The Relationship of Institutional Distance Education Goals and Students' Requests for Accommodations

Lucy Barnard-Brak
Valerie Paton
Texas Tech University

Tracey Sulak
Baylor University

Abstract

Institutional distance education goals reflective of policy can have an impact on practice. These goals have been noted as possibly being associated with improving access and outcomes for students with disabilities. The purpose of this study is to re-examine the association of institutional distance education goals with the frequency in which students with disabilities request accommodations in courses offered at a distance; it consists of a nationally representative sample of institutions of higher education. Results indicate a positive and significant relationship between institutional distance education goals and the frequency with which students with disabilities request accommodations in online courses

Keywords: Disability, higher education, distance education, accommodations

Institutional distance education goals can ostensibly impact the enrollment of students taking these course offerings, including but not limited to non-traditional student populations such as students with disabilities. Despite research indicating positive outcomes associated with distance learning opportunities for students with disabilities (Brown, Crosby, & Standen, 2001; Barnard-Brak & Sulak, 2010), the intersection of disability and distance education has received limited examination in the research literature. Singh, O'Donoghue, and Worton (2005) echo this sentiment indicating numerous possibilities for college students with disabilities given the flexible and dynamic nature of e-learning or distance learning via the Internet. Singh et al. (2005) further suggest that distance education courses delivered via the Internet are restructuring traditional models of higher education in creating new expectations for students, instructors, and institutions themselves. These new expectations lend to the formation of new goals for institutions of higher education with respect to distance education and disability.

An examination of institutional goals with respect to the intersection of distance education and disability is particularly warranted given that students with disabilities continue to experience barriers to participation in courses delivered online (Edmonds, 2004). Edmonds (2004) notes that the presence of these barriers may be attributable to the "…patchwork of federal and state laws" (p. 51) that apply to persons with disabilities and the delivery of distance education. This patchwork can create unwanted complexity in the delivery of distance education to individuals with disabilities. As early as 1998, projects like the Campus Computing Project were tracking the use of computers in higher education and identifying gaps in technology utilization in distance education, such as the lack of long-term institutional goals to direct the budgets in technological infrastructure (Green, 1999). Edmonds (2004) concluded that institutions of higher education must be proactive in improving accessibility for students with and without disabilities to, "avoid costly litigation and offer online distance education courses that are more usable...," (p. 60). In view of Edmonds (2004), the examination of institutional distance education goals becomes all the more important given this call to proactive leadership in forming these goals.

Section 504 of the Vocational Rehabilitation Act of 1973 and the Americans with Disabilities Amendments Act (ADAAA) of 2008 require institutions of higher education to provide equal access to all programs, including online programs, for persons with disabilities if these institutions accept federal funding (Edmonds, 2004). Moisey (2004) found the rate of participation in online courses for persons with disabilities was lower than expected, a finding that may be reflective of issues of access. This may also reflect the lack of appropriate accommodations for students with disabilities, as postsecondary institutions are also required by law to provide reasonable academic accommodations for students with a disability (United States Government Accountability Office [GAO], 2009). As Edmonds (2004) noted, the regulations guiding the provision of accommodations are not specific and may be implemented by an institution on a case-by-case basis, which leaves ample room for a university-specific translation of the terms "access" and "accommodation." While online courses appear to offer increased access for students with disabilities, case studies like Moisey (2004) suggest this access may be illusory.

Institutional distance education goals through Disability Services offices have been indicated as improving the learning experiences of college students with disabilities in distance learning (Moisey, 2004). Although institutions of higher learning are legally obligated to provide equal access to online programs for otherwise-qualified persons with disabilities, these requirements only extend to issues of access and do not include issues related to modifications of curriculum (Edmonds, 2004). Disability Services offices serve a disability-specific function and attempt to help instructors adapt distance learning environments to the needs of the student with the disability through reasonable accommodations. Adaptations of the distance-learning environment are reflective of increased access and this increased access may translate into increased student participation. Moisey (2004) concluded that disability-specific support services can only enhance student success on an individual basis whereas institutions of higher education have the power to effectuate policy and set goals to improve outcomes for students with disabilities as a whole.

Moisey (2004) makes an important distinction between access and success for students with disabilities in higher education. Institutions of higher education must provide equal access to distance education for students with disabilities so that disability-specific services may enhance their opportunities for success. While the issue of access is legally mandated, disability-specific accommodations are only suggested and the institution of higher education may use discretion when provided these (GAO, 2009). Due to the vague nature of legal requirements for higher education with respect to disabilities, institutional goals regarding disability-specific accommodations may help ensure that all students receive the support necessary for success. Establishing clear institutional goals focused on bringing the promise of technology in line with the realities of distance education may help create a more service-based information technology (Green, 2003). In view of Moisey (2004), institutional distance education goals can ensure that students with disabilities find the "doors" (p. 90) to success.

