A Recommendation for Managing the Predicted Growth in College Enrollment at a Time of Adverse Economic Conditions

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Abstract

The purpose of this paper is to explore the option of using distance education courses as a viable alternative to building classrooms and facilities. The continued yearly growth in college enrollment is expected to hold steady for the next ten years. The continued growth in enrollment should be considered beneficial to colleges and universities, however, these facts can be deceiving. The cost of higher education is increasing at a time when federal and state funding, revenues, and endowments are decreasing. Colleges and universities are attempting to offset these conditions by increasing tuition and fees, which, in turn, are impacted by the availability of federal and state funds for student loans and grants.

One solution to the financial and physical facilities problems universities may have in dealing with the predicted economic and enrollment conditions could be found in distance education.

Introduction

The continued yearly growth in college enrollment is expected to hold steady for the next ten years. The continued growth in enrollment should be considered beneficial to colleges and universities, however, these facts can be deceiving. The cost of higher education is increasing at a time when federal and state funding, revenues, and endowments are decreasing. Colleges and universities are attempting to offset these conditions by increasing tuition and fees, which, in turn, are impacted by the availability of federal and state funds for student loans and grants.

This paper provides an overview of the current financial and cost issues associated with higher education. Comparisons of the expected enrollment, total yearly cost, and federal and state funding levels are discussed. In addition, the impact of the current market conditions on endowments and funding are examined and discussed. This paper also advances the principle of using distance learning to offset the conditions imposed by the increase in enrollment and the decrease in financial assets, and explores the requirements associated with distance learning, and compares those requirements to those of traditional education.

Enrollment and Economic Predictions

College enrollment over the next ten years is predicted to grow 1.5% to 2% each year, or 16% over the ten year period. This data was compiled from the "Fall Enrollment in Colleges and Universities Survey" conducted by the US Department of Education, National Center for Education Statistics, and provided as Appendix A. The estimated enrollment projections were computed by using the low, middle and high projections provided in the survey. The following formula was used in the computation:

Estimated Enrollment each year = (a + 4m + b) / 6, Where a = Low projections, m = middle projections, and b = high projections.

The projected enrollment numbers refer to new students enrolling for freshman level courses. The estimated enrollment is provided in Figure 1.

Figure 1. Estimated Yearly Enrollment
Source: U.S. Department of Education, National Center for Education
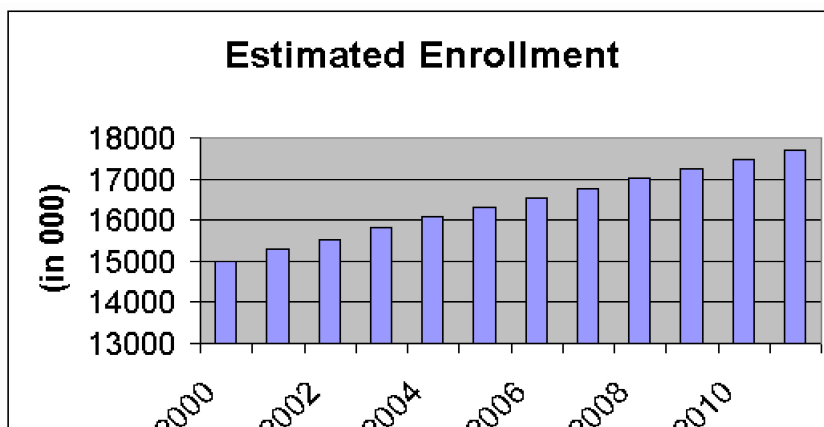
Statistics

Data from the 2000 U.S. Census indicate that the number of traditional age college students, age 20 to 24, will increase significantly through 2015, and then decline. This information is illustrated in Figure 2. This follows the general pattern of expected elementary school enrollment cycles. Total public and private elementary and secondary enrollment is projected to increase from 52.9 million in 1999 to 53.4 million in 2005. Then total enrollment is projected to decrease to 53.0 million by 2011. This data is provided in Figure 3, with the table provided as Appendix A. As illustrated in Figure 2, college enrollment will follow the same patterns through the year 2015.

