

BARRIERS TO DISTANCE EDUCATION AND TRAINING

Survey Results

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A survey (n = 2504) was conducted to help better understand and more systematically study the barriers to distance training and education. This study supplies evidence of not only what barriers there are in distance education, but the priority given to them by various stakeholders and at different stages of organizational maturity regarding distance education and training. Implications include: 1) recognition that it is common for the perceived barriers to be greater in the initial stages of organizational maturity in distance education and training, and 2) it should be expected that the ranking of which obstacles are most important to solve will change as distance training and education within the organization becomes mission-critical.

Technology continues to be a catalyst for change in the lives of each person in developed countries. Technology permeates society. For instance, it has caused a significant change to our modes of transportation, how we communicate with one another, what we eat, how we bank, where we vacation, what we read—essentially, technology is ubiquitous and inescapable within our society. The use of technology in education has long been held as

promising. Of particular interest in this article, a resurgence of interest in distance education has been seen the past two decades. This is due to many factors, but made possible through the application of new computer and communication systems.

Yet, even those people who believe the infusion of technology in the classroom can help teaching and learning, both in-person and at a distance, do not claim the pathway is wide

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and easily traveled. The diffusion of technology into society and its subsystems is not without obstacles. Social, economic, physical, and learning barriers exist in the workplace and in schools with regard to technology and its use at a distance.

The context of this study is distance education, with the focus on barriers perceived by various stakeholders who work within a distance training and education environment. Impediments to teaching and learning at a distance can be situational, epistemological, philosophical, psychological, pedagogical, technical, social, and/or cultural (e.g., Espinoza, et. al., 1996; Kaye and Rumble, 1991; Lewis and Romiszowski, 1996; Sherritt, 1992; Shklanaka, 1990; Spodick, 1996). They include such things as: pay for faculty, academic quality, academic freedom, intellectual property rights, instructors' workloads, tuition, traditional thinking, time requirements, lack of knowledge, policies that impede development, and dozens more.

Which subset of these barriers is perceived to be salient at a particular time and under particular circumstances, is determined by many factors. Determinants such as the work environment—the job function of the person such as teacher, administrator, student; the job sector of the person such as business, higher education, or government; and the discipline in which the person works, such as engineering or health services, all have potential for influencing an individual's perception of what hinders their efforts regarding distance education. What factors are perceived as influential may also be influenced by the level of expertise the individual has regarding distance education, or at what stage of maturity or capability the organization the person works for has with regard to distance education, or what delivery system is used for distance training and education programs (e.g., computer-mediated learning, instructional TV). Part of the challenge in researching obstacles in distance education is to identify a convenient framework for discussion and study.

THE CURRENT STUDY

A survey was conducted to help better understand and more systematically study the barriers to distance training and education. What resulted is meant to serve as a framework for talking about the issues in distance education and learning. From a review of the literature, experience in various distance education settings, and discussions with distance educators, it was hypothesized that several factors might affect the barriers that an individual perceives. This survey addressed six such factors:

1. work place (e.g., community college, government);
2. job function (e.g., support staff; manager, researcher, student);
3. type of delivery system used (e.g., audio-tape, computer conferencing, ITV);
4. expertise of the individual regarding distance education;
5. the stage of the respondent's organization with regard to capabilities in delivering distance education; and
6. the area in which the respondent primarily works (e.g., fine arts, engineering, education).

METHODOLOGY

Berge developed the survey items—64 barriers to distance education—from a review of literature, from previous survey work (Berge, 1998), and from content analyses of selected case studies (Berge & Mrozowski, 1999). Berge then conducted two rounds of beta testing using paper-and-pencil versions of the instrument that were administered to selected members of the target population ($n > 50$). Revisions were made before the final version of the survey was released on the World Wide Web. The survey was programmed to be accessible using standard Web browsers. It was designed so that, as each respondent completed and submitted the survey, the response was captured in an output file that could rela-

tively easily be converted to Statistical Package for the Social Sciences (SPSS). Respondents were asked to rate each of the 64 barriers on a 1-5 scale (no barrier to very strong barrier, respectively).

To announce this survey, we sent individual e-mail messages to personal acquaintances; to thousands of individuals collected from participation lists and membership lists gathered over the years from educational technology, distance education, and training conferences, workshops, seminars, and professional organizations; and to a wide variety of electronic mailing lists in which the topic of discussion was believed to be related to education, distance education, and technology-enhanced learning. The announcement included background regarding the survey, provided the perspective taken, and asked for volunteers to complete the online survey regarding barriers to distance education. Given this selection process, it is nearly impossible to accurately estimate rate of return.

