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eLearning: Is There a Place in Athletic Training Education?

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Objective: To provide an overview of current issue and research literature that discusses the use of eLearning in an academic curriculum. We address several components to be examined before eLearning is incorporated into athletic training education.

Data Sources: We searched MEDLINE and Educational Resources Information Center (ERIC) from 2000 through 2002 using the key words *distance education, online learning,* and the individual research studies referenced in this article.

Data Synthesis: Educational research studies have confirmed that multiple methods in instruction delivery exist. Within the changing culture of higher education, the use of effective communication tools has been shown to increase student knowledge and skills. Through eLearning, methods of instruction design are designed to be student centered and allow the educator to become a facilitator.

Conclusions/Recommendations: Even though the use of eLearning faces many challenges in athletic training education, the research literature does support this method of instructional delivery in selected courses in athletic training education.

Key Words: cybergogy, distance education, student centered

In academic institutions, administrators, faculty, and staff are constantly faced with the challenges of gaining access to funds to support their academic programs and research agendas. The most probable ways to achieve this goal are to increase enrollment and to secure external funds. According to Duderstadt,[1] most institutions depend on several sources of revenue, including tuition and fees, state appropriations, federal research grants and contracts, gifts and endowment income, and auxiliary services such as athletics, residence halls, and campus dining programs.

In an academic culture, many challenges exist. Adult learners are trying to obtaining degrees in the face of existing difficulties including time, distance, family commitments, work-site issues, and economic barriers.[2–4] Characteristics of the college learner are changing. Additionally, the use of technology increases access to higher education programs for the nontraditional student population.[5–7]

To meet today's challenges, the growth of distance education in our colleges and universities has confronted traditional models. According to Gibson,[8] nearly 90% of institutions with an enrollment greater than 10 000 were involved in distance-education efforts. Many programs are struggling to provide adequate quality-control measures.

We focus on several eLearning issues that relate to the discipline of athletic training education. The 4 critical factors include (1) return on investment, (2) quality, (3) knowledge and skill-based learning, and (4) the effectiveness of eLearning.

DEFINING eLEARNING IN THE ACADEMIC SETTING

As terms change and become refined, many professionals are starting to transform the term "distance education" to "eLearning" when addressing technology-based instruction. Historically, distance education was first defined in the late 1800s,[9–14] and several of the components are still included in the definition today. Distance education first appeared in the United States in 1873 when Anna Tichner created the first correspondence course, which encouraged young women to study at home.[15,16] These early distance-education courses were conducted via correspondence using print media and mail services. The instructor and student were physically separated, which is still one of the pillars of today's definition of distance education.

Using the Internet to deliver instruction can be considered either eLearning or distance education. For the purpose of the article, we will use eLearning. This Web-based instructional method typically refers to those educational programs delivered to geographically separated groups and individuals via, for example, audio, video, and computer technologies.

Synchronous and asynchronous deliveries are terms associated with eLearning. With synchronous delivery, the students and instructor meet in real time. This can include traditional classroom delivery, consisting of lectures and in-class experiences, but it also includes delivery via satellite, cable, and direct broadcast of live television to students at remote sites. Videoconferencing through the use of video cameras attached

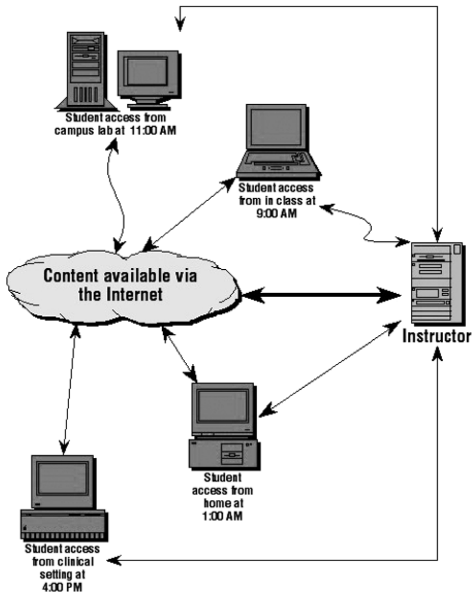

Figure 1. Asynchronous learning model.

