

Multiple Perspectives on the Accessibility of E-Learning in Canadian Colleges and Universities

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ABSTRACT An exploratory study identified and compared the views of 77 campus disability service providers, 38 professors, and 45 e-learning professionals from Canadian colleges and universities regarding their experiences with e-learning and its accessibility to students with disabilities. Findings indicate that all groups saw benefit in having someone who makes e-learning accessible to students with disabilities on campus and that problems related to e-learning accessibility were most likely to go to campus disability service providers and least likely to e-learning professionals. Only half of the participants indicated that professors are taught about e-learning accessibility, that there is someone on campus who makes e-learning accessible, that accessibility is a criterion for selecting new types of e-learning, and that their school has e-learning accessibility guidelines or policies. These findings suggest that important e-learning accessibility problems remain. Recommendations for colleges and universities on how to increase e-learning accessibility are provided.

KEYWORDS accessibility, campus disability service providers, disabilities, e-learning professionals, ICTs, postsecondary education, professors

INTRODUCTION

The increased use of information and communication technologies (ICTs) in most sectors of society, coupled with recent developments in adaptive hardware (e.g., an adapted mouse) and adaptive software (e.g., software that reads what is on the screen), has allowed individuals with disabilities to do things that were difficult or impossible for them to do in the past. For example, it has allowed people who are blind to read print using text-to-speech technology, people who are deaf to easily communicate using chat programs, and people with difficulties using their hands or arms to write and communicate using dictation software (Fichten, Asuncion, Barile, Fossey, & De Simone, 2000). ICT use by professors to teach their courses (i.e., e-learning) has been increasing both in colleges and in universities, not only in the United States but also in Canada (Abrami et al., 2006) and the United Kingdom (Weller, Pegler, & Mason, 2005). Whether PowerPoint presentations delivered in class, the use of Web-based

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discussion boards that further in-class conversation, or courses delivered completely over the Internet, it is clear that e-learning is here to stay.

Understanding how members of different stakeholder groups view and engage themselves in making e-learning accessible to students with disabilities in postsecondary education is critical, because the numbers of these students in postsecondary education have been rising during the past decade. A recent large-scale study showed that in 2003–2004, 11% of U.S. undergraduates had a disability (Snyder & Dillow, 2007). E-learning can promote inclusion of students with various disabilities (Di Iorio, Feliziani, Mirri, Salomoni, & Vitali, 2006). For example, online courses provide enhanced opportunities for individuals who, because of climate, health, transportation, or physical accessibility, experience barriers to attending classroom-based courses (e.g., Debenham, 2002). Similarly, in traditional classes, students who have print impairments can access course notes and handouts on the course Web site without assistance, so long as these materials are designed to be accessible. In addition, e-mail allows students and professors to readily communicate with each other.

In spite of the tremendous opportunities afforded by e-learning for students with disabilities, unless care is taken, there are a variety of barriers that interfere with their effective use. Examples of difficulties using e-learning reported by students with disabilities include inaccessibility of course Web sites and course management systems, lack of knowledge about how to use e-learning on the part of both students and professors, inaccessibility of course materials in various formats both in and outside the classroom, and lack of adaptive technologies needed to access e-learning (Fichten et al., 2010).

Three stakeholder groups play key roles in making e-learning accessible. First are the professors who use e-learning to teach their courses. Their level of experience, the nature of their students' disabilities, the "adventurousness" of their e-learning use, and the nature of their disciplines all influence e-learning accessibility. Second are the campus disability service providers who make disability-related services and subject matter expertise available to the campus community at large and to students with disabilities in particular (AHEAD, 2010). These individuals are called on to resolve a myriad of disability-related issues, from classroom accessibility, to exam accommodations,

to accessibility issues related to e-learning. These campus professionals typically have training in psychology, counseling, and/or special education fields. Although they clearly recognize the importance of e-learning and accessibility, many are either unaware or ill equipped to cope with increasingly complex technological issues (Michaels, Prezant, Morabito, & Jackson, 2002; Stodden, Roberts, Picklesimer, Jackson, & Chang, 2006). Third are the e-learning professionals on campus who provide leadership, select e-learning technologies for campus-wide use, and provide help and training on e-learning and other ICTs to the campus community.