Data were collected between June 1999 and January 2000. Subgroups that were found to be underrepresented in the early stages of data collection (June to December 1999)—such as university students and persons working in elementary and secondary schools—were specifically targeted in the latter stage of data collection (mid-December 1999 to January 2000). As of February 1, 2000, 2,530 surveys were collected. After data cleaning, 2,504 valid surveys remained and were analyzed using SPSS.

Demographic Factors

Self-reported data was collected for each respondent along six factors: work category, job function, work area, delivery system, organizational stage of capabilities, and individual expertise in distance education. The categories for each of these demographic variables, and the number of people who fall into each category are included in Table 1.

Of the 2,504 survey respondents, 1,276 worked in higher education, 448 in corporate

or business organizations, 375 in community colleges, 129 in government, 126 in middle or secondary schools, 117 in nonprofit organizations, and 33 in elementary schools. The job functions of the respondents included 1,150 teachers or trainers; 648 managers, directors, department chairs, or principals; 346 support staff; 167 higher administrators such as dean, provost, vice president, or superintendent; 102 researchers; and 91 undergraduate or graduate students. Respondents worked in a broad range of content areas including education (33.0%), business (16.8%), health sciences (10.2%), humanities (8.6%), engineering (4.8%), behavioral sciences (4.6%), physical sciences (2.6%), fine arts (1.0%), and "other" disciplines (18.5%). The primary distance training and education delivery systems being used by respondents included Internet- or Web-based computer conferencing (1,462); print-based systems (286); videoconferencing or desktop videoconferencing (269); CD-ROM or multimedia (177); audiotape or videotape (123); ITV (118); audioconferencing or audiographics (35); EPSS (electronic performance support system) (32); and radio (2).

Barriers Factors Analyzed

To determine the underlying structure of the data, a common factor analysis using the Generalized Least Squares extraction method and Oblimin rotation was conducted. For a detailed description of the factor analysis, see Mulenburg and Berge (2001).

The factor analysis of the sixty-four barriers to distance education resulted in the following ten factors which accounted for 52% of the overall variance: administrative structure, organizational change, technical expertise, social interaction and quality, faculty compensation and time, threatened by technology, legal issues, evaluation/effectiveness, access, and student support services. Summated rating scales were created based on the items that loaded on each of the factors. The items were summed and averaged so that they could be placed on the one to five scale used with the

TABLE 1
Demographic Survey Questions

<i>Work Category</i>	<i>N</i>	<i>Percent</i>	<i>Organizational Stage</i>	<i>N</i>	<i>Percent</i>
community college	375	15.0	have not attempted to use DL	151	6.0
higher ed (not cc)	1276	51.0	separate or sporadic DL events	881	35.2
elementary ed	33	1.3	tech can support DL; interdisciplinary team replicates DL	432	17.3
middle or sec ed	126	5.0	Has DL policy/planning. Stable process to select tech for DL	483	19.3
non-profit org	117	4.7	DL is institutionalized. Business obj met; syst assessment	557	22.2
business/corp org	448	17.9	Total	2504	100.0
government	129	5.2			
Total	2504	100.0			

<i>Job Function</i>	<i>N</i>	<i>Percent</i>	<i>Individual Expertise</i>	<i>N</i>	<i>Percent</i>
support staff	346	13.8	Don't know much or use much DL	32	1.3
Teacher/faculty/trainer	1150	45.9	Use internet, e-mail, mailing lists for personal productivity	305	12.2
manager/director/dept chair/principal	648	25.9	Learning about DL, but haven't used DL or encouraged others	249	9.9
higher admin (VP; dean; provost; superintendent)	167	6.7	Added DL tech to existing T-methods, or help others to do so	878	35.1
researcher	102	4.1	Use or help others use: project-based, teams, advanced tech	1040	41.5
undergrad student	8	.3	Total	2504	100.0
graduate student	83	3.3			
Total	2504	100.0			

<i>Work Area</i>	<i>N</i>	<i>Percent</i>	<i>Delivery System</i>	<i>N</i>	<i>Percent</i>
question not available	132	5.3	audiotape/videotape	123	4.9
fine arts	24	1.0	CD-ROM/multimedia	177	7.1
physical science	62	2.5	computer conferencing (net/Web)	1462	58.4
behavioral sciences	109	4.4	EPSS	32	1.3
humanities	204	8.1	videoconferencing/desktop videoconferencing	269	10.7
health sciences	241	9.6	Audioconferencing/Audiographics	35	1.4
engineering	113	4.5	Radio	2	.1
education	782	31.2	ITV	118	4.7
business	398	15.9	Print-based	286	11.4
other	439	17.5	Total	2504	100.0
Total	2504	100.0			

items. Scores were such that a one indicated that a barrier was not a problem. A five indicated that it was a very strong barrier. These were used as the dependent measures in the study.

