a greater need to exert control over their learning environment (Robyler, 1999).

There are also differences in the demographics of those who choose online learning. Students who have signed up for online education courses in the past have tended to be adult, working females (Moore & Kearsley, 1996). A more recent prediction indicates that "...the typical distance education student may soon be more equivalent to the traditional student: younger and a full-time student." (Robyler, 1999, p.159). This demographic shift would tremendously increase the likelihood of the results from studies of post-secondary programs being applicable to secondary settings.

Student-Perceived Advantages to Distance Education

A choice of instructional strategies and delivery styles is very important to learners at all levels (Ridley & Husband, 1998; Robyler, 1999). Many older students also indicate that flexibility and convenience regarding time and place of instruction is a top priority (Research Information and Statistics, 2001; Robyler). Students at all levels identify opportunities for increased reinforcement and feedback from instructors as a positive aspect of online education, while other cited advantages include access to a wealth of information not available in most traditional classrooms and the increased privacy afforded by online education (Felix, 2001). Perhaps one of the more widely recognized advantages of online education is that it allows students to take a variety of courses otherwise inaccessible to them (Lifelines of Learning, 1993; MacDonald, 2000; VHS Student Survey Results, 1998-2001). Reyes and Bradley (2000) found that another advantage to online education courses, that of providing a sense of continuity of courses and programs, is cited by students in remote and/or isolated

communities, especially in locations where schools experience a high teacher attrition rate. Rose (1995) states that many persons who would not otherwise seek post-secondary education do so through online education. Flexibility of duration of online coursework is another advantage seen by students. As stated in Keystone National High School's catalog (Homeschool Catalog, 2000-2001), "Keystone is open year-round" (p. 10).

Instructor/Institution-Perceived Advantages to Distance Education

In accord with students, instructors feel that the convenience and flexibility afforded by online education is a major advantage (MacDonald, 2000; Robyler, 1999). Although more work may initially be involved, the ability to individualize instructional methods and feedback is also considered a tremendous advantage by instructors (Schmidt, Shelley, Van Wart, Clayton, & Schreck, 2000). As Trier (2000) points out, online education has the potential to reach a much wider student audience, while Mathew and Dohery-Poirier (2000) acknowledge that web-based instruction can also be used to meet the needs of a more diverse student group. Lan (2001) has called the Internet the world's largest library, suggesting that it can provide access to expert knowledge and resources previously unavailable in most educational settings. Barker (2000) notes, "...Internet connected computers actually do more to put learners in contact with other learners than any other telecommunications medium available." (p. 91), which can lead to broadened personal and educational horizons for all types of learners.

Because, as Hamza and Alhalabi (1999) state, technologies are the driving forces in communications today, exposure to online education and the use of these technologies is also seen as a tremendous advantage. Allowing students to become familiar with the communications technologies already at use in the 'real world' will ensure a greater comfort and preparation level when students do take their place in the work force (Collins, 2001; Lane & Cassidy, 1996).

Another factor considered to be a tremendous advantage for online education is that all types of learners including those identified as talented/gifted

and those identified as learning disadvantaged can benefit from the flexibility and choice of distance education (Shaw, 2000). This can also help eliminate some of the cultural and ethnic biases found in many instructional strategies today by forcing instructors and peers to judge another's work on their words/work alone and not on a reaction to the person. Additionally, access to the Internet provides rich, multicultural experiences and examples not always available in a traditional classroom. And, as found in a study by McLoughlin and Oliver (1998), online learning environments have a tremendous potential for stimulating higher order thinking skills by forcing students to synthesize and analyze more information on their own.

Some institutions find that the potential for long-term savings in costs is a very attractive enticement to enter the online education field (Tricker, Rangelcroft & Long, 2001; Trier, 2000). Of importance to all stakeholders is the academic achievement of online education students versus traditional learners (Carswell, Thomas, Petre, Price, & Richards, 2000; Merisotis & Phipps, 1999). Merisotis and Phipps report that the majority of research investigating the effects of online education has examined student outcomes in terms of grades and test scores. This comparison has yielded results suggesting that online education students score as well as or better than traditional students on identical or comparable tests of academic achievement. They acknowledge, however, that most of the research has focused on individual courses rather than academic programs and does not account for different learning styles between distance education students and traditional students. This finding has been called into question by Ewell (1999) among others, who asks how findings of no significant difference can be present so consistently in such diverse studies. These studies range across a wide scope of population types using varied technologies, yet the results appear to be similar. Ewell also notes, however, that while a pre-research bias in favor of online education could be responsible, similar problems could reasonably be identified in the published research of virtually every instructional method including traditional ones.

Student-Perceived Disadvantages to Distance/Online Education

From the student point of view, there are unique disadvantages unique in online education. A frequent challenge is the need to learn new skills. One necessary skill that must be acquired by students is the ability to “...cultivate communication in a largely asynchronous environment....” (Carswell et al., 2000, p. 45). In addition to acquiring new skills, students must frequently adapt their learning style or develop new learning styles to adjust to new instructional techniques (Gnisci, Papa, & Spedaletti, 1999; Lyall & McNamara, 2000). Carnwell (2000) also found that students are often forced to change learning styles in response to context and materials design in online classes. Many students are reluctant to make any change in what has been successful for them in the past.