Figure 3. Predicted Elementary Enrollments
Source: U.S. Dept. Of Commerce, National Center for Education Statistics,Statistics of Public Elementary and Secondary Schools; Common Core

Figure 2. Predicted College Age (20-24) Population
Source: U.S. Department of Education, Bureau of the Census
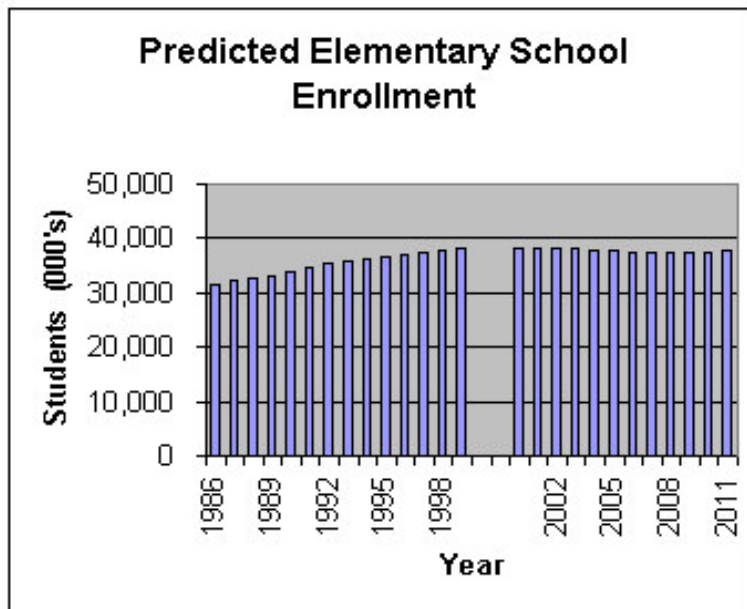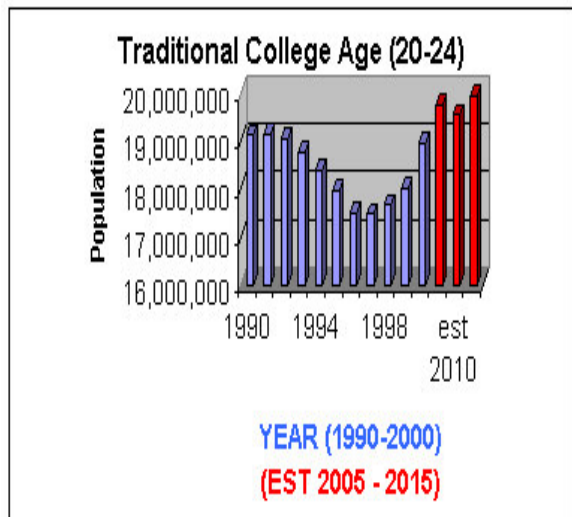
In the period from 2001 through 2011, overall college enrollment predictions indicate that 58% of the students are expected to be female, and 38% are expected to be over the age of 25. This table is provided as Appendix B. Enrollment in degree-granting institutions is projected to increase from 14.8 million in 1999 to 17.7 million by 2011, an increase of 16 percent. This table is provided as Appendix C. The enrollment rates are predicted to begin declining in the year 2015 and beyond. However, for the school year starting in 2011, the increase is significant. If an average sized institution has 10,000 students in 1999, the increase for that institution is predicted to be 1,600 students. The absorption of 1,600 additional students over a 10 year period will require significant increases in residence facilities, classrooms, faculty, and support staff. The financial impact of these additional requirements will be a major impact on budget planning and requirements.

In addition to the impact of increased enrollment, colleges and universities must also deal with the effects of the recent economic conditions. Federal and state funding have been impacted by the current economical conditions. The annual average 5 year percentage of change in appropriations of state funds for higher education from 1997 to 2002 was reported to be 6.5% (Ilstu 2002). The table is provided as Appendix D. The average percentage of change in state appropriations from 2001 to 2002 declined to 4.6% (Ilstu, 2002 a). This information is provided as Appendix E. Five states, Florida, Mississippi, Massachusetts, Iowa and Nebraska, experienced negative growth in 2002 state appropriations. In addition, nine other states reported appropriations increases less than the 2.5% needed to stay ahead of the expected rate of inflation. In addition, the funding rate of grants provided by the National Science Foundation decreased 5% to 27% for the year 2002. The funding rate had averaged 32.5% for the previous 4 years (NSF, 2002).