In studying the intersection of distance education and disability, Kim-Rupnow, Dowrick, and Burke (2001) considered whether the increase in distance education course offerings at institutions of higher education resulted in better access and outcomes for students with disabilities. As a part of research undertaken through the National Center for the Study of Postsecondary Educational Supports, Kim-Rupnow et al. (2001) reviewed current literature to illustrate several themes of interest in distance education and included journal articles published prior to 2001 that represented the intersection of distance education and disability accommodations in postsecondary education. The majority of studies reviewed by Kim-Rupnow et al. (2001) are case studies or small group studies, a factor that limits the application of the results to a broader setting (Flyvbjerg, 2006). The findings of the study are also limited by the research available in 2001 and indicate the need for more studies about distance education and persons with disabilities. From their examination, Kim-Rupnow et al. (2001) indicated a positive relationship between increased emphasis on distance education through strategic planning and goals at institutions of higher education and an increased access to curriculum for students with disabilities at their respective institutions as identified through three main themes: learner characteristics, trends in technology, and support services for individuals with disabilities.

In reviewing the work of Kim-Rupnow et al. (2001), however, Kinash, Crichton, and Kim-Rupnow (2004) noted that this question of a relationship between increased emphasis on distance education and

increased access for students with disabilities had been answered "inconclusively due to the paucity of research" (p. 10). Kinash et al. (2004) also alluded to the theme of increased access leading to better education outcomes for learners with disabilities because increased access should lead to the use of principles such as Universal Design. Issues of access are addressed in the design phase of a course when the principles of UD are implemented as opposed to the current policy of providing accommodations retroactively to students who may have limited access to a course due to a disability (Burgstahler, 2006).

The purpose of the current study was to re-examine this relationship by investigating the association between distance education institutional goals aimed to improve distance education outcomes and how often students with disabilities enroll in these distance education courses and request accommodations at their respective institutions. It should be noted, though, that an increased application of the principles of UD may minimize the need for students to request accommodations. The current study may be distinguished from previous literature based upon two characteristics: (1) the nature of the sample to be analyzed, and (2) the variables we were able to include in our analyses. First, the current study consisted of a nationally representative sample of institutions of higher education. Second, in re-examining the research question of Kim-Rupnow et al. (2001), the current study provided an additional examination of this relationship by including the impact of institutional distance education goals as evaluated by their institutionally-estimated importance and whether they were met according to the institutions in our analyses. These institutional goal evaluation variables examined not only institutional policy but how institutions perceive their policy and practice. In short, we hypothesized that, as institutions evaluate distance education goals as important and meet those goals as reported by them, students with disabilities would appear to experience enhanced access from this increased emphasis.

Method

Participants

The study consisted of a sample of 1,591 institutions of higher education across the United States collected as part of the Postsecondary Education Quick Information System (PEQIS) developed by the National Center for Education Statistics ([NCES], 2005). These 1,591 institutions were sampled to represent a total population of 4,130 Title IV-eligible, degree-granting institutions across all fifty states, including the District of Columbia, based upon institutional characteristics data from the Integrated Postsecondary Education Data System (IPEDS). From the sampling frame of the 4,130 institutions, these 1,591 institutions were selected according to institutional characteristics such as institutional type, Carnegie classification, degree of urbanization, whether the institution may be classified as minority serving and whether the institution has graduate degree programs to represent the population of institutions of higher education in the sampling frame. Approximately 12.87% (n = 193) of the institutions sampled identified themselves as minority-serving. Approximately 48.6% (n = 729) of the institutions of higher education sampled had graduate degree programs while 51.4% (n = 771) of the institutions sampled did not have graduate degree programs. Table 1 contains the summary statistics for institutional type, Carnegie classification, and degree of urbanization variables that reflects national characteristics. These institutional demographic variables were not significantly related to the outcome variables of interest in the current study and thus were not included in our model.

Table 1

Institutional Summary Statistics

Institutional Type	Frequency	Percentage
Public, Two-year	505	33.67%
Private, Two-year	98	6.53%
Private, Four-year	395	26.33%
Public, Four-year	502	33.47%
Carnegie Classification		
Doctoral	208	12.87%
Master's	317	21.13%
Bachelor's	184	12.27%
Associate	585	39.00%
Specialized	116	7.73%
Other	90	6.00%
Degree of Urbanization		
City	760	50.67%
Urban Fringe	390	26.00%
Rural	319	21.27%

Instrumentation

Data were collected as part of the *Distance Education at Postsecondary Education Institutions* survey, a dataset from the PEQIS (NCES, 2005). Please refer to the Appendix B for a screen shot of the survey. As such, each participating institution was asked to identify a campus representative to serve as survey coordinator. This survey coordinator would then identify the appropriate respondent to complete the survey. These respondents were administrators who were considered as being the most knowledgeable and having the most access to information about their institutions' technology and distance education course offerings and programs, including those with respect to students with disabilities. Relevant administrators were encouraged to consult with any departments, offices, or personnel at their institution in responding to the survey.

