THE PART PLAYED BY INSTRUCTIONAL MEDIA IN DISTANCE EDUCATION

by

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Abstract

A content analysis of 409 distance education web sites was conducted to assess their explanations of the media used in their online course offerings. A check sheet consisting of sixteen media strategies was completed for each by examining course demonstrations, video introductions, pages related to “Academics,” pages related to Frequently Asked Questions (FAQ’s) and by analyzing text descriptions of course offerings. Holsti's reliability coefficient showed an 85.3% intercoder agreement among three analysts. Only 67 universities mentioned using seven or more media types and 90 were found to be correspondence courses with email support. Text- based media (e-mail and print-based discussion boards) were mentioned as being the primary method of communication and information exchange. Many of the sites mentioned cutting-edge internet technologies such as streaming video, online conferencing or synchronous lectures, but institutions do not effectively communicate on their websites how these technologies are used to support instruction.

Keywords:

> "*Because the need for preparation for a continually developing life is great, it is imperative that every energy should be bent to making the present experience as rich and significant as possible. Then, as the present emerges insensibly into the future, the future is taken care of." (Dewey, 1946)*

The research question addressed in this paper concerns the media used to deliver online instruction to students enrolled in distance education courses. What media are used for such instructional delivery? Obviously, many that can potentially be used are much faster and are able to deliver content of a more sophisticated nature than the original form of distance education---that depended on correspondence my mail, sending handwritten, typewritten or printed textual messages between the participating parties. An important issue raised by the research question concerns what the student or the instructor actually receives and sees as such exchanges take place. Is it simply printed text, which has been used in distance education for more than a century? Does the student receive lessons packaged in one of the many forms of content that contemporary media are able to deliver? That issue is addressed in this paper by a content analysis of 409 web sites of both virtual and traditional institutions of higher education in the United States and Canada that offer course work or degree programs through the use of the Internet.

Background

Distance education has been a popular means for providing access to higher education for working families, military personnel and other people in remote areas for well over a century. Since the early 20th century, this form of education has proven to be a convenient way to earn college credits for millions of people unable to take up residence and attend classes on a traditional college campus. The tremendous growth of distance education can be attributed to technological developments, including the convergence of digital media. However, the forms and methods of message transmission used to deliver and exchange lectures, assignments and student feedback have a history that began as far back as the late 1700s.

The underlying technology that drives the Internet allows for the integration into computer-presented instruction of photographs, animation, audio and video media in ways not available in

print form. Communication technologies are available that permit both asynchronous exchanges (email, discussion boards) and synchronous modes of communication (audio and videoconference, chat) at a distance. Despite new advances in technology, all forms of distance instruction – whether in web-based or correspondence-by-mail format – share common characteristics that distinguish these instructional systems from traditional classroom and lab methods. For example, distance instruction is delivered without students and tutors meeting personally. It is carried on in person-to-person exchanges at a distance without classrooms. The exchanges are almost always asynchronous (with time gaps between sending and receiving). In addition, courses are pre-produced and include resources that allow students to work independently from the instructor (Holmberg, 1980).

Empirical studies suggest that using multiple media in distance instruction can often enhance learning, because capabilities exist to give those in such learning environments a compelling experience that emphasizes immediacy. However, many questions remain as to whether the new media that are being employed in this way actually do achieve these ends. It is this issue on which the present report is focused. It has implications for students with learning styles that favor auditory and visual content (as opposed to simpler textual messages on computer screens). It also raises questions related to the quality of instruction that is offered through distance programs. Another important consideration is whether students are fully informed of the teaching methods used in a course prior to enrolling in a distance education class. Do providers make such information available to potential students who are seeking distance learning environments? Does the website provide information that informs them about visual, aural or creative uses of synchronous media environments that match their learning style or enhance their experience? While there is sufficient evidence that distance learning programs can be educationally effective, and that for many people they can provide a valuable service, this research seeks to discover the depth of media use to achieve immediacy and to accommodate a variety of learning styles.