Each of these three stakeholder groups has an important role to play in assuring the accessibility of e-learning in colleges and universities. Because of their different backgrounds, roles, and experiences, these three groups are likely to have different perspectives about e-learning accessibility. Understanding these perspectives, along with associated commonalities, differences, and concerns, is necessary if e-learning is to become accessible to all postsecondary students. There have been studies related to the ICT needs and concerns of students with disabilities, including e-learning, where the participants were campus disability service providers (e.g., Fichten, Asuncion, Barile, Fossey, & Robillard, 2001; Stodden et al., 2006), assistive technologists (Thompson, 2004), and professors (Vogel, Leyser, Burgstahler, Sligar, & Zecker, 2006). The findings of these studies are difficult to compare because each had different goals, used different survey questions, and had different sampling limitations. Perhaps most important, none of these studies included the perspectives of e-learning professionals in their samples.

In the present study, which forms part of a larger investigation of e-learning (Asuncion, Fichten, & Barile, 2007; Fichten et al., 2010), the views of these three groups of stakeholders regarding their experiences and involvement in addressing the accessibility of e-learning to students with disabilities are compared. The following issues are also examined: (a) whether people and processes exist today to support e-learning accessibility on campus; (b) when they do exist, how well they work; and (3) in cases where they are absent, how well it might work if such people and processes did exist.

The study of e-learning accessibility to students with a variety of disabilities is relatively new. Hence, there is very little by way of developed theory.

Research tends to be purely applied and virtually atheoretical. This, too, is the case for the present investigation, which is an exploratory, descriptive study that is not theoretically based. Its main objectives are to identify and compare the views of the three groups and to suggest practical recommendations and hypotheses for future investigations.

METHODS

Participants

Seventy-seven campus disability service providers (19 males and 58 females), 38 professors (17 males and 21 females), and 45 campus e-learning professionals (23 males and 22 females) from 98 Canadian postsecondary institutions participated. Forty-six campus disability service providers worked at a junior/community college and 28 at a university, two worked at another type of postsecondary institution, and one did not specify the type of institution. They had worked providing services an average of 7 years ($SD = 6$, range = 8 months–35 years, median = 5). They indicated that an average of 249 students ($SD = 303$, range = 1–1,100, median = 113) were registered to receive services from their office. However, given the very large range, the median of 113 is probably a better measure of central tendency than the mean in this case.

All professors had taught at least one student with a disability in a course where they had used some form of e-learning during the last 3 years. Twenty-one worked at a junior/community college, 16 at a university, and one did not specify the type of institution. They taught in a variety of disciplines including arts, science, commerce, communications, office administration, and millwright technology. They had taught an average of 26 students with disabilities ($SD = 77$, range = 1–450, median = 10) during the past 3 years. Again, the median of 10 students probably represents the best measure of central tendency. They had been teaching in postsecondary education for a mean of 14 years ($SD = 11$, range = 1–43, median = 12) and had used e-learning for a mean of 7 years ($SD = 5$, range = 1–25, median = 5).

Twenty-five e-learning professionals worked at a junior/community college, 19 at a university, and one at another type of postsecondary institution. They had worked at 38 different postsecondary institutions for

an average of 17 years ($SD = 10$, range = 1–35, median = 20), and they had been involved with e-learning for an average of 7 years ($SD = 4$, range = 1–16, median = 7). Their job titles were varied and included help desk intern, distance education specialist, and director of educational media development.

Procedure

In the first half of 2006, online questionnaires were administered to participants from universities and junior/community colleges from nine of Canada's 10 provinces as part of a larger investigation of the accessibility of e-learning to postsecondary students with disabilities. The research protocol was approved by the Dawson College Human Research Ethics Committee.

Participant Recruitment

Participants were recruited through e-mail discussion lists focusing on Canadian postsecondary education or e-learning and through project partners (Canadian Association of Disability Service Providers in Postsecondary Education and the Adaptch Research Network); in the case of professors and e-learning professionals, where it proved challenging to find participants, campus disability service providers were asked to recommend potential participants. In all cases, participants who indicated their interest were directed to a Web site where they read the consent form, which provided information about the study, including the draw for \$100 gift certificates to a large online computer store for each group. Clicking on the "I consent" button brought participants to the online questionnaire for their specific group.