Overall Pattern of Results

In general, the means of each of the 10 factors when rank-ordered produce the following listing. As can be seen in Table 2, faculty compensation and time is the highest ranked barrier. Administrative structure is the lowest ranked. None of the barriers are rated as strong

barriers on average. All have means in the weak to moderate range.

Differences in Barriers Related to Demographic Characteristics

Overview. In order to determine whether the overall pattern of magnitude and ranking held for the different demographic groupings, a series of ANOVAs were undertaken for each demographic and to determine whether the patterns were the same or different for each barrier and demographic factor. It was found that the relative ranking and magnitude of bar-

TABLE 2
Mean Barriers to Distance Education

Rank	Barriers Factor	Mean
1	Faculty Compensation and Time	3.17
2	Organizational Change	2.84
3	Lack of Technical Expertise/Support	2.82
4	Evaluation	2.60
5	Social Interaction	2.57
6	Access	2.52
7	Student Support Services	2.51
8	Legal Issues	2.41
9	Threatened by Technology	2.33
10	Administrative Structure	2.18

riers varied somewhat as a function of some of the demographic variables examined in the study. Statistically significant interactions that accounted for at least two percent of the variance in barrier scores were interpreted. This was done because the large N made statistical significance very easy to attain. Most of the effects are small, accounting for less than 10% of the variability in the barrier scores. Hence, while we will describe some variability due to the various demographic factors, that variability does not account for large amounts of variance in the barrier factor scores. Also, because of the confusion created by comparing individual groups that vary dramatically in size (some comparisons may appear significant when they are not because of the dramatic sample size differences), we decided to compare the groups to the overall unweighted mean for a barrier. What that means is we will discuss how groups deviate from the overall pattern of results.

It should also be noted that we report statistically significant results using two different alpha levels. First, we report deviations that are statistically significant using a comparison-wise alpha of .05. This was done because sometimes when smaller groups ($n = 20$ or 30) were compared to the overall mean, the comparison was not done with much statistical power. Second, we corrected each family of comparisons for a demographic variable such that the family of comparisons for a barrier and demographic maintain an overall alpha of .05.

This gave us a more conservative alpha level. We also noted in a couple of places, comparisons that were not statistically significant, even though the differences looked like they should have been. This is due to the sample size for these groups being rather small. Given the newness of the scale and the exploratory nature of the study, we felt that providing conservative and more liberal criteria for statistical significance for the reader to consider made sense. The sets of means for the different demographic variables are displayed in several tables.

Finally, it should be noted that higher-order interactions involving the different combinations of demographic factors were not considered. They did not account for any substantial variance in the outcomes, and in some cases, the one set of demographic categories overlapped with other demographic factors. Hence, they did not add any new insight into the findings here. Future research might examine some of these higher-order interactions.

Work Category. Table 3 shows the statistically significant deviations of groups from the overall grand means on the barriers for Work Category. One trend that can be seen in the data is that businesses and corporations tend to be below average on most barriers. Community colleges and higher education seem to be below average in the organizational problems they perceive, but above average when it comes to faculty compensation and time. These are perceived as moderate to strong bar-

TABLE 3
Mean Barriers to Distance Education as a Function of Work Category

<i>N</i>	<i>I work in...</i>	<i>Admin.</i>	<i>Org. Change</i>	<i>Tech. Supp.</i>	<i>Soc. Qual.</i>	<i>Faculty Comp.</i>	<i>Threat</i>	<i>Legal</i>	<i>Eval.</i>	<i>Access</i>	<i>Stud. Supp.</i>
375	community college	2.19	2.71 ^{BB}	2.83 ^B	2.55	3.36 ^{AA}	2.34	2.48	2.59	2.51 ^{BB}	2.71 ^{AA}
1276	higher ed (not cc)	2.25	2.80 ^{BB}	2.79 ^{BB}	2.55	3.44 ^{AA}	2.34	2.51 ^{AA}	2.58	2.42 ^{BB}	2.57
33	elementary ed	2.51 ^A	3.35 ^{AA}	3.23 ^A	2.81	3.32	2.46	2.47	2.91	2.95	2.91 ^{AA}
126	middle or sec ed	2.33	2.99	2.82	2.57	3.15	2.29	2.34	2.67	2.76	2.58
117	non-profit org	2.27	2.97	2.94	2.62	3.08	2.40	2.46	2.61	2.82	2.43
448	business/corp org	1.93 ^{BB}	2.87	2.79	2.61	2.40 ^{BB}	2.22 ^{BB}	2.11 ^{BB}	2.63	2.56 ^B	2.19 ^{BB}
129	government	2.11	3.09 ^A	3.08 ^{AA}	2.58	2.73 ^{BB}	2.48	2.29	2.61	2.78	2.38 ^B
2504	Unweighted Grand Mean	2.23	2.97	2.92	2.61	3.07	2.36	2.38	2.66	2.69	2.54