The economic conditions have also had a negative impact on grants and endowments. The average college endowment fund has lost value over the past two years. In 2001, the average college endowment decreased in value by an estimated 3.6%. This figure includes growth from gifts and returns on investments, as well as reductions from expenditures and withdrawals (Pulley, 2002). This is illustrated in Figure 4.

Figure 4 AVERAGE RETURNS, 1998-2001
Source: The Chronicle of Higher Education, Pully, J. For Investment Managers, Boom Years Are Over, 25 January 2002
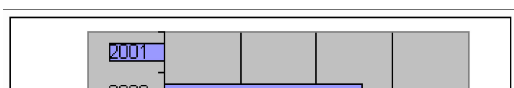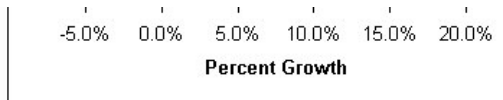
The economic downturn in endowment revenues, lower state funding, and reduced gifts and grants have come at a time that institutions should be preparing for significantly higher student enrollments. These conditions have resulted in an average increase in tuition and fees of 7.7% at public four-year institutions, and 5.5% in four-year private schools in 2001. This trend is expected to continue for the 2002-2003 academic year. The out of state cost at four-year colleges increased in 2001 to $5,764, compared with a $5,510 cost in 2000. The increase in tuition and fees has raised the total number of institutions that cost over $100,000 for four years to 67, an increase from 32 institutions in 2000 (Brownstein, 2001). This increase in tuition has caused a similar increase in the number of students that apply for financial aid. An estimated 60% of the 1999-2000 graduates from public four year institutions had taken out student loans. Of the 60%, the average cumulative student loan debt was $16,100. (NPSAS, 2000) The average yearly cost of attendance at a four year public university in 2001 was $11,976. This included tuition, fees, room, board and expenses. The same cost for a private 4 year college was $26,070 (Brownstein, 2001).

Purpose

One solution to the financial and physical facilities problems universities may have in dealing with the predicted economic and enrollment conditions could be found in distance education. The purpose of this paper is to explore the options of using distance education courses as a viable alternative to building classrooms and facilities. The growth in distance learning (DL) and Internet based education is changing the face of traditional education. The technology advances allow educators to eliminate space and physical facilities requirements, and to eliminate class size limits. For the purpose of this paper the definition of distance learning, also sometimes referred to as distance education, will be taken from the 2001 proceedings of the Commission on Technology and Adult Education, American Society for Training and Development, National Governors' Association. That council defined distance learning, or e-learning, as any instructional content or learning experiences delivered by electronic technology. Distance learning technologies include internet / intranet, video and video teleconference, satellite, email, chat room, and other synchronous and asynchronous processes.

The status and acceptance of distance education varies within each school system. Maryland can be assumed to offer a typical example of distance education programs. In the 2000 academic year, Maryland colleges offered 2,135 credit courses on-line, with 53,194 enrollments. Maryland also has 14 colleges that offer 50 degree programs either primarily or entirely on-line (MSHEC, 2000). This commission also reported a digital divide in the state's colleges and universities. Generally smaller private schools, smaller public colleges, and community colleges have not invested in distance education.

Review of the Literature on Distance Learning

Research on distance learning and Internet based education is in the early stages of development. Many terms are used to refer to distance learning, such as distance education, distance learning, and e-learning. The published studies tend to investigate the technologies and methods used in the development of these courses. There are some studies that examine the role of educators in the development and implementation of distance education. Others address the effectiveness of electronic and other forms of distance education.