Online Questionnaire

The online packages were slightly different for the three participant groups. These consisted of demographic questions, e-learning accessibility questions required for the larger investigation, the closed-ended e-learning-related questions for the present study, and a coupon to enter the draw for the gift certificate. Questions, which were developed in consultation with the project team and project partners, were pilot tested to uncover problems. Four-week test-retest reliability

was conducted. Questions with poor reliability were omitted from the final questionnaires, which are available from the corresponding author.

Experiences with E-Learning

Participants were asked to rate their level of agreement with a series of statements about their experiences with e-learning using a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). All three groups were asked about the following aspects of the state of e-learning at their school: (a) their awareness of the e-learning accessibility needs of students with disabilities, (b) their knowledge about how to improve e-learning accessibility to students with disabilities, (c) the accessibility of e-learning to students with disabilities when used by professors in their courses, and (d) how interested professors are in receiving information on how to make e-learning accessible to students with disabilities. E-learning professionals and disability service providers were also asked how knowledgeable they were about the types of e-learning used by professors at their school.

Actual and Potential Situations

All participants were also asked to rate their level of agreement with six pairs of statements about e-learning situations at their school using a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). The first item in each pair was a statement about a situation related to aspects of e-learning accessibility at the participant's school (e.g., "At my school, accessibility to students with disabilities is a criterion for selecting new types of e-learning"). If participants agreed with the statement (i.e., rating equal to or greater than 4), this was taken to mean that this was the *actual situation* that currently existed at their school. They were then asked to rate, on a 6-point Likert scale, how well the actual situation works (e.g., "At my school, it *works well* if accessibility to students with disabilities is a criterion for selecting new types of e-learning").

If participants disagreed with the statement about the situations (i.e., rating of 3 or less), this was taken to mean that the described situation did not exist at their school. These participants were asked to rate how well they felt it would work if the situation were to be true (i.e., *potential situation*; e.g., "At my school, it *would work well* if accessibility to students with disabilities

were to be a criterion for selecting new types of e-learning") on a 6-point Likert scale. Display of the second statement (actual/potential situation) was programmatically controlled in the Web-based questionnaire.

Situations that were asked about included (a) whether participants play an important role in ensuring that e-learning is accessible to students with disabilities, (b) whether problems related to the accessibility of e-learning usually come to them or their department/office for resolution, (c) whether professors at their school are taught about e-learning accessibility-related issues, (d) whether there is someone who makes e-learning accessible to students with disabilities at their school, (e) whether accessibility to students with disabilities is a criterion for selecting new types of e-learning at their school, and (f) whether their school has guidelines/policies that explicitly address the accessibility of e-learning to students with disabilities.

RESULTS

Experiences With E-Learning

Table 1 presents the percentage of participants from the three groups who agreed with each statement about their experiences with e-learning. Chi-square goodness-of-fit tests, also seen in Table 1, were performed on the frequencies. Results indicate that most disability service providers and e-learning professionals felt they were knowledgeable about the types of e-learning used by professors at their school. Over two thirds of all three groups agreed that they were aware of the e-learning accessibility needs of students with disabilities. Close to 90% of disability service providers agreed they were knowledgeable about how to improve e-learning accessibility to students with disabilities, although only about two thirds of professors and e-learning professionals agreed with this statement. In contrast, 85% of professors agreed that e-learning is accessible to students with disabilities, although approximately 50% of disability service providers and e-learning professionals agreed with this statement. While virtually all professors felt that faculty are interested in receiving information on how to make e-learning accessible, less than two thirds of disability service providers agreed with this statement.

