JOURNAL OF DISTANCE EDUCATION
REVUE DE L'ÉDUCATION À DISTANCE
SPRING/PRINTEMPS 2004
VOL. 19, No 1, 73-91

Students with Disabilities in Distance Education: Characteristics, Course Enrollment and Completion, and Support Services

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Abstract

This study describes the characteristics, enrollment, and completion rates of students with disabilities and the support services they received over a three-year period. Between 1998 and 2001 a total of 604 students with disabilities enrolled in undergraduate courses at Athabasca University, which represents 1.5% of the student population. More than half (52%) had a physical disability, 20% had a learning disability, 20% had a psychological disability, 4% had some form of visual impairment, and 3% had a hearing impairment. Of these students 56.6% completed one or more of the courses in which they were enrolled. Their overall course completion rate (including early withdrawals) was 45.9%, somewhat lower than that of the general university population. Most students received a variety of types of assistance and accommodation through the Office for Access for Students with Disabilities. Only 7% of students with disabilities received no support services. Students who received more types of support services tended to have somewhat more success in terms of course completions, and certain types of disabilities appeared to be more amendable to certain types of assistance.

Résumé

L'étude décrit les caractéristiques des étudiants handicapés, leur inscription aux cours, leur taux de réussite ainsi que les services de soutien qu'ils ont reçus sur une période de trois ans. Entre 1998 et 2001, un total de 604 étudiants handicapés se sont inscrits à des cours de premier cycle à l'Université d'Athabasca, soit 1,5 % de la population étudiante. Plus de la moitié de ces étudiants (52 %) avaient un handicap physique, 20 % avaient des difficultés d'apprentissage, 20 % avaient une déficience psychologique, 4 % avaient une déficience visuelle et 3 % avaient une déficience auditive. De ces étudiants, 56,6 % ont complété un ou plus d'un cours auxquels ils s'étaient inscrits. Dans l'ensemble, le taux de réussite (incluant les abandons avant pénalité) était de 45,9 %, un peu plus bas que celui de la population universitaire générale. La plupart des étudiants ont reçu une variété de types d'assistance et d'arrangement par le biais du Bureau pour l'accessibilité aux étudiants handicapés. Seulement 7 % des étudiants handicapés n'ont pas reçu de services de soutien. Les étudiants qui ont reçu le plus de types de services de support avaient tendance à avoir un peu plus de succès dans la réussite des cours,

et les personnes avec certains types de handicap ont semblé être plus réceptives à certains types d'assistance.

Distance education provides distinct advantages for many students with disabilities by offering access to postsecondary educational opportunities that may not be present at more conventional universities. For example, Paist (1995) notes that flexibility in the location, scheduling, and delivery of distance education programs can provide disabled students with what may be their first real access to higher education. Similarly, Ommerborn (1998) in an extensive review of distance education programs worldwide for students with disabilities notes similar findings, emphasizing that in addition to improving access, it is equally important to ensure that students with disabilities receive the support they require to ensure success in their studies. Disability-specific services are an important contributor to success in postsecondary education for students with disabilities. Studies show that postsecondary students with disabilities who receive appropriate support services persist in their studies and graduate at the same rates as their non-disabled counterparts (Horn & Berktold, 1999).

For more than two decades, in both Canada and the United States, students with disabilities have been attending postsecondary institutions in increasing numbers, and disability-related support services have emerged (Hill, 1996). In the US, services for students with disabilities are mandated by legislation, and programs for ensuring access and success and students with disabilities are commonplace. For example, the DO-IT Project at the University of Washington (http://www.washington.edu/doit) is an exemplary program of support for students with disabilities. Moreover, this program has fostered research into the application of Universal Instructional Design (Burgstahler, 2001), an instructional design model that enhances access to and success in both distance and classroom-based learning.

In Canada, however, supports to postsecondary students with disabilities are a more recent occurrence. Nonetheless, several Canadian research centers that conduct research on students with disabilities in postsecondary education and the support services they require have been established. For example, the SNOW Project (Special Needs Opportunity Windows) at the University of Toronto provides online resources for educators of students with special needs and conducts research into the use of adaptive technology to assist learning. The Adaptech Project at Dawson College conducts research into the use of computer, information, and adaptive technologies by students with disabilities and has published extensively in this area. They have conducted numerous surveys and interviews in colleges and universities throughout Canada with students with disabilities and support service providers (Fichten, Barile, & Asun-

cion, 1999; Fichten, Jennison et al., 2000). Until recently, the Adaptech Project has focused primarily on traditional campus-based programs; however, they recently began a three-year study to investigate the accessibility for students with disabilities of the various forms of e-learning in Canadian colleges and universities.