As part of the survey study, relevant administrators were asked to estimate the frequency with which students with disabilities requested accommodations in distance education course offerings during the previous three years (i.e., 2002-2005) for the institution as a whole. This item, which estimates the frequency with which students with disabilities requested accommodations in distance education courses according to the relevant institutional administrators, consisted of a

4-point, forced choice format with responses ranging from "never," "occasionally," "frequently," to "don't know." Responses of "don't know" were subsequently treated as missing data in our analysis. Table 2 contains the eight survey items concerning institutional distance education goals analyzed in the current study. Relevant administrators at the sampled institutions of higher education rated the importance of each of these eight distance education goals at their institution as being "not important," "somewhat important," or "very important." Then, the same administrators were asked the extent to which each of the goals was met as being "not at all," "minor extent," "moderate extent," or "major extent." Importance of the goals and the extent to which the goals were met were estimated as two separate, latent variables, which composed the higher, second order latent variable that estimated the overall evaluation of the goals. Confirmatory factor analyses of these two, separate latent variables indicate evidence towards the construct validity of them with Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) values ranging from .96 to .98 and Root Mean Square Error of Approximation (RMSEA) values being less than .05. To examine the reliability of the survey items, an internal consistency of scores of $\alpha = .83$ and $\alpha = .91$ was achieved for the latent variables of 'goal importance' and 'goal met' respectively.

Procedure

Analyses were performed in M*Plus* (v. 5.10) (Muthén & Muthén, 2008). Missing data for scores were analyzed using full information maximum-likelihood (FIML) as the method of estimation. As an extension of maximum likelihood, FIML takes advantage of all possible data points in analysis. Enders and Bandalos (2001) indicated that full information maximum-likelihood is superior to listwise, pairwise, and similar response pattern imputations in handling missing data that may be considered ignorable. Missing data accounted for less than 10% of all cases. Weights were employed in M*Plus* (v. 5.10) to produce accurate population estimates based upon sample characteristics by accounting for sampling errors due to random discrepancies between the true population and sample achieved.

Analysis

Structural equation modeling was performed to examine how the goals as evaluated as a function of goal importance and the extent to which goals were met, were related to the frequency with which students with disabilities requested accommodations in distance education course offerings. Structural

Table 2

Survey Items

Distance Education Goal Items
Q7A: Reducing institution's per-student costs.
Q7B: Making educational opportunities more affordable for students.
Q7C: Increasing institution enrollments.
Q7D: Increasing student access by reducing time constraints for course taking.
Q7E: Increasing student access by making courses available at convenient locations.
Q7F: Increasing the institution's access to new audiences.
Q7G: Improving the quality of course offerings.
Q7H: Meeting the needs of local employers.

equation modeling may be considered a means of testing conceptual models by specifying relationships among latent and observed variables. Latent variables refer to those variables represented by circles and are considered comprised of observed or measured variables represented by squares. Hence, responses to measurable goals as identified through the survey in the current study were utilized to estimate the two latent or unobservable variables of "goal importance" and "goal met." These two latent variables were utilized to estimate a higher order latent variable of "goal evaluation." We then examined the association of "goal evaluation" on the frequency with which students with disabilities requested accommodations while statistically controlling for the number of distance education offered. Refer to Figure 1 for this conceptual model and Appendix A for more information regarding structural equation modeling and its applications. In performing our analyses, five statistics reflecting fit were reported: the chi-square ($\chi 2$) test statistic; the ratio of chi-square statistic to degrees of freedom; the RMSEA; the TLI, also known as the Non Normed Fit Index (NNFI); and the CFI as appropriate.

Results

In evaluating model fit, the chi-square goodness-of-fit statistic was significant, indicating that the data may not fit the model, $\chi 2(100) = 250.92$, $p < .05$. The chi-square statistic has been indicated as being sensitive to sample size, thus an adjunct discrepancy-based fit index may be used as the ratio of chi-square to degrees of freedom ($\chi 2/df$). A $\chi 2/df$ ratio value less than 5 has been suggested as indicating an acceptable fit between the hypothesized model and the sample data (MacCallum, Brown, & Sugawara, 1996). With a $\chi 2/df$ ratio value of 2.51, the proposed model may have an acceptable fit. The RMSEA compensating for the effects of model complexity was 0.037, which according to Browne and Cudek (1993) indicates an acceptable fit of the model being less than or close to 0.05. The value of TLI, also known as the NNFI, was .960, and value of the CFI was .971. Hu and Bentler (1999) note that fit index values of .95 (or better) are indicative of good fit. Figure 1 contains the path diagram for the association between the evaluation of distance education institutional goals and frequency in which students with disabilities request accommodations.