to computer systems and various chat applications, which allow users to communicate at the same time while connected to the Internet, can also be considered synchronous. Through asynchronous learning, access can occur at any time of day and at any location and does not result from real-time contact with the instructor (Figure 1). Several variations of asynchronous instruction exist, including mailing videotapes to students, compressed video, e-mail, and comprehensive Web-based courses. The typical elements of an online course include the lecture, which can include text and video clips, graphics, useful links, downloadable files, e-mail, and areas for synchronous contact such as chat. Converting or designing a course for online delivery takes time and demands a team approach.

Through eLearning, the method of teaching changes to a student-centered culture (Figure 2). Cybergogy has become a frequently used term to define teaching via technology-based instructional programs. As student populations are being recruited to enroll in technology-based courses, faculty involvement is critical. For many faculty members, eLearning is a major shift in the fundamental roles of the instructor. Much of the course development must be done before the beginning of the class; technical skills and support are critical to the success of the class; and a shift from a presenter of information to a facilitator of knowledge is key for eLearning instruction.

Use of eLearning in the Academic Setting

Evolving technologies have made online instruction appealing and have increased interest among both the academic and the business communities.[17] Kearsley[18] noted that many users of online instruction do not take full advantage of the Internet's asynchronous potential. While traditional, synchronous instruction typically takes place in a classroom with instructors delivering lectures and students being assessed via tests and written papers, in an asynchronous format the courses provide for a more student-centered and project-based learning environment. A typical online, asynchronous course may consist of online syllabi, study guides, external research links, online assignments, threaded discussion boards, and electronic mail correspondence.

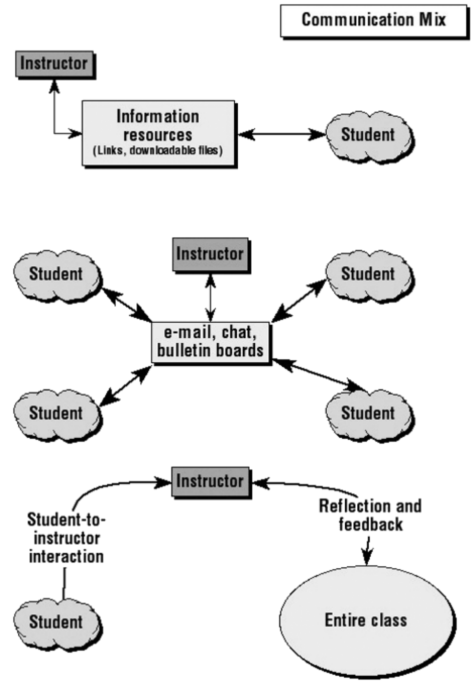

Figure 2. Student-centered learning.

In the discipline of athletic training, the delivery of online content can occur in many ways. One of the most common ways is to develop the files using an HTML (hypertext markup language) editor and then to load those files to an institution's network server. Additionally, some institutions may have templates or purchased site licenses to commercial products, such as WebCT (Lynnfield, MA) and BlackBoard (BlackBoard Software, Inc, Arvada, CO), that enable instructors to develop courses without using HTML editors. Educators routinely use collaborative learning and teamwork activities to accomplish learning objectives and to motivate and empower students. Educators have also seen the value of collaboration on research projects and now, with the evolving use of technology, can more quickly and easily collaborate with distant colleagues on other efforts, such as online instruction and serving as mentors in areas in which one colleague may feel more comfortable than another. In the Olson and Blye[19] study of distance learning of collaboration via distance, the researchers found that computing includes tools that support interactions and encourages work beyond the boundaries of physical space.