Findings on agreement ratings for the same items, which provide more detail, are presented in Table 2,

TABLE 1 Percentages of participants who agreed with each e-Learning statement

Experiences with e-learning	Participants who agreed (%)			df, χ^2
	Disability service providers	Professors	E-learning professionals	
I am (my staff are) knowledgeable about the types of e-learning used by professors at my school	89.5	—	93.3	1, 0.09
I am (my staff are) aware of the e-learning accessibility needs of students with disabilities	89.5	80.0	73.3	2, 5.37
I am (my staff are) knowledgeable about how to improve e-learning accessibility to students with disabilities	86.7	67.6	67.4	2, 7.85*
When professors use e-learning in their courses (e.g., PowerPoint in the classroom, downloadable PDF files, CD-ROMs, WebCT), it is accessible to students with disabilities	57.5	84.8	42.5	2, 13.70**
At my school, professors are interested in receiving information on how to make e-learning accessible to students with disabilities	63.4	94.1	82.6	2, 7.01*

* $p < .05$; ** $p < .01$

TABLE 2 Agreement ratings for experiences with e-Learning statements

Experiences with e-learning	Disability service providers		Professors		E-learning professionals		ANOVA			Post-hoc tests ^a
	M	SD	M	SD	M	SD	F	df	p	
I am (my staff are) knowledgeable about the types of e-learning used by professors at my school	4.67	1.22	—	—	5.07	1.32	2.81	1, 119	.097	—
I am (my staff are) aware of the e-learning accessibility needs of students with disabilities	4.99	1.38	4.40	1.77	4.18	1.34	4.83	2, 153	.009**	D > E
I am (my staff are) knowledgeable about how to improve e-learning accessibility to students with disabilities	4.52	1.35	4.03	1.59	3.77	1.23	4.43	2, 149	.014*	D > E
When professors use e-learning in their courses (e.g., PowerPoint in the classroom, downloadable PDF files, CD-ROMs, WebCT), it is accessible to students with disabilities	3.68	1.51	4.85	1.44	3.45	1.66	8.70	2, 143	.000**	P > D = E
At my school, professors are interested in receiving information on how to make e-learning accessible to students with disabilities	3.83	1.32	5.47	1.23	4.43	1.24	9.97	2, 78	.000**	P > D = E

Note. The higher the score, the greater the agreement. Sample sizes vary slightly, because some participants failed to answer all questions.

^aD = disability service providers; P = professors; E = e-learning professionals.

* $p < .05$; ** $p < .01$

along with the results of one-way analysis of variance (ANOVA) and Tukey HSD post-hoc tests. These show that disability service providers were significantly more likely than e-learning professionals to indicate that they are aware of the e-learning needs of students with disabilities and that they are knowledgeable about how to improve e-learning accessibility. Professors' scores did not differ from either of these two groups

on these items. When it comes to the accessibility of e-learning, professors were significantly more likely to indicate that this was accessible than either disability service providers or e-learning professionals, who did not differ. The same was the case for the item dealing with professors being interested in receiving information on how to make e-learning accessible. Disability service providers and e-learning professionals did not

differ in the extent to which they felt they were knowledgeable about the types of e-learning used by professors at their school.

Actual E-Learning Situations

Table 3 presents chi-square goodness-of-fit test results along with the percentages of participants from the three groups who agreed with each statement about actual e-learning situations at their school. Overall, approximately two thirds of all three groups agreed that they play an important role in ensuring that e-learning is accessible. Problems related to the accessibility of e-learning were most likely to come to disability service providers, with over 70% indicating that this was the case at their school, and least likely to come to e-learning professionals (40%). Less than half of the participants from each group agreed that professors at their school are taught about accessibility-related issues. Roughly half of the participants from each group agreed that there is someone who makes e-learning accessible to students with disabilities at their school, with disability service providers being the most pessimistic. Less than 40% of professors and disability service providers and a little over 50% of e-learning professionals felt that accessibility is a criterion for selecting new types of e-learning. Only about 20% of disability service providers and approximately 50% of the other two groups agreed that their school has

guidelines/policies that explicitly address the accessibility of e-learning.

Findings on mean agreement ratings for these items, which provide more detailed information, are presented in Table 4, along with the results of one-way ANOVA and Tukey HSD post-hoc tests. These show that disability service providers and professors were significantly more likely than e-learning professionals to indicate that problems related to the accessibility of e-learning to students with disabilities usually come to them for resolution. Disability service providers were significantly less likely than the other two groups to indicate that there is someone at their school who makes e-learning accessible or that their school has guidelines/policies that explicitly address the accessibility of e-learning to students with disabilities. E-learning professionals were significantly more likely than the other two groups to indicate that accessibility is a criterion for selecting e-learning at their school.