After establishing model fit, the model can then be examined with respect to individual path values. In our analyses, we statistically controlled for the number of courses offered at a distance on the frequency with which students requested accommodations given that as the number of courses offered at a distance increase at an institution, the frequency of requests for accommodations in these distance education courses would logically also increase. In modeling the number of courses offered at a distance as a covariate, this variable was positively associated with the frequency in which students requested accommodations for courses offered at a distance with a standardized path coefficient of .15 ($p < .01$). The relationship of institutional distance education goals as evaluated for their importance and how these goals were met as it relates to the

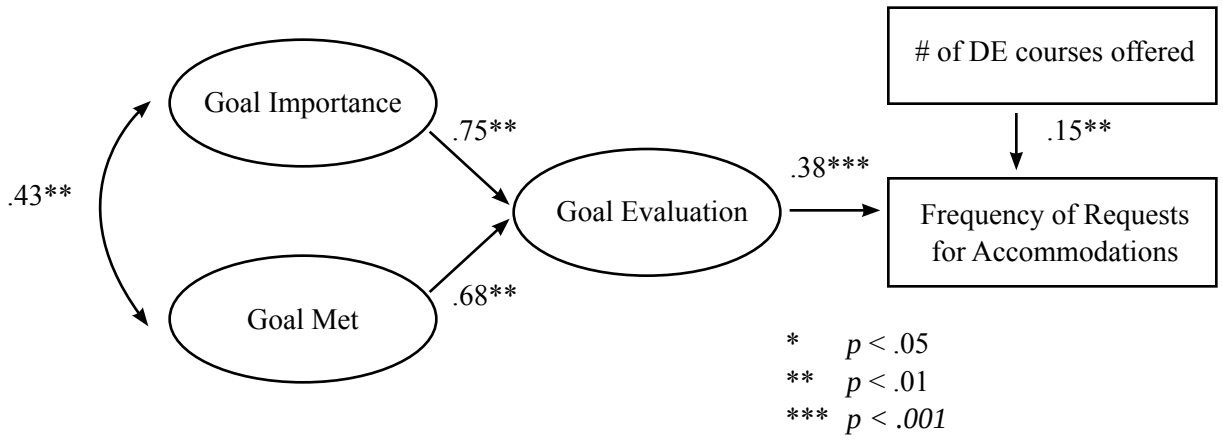

Figure 1. Path diagram for institutional distance education goals

frequency of students requesting accommodations was positive, moderate, and significant at the .001 level with a standardized path coefficient of .38 ($p < .001$). This relationship indicates that, as the importance of institutional distance education goals and these goals being met increases, the frequency of students' requests for accommodations also increases. Thus, evaluation of institutional distance education goals may be considered a function of how important institutions consider these goals and whether these goals were met according to the institution. This finding suggests how institutional distance education goals can translate into enhanced access for students with disabilities. Table 3 contains the standardized path coefficients from the latent variables of goal importance and goal met to the observed variables.

Discussion

The results of this study indicate a significant and positive relationship between institutional distance education goals and the frequency with which students with disabilities request accommodations in distance education while statistically controlling for the number of courses offered at a distance. This result indicates that these institutional distance education goals that are evaluated as important and as met according to institutions, appear to have a positive impact on the frequency with which enrolled students with disabilities subsequently request accommodations for courses offered at a distance. Meeting these goals, considered important and met by institutions, may not only benefit students with disabilities by providing enhanced access but may also benefit the institutions themselves, the communities they serve, and students enrolled in courses offered at a distance as these courses can offer access to higher education to students who would not otherwise have such access.

Several limitations emerged in conducting the current study. Firstly, the frequency of students with disabilities who request accommodations may be an underestimate given the unknown number of students with disabilities who do not request accommodations for their disabilities regardless of course delivery format. The *Distance Education at Postsecondary Education Institutions* survey does not appear to collect data pertaining to institutional distance education curricular accessibility, which includes day to day accommodation practices and receptivity to requests. Secondly, other institutionally related variables such as student population characteristics, availability of accommodations, and number and types of course of-

Table 3

Standardized Path Coefficients from Latent Variable to Observed

Path	Std. Coeff.	Path	Std. Coeff
Goal Importance → Q7Aa	.450	Goal Met → Q7Ab	.544
Goal Importance → Q7Ba	.535	Goal Met → Q7Ab	.597
Goal Importance → Q7Ca	.497	Goal Met → Q7Ab	.733
Goal Importance → Q7Da	.376	Goal Met → Q7Ab	.562
Goal Importance → Q7Ea	.404	Goal Met → Q7Ab	.591
Goal Importance → Q7Fa	.529	Goal Met → Q7Ab	.706
Goal Importance → Q7Ga	.611	Goal Met → Q7Ab	.641
Goal Importance → Q7Ha	.627	Goal Met → Q7Ab	.643

ferings and their accessibility to students with disabilities need to be examined as they relate to the number of requests for accommodations. The extension of the *Distance Education at Postsecondary Education Institutions* survey to include these variables would support the spirit of legislation and policy pertaining to postsecondary students with disabilities and their access to higher education that has increased over the past three decades.