An historical perspective: Distance education by correspondence

The first distance education courses leading to college-level degrees were offered by mail in 1873. At that time, Illinois Wesleyan University, a private institution, developed a curriculum leading to bachelors, masters and doctoral degrees (Bittner & Mallory, 1933). Within a few decades, distance learning enrollments had grown to an almost mind-boggling level.

William Rainey Harper, a pioneer in higher education in the late 1800's, has been attributed with being the first administrator to incorporate distance education into a public university extension department. Harper started his work with education via the mail when he founded the Correspondence School of Hebrew in 1879. After ten years, the school had 70 instructors servicing more than 1,000 students studying "at a distance." His success with his innovative program became so well known that in 1890, he was invited to organize the newly established University of Chicago. Harper seized this opportunity and included a University Extension Division in the five that formed the university. It was through that Division that, in 1892, the first correspondence degree program was offered by a public institution. The program started with 39 courses enrolling 82 students. By the time of Harper's death in 1906, it had grown to nearly 300 courses with 1,600 students enrolled. (Bittner & Mallory, 1933).

Throughout the early 20th century, degree programs offered by both public and for-profit commercial correspondence institutions grew at an astounding rate. An organization entitled International Correspondence Schools was established and reported that between 1892 and 1899, enrollments in mail-based schools had grown from 10,000 to 80,000. Seven years later, in June of 1906, such enrollments increased more than ten-fold to 900,000 (Clark, 1906). That figure doubled again by 1915, to a total of 1.75 million students (Galloway, 1916).

The popularity of correspondence schools, and institutions such as the University of Chicago extension program, was so profound that by 1920, 73 American Universities (61 public, 12 privately endowed) in 39 states offered for-credit distance programs on a variety of professional and academic topics (Klein, 1920). By 1927, there were more than 2 million students enrolled in correspondence schools. It is important to note that this "at a distance" enrollment during the 1920s represented more than "*four times* the

total number of students studying full-time in all the colleges, universities and professional schools in the United States" (Fisher, 1932). By 1930, the University of Chicago had more than 6,000 students enrolled in their distance learning degree programs (Bittner and Mallory, 1933).

From its high point in early 1930s, and near the end of that decade, distance education by mail went through the first of many transformations. First, enrollments decreased significantly. One reason was that the Federal Trade Commission introduced new legislation to curtail fraudulent advertising concerning the benefits of earning such degrees. The agency sought to close institutions that made false or misleading claims concerning the consequences in the real world of completing distance education courses. Claims that promised employment or work-related advancement were banned by many states through laws making it illegal to promise that completion of a correspondence course or program would result in employment without a signed letter from a prospective employer (Anon, 1940). Another factor was World War Two. The demands of the conflict brought full employment, in addition to a new focus for university correspondence programs---which shifted to providing educational services to military personnel

Incorporating new technologies

Throughout it's long history, experimentation with various forms of "new media" to enhance the learning experience have been incorporated into distance learning. As new communications technologies were developed in the early 20th century, instructional programming expanded to include radio, lantern slides and the phonograph. In the years that followed, a number of media, including radio, television, videotape, audiotape, telephone and a variety of print forms were introduced as these technologies became available and cost effective. These media were introduced to help create the illusion of the classroom, to enhance the sense of 'being there' (Lombard & Ditton, 1997; Biocca, Kim & Levy, 1995; McCluhan, 1964) and to try foster two-way communication where students had no face-to-face contact with their instructors or peers.

As these various new media technologies became available, beginning in the early 1900's, various attempts were made to integrate them into the delivery of distance instruction. As early as 1902, for example, blank phonograph disks were sent to students who were taking singing or language lessons. These allowed their performances to recorded for review by their teachers at a distance (Doubleday, 1902). During this

period, millions of dollars were spent to improve print materials and to standardize lessons (Galloway, 1916). As enrollments continued to increase, educational institutions turned to other media to reach new audiences. For example, during the 1920's, the Federal Communications Commission granted radio broadcast licenses to colleges and universities. At the time, they began to be put to widespread use. The first educational radio licenses were granted to the University of Salt Lake, the University of Wisconsin, the University of Minnesota and Pennsylvania State University. In 1925, the University of Iowa had incorporated radio-correspondence for credit into their extension curriculum – including the "only regular college course in the world given by radio" (Anon, 1925). It was offered by the Kansas State Agricultural College, and was broadcast by 40 stations Monday through Friday at 7:00 PM in the evening.