How Well Situations Actually Work and How Well They Could Potentially Work

Table 5 presents mean ratings of how well actual situations work and how well potential situations would work if they were to exist. A series of ANOVA comparisons (3 groups \times 2 situations [actual/potential])

TABLE 3 Percentages of participants who agreed with each actual situation statement

Actual situation	Participants who agreed (%)			df, χ^2
	Disability service providers	Professors	E-learning professionals	
At my school, I (my service) generally play an important role in ensuring that e-learning is accessible to students with disabilities	74.0	62.9	66.7	2, 1.64
Problems related to the accessibility of e-learning to students with disabilities usually come to me (my service) for resolution	71.1	60.0	40.0	2, 11.30**
At my school, professors are taught about e-learning accessibility-related issues	43.4	34.3	40.0	2, 0.84
At my school, there is someone (a department) who makes e-learning accessible to students with disabilities (e.g., produces captioning for online audio files)	39.0	58.8	57.8	2, 5.80
At my school, accessibility to students with disabilities is a criterion for selecting new types of e-learning	38.7	37.5	53.3	2, 2.93
My school has guidelines/policies that explicitly address the accessibility of e-learning to students with disabilities	21.1	52.9	52.3	2, 16.40**

** $p < .01$

TABLE 4 Agreement ratings for actual situation statements

Actual situation statement	Disability service providers		Professors		E-learning professionals		ANOVA			Post-hoc tests ^a
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>df</i>	<i>p</i>	
At my school, I (my service) generally play an important role in ensuring that e-learning is accessible to students with disabilities	4.25	1.57	3.89	1.97	3.98	1.56	0.71	2, 154	.493	—
Problems related to the accessibility of e-learning to students with disabilities usually come to me (my service) for resolution	4.14	1.70	3.97	1.72	2.89	1.57	8.41	2, 153	.000**	D = P > E
At my school, professors are taught about e-learning accessibility-related issues	3.03	1.50	2.60	1.63	2.93	1.39	0.98	2, 153	.376	—
At my school, there is someone (a department) who makes e-learning accessible to students with disabilities (e.g., produces captioning for online audio files)	2.82	1.86	3.82	1.82	3.64	2.01	4.52	2, 153	.012*	P = E > D
At my school, accessibility to students with disabilities is a criterion for selecting new types of e-learning	2.79	1.66	2.72	1.63	3.64	1.51	4.74	2, 149	.010*	E > D = P
My school has guidelines/policies that explicitly address the accessibility of e-learning to students with disabilities	2.38	1.53	3.47	1.93	3.52	1.77	8.40	2, 151	.000**	P = E > D

Note. The higher the score, the greater the agreement. Sample sizes vary slightly, because some participants failed to answer all questions.

^aD = disability service providers; P = professors; E = e-learning professionals.

* $p < .05$; ** $p < .01$

as well as Tukey HSD post-hoc test results are also available in Table 5. Of interest here are situation main effects and the Group \times Situation interaction.

Results indicate that respondents rated the actual situation significantly more favorably than the potential situation on the item dealing with how well it works when they, themselves, play a role in ensuring e-learning accessibility and on the item dealing with how well it works when problems related to accessibility go to them for resolution. Conversely, potential situation ratings were significantly higher than actual situation ratings on the items dealing with how well it works when professors are taught about e-learning accessibility-related issues and on when guidelines and/or policies that address e-learning accessibility are in place.

A significant Group \times Situation interaction was also found for the item related to participants' role in ensuring that e-learning is accessible. This indicates that when members of each stakeholder group feel they play an important role, all groups believe that this works well. Although individuals who currently do not play an important role are, as a group, more pessimistic, this is not true of disability service providers,

who believe that it would work reasonably well if they were to play an important role.

DISCUSSION

Before discussing the findings, it must be stressed that this study has limitations that may have influenced the results and may affect their generalizability. While all regions of Canada and both college and university sectors are represented, the samples are neither random nor fully representative of the populations studied. Given self-selection biases, disability service providers who are passionate about and, possibly, more heavily engaged in e-learning and accessibility on their campus are likely to be oversampled. Specific professors and e-learning professionals who had experience using e-learning in courses that enrolled students with disabilities were also deliberately sought out. Thus, their views may not be typical. Furthermore, because of the manner in which participants were recruited, it is impossible to calculate a final return rate. The use of e-mail discussion lists as the main form of recruitment poses methodological challenges in this regard.