Effectiveness of Distance Education

Numerous studies have been completed on the effectiveness of distance education. Most of these studies attempt to compare the final grades of students in distance learning classes to students in traditional classes (Souder, 1993). Many studies have concluded that correspondent students perform as well as students in traditional classrooms (Bui & Sankaran, 2001). Snell (2001) examined research published on distance learning, beginning with correspondence courses through today's Internet courses. Another study compared the grade results of two groups of graduate students, one in traditional education and the other using satellite broadcasting technologies (Souder, 1993). This study reported that distance learners outperformed students in the traditional classroom settings. Based on a literature review, Porter advanced the theory that distance education is at least as effective as that of traditional lectures (Clemens, Duin, & Starke-Meyeering, 1999). Burnham and Wilkes (1991) provided the most logical conclusion to the debate on the effectiveness of distant education. They advanced the theory that "Good distance teaching practices are fundamentally identical to good traditional teaching practices, and those factors which influence good instruction may be generally universal across different environments and populations."

The trend of most research studies in this area is to use the traditional lecture method of instruction as a benchmark for comparison. Weigel (2000) stated in his article "the 'no significant difference' theory may represent the most egregious application of benchmarking in the past 20 years." This article discussed the tradeoff between richness and reach in distance education. He defines "richness" as the overall quality of information provided, for example currency, accuracy, interactivity and relevance. He uses the term "reach" to refer to the number of people involved in the exchange of the information. In traditional education, the tradeoff between richness and reach is cost. The institutions must balance the cost of richness, or depth, of the traditional course with the cost associated with expanding the reach outside of the traditional area market. With Internet technologies, the additional costs of expanding the reach outside of the traditional market are reduced. Marchese (2000) believes that the search for richness does not impact upon the search to improve reach.

There has also been a movement in the past few years to establish quality analysis to distance learning. Gilroy, Long, Tricker, and Rangecroft (2000) provide a model template to measure student satisfaction of their learning experiences in the distance learning process. This study was based on a template designed to measure customer satisfaction in service industries (Staughton & Williams, 1994). The template is designed to measure the gap between what students are looking for, and what they experience. This method addresses such areas as student perception and satisfaction. Another group of researchers developed a parsimonious model that can be used to evaluate the relative quality of distance education (Dominguez & Ridley, 2001). This study questioned the effectiveness of distance education in preparing students for further study, by shifting the emphasis from student level data to course based data. This study reported that preparation for advanced courses was statistically equivalent whether the prerequisites were taken on line or in a traditional classroom environment. This study went beyond the comparison of grade point averages in like courses to measuring student performance in upper level courses that required knowledge covered in the prerequisites. This study was conducted using courses offered between 1994 and 1997. A potential problem area in the study was the final number of students used. The researchers were able to identify 50 student records that could be used. This number could be considered

insufficient to justify the advancement of these outcomes to a general population.

Other education professionals also have indicated negative results in studies conducted on Internet based educational programs. One such study urged caution in the development and advancement of distance learning programs and platforms (Marett, Miller, Pearson, & Salisbury, 2002). They expressed the concern that the high technology and development cost may impact on the traditional academic programs. Their study reported perceptions of students in the distance learning setting were less favorable than the local setting for traditional classes.

Another variable that has been considered is the inability of distance education to influence the social growth of students (Armstrong, 2000). Armstrong provides a strong argument that traditional education provides an important function in the social growth of students. The traditional residential college experiences contribute to student education by focusing on the social structure, building peer networks, and advancing social responsibilities. Distance education courses do not provide the same opportunities and services. Armstrong also advances the theory that Internet based distance learning is more attractive to continuing professional educational adults and students looking for a quick and efficient way of completing their degree. This attraction has placed public universities into direct competition against for profit organizations.

Many universities, such as University of Maryland, University College and Phoenix University, have entered into this competition. Armstrong discusses the choices that universities have to make to retain market share, and the legal issues involved in the development of Internet based courses. The percentage of older students enrolled in higher education organizations has increased from 32% in 1989 to 59% in 1999 (Antonucci & Cronin, 2001).

In a recent article published on the website Distance-Educator.com, Brian Morgan (2002) reported that some of the greatest concerns in the area of online courses, retention and equality of content, has been resolved. Retention rates in online courses at many institutions, including Marshall University, are in the 70% range and accrediting agencies, such as The Association to Advance Collegiate Schools of Business, (AACSB), are accepting online courses as an acceptable form of delivery.