As this variety of new technologies developed they were used to provide greater access to home study lectures. Instruction was delivered particularly to people in rural areas where it was thought that there were "39 million potential students living on farms" (Anon, 1925).

Educational radio however, was slow to start. The far more popular commercial radio programming effectively captured audiences and by soon passed educational programming, such as that offered by Kansas State.

In 1934, at the dawn of the television age, legislative efforts were being made to recognize the new medium formally for instructional purposes. It was during this time period that Federal Communications Commission was lobbied to reserve broadcast bandwidth for educational purposes. These efforts would go unrealized until 1953 when the FCC reserved one-forth of the television broadcast spectrum for educational purposes. In that year, with the medium more fully developed, the FCC allotted 252 channels for education, effectively establishing a public broadcasting network (Zechowski, 2005).

It was during the 1950's that a new emphasis appeared on the use of technology to supplement education. A number of experiments were funded by the Ford Foundation to promote televised educational programming. These experiments included more than 200,000 school children serving as subjects in a variety of educational settings. Education "at a distance" took on new meaning when televised educational programming began to the rural schools of American Samoa. Although such educational programming met

with some initial resistance, these projects did much to demonstrate the benefits and effectiveness of audio-visual programming in public schools. (Goldfarb, 2002).

During the past 15 years, enrollments in distance education programs have increased dramatically. Today, traditional institutions offer a wide variety of for-credit courses through correspondence by mail, online Internet systems and other forms of distributed educational programs. These programs provide students with a convenient way to earn college credits by making it possible to earn degrees by completing coursework entirely off-campus. Technological advances have continued, allowing for greater integration of various media through web-deployed learning systems. These offer media-rich learning environments that include audio, video, motion graphics and text-based communication.

Debate over online education

Throughout the history of distance education, various kinds of evaluative empirical research have been undertaken. There are literally hundreds of studies that have been conducted over the past one hundred years that show the educational outcomes of online programs match or exceed those of “traditional” instruction in the delivery of content (Russell, 1999). Further, numerous studies have shown that a majority of students enrolled in distance education classes are “equally satisfied” or “more satisfied” with online classes, compared to their satisfaction with traditional courses (Beker et al., 2003). Media-rich instructional materials (such as audio and video, audio graphics and animation) have been shown to support complex cognitive process such as elaborate and dual encoding (Schmeeckle, 2003). While it is unclear as to the extent that multimedia is being used in online courses, some research shows that knowledge acquired by online distance learning is equal to, or even superior to, that obtained in traditional settings (Joy & Garcia, 2000).

Today, the research findings on the effectiveness of distance education using various media present a mixed picture. Distance education programs provide access to education for military personnel, working parents and rural professionals that might not be able to obtain a higher education. However, critics see personal contact with instructors (Gagne & Shepard, 2001) and face-to-face interaction with other students (Adams & DeFleur, 2006) as critical elements to an educational experience. From an interpersonal

communication perspective, instructors and students in an asynchronous communication format have no opportunity to alter their delivery to accommodate learning styles through role-taking and direct feedback. This, communication theorists point out, is a serious limitation (DeFleur, Kearney, Plax & DeFleur, 2005). The use of educational multimedia online does not completely resolve these problems because multimedia has only an indirect affect on learning (Jonassen, Campbell & Davidson, 1994).

Recently, a new area of research has begun to focus on the *acceptability* of degrees earned online, or even partially online. Rather than focusing on the educational merits or quality of such instruction, these studies simply ask whether earning a degree online provides the graduate with the same benefit as a degree earned in a traditional program. These 'acceptability studies' have investigated whether an online degree is viewed as meeting the same standard as a traditional degree to enter a graduate program (DeFleur & Adams, 2004), in hiring faculty (Adams $ DeFleur, 2005) and hiring employees across a wide spectrum of business and industries (Adams & DeFleur, 2006). In each case, gatekeepers were asked whether an applicant's credentials would have *the same chance of being accepted* if they had to choose between one whose degree has been completed through online or traditional on-campus coursework. These studies have shown that earning a degree by completing online courses – or by completing a significant portion of coursework online – is not *equally acceptable* in these situations compared to a traditional degree.