Additionally, instructors of distance education courses may adhere to the principles of UD, thereby minimizing students with disabilities' need to request accommodations. Indeed, Barnard-Brak, Lechtenberger, and Lan (2010) indicated that "…adhering more closely to the principles of UD could make disability a non-issue" (p. 425). However, the survey utilized in the current study did not ask questions about the use of UD in developing distance education course offerings. A final limitation that should be noted is that a student with a disability who requests accommodations in a distance education course does not automatically receive those accommodations, as the provision of accommodations is a function of both the eligibility of the student and reasonableness of the request. Thus, the results of the current study should be tempered by a potential difference between the changes in requested accommodations and those that were actually provided. Interestingly, in examining the perceptions of students with disabilities in the online versus face-to-face learning environment, Barnard-Brak and Sulak (2010) found that students with disabilities as a whole did not differ significantly in their perceptions or attitudes regarding requesting accommodations between these learning environments. As a result, we may be able to conclude that frequency of requesting and receiving accommodations may have a similar pattern among students with disabilities but institutional policy may influence this pattern.

In addition to federal legislation that has increased access to higher education for students with disabilities, several consortia and organizations have emerged as leaders in the last decade in developing innovative practices for the delivery of online course content. In particular, the W3C is a global consortium of members from "industry, disability organizations, accessibility research centers, government, schools and universities…" that has sponsored the Web Assisted Initiative (WAI), which has established standards to "ensure that Web technologies support access," WAI, Web content accessibility, and policy development for Web-accessibility (W3C Web Accessibility Initiative, 2006). In particular, WAI's "Essential Elements of Web Accessibility" are critical to institutions engaged in the delivery of online coursework to students with disabilities. However, the available course management systems for delivery of online curricula still lag behind the "best practices" of the WAI. The result is that institutions vary markedly in the accessibility of their online curricula.

Conclusion

As the purpose of the current study was to examine the association between distance education institutional goals aimed to improve distance education outcomes and how often students with disabilities enroll in these distance education courses and request accommodations at their respective institutions, results indicate enhanced access to students with disabilities as associated with these distance education goals. It appears from these findings that disability service providers should pay attention to their institution's distance education policies and goals as these goals do appear to be associated with enhanced access to students with disabilities. Thus, disability service providers should be concerned with the development and implementation of their institution's distance education goals as students with disabilities will ostensibly be impacted by these goals. Future research should consider examining how relevant institutional administrators consider distance education policies and goals as these goals relate to the access and persistence of students with disabilities. Additionally, future research should consider examining the perceptions of relevant institutional administrators, students with disabilities, as well as students without disabilities regarding access to courses offered at a distance and the implementation of the principles of UD. The questions for relevant institutional administrators as compared to students with and without disabilities would differ as to this purpose but would seek to determine the impact of UD in curriculum and instruction.

References

Americans with Disabilities Act of 1990 (ADA; PL 101-336). 42 U.S.C.A. § 12101 et seq.

Barnard-Brak, L., Lechtenberger, D., & Lan. W. Y. (2010). Accommodation strategies of college students with disabilities. *The Qualitative Report, 15*(2), 411-429.

Barnard-Brak, L., & Sulak, T. N. (2010). Online versus face to face accommodations among college students with disabilities. *American Journal of Distance Education, 24*, 81-91.

Brown, D., Crosby, J., & Standen, P. (2001). The effective use of virtual environments in the education and rehabilitation of students with intellectual disabilities. *British Journal of Educational Technology, 32*(3), 289-299.

Browne, M. W., & Cudek, R. (1993). Alternative ways of assessing models fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models*. Newbury Park, CA: SAGE.

Burgstahler, S. (2006). The development of accessibility indicators for distance learning programs. *Research in Learning Technology, 14*, 79-102.

Edmonds, C. D. (2004). Providing access to students with disabilities in online distance education: Legal and technical concerns for higher education. *The American Journal of Distance Education, 18*(1), 51-62.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal, 8*, 430-457.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry, 12*, 219-245.

Green, K. C. (1999). High tech vs. high touch: The potential promise and probable limits of technology-based education and training on campuses. *Competence Without Credentials*, Washington, DC: US Department of Education.

Green, K. C. (2003). The new computing – revisited. *Educause Review, 38*, 33-43.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.

Kim-Rupnow, W. S., Dowrick, P. W., & Burke, L. S. (2001). Implications for improving access and outcomes for individuals with disabilities in post-secondary distance education. *The American Journal of Distance Education, 15*(1), 25-40.

Kinash, S., Crichton, S., & Kim-Rupnow, W. S. (2004). A review of 2000-2003 literature at the intersection of online learning and disability. *The American Journal of Distance Education, 18*(1), 5-19.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130-149.

Moisey, S. D. (2004). Students with disabilities in distance education: Characteristics, course enrollment and completion, and support services. *Journal of Distance Education, 19*(1), 73-91.

Muthén, L. K., & Muthén, B. O. (2008). *MPlus user's guide*. Los Angeles, CA: Muthén & Muthén.