Note: Overall Mean is in Bold.

A = Significantly greater than the Overall Mean, $p < .05$.

B = Significantly lower than the overall mean, $p < .05$.

AA = Significantly greater than the overall mean, $P < .007$.

BB = Significantly lower than the overall mean, $p < .007$.

riers in these contexts. Those in elementary education tend to be above average on three barriers: Administrative, organizational change, and student support services. Those in middle or secondary education do not seem to vary in either direction. Finally, it should be noted that no groups vary from the overall mean on social quality or evaluation issues.

Work Area. A second related area to work category is "Work Area." Work Area refers to the field the respondent is in rather than the work setting (e.g., government, business, and

so on). Table 4 contains the means for the ten barriers for each of the different work areas. Respondents in engineering seem to perceive less threat than average for all of the various barriers except for organizational change. Those in business seemed to perceive less threat for 5 of the 10 barriers. Administrative barriers, faculty compensation, legal threats, evaluation, and student support services are perceived to be less of an issue for those in business. Faculty time and compensation seems to be a barrier that differentiates

TABLE 4
Mean Barriers to Distance Education as a Function of Work Area

<i>Work Area</i>	<i>Admin.</i>	<i>Org. Change</i>	<i>Tech. Supp.</i>	<i>Soc. Quality</i>	<i>Faculty Comp.</i>	<i>Threat</i>	<i>Legal</i>	<i>Eval.</i>	<i>Access</i>	<i>Student Supp.</i>
Fine Art	2.17	2.93	3.06	2.78	3.39	2.23	2.78	3.10 ^A	2.73	2.74
Physical Science	2.35 ^A	2.90	2.88	2.67	3.45 ^A	2.32	2.68	2.76	2.56	2.74
Behavioral Science	2.22	2.94	2.90	2.75	3.32	2.41	2.61	2.75	2.62	2.72 ^A
Humanities	2.09	2.75	2.84	2.53	3.42 ^{AA}	2.26	2.45	2.65	2.51	2.67
Health Sciences	2.17	2.80	2.91	2.58	3.43 ^{AA}	2.27	2.41	2.49 ^{BB}	2.47	2.50
Engineering	2.03 ^B	2.79	2.52 ^{BB}	2.45 ^B	2.84 ^{BB}	2.12 ^{BB}	2.27 ^B	2.43 ^{BB}	2.24 ^B	2.31 ^{BB}
Education	2.32 ^{AA}	2.92	2.90	2.58	3.28	2.37	2.48	2.68	2.63 ^A	2.63
Business	1.97 ^{BB}	2.80	2.80	2.58	2.70 ^{BB}	2.23	2.15 ^{BB}	2.54 ^B	2.47	2.23 ^{BB}
Other	2.19	2.83	2.75 ^B	2.58	3.16	2.44 ^{AA}	2.43	2.57	2.45	2.49
Overall	2.17	2.85	2.84	2.61	3.22	2.30	2.47	2.66	2.52	2.56

Notes: Overall Mean is in Bold

A = Significantly above average, $p < .05$

B = Significantly below average $p < .05$

AA = Significantly above average $p < .005$.

BB = Significantly below average, $p < .005$

between groups for work area as well as work category. Those in physical science, humanities, and health sciences were significantly above the average on this barrier. As noted earlier, those in business and engineering perceived faculty compensation and time to be less of a problem.

There were a few other barriers where there were some differences of note as well. Although administrative barriers were only rated as weak threats overall, those in physical science and education rated them to be more of a threat than others (although they still rate them as only a weak threat). Finally, those in behavioral sciences rated student support services as more of a barrier than average, and fine art respondents rated evaluation as an above average threat. Those in health sciences, engineering, and education rated it below the average.