Impact of eLearning

The increased availability of technology, including the Internet, allows faculty to develop distance-education courses and to deliver content to learners who would not otherwise have the opportunity to complete courses.[2–4] As students in today's colleges and universities change from the traditional 18- to 22-year-old group to the adult learner, higher education must seek ways to build educational programs that are more appealing to these students. Currently, only 17% of students attending college are 18 to 22 years old.[1] Nontraditional learners demand that universities provide lifelong learning programs and that these programs include flexible instructional models.[20]

A frequent topic of debate related to the use of computer-based instruction is the question of effect on student learning.[8,21] The question cannot be ignored at any level of education. Do students participating in an online course perform as well as their traditional counterparts? To consider this question, we will outline thoughts related to return on investment, quality, knowledge- and skill-based learning, and the effectiveness of eLearning. While we used several sources to gather data on these issues, including questions on both faculty and student surveys, results from state and national certification and licensing examinations provide the most promising evidence regarding the outcome of eLearning.

DISCUSSION

Return on Investment: Is it Worth it?

Creative administrators have targeted distance education as a response to the economic, political, and educational changes taking place on college campuses.[22] The exploration of new technologic delivery methods to increase access to higher education in conjunction with cost-effective degree programs is a high priority for administrators.[5,6] Even upon entering college, many undergraduates are beginning to be required to own or to use computers.

Before the development of online courses is considered, it is important to determine whether the content is appropriate for online delivery. Through collaborative efforts, faculty can determine content and delivery methods. A team approach aids in conversion of online delivery. Building a team to accomplish the goal of online delivery is also important. Potential team members are content experts, instructional designers, technical support and administrative support members, and evaluators. Once a timeline is established, implementation of strategies can be assessed and whether learning is appropriate can be determined. Only through a systematic approach (analysis, design, development, and evaluation) can the return on investment be determined.

Quality: Can it be Controlled?

Concrete evidence about the quality control of distance education is readily available when one catalogs the recent rash of distance-education reports and standards. The Southern Regional Education Board[23] has created sets of quality guidelines titled *Principles of Good Practice* that constitute a checklist of criteria for an effective online program. Additionally, the American Federation of Teachers[24] recently released a report suggesting that the lack of quality control in distance education could greatly jeopardize an institution's effort to implement a quality distance-education program. Through these efforts, guidelines can be implemented to structure quality control.

The development and implementation of a quality-control system for online course delivery is a work in progress and will continue to evolve in the foreseeable future. For change related to technology integration to occur, instructors must not only acquire new skills, but they must also change attitudes and behaviors in order to function successfully in the electronic classroom.[25,26] In many ways, the issues and concerns are the same as with traditional classroom-based instruction. At the same time, assessing and ensuring the quality of online instruction requires a rethinking of some of our traditional approaches to quality control. When confirming quality, the program, institution, and accrediting bodies must agree upon the appropriate use of technology-based instruction within the discipline. Once this has been established, a continuing monitoring system addressing development, delivery, and evaluation must ensure appropriate outcomes.

Knowledge- and Skill-Based Learning: All or None?

In selected disciplines, the debate concerning the use of nontraditional learning methods will always exist. Personal preferences regarding instructional design and delivery sometimes override current research trends. With this in mind, faculty and staff should always consider the students and their current knowledge of the basic core of productivity and Internet software (ie, word processing, Web-based instructional programs, databases, browsers). Tapscott[27] noted that the baby-boom echo generation is the first generation to grow up in the digital age and, therefore, has no fear of new technologies. Thus, selected knowledge- and skill-based components might be better presented in a more appealing and convenient manner.

Faculty must understand the fundamentals of time spent on learning and its effects on retention. Also, educators should address their goals and how they can use technology to help achieve those goals in a way that traditional means cannot. Most instructors are discovering that the new generation of students is more knowledgeable and comfortable with technologies because they grew up with technology and, further, expect technology to be integrated into their educational experiences. These expectations of students will only increase.

eLearning moves the instructional model from an instructor-centered presentation model to a student-centered learning model. The instructors act as facilitators of learning, assisting and engaging students in group discussions.[27,28] Students who participate in eLearning courses expect regular interaction and feedback from the instructor.