TABLE 5 Agreement ratings for how well actual and potential situations work

Situation statement ^a	Disability service providers			Professors			E-learning professionals			ANOVA			Post-hoc tests ^b	
	M	SD	n	M	SD	n	M	SD	n	F	df	p		
Actual														
At my school, it works well when I (my service) play an important role in ensuring that e-learning is accessible to students with disabilities	5.14	0.97	57	5.1	1.2	22	5.00	0.64	30	Group	7.1	2, 151	.001**	D > E
Potential														
At my school, it would work well if I (my service) were to play an important role in ensuring that e-learning is accessible to students with disabilities	4.95	1.36	20	3.7	1.7	13	3.40	1.64	15	Situation	27	1, 151	.000**	A > Po
Actual														
It works well when problems related to the accessibility of e-learning to students with disabilities come to me (my service) for resolution	4.91	1.07	54	4.7	1.5	19	4.83	0.99	18	Group	0.9	2, 148	.428	
Potential														
It would work well if problems related to the accessibility of e-learning to students with disabilities were to come to me (my service) for resolution	4.09	1.6	22	3.6	1.3	14	3.81	1.62	27	Situation	18	1, 148	.000**	A > Po
Actual														
At my school, it works well when professors are taught about e-learning accessibility-related issues	4.94	1.11	32	4.6	1.2	12	4.89	0.83	18	Group	1.5	2, 149	.227	
Potential														
At my school, it would work well if professors were taught about e-learning accessibility-related issues	5.49	0.74	43	5.2	0.8	23	5.33	0.83	27	Situation	11	1, 149	.001**	Po > A
										Interaction	0.1	2, 149	.932	

Actual	At my school, it works well when someone (a department) makes e-learning accessible to students with disabilities (e.g., producescaptioning for online audio files)	5.23	0.86	30	5.2	0.83	20	5.23	1.21	26	Group	0.72	2, 150	.488
Potential	At my school, it would work well if someone (a department) were to make e-learning accessible to students with disabilities (e.g., produces captioning for online audio files)	5.47	0.8	47	5.36	1.0	14	5.05	0.78	19	Situation	0.21	1, 150	.651
											Interaction	0.73	2, 150	.486
Actual	At my school, it works well when accessibility to students with disabilities is a criterion for selecting new types of e-learning	5.17	0.81	29	5.0	0.85	12	4.96	1.12	24	Group	3.11	2, 146	.047*
Potential	At my school, it would work well if accessibility to students with disabilities were a criterion for selecting new types of e-learning	5.3	1.35	46	4.4	1.43	20	4.62	1.2	21	Situation	1.67	1, 146	.199
											Interaction	1.19	2, 146	.308
Actual	Having guidelines/policies that explicitly address the accessibility of e-learning to students with disabilities at my school works well	4.94	1.12	16	4.61	1.38	18	4.39	1.27	23	Group	1.91	2, 148	.151
Potential	Having guidelines/policies that explicitly address the accessibility of e-learning to students with disabilities at my school would work well	5.25	1.1	60	5.19	1.17	16	4.86	1.06	21	Situation	4.69	1, 148	.032*
											Interaction	0.14	2, 148	.873

Note. The higher the score, the greater the agreement. Sample sizes vary slightly, because some participants failed to answer all questions.

^aActual situations relate to aspects of e-learning accessibility that currently exist. Potential situations relate to aspects of e-learning accessibility that do not currently exist. Participants who agreed with an actual situation statement rated how well the situation works at their school. Those who disagreed with an actual situation statement rated how well the situation would work in their school.

^bD = disability service providers; P = professors; E = e-learning professionals; A = actual, Po = potential.

* $p < .05$; ** $p < .01$

Knowledge About E-Learning and its Accessibility

Although it was clearly expected that e-learning professionals would indicate that they knew about the types of e-learning professors use, it was reassuring to find that disability service providers were just as likely to indicate that they were knowledgeable. Nevertheless, in this case, the word “knowledgeable” might have different meanings for the two groups.