National Center for Education Statistics. (2005). *Distance education at degree-granting postsecondary institutions: 2000-2001*. (NCES 2005-118). Retrieved May 18, 2008, from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2003017 .

Singh, G., O'Donoghue, J., & Worton, H. (2005). A study into the effects of eLearning on higher education. *Journal of University Teaching and Learning Practice, 2*(1), 13-24.

United States Government Accountability Office. (October 2009). *Higher education and disability: Education needs a coordinated approach to improve its assistance to school supporting students.* (GAO-10-33). Retrieved September 2, 2010, from http://eric.ed.gov/PDFS/ED506945.pdf

Vocational Rehabilitation Act. (1973). Pub. L. 93-112, U.S. Code Vol. 29, §504 et seq.

Vocational Rehabilitation Amendments. (1998). Section 508, Pub. L. 105-220, U.S. Code. Vol. 29 §794d.

W3C Web Accessibility Initiative. (2006). *Essential components of Web accessibility.* Retrieved June 8, 2008 from http://www.w3.org/WAI/intro/components.

About the Authors

Lucy Barnard-Brak received her Ph.D. in educational psychology from Texas Tech University. She is currently an assistant professor in the Department of Educational Psychology and Leadership at Texas Tech University. Her research interests include the educational experiences and outcomes of individuals with disabilities. She can be reached by email at: lucy.barnard-brak@ttu.edu

Valerie Paton, Ph.D is the Vice Provost for Planning and Assessment for Texas Tech University.

Tracey Sulak is doctoral candidate in the Department of Educational Psychology at Baylor University.

Appendix A

SEM Technical Notes

For readers less familiar with structural equation modeling (SEM), let's begin with the end in mind. The goal of SEM is to determine the extent to which a conceptual model fits or represents sample data. Therefore, in SEM, a researcher proposes a conceptual or theoretical model that is tested based upon their data. These models consist of observed (or measured variables) and latent (or hidden) variables. Observed variables are represented by squares while latent variables are represented by circles. Observed variables are variables that are directly measurable in some quantity. For example, in the current study, the number of courses offered at a distance is an observed variable. Latent variables are constructs that are the function of observed variables. For example, in the current study, the importance of distance education goals was considered a function of ratings by relevant administrators at institutions surveyed. Thus, a composite construct was created from the observed ratings of relevant administrators. For more information regarding SEM and its applications, please refer to the following resources:

- Hoyle, R. (1995). *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks, CA: SAGE Publications.
- Kaplan, D. (2009). *Structural equation modeling: Foundations and extensions*. Thousand Oaks, CA: SAGE Publications.
- Schumaker, R. E. & Lomax. R. G. (2004). *A beginner's guide to structural equation modeling* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

Appendix B

PEQIS Survey

U.S. DEPARTMENT OF EDUCATION NATIONAL CENTER FOR EDUCATION STATISTICS WASHINGTON, D.C. 20006-5651 **DISTANCE EDUCATION AT HIGHER EDUCATION INSTITUTIONS: 2000–2001** POSTSECONDARY EDUCATION QUICK INFORMATION SYSTEM	FORM APPROVED O.M.B. No.: 1850-0733 EXPIRATION DATE: 07/2002
This survey is authorized by law (P.L. 103-382). While participation in this survey is voluntary, your cooperation is critical to make the results of this survey comprehensive, accurate, and timely.	

Definition of distance education for this survey refers to education or training courses delivered to remote (off-campus) location(s) via audio, video (live or prerecorded), or computer technologies, including both synchronous and asynchronous instruction. For purposes of this survey, courses conducted **exclusively** on campus are not included in this definition of distance education (although **some** on-campus instruction or testing may be involved); courses conducted **exclusively** via written correspondence are also not included (although **some** instruction may be conducted via written correspondence). Distance education also does **not** include courses in which the instructor travels to a remote site to deliver instruction in person. *Distance education courses may include a small amount of on-campus course or lab work, on-campus exams, or occasional on-campus meetings.*

The survey is designed to be completed by the person(s) most knowledgeable about your institution's distance education course offerings. Since we are interested in all such courses offered by your institution, we ask that you consult with your colleagues in other departments/offices that may also offer distance education courses.

IF ABOVE INSTITUTION INFORMATION IS INCORRECT, PLEASE UPDATE DIRECTLY ON LABEL.

Name of Person Completing This Form:_____

Title/Position:_____

Telephone Number:_____ E-mail:_____

THANK YOU. PLEASE KEEP A COPY OF THIS SURVEY FOR YOUR RECORDS.