Can the Effectiveness of eLearning be Measured?

Much research has been conducted on the quality of educational technology. According to Russell,[29] this instruction is equivalent to traditional instruction. Russell examined more than 250 research reports from 1928 to 1999, comparing traditional instruction with various forms of alternative instruction, including radio, film, open-circuit television, audiotape, closed-circuit television, audio-visual, satellite, teleconferencing, videotape, and computer-assisted instruction. In each case, the innovation was as effective as traditional instruction. Russell called this the "no significant difference phenomenon": regardless of the actual quality of traditional instruction, distance education can be just as effective.

A major difference in traditionally taught courses and distance-education courses is that in distance courses, assessment is typically performed via student-centered projects and the use of standardized tests administered online in a proctored environment.[29] Peter Ewell, of the National Center for Higher Education Management Systems, noted that higher education is moving toward outcome-based assessments and that e-Learning is leading the charge in this area.[29] Using outcome-based assessments, students are able to show learning by performance and have the ability to apply that content in a real-life component.

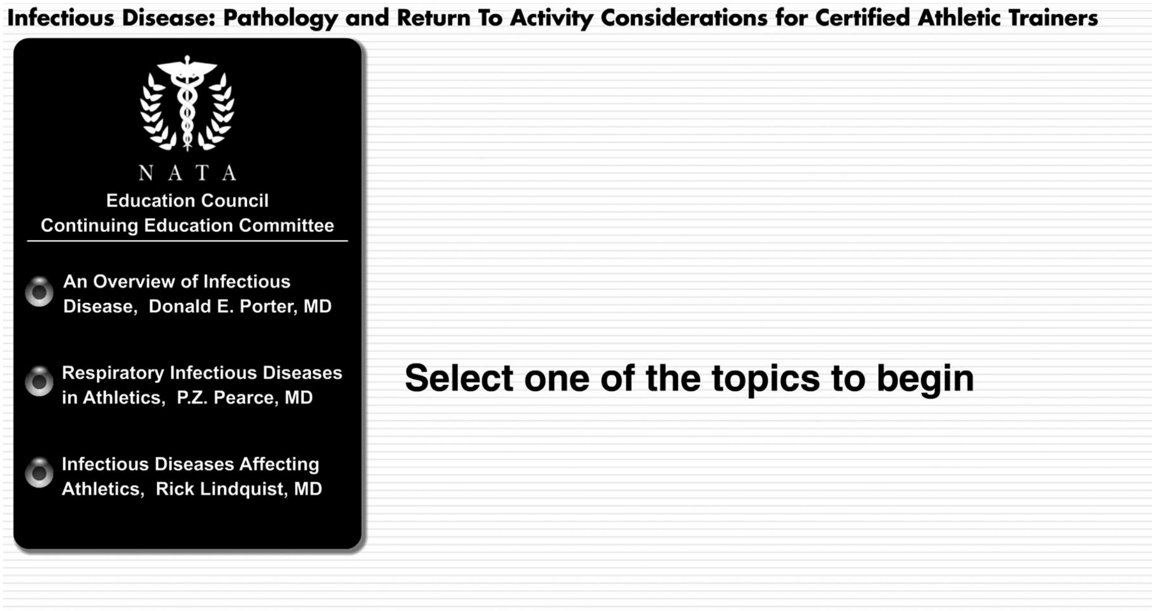

Figure 3. NATA Continuing Education Committee Web site.

eLearning in Athletic Training Education

Athletic training education through the Internet is possible. The ability to deliver multimedia content asynchronously via the Internet offers many possibilities to the athletic training educator. For example, success in the profession of athletic training requires professional education in athletic training. Students of athletic training are required to accumulate many hours of clinical experience to acquire the competencies of a National Athletic Trainers' Association Board of Certification (NATABOC) certified athletic trainer. However, for the athletic training educator, recreating realistic injury scenarios for practice purposes can be challenging. Without actual injuries, the quality and realism of the experience are limited. Well-designed multimedia via the Internet can assist in recreating realistic injury scenarios to facilitate learning and provide quality assessment opportunities.