The influence of the instructional media used

The process of including instructional media in a distance education environment is a complex process. Written content has to be composed for both specific instructional purposes and audience appropriateness. Based on audience characteristics as well as the nature of the information, media are selected according to any number of instructional design models (Romiszowski, 1981). These include scales of appropriateness (Rice, 1993), theoretic perspective, such as "media richness" as outlined by Daft and Lengel (1983) and presumed benefits of "social presence" in the instructional setting (Rice, 1993).

Social presence and media richness theories are two perspectives that provide insight on how media can communication, introduce constraints on, or transmit social and nonverbal cues that characterize face-to-face communication. The principle idea behind these two theories is that the degree to which a

specific medium conveys a heightened sense of reality enables it to lead to more effective or satisfying student performance (Rice, 1993).

Media richness theory proposes that each medium has capacities for reducing ambiguity, facilitating interpretations and increasing understanding (Daft & Lengel, 1984). Central to this theory is that face-to-face communication offers the greatest amount of information in an exchange of information. Face-to-face exchanges between two people within arm's reach are considered the most 'media-rich' communication because all of the senses play a part in sending and receiving information. As channels of communication are reduced (or removed) communication is less effective (Biocca, Harms & Gregg, 2001; Hiemstra, 1982). Conversely, if distance learning environments are text-based, adding other forms of media have the potential to fill in missing channels of communication that may be lacking. It is important to note, however, though specific media may be better suited to certain types of communication activity (Rice, 1993), online communication is computer-mediated and because of this, the same level of information experienced in face-to-face communication (Jonassen, Campbell & Davidson, 1994) is not possible.

Individual learning styles are unique, as are a person's preference for a particular educational medium or mode of instructional presentation. As a simple example, some people prefer novels that they can listen to on tape; others would rather watch the film version, while still others are content with nothing less than a printed book. This is an important variable when considering media and outcome effectiveness. Each student may do best with a particular mode of learning, such as cooperative, competitive or individualized (Sherry, 1995) For that reason, text-driven online learning environments may discourage a student who prefers visual and spoken (audio-visual) presentations. For example, new communication technologies have eliminated problems related to delayed feedback, but studies conducted by the Mastery in Learning (organization) found that an email-driven community was not found to be an interactive mode of communication. Only 43% of the 540 network exchanges studied were found to have conversation threads that consisted of two transactions or more (Livingston, 1991, p. 20). Moreover, a relatively small number (10%) of people made 75% of the contributions (Adams, 1995). Thus, although online communication may

have opened up a new world for verbal communicators, a text-driven method clearly does not suit everybody.

Producers of digital media require a wide variety of production skills and familiarity with media strategies that have been effective in the past. The delivery of digital content includes defining the instructional content, selecting a specific medium (i.e. video, audio, slides), producing, distributing and evaluating the results for effectiveness. All of these factors are complicated because a professor of record is likely to be the content expert, the media producer and the instructor. The availability of production services, time, practicality of choices and prior experience in working with particular media are factors that media use (Romiszowski, 1981; King and Xia, 1997). For many, it is simply easier to proceed with teaching methods that are familiar rather than learn how to adopt facilitative teaching techniques that rely on unfamiliar media (Novek, 1999) and to develop new production skills. The variety of media used, then, may be constrained due to a lack of resources, familiarity with effective media strategies or by the relatively complicated skills required to design a program and produce it for digital media.

Research Questions

The purpose of the present research, then, is to investigate to what degree a diverse set of media is being used in distance education courses. Empirical studies have shown that using multiple forms of media can enhance learning, but there is little information on how these media are currently being used in distance learning programs. Therefore, this study is an exploratory work designed to assess media use in online courses and to gauge the amount of information available for students who are new to distance learning. These questions have implications for students with learning styles that favor auditory and visual content, and it raises questions related to the quality of online instruction that is offered through distance programs.