Individual Expertise. Table 5 presents the mean number of barriers as a function of the expertise of the respondent. As can be seen, the general trend is for the threats to decrease as expertise increases, but there are some exceptions. Those with the lowest expertise are significantly above the average for technical support, and significantly below the average for faculty compensation. They appear a bit above the average also for social quality concerns and access, although these differences did not quite reach significance. The small

sample size in this group may be responsible for these differences not reaching significance. They also believed that faculty compensation and time was less of a barrier than other groups. Those who know a little more, those who use technology for personal use, are significantly above the overall mean on four different barriers. They perceive administrative barriers, faculty compensation and time, student access, and student support services greater barriers than others. Those who are learning about distance education are above average on four different barriers. They view technical support, social quality and interaction, evaluation, and access as greater barriers than others. Those who have incorporated distance training and education into their classes report that administrative barriers, technical support, quality of social interaction, evaluation issues, and access are of less concern than others. Finally, those at the highest level of personal expertise report the same barriers to be less of a concern, but also view student support services as less of a concern than others.

Stage of Adoption Process. The next demographic factor we examined was the stage in the distance education adoption process that respondents reported for their organization. As can be seen by examining Table 6, the general trend was for organizations that were further along to report that the barriers were less of an issue than those at earlier stages in the process.

TABLE 5
Mean Barriers as a function of Level of Individual Expertise

N	Level of Expertise	Org. Tech. Social Fac. Student									
		Admin.	Change	Supp.	Qual.	Comp	Threat	Legal	Eval.	Access	Supp.
32	Don't know much	2.20	3.14	3.41 ^{AA}	2.91 ^C	2.75 ^B	2.33	2.48	2.81	2.83 ^C	2.44
305	Use tech for personal	2.32 ^A	3.02	3.13	2.77	3.25 ^A	2.45	2.49	2.79	2.81 ^A	2.73 ^{AA}
249	Learning about DL	2.29	3.00	3.20 ^{AA}	2.88 ^{AA}	3.19	2.32	2.38	2.89 ^{AA}	2.86 ^{AA}	2.61
878	Used DL	2.12 ^{BB}	2.80 ^{BB}	2.84 ^{BB}	2.58 ^{BB}	3.14	2.26	2.40	2.57 ^{BB}	2.49 ^{BB}	2.51
1040	Use/help others; projects	2.18	2.77 ^{BB}	2.61 ^{BB}	2.42 ^{BB}	3.19	2.35	2.40	2.50 ^{BB}	2.37 ^{BB}	2.43 ^{BB}
2504	Grand Mean	2.22	2.95	3.04	2.71	3.10	2.34	2.43	2.71	2.67	2.54

Notes: C=Not significant $p = .10$

A=Significantly Greater than mean $P < .05$

B=Significantly Below the mean $P < .05$

AA=Significantly Greater than mean $P < .01$

BB=Significantly Below the mean $P < .01$

TABLE 6
Mean Barriers to Distance Education as a Function of Organizational Stage

<i>N</i>	<i>Organi- zational Stage</i>	<i>Admin.</i>	<i>Org. Change</i>	<i>Tech. Supp.</i>	<i>Social Qual.</i>	<i>Fac. Comp</i>	<i>Threat</i>	<i>Legal</i>	<i>Eval.</i>	<i>Access</i>	<i>Student Supp.</i>
151	Not Attempted DL	2.37 ^{AA}	3.3 ^{AA}	3.3 ^{AA}	2.83 ^{AA}	3.15	2.37	2.45	2.91 ^{AA}	2.88 ^{AA}	2.75 ^{AA}
881	Sporadic	2.25	3.22 ^{AA}	3.14 ^{AA}	2.7 ^{AA}	3.26 ^{AA}	2.40 ^A	2.48 ^A	2.74 ^{AA}	2.72 ^{AA}	2.66 ^{AA}
432	Can Support DL	2.24	2.88	2.78 ^B	2.56	3.25 ^A	2.40	2.47	2.61	2.49	2.56
483	Stable DL Process	2.12 ^{BB}	2.63 ^{BB}	2.66 ^{BB}	2.56	3.20	2.36	2.42	2.55 ^B	2.43 ^{BB}	2.44 ^{BB}
557	DL Institutionalized	2.04 ^{BB}	2.26 ^{BB}	2.37 ^{BB}	2.31 ^{BB}	2.97 ^{BB}	2.11 ^{BB}	2.25 ^{BB}	2.34 ^{BB}	2.19 ^{BB}	2.24 ^{BB}
2504	Grand Mean	2.20	2.86	2.85	2.59	3.17	2.33	2.41	2.63	2.54	2.53

Note: Overall Mean is in Bold.