PLEASE RETURN COMPLETED FORM TO:	IF YOU HAVE ANY QUESTIONS, CONTACT:
Laurie Lewis (7166.26) Westat 1650 Research Boulevard Rockville, Maryland 20850-3195	Laurie Lewis (800-937-8281, x. 8284 or 301-251-8284) or Tiffany Waits (800-937-8281, x. 3829 or 301-294-3829) Fax: 800-254-0984 E-mail: laurielewis@westat.com or tiffanywaits@westat.com

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 1850-0733. The time required to complete this information collection is estimated to average 30 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments concerning the accuracy of the time estimate or suggestions for improving this form, please write to: U.S. Department of Education, Washington, DC 20202-4651. If you have any comments or concerns regarding the status of your individual submission of this form, write directly to: National Center for Education Statistics, 1990 K Street, NW, Washington, DC 20006.

PEQIS Form No. 13, 02/2002

1. Did your institution offer any distance education courses (as defined on the front of this questionnaire) in 2000–2001 (12-month academic year), or plan to offer any such courses in the next 3 years (2001–2002 through 2003–2004)? *(Circle only one number.)*

Offered courses in 2000–2001 ..... 1 *(Continue with question 2.)*
Did not offer in 2000–2001, but planned to offer in the next 3 years ..... 2 *(Skip to question 11.)*
Did not offer in 2000–2001, and did not plan to offer in the next 3 years . 3 *(Skip to question 12.)*

2. In the grid, please provide information about the distance education courses offered by your institution in **2000–2001 (12-month academic year)**.

- For **courses**, provide information about the number of **different** distance education courses offered by your institution in 2000–2001. If a course had multiple sections or was offered multiple times during the academic year, count it as only one course. If your institution did not offer a particular type or level of distance education course in 2000–2001, enter 0.
- **Dual-level courses** (i.e., courses that can be taken for either undergraduate or graduate credit) should be reported as undergraduate courses, and enrollments for these courses should be counted as undergraduate enrollments.
- **Enrollments** may include duplicated counts of students, i.e., a student should be counted for each course in which he/she was enrolled.

⇒ **In column 1**, report the number of distance education courses **for all levels and audiences**, and the number of students enrolled in those courses. Include courses designed for all types of students, including elementary and secondary, college, adult education, continuing and professional education, etc.

⇒ **In columns 2 through 4**, report **only college-level, credit-granting** distance education courses and their enrollments, as follows:

In column 2, report the total (i.e., the sum of undergraduate and graduate/first professional).

In column 3, report for undergraduate-level only.

In column 4, report for graduate/first-professional-level only.

For 2000–2001 (12-month academic year)	1. Total for all levels and audiences	College-level, credit-granting		
		2. Total for college-level credit-granting (undergraduate and graduate)	3. Undergraduate only	4. Graduate/ first-professional only
a. Number of courses				
b. Number of enrollments				

3. In 2000–2001 (12-month academic year), did your institution have any college-level degree or certificate programs designed to be completed totally through distance education? *(Include only degree or certificate programs that are based on credit-granting courses; include programs that may require a small amount of on-campus course or lab work, clinical work in hospitals, or similar arrangements, and baccalaureate degree completion programs.)*

Yes ..... 1 *(Continue with question 4.)* No ..... 2 *(Skip to question 5.)*

4. How many different college-level degree or certificate programs designed to be completed totally through distance education did your institution offer in 2000–2001 (12-month academic year)?

Distance education degree and certificate programs	Undergraduate		Graduate/first-professional	
	Degree	Certificate	Degree	Certificate
Total number of college-level distance education degree and certificate programs based on **credit-granting** courses				

5. Does your institution participate in any distance education consortia?

Yes ..... 1 *(Continue with question 6.)* No ..... 2 *(Skip to question 7.)*

6. In what types of consortia does your institution participate? *(Circle one on each line.)*

	Yes	No	Don't know
a. System (e.g., within a single university system or community college district)	1	2	3
b. State (i.e., within a single state)	1	2	3
c. Regional (i.e., multi-state)	1	2	3
d. National	1	2	3
e. International	1	2	3

7. How important are the following goals to your institution's distance education program? **For each goal that is somewhat or very important**, indicate to what extent your distance education program is meeting that goal.

	Importance			Extent goal met			
	Not important	Somewhat important	Very important	Not at all	Minor extent	Moderate extent	Major extent
	(Circle one on each line.)			*(Circle one on each line.)*			
a. Reducing institution's per-student costs	1	2	3	1	2	3	4
b. Making educational opportunities more affordable for students	1	2	3	1	2	3	4
c. Increasing institution enrollments	1	2	3	1	2	3	4
d. Increasing student access by reducing time constraints for course taking	1	2	3	1	2	3	4
e. Increasing student access by making courses available at convenient locations	1	2	3	1	2	3	4
f. Increasing the institution's access to new audiences	1	2	3	1	2	3	4
g. Improving the quality of course offerings	1	2	3	1	2	3	4
h. Meeting the needs of local employers	1	2	3	1	2	3	4
i. Other *(specify)*_____	1	2	3	1	2	3	4

8. How often in the last 3 years has your institution received requests to provide accommodations for students with disabilities in your distance education courses? *(Circle one.)*