RQ1: Which new communication technologies are being used in online courses and what is their distribution or use?

RQ2: How are communication technologies being used to support online curricula?

Method

A content analysis of web sites was conducted to assess descriptions of how media are integrated into teaching methods for distance learning degrees and courses. The first step was to develop a master list of web sites that offer such programs. This was done by gathering web addresses from Petersons.com and Degree.net, two widely recognized lists of accredited online courses and degree programs. Degree.net maintains a list of 100 recommended online programs, listed alphabetically, and Petersons.com has a database of 409 accredited non-residence programs that lead to a bachelor's, master's or doctoral degree. The names and web addresses of university degree programs were selected from these two sources to form as complete a list as possible. To avoid duplication, whenever a university or college program was listed on both sites, the contact information from Petersons.com was used. After carefully listing the institutions and removing duplicate listings, the resulting list consisted of 430 of virtual and traditional college and university names located in the United States and Canada.

A media usage check sheet was developed by examining web sites and adding media delivery strategies (i.e. email, chat, discussion board) to a list until no further unique instances of media implementation could be discovered. The check sheet consisted of sixteen media strategies and eight categories of relevant information related to the institution or program. The check sheets were completed by examining course demonstrations, video introductions, pages related to "Academics," pages related to "Frequently Asked Questions" (FAQ's) and by analyzing text descriptions of course offerings. The procedure was time- consuming, to say the least, because each institution uses a different presentation style and each of the sites contains a wide variety of descriptive pages that had to be sorted through.

Three researchers selected a test sample of 15 sites in order to refine the check sheet and to ensure procedural agreement between the coders. This process also ensured that the 26 point checklist was thorough and that the 16 media categories were exhaustive and reliable (Wimmer and Dominick, 1991). This also provided an opportunity for the researchers to reach agreement on how to examine each web site and to revise coding rules (Weber, 1985). The checklists used during the training session were discarded. A number of additional sites were discarded because, even though listed on Peterson's or Degree.net, online programs

could not be found by browsing or searching. The total number of sites that remained after these refinements was 409. These were analyzed and used to compile the results set forth below.

The author and two researcher assistants conducted the content analysis on all of the sites included in this sample. To test intercoder reliability, 50 university names were drawn randomly from the master list of non-residential online programs by matching their numerical position on the list with a number randomly generated by a computer program. These sites were then assessed and coded by each of the three individuals. PRAM, a software package designed to assess intercoder reliability, was used to perform the relevant analysis. Holsti's reliability coefficient showed an 85.3% intercoder agreement based on the analysis of the 50 coding sheets (Tinsley& Weiss, 2000).

The lowest percentage agreement among the coders (67%) was for how correspondence education was interpreted and entered onto the checklist. Because the percentage of agreement was lowest on this measure, 50 sites were selected where disagreement existed (i.e. where one coder claimed to have found a correspondence program and one or more did not). These were then revisited. Disagreements that existed were attributed to the number of page visits per site that were required to identify clearly whether the mail was or was not being used to transfer course materials and completed lessons. These efforts were also complicated because mail-based correspondence programs are, in part, using new technologies. For example, some programs delivered lesson materials (course packets including lesson completion check sheets, study guides and course texts) by surface mail, but students had the option of returning completed assignments to the instructor for feedback by email. Disagreement in these cases were resolved by categorizing those that do not use a course management software, are self-paced courses of study, and use fax, phone, mail and email to communicate with the professor as correspondence programs.

Limitations

As explained, the results of the research are based on a content analysis of course descriptions, pages containing information related to “frequently asked questions” and additional information provided by each institution. The details of media use outlined in this study are not fully conclusive because the manner of such media use in course development is highly dependent on the production skill of the instructor

developing the class. In a majority of cases this was evident by comparing computer system requirements and the results of the media usage check sheet. Finally, it was not possible fully to assess each of the 90,000 distance education courses offered for credit in the U. S. (National Center For Education Statistics, 2003) by actually observing how the classes are taught, or to understand fully -- on a case-by-case basis -- the digital media production resources available through each institution.