Development and Implementation Issues

Distance education has existed in some form for many years. Correspondence courses, television, video, Internet based, and interactive, two-way video presentations are part of the history of distance education. The process of distance education has been defined as providing a structured learning environment that involves the separation of parties over distance and/or time (Carter, 2001). Student success in distance education depends on the quality of course design, instructor presentation, course interaction, equipment and technology. One of the major issues in developing an effective Internet based course is the ability of current faculty to perform in this environment. Internet technologies have been growing since the early 1990's. There exist different levels of computer skills and abilities in all faculties. The levels of computer and technology efficiency in most universities are inversely correlated with faculty age and academic experience. (Lan, 2001). Faculty technology experience can be used as a predictor of potential participation in technology based instruction.

The demographics of the typical student body is changing, from students pursuing their first degree, to experienced students working to either change careers or add a new endorsement. This change is forcing universities to develop complete degree programs for on-line delivery. These schools have to develop facilities and environments that use the latest technologies to challenge student learning and attract new students (Ferrell, Lowell, Persichitte, & Roberts, 2001).

Regardless of the technology used for delivery, effective distance education still requires students and teachers to engage in discussions and dialogue (Caverly & MacDonald, 2001). The communication process required for on-line courses is no different from that of traditional classes. The process requirements include access, motivation, socialization, and information exchange. Universities must also be aware of the effects of technology, constraints, and the reputation of their schools on the effectiveness of distance learning (Anakwe, Christensen & Kessler, 2001). This requirement is often not addressed in the initial development and implementation of the distance learning process. As technology advances, the student – teacher contact will become more important.

Development of distance education courses, to include Internet based instruction, involves three processes: outcome and course content analysis, course design, and pilot testing (Ferguson & Wijekumar, 2000). The outcomes and course content analysis should be based on student preferences and learning styles, in addition to recommendations from the subject matter experts. Once content and audience is selected, the method of delivery should be defined. In the design process, courses should be developed that focus on cognitive learning theories. Influences in cognitive learning that should be addressed include student attitudes, values, knowledge, skills, and experience (Notar, Ross, & Wilson, 2002). The final process is pilot testing. Each course developed should be tested in the format it was designed to operate in. Testing should include both content and delivery systems.

These articles were selected as representative of the current literature available on the subject. Most of the studies are based on snap shot views that compare the grade point averages of students in traditional education against those in distance learning programs. These studies support the theory that distance education, regardless of delivery format, is as effective as the traditional classroom or lecture method. There is sufficient need for additional research to determine the most appropriate types of courses to offer and the demographics of the target audience that benefits best from distance education formats.

Implementation Issues

By establishing distance learning courses, universities can position themselves to overcome the barriers imposed by the current economic conditions, and eliminate the requirement to construct new or additional classrooms and support services to accommodate the increased enrollment. This paper recommends that distance learning, or internet based courses, be offered to supplement the traditional classroom instruction, not replace it.

As the number of students enrolled increases, the need to offer additional sections of core classes will increase. To reduce the additional amount of facility requirements, sections of each core course could be offered, on line, in addition to the traditional classroom. Using this system, a student may in fact have a mixture of in-class and on-line courses during the semester. The academic faculty could also have a mixture of traditional and on-line courses.

The student could benefit by taking the online courses that provide the most comfort, while benefiting from the in-class experience in their other courses. Students that have a higher level of maturity, and are comfortable using computer technology would benefit most from these courses. For students that find they need additional information, they have the same availability to the instructor as traditional classes. This method provides some benefits to the instructor as well. The instructor may be able to identify students that have mastered the subjects early, and could concentrate on those that require additional assistance. In addition, the student still benefits from the traditional social environment that is required for advancing social responsibilities and peer networks (Armstrong, 2000).

In addition to the possibility of gaining new students outside their area of influence, institutions could benefit by avoiding the cost of acquiring new facilities. Even if funds were available, the time frame for most major construction projects is extensive. In most cases, the predicted bubble in enrollment will be declining prior to the completion of the construction process.