Some students also cite the presence of distractions when they are not actually required to be in a specific at a specific time with an instructor in attendance as a disadvantage, as well as missing the personal interaction with the instructor and classmates (Felix, 2001). Felix also states that other students consider the lack of speaking practice an additional disadvantage and claims that at some point almost all students indicate that they are not initially comfortable with the technologies required for online education.

Many students are uncomfortable with the lack of information about their classmates (Frew & Weber, 1995). While the question of ethnic and racial prejudices that may exist has also been suggested (Robyler, 1999), a more recent study indicates that this may not be true at all (Christensen et al., 2001). According to Christensen et al., the lack of face-to-face meetings may actually be lead to a broader, less biased acceptance of students by instructors and classmates. Christensen et al., also found that the rapid expansion of technology today, its increased pervasiveness in society, and its subsequent availability have all but negated any potential ethnic or racial differences in accessibility caused by possible socio-economic differences. This suggests that greater opportunities for feedback and small-group learning processes may actually be more beneficial for minority students in terms of interactions and elimination of prejudices.

It has been noted that students who have problems with traditional learning strategies will tend to have even more problems with the techniques and learning styles required for distance education learning (Robyler, 1999). It has also been acknowledged that these students may need additional assistance in

copied with the technology and strategies involved (Kazmer, 2000). Carnwell (2000) says “...students use different approaches to study in distance learning depending upon their preferred style of learning, and this is mediated by the learning context and materials design.” (p. 132).

Some of the disadvantages to online education cited by students may be the result of poor institutional or instructor practices rather than being indigenous to the medium itself. Perhaps one of the more common complaints on the part of students is that of ambiguous instructions in courses. In the absence of an on-site instructor to interpret and explain, students who often need additional assistance in traditional classes may become even more confused and frustrated in distance education classes (Hara & Kling, 1999; Harnar, Brown & Mayall, 2000).

Because distance education makes learning the students’ responsibility, success in this educational environment is strongly dependent on the student’s personal sense of motivation (Shaw, 2000) and responsibility (Inman, Kerwin, & Mayes, 1999) and this can be a problem for some students who may feel pressured.

Kazmer (2000) notes that online education requires that an individual student exhibit more discipline and organization. Younger students especially seem to need the presence of an on-site adult supervisor (Threkeld & Brzoska, 1994).

Younger students may also perceive the instructor as less prepared and less responsible because of the lack of immediate explanations and attention and less of a willingness to think for themselves (Clow, 1999).

Instructor/Institution-Perceived Disadvantages to Distance/Online Education

In addition to complaints about technology-related problems and the loss of personal interaction with students, instructors and institutions often question the quality of distance education courses (Bermudez & Hirumi, 2000; Lan, 2001).

Inman et al. (1999) report that most instructors feel that distance and online education courses are of much lower quality than traditional courses. As Schmidt et al. (2000) note many instructors have a “...highly negative perception about the quality of distance learning....” Adding to the feeling of loss at the lack of one-on-one contact with learners is what Oliver (2000) describes as a “...lack of control over the evaluation process because students are dispersed.” (p. 91) and “...a lack

of contextual clues....” (p. 91) to aid in developing and shaping instruction. Instructors are also concerned with the lack of importance and support given to online education courses by administrations (Schmidt et al.). This perceived lack of support and importance leads to a low degree of faculty interest in developing education courses.

Institutions are particularly concerned with the funding required to develop and implement online education courses (Collins, 2001; Schmidt et al, 2000). Although once developed and implemented costs may actually be lower than those associated with traditional courses (no building maintenance, etc.) the initial development and the need for enhanced technology is a major expense at first. However, it has been noted by Hirumi and Bermudez (1996) that the benefits derived from development of online education courses such as transfer of power and responsibility for success to the students seem to offset the efforts of development, evaluation, and implementation and the initially greater costs. This concern parallels that of instructors about the lack of training and instruction for themselves prior to development and implementation of courses. Just as students need training in the technologies involved, many instructors do, too (Collins, 2001; Lan, 2001; Nasseh, 2000). The initial development of distance and online programs also requires more extensive and careful planning than do traditional forms of instruction (Hirumi & Bermudez, 1996). Instructors are especially aware of the fact that many young learners, simply due to their less well-developed reading, comprehension and interpretation skills, often find online learning more difficult. This is true with secondary learners and even more so with pre-secondary learners. These difficulties necessitate changes in the style and methods of instruction and delivery. Instructors are concerned that these changes may dilute the effectiveness of their instruction, especially when training in new instructional/delivery techniques is not made available to them as is often the case today (Clow, 1999).

Institutions are also necessarily concerned about equity of access for today’s learners (Distance Education in Higher Education Institutions, 1999; Lifelines to Learning, 1993; Robyler, 1999) although this has been noted by Christensen et al. (2001) to be less of a problem today than it once might have been. As previously stated, with technology more readily available today than every before, the

majority of students do have access to the technologies necessary for distance education.