Assessment of eLearning courses can be performed using both standardized tests delivered online and multimedia simulation and practical examinations administered by Approved Clinical Instructors. The quality of these courses is still controlled by the instructors of record at accredited institutions, but the physical location of the students is not a limiting factor because Approved Clinical Instructors (ACIs) may be located anywhere.

Using eLearning courses in athletic training education may require a standardized clinical-instructor certification, much like the current model of NATABOC practical examiner certification, which would be a shift from the current model. This allows Committee on Accreditation of Allied Health Education Programs-accredited programs to expand clinical opportunities to students to virtually anywhere in the world, provided an ACI is available to administer the clinical aspect for the student.

One of the most challenging issues facing athletic training educators today is adequately presenting all of the educational competencies within the time allotted to the curriculum. Existing eLearning modules can help the athletic training educator. For example, within the area of general medical conditions, infectious disease content must be provided to the student. In most situations, the athletic training educators either present the content or invite another health care specialist (such as a physician) into the classroom to lecture on the topic. In either case, the information is presented in a synchronous fashion and requires valuable classroom time. In contrast, the athletic training educator could use the online infectious disease resource made available by the National Athletic Trainers' Association Education Council Continuing Education Committee. (See http://www.csuchico.edu/~sbarker/CEC/virtual_library.html) Even though this Web site is intended as a continuing education resource for certified athletic trainers, the content could easily be used in the athletic training education process. The infectious disease material could be completed asynchronously as an out-of-class assignment. The athletic training educator could then decide how to incorporate the application and assessment of this content. One example would be to structure a brief, in-class discussion to allow for application of this content. This is just one example of incorporating eLearning into the athletic training education process. Many other resources such as this can be used, and many more will be available in the future (Figure 3).

CONCLUSIONS

The use of eLearning methods in the discipline of athletic training education faces many challenges. However, several allied health disciplines use distance education to deliver educational content to students. These programs are identified in the 2001 Peterson's Guide to Distance Learning Programs (http://www.petersons.com/dlearn/dlsector.html).

With the increasing emergence of technology in the world today, athletic training educators must evaluate collaborative methods. Constantly changing educational reform, revision of educational competencies, clinical documentation of learning over time, research with colleagues around the world, and maintaining up-to-date information are reasons to make effective use of technology to collaborate across distance. Technology is changing the way we deliver knowledge and skills. Distance should no longer be an obstacle for learning.

There is no turning back or minimizing the role of technology in our educational systems. As educators, we must learn to work in teams to meet the challenges of educating tomorrow's students. Representatives from the private business sectors agree that information technology has allowed them to either gain a competitive edge or to simply remain competitive. Many of us currently in the classroom did not grow up with the technologic edge our students have today; therefore, we do not have technology mentors. With this in mind, it becomes even more important to collaborate with other faculty members and to take advantage of technologic learning opportunities offered by one's institution. For changes to occur, athletic training educators need to make efficient use of technology in teaching. With so many different ways to collaborate across distance, the professional and educational growth will occur among colleagues. Through collaboration with other athletic training educators, we can expand our use of technology-based learning modules in our discipline.