The establishment of a distance learning program does, however, involve some cost (Threlkeld & Brzoska, 1994). Development and implementation cost will vary across universities, based on their current technology programs. Components that should be factored into the decision to implement a distance learning program include:

Technology: Hardware and software requirements

Transmission: On going expense associated with transmission systems

Maintenance: Repair and maintenance of equipment, to include lifecycle cost

Infrastructure: Network and telecommunications infrastructure on campus

Production: Technological and personnel support required to develop teaching materials.

Support: Miscellaneous expenses, administrative cost, and overhead cost

Personnel: Staff support for all functions

These costs could also be associated with traditional education courses. Most institutions now have the technology, infrastructure, support and personnel to accommodate the development of distance learning courses. In addition, most universities have both internet and intranet services online, supported by full service IT departments. With the advance and popularity of software packages, such as Blackboard5, WebTV, and Serf, software development cost is no longer a major issue. In addition, these software packages can be fully utilized with little formal training. Once developed, most courses can be offered again and again with little modification, thereby lowering development cost. The maintenance and transmission cost could increase, based on usage of the systems. These costs, along with other miscellaneous support and overhead cost, would be directly proportional to student enrollment and use.

Other Issues

The decision to use Distance Learning also requires consideration be given to other issues. These issues include faculty availability and training, course development cost, copyright laws, course enrollment limits, technology availability to students, and course selection.

In developing effective distance learning courses, institutions must establish policies to manage the course development. The need for additional faculty will be present, both for traditional courses and internet based courses. The increase in enrollment will determine the need for additional faculty, not the method of course presentation. These polices should help define the role and responsibility of the Distance Learning faculty, along with training policies and guidelines. These polices should also address issues such as class size limits, preparation time, and course development cost. When discussing copyright policies, decisions should be made regarding ownership of course material and other copyright issues.

Courses selected for Distance Learning should be selected based on learning objectives, teaching methods, and course content. There are sufficient numbers of institutions offering on-line courses to use for benchmark comparisons. In addition, colleges and universities must provide sufficient technological resources to support students enrolled in the Distance Learning courses. This support ranges from sufficient computers and workstations to allow student access, to help desk and support services. Most colleges and universities have student computer labs, library computer labs, and other support services that provide technical and support services.

Conclusion

This paper advances the recommendation that universities and colleges combine the use of distance learning technologies with traditional classroom courses. This recommendation is offered as an alternative method of providing quality educational courses and services over the next decade. The expected increase in enrollment over the next ten years, hampered by the decline of available financial resources, will place a strain on most colleges and universities. College enrollment is expected to grow by 16% over the next decade, then decline. The additional enrollment will require additional funds beyond tuition and fees. This increase is occurring at the same time federal and state governments are cutting back on educational funding programs. In addition, federal grants for research programs are decreasing. Another adverse effect of the economic downturn is the performance and growth of endowment funds. In addition to decreased numbers of new grants and endowments, colleges and universities are seeing a drastic decline in the value of endowment funds. In 2001, the average endowment fund decreased in value by 3.6%.

In an attempt to offset these financial conditions, colleges and universities have increased tuition and fees. Public four year institutions increased tuition and fees by 7.7% in 2001, while private four year institutions increased tuition by 5.5%. This resulted in an average cost of attendance to a four year public university of $11,976. The cycle continues, as more students decide to attend schools in their home state, and are forced to apply for some type financial aid. 60% of the 2000 graduates from public four year institutions had student loans, with an average cumulative student loan debt of $16,100.

This paper recommends the focus of distance education programs be targeted to on-campus traditional students. Students would enroll in a combination of internet / intranet courses and traditional lecture based courses. By utilizing Distance Learning, or internet based courses, colleges and universities can offset the impact and effects of the current economic conditions, while providing quality educational services to manage the predicted growth in enrollment". Courses can be offered in both online and traditional formats, which will help reduce the impact of the facility limitations, while continuing to provide quality instruction. By augmenting the traditional classroom instruction with internet / intranet based instruction, the universities, faculty and students benefit.

Appendix A

Appendix B

Appendix C

Appendix D

Appendix E

Reference List

Anakwe, U., Christensen, E., & Kessler, E. (2001). "Receptivity to Distance Learning: The Effects of Technology, Reputation, Constraints, and Learning Preferences". *Journal of Research on Computing in Education.* 33. 263-280.