A = Significantly greater than the Overall Mean, $p < .05$.

B = Significantly lower than the overall mean, $p < .05$.

AA = Significantly greater than the overall mean, $p < .01$.

BB = Significantly lower than the overall mean, $p < .01$.

Individuals at the first two stages were above average on six of the ten barriers. In particular, organizational change, technical support, social quality, evaluation, access, and student support services were greater than average. Administrative barriers were higher only for those at the first stage where distance training and education had not been attempted. Interestingly, faculty time and compensation, feeling threatened by technology, and legal issues become statistically significant at the second stage where sporadic attempts to incorporate distance education take place. As they move into the third level, where the ability to support distance training and education emerges, faculty compensation and time still remains above

average, but technical support drops below the overall average. When a stable distance education process is in place, it can be seen that six of the ten barriers are now significantly below the overall mean. Administrative, organizational change, technical support, evaluation, student access, and student support services are below the overall mean. Finally, when distance education and training become institutionalized, all the barriers are rated below the overall means.

Job Function and Delivery System. The two other demographics examined (job function and delivery system) did not yield many comparisons that accounted for at least two percent of the variance. The only barrier where almost

TABLE 7
Faculty Compensation and Time as a Function of Delivery System

<i>N</i>	<i>Delivery System</i>	<i>Mean</i>
123	audiotape/videotape	3.32
177	CD-ROM/multimedia	2.70 ^{BB}
1462	computer conferencing (net/Web)	3.21
32	EPSS	2.94 ^B
269	videoconferencing/desktop videoconferencing	3.28
35	Audioconferencing/audiographics	2.89 ^B
2	radio	4.67 ^A
118	ITV	3.27
286	Print-based	3.15
	Overall Unweighted Mean	3.27

Notes: A = Significantly above average, $p < .05$

B = Significantly below average $p < .05$

AA = Significantly above average $p < .005$.

BB = Significantly below average, $p < .005$

two percent of the variability was accounted for with job function was organizational change. Teachers and trainers viewed organizational change as significantly less of a barrier than others. Delivery system accounted for 2.5% of the variance in faculty compensation and time. Table 7 presents the means for delivery system for faculty compensation and time. As can be seen in Table 7, those whose delivery system is CD-ROM/Multimedia, EPSS, and audioconferencing are significantly below the overall mean. Those who use radio, only two individuals, appear to be significantly above the overall mean. Because of the small number of individuals, caution needs to be used in interpreting this result.

IMPLICATIONS FOR THE FIELD

This study suggests at least two implications. First, persons charged with implementing distance training and education within the organization need to recognize that it is common for the perceived barriers to be greater in the initial stages of organizational maturity in distance education and training. These normally abate as the organization matures. Stated another way, the responses to this survey support the proposition that educators and trainers perceive fewer, or less intense, barriers in organizations that are more capable for delivering distance education.

Secondly, it should be expected that the ranking of which obstacles are most important to solve will change as the organization gains experience with DE and as distance training and education becomes mission-critical within the organizational strategic planning.

This study supplies evidence of not only what barriers there are in distance education, but the priority given to them by various stakeholders and at different stages of organizational maturity regarding distance education and training. A next step that seems obvious and logical is to find *solutions* to the most important barriers in the field.

SUGGESTIONS FOR FURTHER RESEARCH

Further study in several areas should be done. While this study goes beyond the commonly reported laundry list of problems to distance education, the next steps may include a systematic study of solutions to the most important obstacles at each stage of organizational capability regarding distance training and education.

One of the trends this research indicated is that businesses and corporations tend to be below average on most barriers compared to all educational institutions. If this is combined with the fact that responses from persons in business and engineering perceived a different ranking of the barriers than education (i.e., faculty compensation and time is less of a barrier to these business people than it is to educators), it may be that these populations should be studied separately, rather than together or through comparisons.

Separately, a question formed during the analysis of this survey regarding whether the size of the organization would matter. It may be that large organizations face different problems than small organizations at each stage of organizational maturity regarding distance training and education. In fact, perhaps there are other demographic characteristics of the organization or of the persons involved in distance training and education that should be used when designing a future study.

Finally, as we worked with the responses to this large dataset, it became clear that there was an inherent bias in the original survey toward a faculty perspective. There is need for future research concerning barriers to distance education from the student perspective.

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