Results

The number and variety of online courses varied widely in the 409 institutions that were reviewed, ranging from only a few classes to a number sufficient to support more than 100 degree programs at one institution. The distribution of degree programs consisted of 277 bachelor's programs, 264 master's programs and 43 doctoral programs. Of all the institutions, 89 offered only an undergraduate degree and 63 offered only a master's degree. Independent doctoral programs were least common, as most (N=31) offered a complete course of studies starting at the undergraduate level.

An unexpected finding, reflecting the history of distance education, was that twenty-two percent (N=88) of the institutions still used surface mail to transfer text-based lesson materials, completed assignments and grades. Although some of these programs did mention email as being a primary vehicle to transmit completed lessons, it was clear from the descriptions of the programs that there were no course management software, discussion boards or chat rooms characteristic of contemporary web-based distance learning programs. One program description described the course materials as consisting of a lesson book, a (printed) program of study, a progress check sheet and assignments---a system identical to correspondence programs in the late 19th and early 20th century (Galloway, 1916).

Institutions offering correspondence courses (N=26) made no mention of new communication technologies or audio-visual media, relying completely on printed course packages delivered by mail, with fax or telephone to submit completed lessons. The remaining correspondence programs included CD-ROM, video or audiotape in course packages and about one third (N=28) of the correspondence programs suggested that email was an acceptable means by which completed lessons could be submitted.

Media use

The 16 items included on the media checklist were categorized into four groups. These were text-print, audio, graphics-animation and audio-visual. The media associated with each were then arranged on an ordinal scale. Overall, the average number of media used in online teaching methods was 4.13 with the greatest number of web sites mentioning five media methods (N=63). Three institutions claimed to use all 16 media methods in their courses and 52 made no mention at all of how media are used in distance learning instruction.

By far, text- based media were mentioned as being the primary method of communication and information exchange. Discussion boards were the most frequently mentioned forms of communication N=313) with text document attachments as the medium accompanying transmissions. Chat was mentioned less often and appeared to be an "add-on" left to the discretion of teachers and students.

Universities that used more than seven media types (N=67) were sorted into a separate group and compared to how media were being used across all institutions. The rough percentage increases in media use were fairly uniform across all media types, with the audio-visual and audio media groups being the sub-set where media use increases the most on average. In the text-print media group, the largest increase was in the use of chat.

TABLE 1 ABOUT HERE

Video or broadcast television was the next most frequently mentioned medium being used, including archived, one-way (asynchronous) and live two-way (synchronous) events. The majority of online audio-visual media content consisted of taped classroom lectures available for distance students though a digital archive (N=167). However, a surprising number of institutions are employing online synchronous audio–visual methods (N=102). Interactive television was included in this group, but it is only available to students who can travel to a distribution point where classroom lectures, discussions and activities are

broadcast. This form of distributed video conferencing was being used by only thirteen percent of the institutions reviewed (N=55).

TABLE 2 ABOUT HERE

The use of teleconferencing in distance classes is the most commonly mentioned method for audio communication. As in the case of audio-visual media, pre-recorded lectures were taped and mailed, or were available online, as a digital media resource. The telephone, used in either teleconferences or as a means by which correspondence students could communication directly with an instructor during “office hours,” was the most commonly mentioned medium for audio communication. Using the computer to mediate conference calls, or to present synchronous lectures, were mentioned only rarely. It is interesting to note that one institution listed radio programming as part of its distance curriculum.

TABLE 3 ABOUT HERE

New technologies such as Flash, an animation tool that can be used to produce animation and motion graphics was mentioned by very few institutions. This raises the question as to why a technology that is installed on nearly all personal computers that are used to view web content is so underutilized.

TABLE 4 ABOUT HERE

In addition to assessing the variety of media used in course instruction, also tracked was how students new to distance education might learn what kind of experiences are included in the classes, or whether this manner of education will be suitable for their learning style. In this respect, colleges and universities support distance classes poorly. Less than half (N=197) of the 409 institutions provide course-related pages with answers to frequently asked questions. Only those institutions offering answers to

"frequently asked questions" were likely to provide a readiness questionnaire, but only forty-seven percent (N=91) of this group included a questionnaire and a demonstration lesson. Demonstration videos were less frequent and they generally supplanted a software-based demonstration lesson by providing a linear walk-through of the online learning environment.