A final concern on the part of instructors and institutions includes copyright and intellectual property laws (Getting America's Children Ready for the 21st Century, 1996). Once the course is created and presented as a distance or online education course, to whom does it belong: the creator or the institution under whose auspices it was created and delivered? This question is currently being vigorously debated in institutions around the world.

Needs for Future Distance/Online Education Courses

Students want courses (both traditional and those presented as distance or online education courses) to be relevant to them. They want the material to specifically have meaning for them (Getting America's Students Ready for the 21st Century, 1996; Gnisci, Papa & Spedaletti, 1999). As noted by Tricker et al. (2001), "Professionally relevant assignments and high quality feedback..." (p. 175) are high priority criteria for students. They also want projects that are linked to specific course information and are relevant to their studies (Collins, 2001; Lane & Cassidy, 1996) and want the course to be highly interactive (Christensen et al., 2001; Gnisci, Papa & Spedaletti).

Most students seem to prefer a combination of online education courses with traditional learning (Felix, 2001; Hawkins, 2001) and want the course objectives to be clearly stated. They also want skills instruction prior to the beginning of the course (Carswell et al., 2000), and to help cope with frequent technical problems, students want to know exactly whom to contact for technical assistance and whom to contact for instructional assistance (Hara & Kling, 1999; Kazmer, 2000). Instructors and institutions seek early knowledge of funding sources prior to development of a course (Collins, 2001). Additionally, because there is little instructor-student contact, institutions are concerned that it be of the highest quality. This suggests that only the best instructors be given an opportunity to develop and implement online education courses (Tricker, Rangecroft & Long, 2001), which is in direct contrast to the instructors' concerns regarding the

perceived lack of institutional support. Armstrong (2000) found that "...Internet-mediated distance learning would affect everything from institutional finance to expectations for faculty performance." (p. 27). With such a potential for change, online education must be carefully planned by both institutions and instructors. An additional, ever-increasing concern among institutions and instructors is the lack of standard guidelines for development of online courses. Although various organizations and institutions such as The Virtual High School of the Concord Consortium have a set of instructional standards (Delivery Standards, VHS, 2001; Evaluator's Report Form, VHS, 2001) there is no currently recognized format for delivery of an online course.

Current/Future Trends in Distance/Online Education

Current trends and possible future trends include a careful consideration of the user interfaces involved (Dede, 1996; Robson, 2000). As stated by Ahern and Repman (1994), "...the kinds of interaction that take place in a distance learning environment seem to be particularly crucial..." (p. 541) and should be carefully considered. Because the type of technology used determines many of the instructional strategies available, it should be carefully studied with an eye to desired effects.

In the online education-associated paradigm which is rapidly increasing in popularity in educational circles, the instructor is seen more and more as a facilitator of learning not a deliverer of information (Inman, Kerwin & Mayes, 1999). Jonassen (2000) states that "...knowledge is built by the learner, not provided by the teacher." (p. 10). Online education provides both the opportunity and the challenge for instructors to create additional opportunities for the development of critical thinking skills, problem solving abilities, and reasoning skills (Hannafin & Land, 1997). Hannafin and Land also note that technology-enhanced learning requires that the learner be an active participant in the learning process, recognizing that cognition is now considered to be a shared process between learner and instructor and not simply the reception of information by the learner.

Conclusions

Online education can provide advantages not available with other forms of learning: access to otherwise unavailable courses and information, flexibility in educational opportunities, exposure to technologies and experiences which will provide relevance in the future, a potential to develop critical thinking skills in students which will help them learn to learn, and reduced long-term costs and increased enrollments for educational institutions. Although it does lead to increased requirements for learners and instructors to acquire new skills, for an increased sense of personal responsibility and motivation on the part of learners, and higher initial costs for institutions, it has a tremendous potential to contribute to a positive educational experience for many learners who might not otherwise have access to certain courses and programs.

Potential for Future Research

Following the haphazard birth of online learning and research in online learning, the time has come for increased research regarding the development of online courses based on relevant educational theories and following acceptable guidelines. Additional research into necessary instructor and learner training in new technologies is needed, as is research in a secondary setting with regard to a comparison of perceived educational experiences of online students with traditional students and the academic achievement of the two groups when exposed to comparable courses.

The lack of study specifically at the secondary level is perhaps the most obvious gap in the research. Although there are still many areas to explore at the post-secondary level, very little investigation and research has even been attempted in secondary settings. There should also be studies done concerning the effect of students' and instructors' attitudes toward online education on student achievement. An evaluation of the educational experiences of students enrolled in online courses as compared to their experiences with similar, traditional courses

could be invaluable. And, of course, follow-up studies of a comparison of student achievement in online courses versus student achievement in comparable, face-to-face courses are needed.

In view of the potential impact of online learning on education in the future, research into all areas impacting online learning is urgently needed at all levels. These areas include the development of courses, comparison of academic achievement results with traditional learning, and student perceptions of online learning and the effects of these perceptions on learning. Nowhere is this research needed more than at the secondary level where national and state mandates have pushed technology into the forefront of education and where online learning is becoming the 'in' thing in high schools.

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