REFERENCES

1. Duderstadt JJ. *A University for the 21st Century.* Ann Arbor, MI: The University of Michigan Press; 2000:1–15.
2. Dellana SA, Collins WH, West D. On-line education in a management science course—effectiveness and performance factors. *J Educ Business.* 2000;6:43–48.
3. Drury T. Learning from a distance. *Buffalo Business First.* Available at: http://buffalo.bcentral.com/buffalo/stories/2001/02/26/focus1.html. Accessed March 6, 2002.
4. Palloff RM, Pratt K. *Building Learning Communities in Cyberspace: Effective Strategies for the Online Classroom.* San Francisco, CA: Jossey-Bass; 1999:4–39.
5. Blumenstyk G. Campuses in cyberspace: Western governors will explore the establishment of a ''virtual university.'' *Chronicle of Higher Education.* 1995;42:A18–A21.
6. DeLoughery TJ. Colleges join forces to create distance-learning programs. *Chronicle of Higher Education.* 1995;42:A21.
7. Sankaran SR, Sankaran D, Bui TX. Effect of student attitude to course format on learning performance: an empirical study in web vs. lecture instruction, *J Instruct Psychol.* 2000;27:66.
8. Gibson C. *Distance Learners in Higher Education: Institutional Responses for Quality Outcomes.* Madison, WI: Atwood Publishing; 1998:85–99.
9. Billings D. *Learning Style Preferences and Distance Education: A Review of Literature and Implication for Research.* University Park, PA: American Center for the Study of Distance Education; 1991. (Eric Document ED 371–750).
10. Keegan D. *The Foundations of Distance Education.* London, England: Croom Helm; 1986:1–35.
11. Rumble G. On defining distance education. *Am J Distance Educ.* 1989; 3:8–21.
12. Schlosser CA, Anderson ML. *Distance Education: Review of the Literature.* Washington, DC: Association for Education Communications and Technology; 1994:24–29.
13. Shale D, Garrison DR. Education and communication. In: Garrison DR, Shale D, eds. *Education at a Distance: From Issues to Practice.* Malabar, FL: Krieger Publishing Co; 2000:23–36.
14. Sherry L. Issues in distance learning. *Intl J Distance Educ.* 1995;1:337–365.
15. Barron DD. Distance education: removing barriers to knowledge. *School Library J.* 1989;35:28–33.
16. Watkins BL. *The Foundations of American Distance Education.* Dubuque, IA: Kendall/Hunt; 1991:1–35.
17. Khan B. *Web-Based Training.* Englewood Cliffs, NJ: Educational Technology Publications; 1998:34–43.
18. Kearsley G. A guide to online education. Available at: http://www.gwu.edu/~etl.online.html. Accessed April 6, 1999.
19. Olson M, Blye S. The Portland Experience: a report on a distributed research group. In: Greenberg S, ed. *Computer Supported Cooperative Work and Groupware.* San Diego, CA: Academic Press; 1991:81–98.
20. Edwards R. *Changing Places? Flexibility, Lifelong Learning and a Learning Society.* London, England: Routledge; 1997:45–53.
21. Simonson M, Smaldino S, Albright M, Zvacek S. *Teaching and Learning at a Distance: Foundations of Distance Education.* Upper Saddle River, NJ: Prentice-Hall Inc; 2000:23–49.
22. Evans T, Nations D. *Reforming Open and Distance Education.* New York, NY: St Martin's Press; 1993:12–33.
23. Southern Regional Education Board. *Principles of Good Practice.* Atlanta, GA: Southern Regional Education Board; 2001.
24. Union offers warning on distance education. *Chronicle of Higher Education.* 2001;48:A39–A40.
25. Fullan M. *Change Forces: Probing the Depths of Educational Reform.* London, England: The Falmer Press; 1993:55–62.
26. Rogers E, Shoemaker F. *Communication of Innovations: A Cross-Cultural Approach.* 2nd ed. New York, NY: The Free Press; 1971:12–33.
27. Tapscott D. The new U: when your graduates are ready for college, will college be ready for them? Available at: http://www.electronic-school.com/199909/0999f2.html. Accessed November 1, 1999.
28. Carnevale D. Study assesses what participants look for in high-quality online courses. *Chronicle of Higher Education.* 2000;47:A46.
29. Russell TL. The ''no significant difference'' phenomenon. Available at: http://cuda.teleeducation.nb.ca/nosignificantdifference/. Accessed on August 25, 1999.