TABLE 5 ABOUT HERE

Discussion

What the results of the present analyses reveal is that, overall, institutions do not communicate well to prospective students concerning the issues discussed above. Many of the web sites mention cutting-edge Internet technologies such as streaming video, online conferencing or synchronous lectures, but there is little information on how these technologies are actually used to support a curriculum. Interestingly, the use of these technologies seemed to be at the discretion of the instructing professor. Perhaps this contributed to the overall disorganization of descriptive information that appeared on the pages that contained general information. Ultimately, there were only a handful of institutions that included complete information about how courses were taught, with lesson demonstrations, free online workshops to prepare students, video introductions, frequently asked questions and readiness questionnaires.

In general, then, the results of this research indicate that only a relatively small number of the institutions in this sample appear to employ a truly diverse set of media in the delivery of instruction, with most favoring text as the principle mode of communication. In spite of the advancement of new communication technologies that might add more channels of communication to text-based instruction to create a 'media-rich' learning environment, the delivery of course instruction online appears to rely heavily on email, chat and discussion boards. From this perspective, then, online courses can be viewed as electronically bound volumes, employing electronic (rather than printed on paper) text as the principle mode of communication. What this implies is that while electronic delivery has obviously made the delay in communication much shorter, in many cases these new means of communication have not substantially

changed the basic mechanics of instruction from what it was in the 19th century. This raises questions as to whether distance education programs are advancing education through innovative use of new communication technologies. At the same time, students may not have sufficient information to gauge whether their learning style 'fits' online course work as they prepare to enter their first online experience.

This research opens up several avenues for further research that includes comparing how traditional and online institutions use media to investigate whether the technologies used in the course of instruction differs between these two groups. How do the written course descriptions affect whether a student decides to enroll in a particular class? Which information (FAQ, course descriptions, and demonstrations) plays a central role in the decision to enroll in a course? If these media do influence these decisions, then how can multiple instructional strategies best be utilized for online learning?

Another potential area of research is to examine if the use of media employed by online programs is related to the perceived quality of instruction. In other words, in our technology-driven world where the latest technologies are inherently attractive, would greater use of these technologies change the perception of the acceptability of distance coursework? Specifically, by examining how new communication technologies are being used, are there any implications that might suggest a better use for new communication technologies? As the new technologies that are so pervasive in consumer markets are finding new uses in education, it may be time for our universities and colleges to move more quickly to adopt these for educational purposes.

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Tables and figures

Table 1. **Text-Print**

Mode of communication	Email	Discussion board	Chat	Surface Mail	Fax
All institutions (N=409)	77% (N=313)	62% (N=252)	42% (N=172)	24% (N=98)	10% (N=42)
High media use (N=67)	100% (N=67)	93% (N=62)	72% (N=48)	51% (N=34)	27% (N=18)

Table 2. Audio Visual

Media type	Streaming Video (online)	Video Tape, DVD	Broadcast TV	Interactive TV	Video conference (online)
All institutions (N=409)	23% (N=93)	18% (N=74)	14% (N=59)	14% (N=55)	13% (N=52)
High media use (N=67)	58% (N=39)	51% (N=34)	33% (N=22)	28% (N=19)	30% (N=20)

Table 3. Audio

Transmission	Telephone	Pre-recorded audio	Audio chat
All institutions (N=409)	19% (N=78)	11% (N=44)	7% (N=30)
High media use (N=67)	41% (N=30)	39% (N=26)	21% (N=14)

Table 4. Text / Graphics

Transmission	Powerpoint	Flash
All institutions (N=409)	7% (N=29)	4% (N=15)
High media use (N=67)	22% (N=15)	12% (N=8)

Table 5. Preparing students to learn

Support Media	Frequently Asked Questions	Readiness Questionnaire	Lesson Demo	Video Demo
All institutions (N=409)	48% (N=197)	23% (N=93)	23% (N=91)	9% (N=37)
High media use (N=67)	39% (N=26)	37% (N=25)	37% (N=25)	13% (N=9)