When it comes to awareness of the e-learning accessibility needs of students with disabilities and about how to make e-learning accessible to them, disability service providers were most likely to indicate that they were aware. This is consistent with recent trends reported by Stodden et al. (2006) and makes sense in light of the finding that this group was most likely to indicate playing an important role both in ensuring e-learning accessibility and in dealing with e-learning accessibility issues. That being said, professors and e-learning professionals are ultimately the users, drivers, adopters, and decision makers around these technologies. This suggests that they need to improve their level of understanding and involvement in these areas.

Another study objective was to gain information about the accessibility of e-learning used by faculty and about how interested professors were in receiving information about making e-learning accessible. The results indicate that professors were most optimistic on both counts by a large margin. Certainly the professors in this sample are telling us that they do want this type of information. But as noted in the section on limitations, the sample of professors was selected based on the recommendations of disability service providers and may not be typical of faculty in general. Regrettably, less than two thirds of disability service providers, who are most closely involved with accessibility issues, felt that professors were interested in receiving information about how to make e-learning accessible. Thus, it was not surprising to find that only about 40% of all three groups of respondents indicated that professors at their school are taught about e-learning accessibility-related issues.

Disability service providers may well be responding based on the type of reaction they receive when they reach out directly to professors, who often want information delivered on an “as needed” basis, as suggested by Bissonnette (2006). His findings show that, when asked how they wished to receive information about

accessibility and disability issues in general, professors chose a Web site and printed material. As Bissonnette points out, the limitation of such a just-in-time approach is that accessibility is retrofitted, a solution that does not yield optimal results (Burgstahler, 2008).

How Is E-Learning Accessibility Being Addressed?

As noted earlier, disability service providers are most likely to play an important role in ensuring accessibility and in solving e-learning problems. Professors are generally not taught how to make e-learning accessible, possibly because of lack of interest or because of issues related to the format and vehicle for instruction (Bissonnette, 2006). These results, coupled with the findings showing that (a) only half of the participants agreed that there is someone at their school who is responsible for making e-learning accessible to students, (b) less than half of the participants agreed that accessibility is a priority criterion for selecting new types of e-learning at their school, and (c) only somewhere between one third and one half of the participants agreed that their school has guidelines about the accessibility of e-learning, suggest that serious problems related to the accessibility of e-learning remain.

Similarities and Differences Between Groups

The results show that e-learning professionals indicate being least aware of the e-learning access needs of students with disabilities and least knowledgeable about how to make e-learning accessible. On the topic of whether there is someone who makes e-learning accessible to students with disabilities at their school, professors were most likely to believe that there was someone like that on campus. Given the responses of disability service providers, who were least likely to believe that there is someone on campus who is charged with this task, one might assume that professors and e-learning professionals had disability service providers in mind when responding to this item. This would not be an unreasonable conclusion when taking into account that disability service providers are seen to be the subject matter experts when it comes to “all things” involving students with disabilities.

Another study objective was to determine whether accessibility was a criterion in decision making when it comes to the adoption of e-learning products. E-learning professionals were, on the whole, more likely than the other two groups to indicate that this was the case, although only half of them indicated this. Related to this topic, participants were asked about the availability of guidelines or policies that explicitly address the accessibility of e-learning to students with disabilities on their campuses. Very few disability service providers told us that guidelines or policies existed at their school, whereas professors and e-learning professionals were more optimistic that such policies or guidelines were in place.

How Well Situations Actually Work and How Well They Could Potentially Work

For those who indicated that they play an important role when it comes to ensuring that e-learning is accessible to students with disabilities, there was moderate agreement among the three groups that this situation works well. Similarly, those who indicated that problems related to the accessibility of e-learning come to them for resolution also indicated that this works reasonably well.

The views of those campus disability service providers, professors, and e-learning professionals who told us that they were not involved with ensuring e-learning accessibility and who did not have people or processes in place to make e-learning accessible to students with disabilities were also explored. These individuals were asked about how well things would work if circumstances were different, and they had a larger role to play. Here the findings indicate that of those who currently do not do so, only disability service providers believe that playing an important role in ensuring accessibility would work well. The other two groups were more pessimistic about this. As for e-learning problems coming to them for resolution, the results indicate that those not currently responsible for resolving problems believe that problems coming to them would not work especially well.