Antonucci, R., & Cronin, J. (2001). "Creating an Online University". *Journal of Academic Librarianship*. 27. 20-24.

Armstrong, L. (2000). "Distance Learning: An Academic Leader's Perspective on a Disruptive Product." *Change*. 32. 20-28.

Brownstein, A. (2001). "Tuitions Rise Sharply, and This Time Public Colleges Lead the Way". *The Chronicle of Higher Education.* 10.

Brzoska, K. & Threlkeld, R. (1994). "Research in Distance Education". In B. Willis (ED.), *Distance Education: Strategies and Tools.* Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Bui, T., & Sankaran, S. (2001). "Impact of Learning Strategies and Motivation on Performance: A Study in Web-based Instruction." *Journal of Instructional Psychology*. 28. 191-199.

Burnham, B. & Wilkes, C. (1991). "Adult Learner Motivations and Electronics Distance Education". *The American Journal of Distance Education.* 5. 43-50.

Carter, A. (2001). "Interactive Distance Education: Implications for the Adult Learner." *International Journal of Instructional Media*. 28. 249-261.

Clemens, L., Doreen, A., & Starke-Meyeering, D. (1999). "Review of Creating the Virtual Classroom]." *Journal of Business & Technical Communication*. 13. 101-102.

Dominguez, P., & Ridley, D. (2001). "Assessing Distance Education Courses and Discipline Differences in Their Effectiveness." *Journal of Instructional Psychology*. 28. 15-20.

Ferguson, L, & Wijekumar, K. (2000)."Effective Design & Use of Web-based Distance Learning Environments." *Professional Safety*. 45. 28-33.

Ferrell, K., Lowell, N., Persichitte, K., & Roberts, S. (2001). "The Evolution of a Distance Delivery System That Supports Content, Students, and Pedagogy." *Journal of Visual Impairment & Blindness*. 95. 597-609.

Gilroy, P., Long, P., Rangecroft, M., & Tricker, T. (2000). "Satisfaction With Distance Education; Evaluation of a Service Template." *Total Quality Management.* 11. 530-537.

(Ilstu) Illinois State University, (2001). http://www.coe.ilstu.edu/grapevine/50state.htm

Lan, J. (2001). "Web-based Instruction for Education faculty: A Needs Assessment". *Journal of Research on Computing in Education*. 33. 385-400.

Marchese, T., (2000)." Learning and E-Learning". *Change*. 33. 4.

Marett, K., Miller, D., Pearson, R., & Salisbury, W., (2002), "The Limits of Information". *e-Service Journal*. 1. 65-83.

(MSHEC) Maryland State Higher Education Commission, (2000). http://www.mdarchives.state.md.us

Morgan, B. (2002). "Is Distance Learning Worth It? Helping to Determine the Costs of Online Courses", http://www.distance-educator.com/recent_articles/onlinecost.html

Notar, C., Ross, K., & Wilson, J. (2002). Distance Learning for the Development of Higher-Level Cognitive Skills. *Education*. 122. 624-649.

(NPSAS) National Postsecondary Student Aid Study. (2000). *U.S. Department of Education*, National Center for Education Statistics. Washington DC

(NSF) National Science Foundation (2002) "Funding rate by State and Organization, http://dellweb.bfa.nsf.gov/awdfr3/state.asp

Pulley, J. (2002). "For Investment managers, Boom Years Are Over". *The Chronicle of Higher Education.* 20.

Snell, J. (2001). "Distance Learning: Observations." *College Student Journal.* 35. 258-260.

Souder, W. (1993). "The Effectiveness of Traditional Verses Satellite Delivery in Three Management Technology Master's Degree Programs." *The American Journal of Distance Education.* 7. 37-53.

Staughton, R., & Williams, C. (1994). "Towards a Simple, Visual Representation of Fit in Service Organizations; The Contribution of the Service Template." *International Journal of Operations and Production Management.* 14. 76-85.

Weigel, V. (2000). "E-Learning and the Tradeoff Between Richness and Reach in Higher Education." *Change.* 33. 10-16.

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