Never ..... 1 Occasionally ..... 2 Frequently ..... 3 Don't know 4

9. To what extent do the Web sites for the distance education courses offered by your institution follow established accessibility guidelines or recommendations for users with disabilities (e.g., guidelines/recommendations from the U.S. Department of Education or the World Wide Web Consortium)? *(Circle one.)*

If no Web sites are used, check here ☐ *and skip to question 10.*

Not at all ..... 1 Minor extent ..... 2 Moderate extent ..... 3 Major extent ..... 4 Don't know 5

10. Which types of technology did your institution use as a **primary** mode of instructional delivery for distance education courses in 2000–2001 (12-month academic year)? *Circle yes for all the technologies that any distance education course used as a primary mode of delivery. If a course used multiple technologies to deliver instruction, but one mode predominated, circle yes for the predominant mode for the course. (Circle one on each line.)*

	Yes	No
a. Two-way video with two-way audio (i.e., two-way interactive video)	1	2
b. One-way video with two-way audio	1	2
c. One-way live video	1	2
d. One-way prerecorded video (including prerecorded videotapes provided to students, and television broadcast and cable transmission using prerecorded video)	1	2
e. Two-way audio transmission (e.g., audio/phone conferencing)	1	2
f. One-way audio transmission (including radio broadcast and prerecorded audiotapes provided to students)	1	2
g. Internet courses using synchronous (i.e., simultaneous or "real time") computer-based instruction (e.g., interactive computer conferencing or Interactive Relay Chat)	1	2
h. Internet courses using asynchronous (i.e., not simultaneous) computer-based instruction (e.g., e-mail, listservs, and most World Wide Web-based courses)	1	2
i. CD-ROM	1	2
j. Multi-mode packages (i.e., a mix of technologies that cannot be assigned to a primary mode) *(specify technologies used)*_____	1	2
k. Other technologies *(specify)*_____	1	2

11. In the next 3 years, what are your institution's plans concerning the number of distance education courses that will be offered using the following technologies as the **primary** mode of instructional delivery? *If a course will use multiple technologies to deliver instruction, but one mode will predominate, consider the course under the predominant mode. (Circle one on each line.)*

	Reduce	Keep same number	Start or increase	No plans
a. Two-way video with two-way audio (i.e., two-way interactive video)	1	2	3	4
b. One-way video with two-way audio	1	2	3	4
c. One-way live video	1	2	3	4
d. One-way prerecorded video (including prerecorded videotapes provided to students, and television broadcast and cable transmission using prerecorded video)	1	2	3	4
e. Two-way audio transmission (e.g., audio/phone conferencing)	1	2	3	4
f. One-way audio transmission (including radio broadcast and prerecorded audiotapes provided to students)	1	2	3	4
g. Internet courses using synchronous (i.e., simultaneous or "real time") computer-based instruction (e.g., interactive computer conferencing or Interactive Relay Chat)	1	2	3	4
h. Internet courses using asynchronous (i.e., not simultaneous) computer-based instruction (e.g., e-mail, listservs, and most World Wide Web-based courses)	1	2	3	4
i. CD-ROM	1	2	3	4
j. Multi-mode packages (i.e., a mix of technologies that cannot be assigned to a primary mode) *(specify technologies to be used)*_____	1	2	3	4
k. Other technologies *(specify)* _____	1	2	3	4

12. To what extent, if any, are the following factors keeping your institution from starting or expanding distance education offerings? *(Circle one on each line.)*

	Not at all	Minor extent	Moderate extent	Major extent
a. Lack of fit with institution's mission	1	2	3	4
b. Lack of perceived need (e.g., limited student market)	1	2	3	4
c. Lack of support from institution administrators	1	2	3	4
d. Program development costs	1	2	3	4
e. Equipment failures/costs of maintaining equipment	1	2	3	4
f. Limited technological infrastructure to support distance education	1	2	3	4
g. Concerns about faculty workload	1	2	3	4
h. Lack of faculty interest	1	2	3	4
i. Lack of faculty rewards or incentives	1	2	3	4
j. Legal concerns (e.g., intellectual property rights, copyright laws)	1	2	3	4
k. Concerns about course quality	1	2	3	4
l. Lack of access to library or other resources for instructional support	1	2	3	4
m. Interinstitutional issues (e.g., allocations of financial aid, course credit)	1	2	3	4
n. Restrictive federal, state, or local policies (e.g., limitations on the number of distance education credits students may earn, student ineligibility for financial aid)	1	2	3	4
o. Inability to obtain state authorization	1	2	3	4
p. Other *(specify)*_____	1	2	3	4

13. Is your institution offering any distance education courses this academic year (2001–2002)?

Yes..... 1 No..... 2

14. **For institutions that did not offer any distance education courses in 2000–2001:** Did your institution offer any distance education courses in the previous 5 years (1995–2000)?

Yes..... 1 (*Date last offered*_____) No..... 2 Don't know..... 3

Thank you. Please keep a copy for your records.