When it came to the perceived benefits of teaching professors about e-learning accessibility and about implementing institution-wide accessibility guidelines, the findings indicate that those who do not have these structures in place are more optimistic that these

changes would be beneficial than are those who have experience with these, and are thus more informed.

The one realm where both the “haves” and the “have-nots” of all three groups agreed concerns the benefit of having someone who makes e-learning accessible to students with disabilities on campus. All three groups, including those who actually have a person charged with this responsibility at their school and those who do not, agreed that this state of affairs is very desirable.

SUMMARY AND IMPLICATIONS

Overall, the findings indicate that campus disability service providers were most likely to believe that problems related to the accessibility of e-learning go to them and e-learning professionals were least likely to believe this. In addition, only half of the participants indicated that (a) professors are taught about e-learning accessibility, (b) there is someone on campus who makes e-learning accessible, (c) accessibility is a criterion for selecting new types of e-learning, and (d) their school has guidelines or policies about e-learning accessibility. These findings suggest that serious problems related to the accessibility of e-learning remain.

The finding that problems associated with e-learning accessibility are typically not brought to the attention of e-learning professionals who, after all, support and deal with e-learning on campus was puzzling. Is it that there is little communication between campus-based disability service providers and e-learning professionals? Or is it that e-learning professionals do not see themselves as being responsible for addressing the requirements of the subset of students with disabilities, leaving this to the domain of disability service providers?

Even more troubling were the findings that in the cases of both accessibility guidelines and faculty training, those individuals who did not have these in place at their school felt that they were more desirable to have than was warranted, according to the opinion of those who actually had them at their schools. This suggests a closer look is required into whether faculty actually make use of available training in e-learning accessibility and whether policies to purchase accessible e-learning exist only on paper, rather than in actuality.

Finally, in cases where colleges and universities do have policies and guidelines that specifically address

e-learning accessibility training and policies, understanding what has worked well and what has not would clearly be of use to those institutions that might wish to put such practices in place.

RECOMMENDATIONS

Create a Role for an E-Learning Accessibility Specialist

Whether it means adding to an individual's existing mandate or creating a new role, the results indicate that having someone on campus who is responsible for making e-learning accessible to students with disabilities would be beneficial. This is not to suggest that this accountability should rest within the office or service responsible for students with disabilities. Rather, it would be appropriate that this person be a member of the department or unit that is responsible for e-learning for the school.

Adopt E-Learning Accessibility Guidelines

Colleges and universities should consider developing and adopting e-learning accessibility guidelines that address both in-house development of e-learning and purchases of e-learning products and technology. To be effective, such guidelines would need to be viewed as requirements, as opposed to being optional. They would need buy-in from a variety of stakeholders and would need senior-level support within the institution.

Improve Training

Many colleges and universities already offer training on how to integrate e-learning in teaching and on how to use specific e-learning tools. As a start, developing a module on how to make e-learning accessible and integrating this into existing training would, at a minimum, begin sensitizing faculty and staff to the issues. Other, more targeted modules can be considered on specific topics, such as how to make a Web site or a PDF file accessible, based on needs. There are numerous online resources to act as a starting point, including EASI (<http://easi.cc/>), DO-IT (www.washington.edu/doi/), and WebAIM (www.webaim.org/).

Have the Campus Disability Service Provider Play a Larger Role in E-Learning Decisions

Virtually all schools have an individual, a committee, or a department that is responsible for e-learning products and the training of faculty in the effective use of ICTs in teaching. Inviting campus-based disability service providers to sit on this body could go a long way toward ensuring that e-learning is accessible to students with disabilities, toward developing guidelines and policies that explicitly address the accessibility of e-learning, and toward including accessibility issues in faculty training.

CONCLUSIONS

To assure that students with disabilities have the chance to gain the same skills, experience, and opportunities that their nondisabled peers derive from e-learning, professors, e-learning professionals, and campus disability service providers, together, must play a role in making e-learning accessibility a priority.

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Multiple Perspectives on the Accessibility of E-Learning in Canadian Colleges and Universities

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