In a recent survey, Fichten, Asuncion, Barile, Robillar, and Lamb (2003) studied 156 disability services providers in Canadian colleges and universities, two from distance education institutions. They found that 8% of the postsecondary institutions surveyed had no students with disabilities, and that overall, 2% of students were receiving disability-related services. In distance education 3% of students were receiving such supports. In their findings they questioned the adequacy of the support students with disabilities receive in Canadian postsecondary institutions. Based on estimates of the number of students with disabilities in postsecondary institutions, which tend to range from about 4% to 6% (Horn & Berktold, 1999; Taillon & Paju, 2000), Fichten et al. estimated that more than 100,000 students with disabilities are currently enrolled in Canadian postsecondary institutions, but that fewer than half are receiving support services. Given the importance of disability-specific services for the success of students with disabilities in postsecondary education, the lack of services for many students is a serious concern.

As the discussion above indicates, students with disabilities and the support services they access in distance education settings have received relatively little attention in comparison with those students in more traditional postsecondary programs. Kim-Rupnow, Dowrick, and Burke (2001) note, “there is a serious lack of information on whether distance education is reaching those individuals with disabilities who might not otherwise have access to higher education” (p. 34). They cite the lack of research concerning the overall effectiveness of disability-specific supports, noting the dearth of outcome-based research. More knowledge is needed about the participation of students with disabilities in distance education, the services they access, and the success they experience in their studies. The experience of Athabasca University with students with disabilities and the services they access may contribute to closing this knowledge gap.

Athabasca University’s attention to students with disabilities is by no means new. Throughout the 1980s and into the 1990s numerous reports were prepared and presentations made regarding the provision of services to students with disabilities (Gaudette, 1992; Gerofsky, 1997, 1998; Leavens, 1997; Nilsson, 1983; Young & Gaudette, 1997). Following from this work, the Office for Access to Students with Disabilities was established in April 1998.

Currently staffed with a coordinator and student advisor, the Office for Access to Students with Disabilities (ASD) provides support services to

students with physical, sensory, learning, emotional, and other disabilities. The aim is to provide them with an equal opportunity to access and succeed in Athabasca University courses and programs. Services are responsive to a wide variety of needs. Students receive information, assessments for assistive technology, assistance and/or referral for funding and services, help with study skills and organizational strategies, extension of course contract dates, alternative methods for writing exams, and a variety of other services.

Since its inception, requests for support services have been growing. Between April 1, 1998 and April 1, 2001, 604 students with disabilities were enrolled in Athabasca University; 93% (563) of these students received services. In April 2002 709 active students and an additional 100 prospective students were receiving services through the ASD office. Prospective students are those who are planning to take courses but who have not yet registered. They are receiving services in anticipation of their studies, for example, getting help in arranging funding and acquiring assistive technology so they will be ready when their courses begin. In April 2003 there were 679 active students, 479 inactive (no course-related activity for 12 months), and 130 prospective students. In March 2004 there were 912 active students, 549 inactive students, and 149 prospective students. The latter represents a 34% growth rate in less than a year.

To obtain a greater understanding of the nature of students with disabilities at Athabasca University and the support services they receive, an exploratory study was conducted to coincide with the first three years of the operation of the ASD office (1998-2001).

Method

A case study design was used to explore the nature and experience of students with disabilities at Athabasca University, particularly with regard to the support services they received. The study investigated the following questions.

- What are the characteristics of students with disabilities at Athabasca University? What are their enrollment patterns?
- Is the level of course completion of students with disabilities different from that of the general Athabasca University undergraduate population?
- What is the relationship between course completion and factors such as type of disability and type(s) of services received?

The study examined the cohort of students with disabilities who enrolled in one or more Athabasca University courses with a start date between April 1, 1998 and April 1, 2001. Students with disabilities were identified in two ways: (a) by indicating they had a disability on the

General Admissions Form on applying to the university; or (b) by referral or self-referral to ASD after starting their studies.

Data were obtained from two sources. Data from Institutional Studies included student name, age, sex, enrollment date, courses enrolled in, and courses completed. Enrollment and completion data from the general AU population during this period were also obtained. Data from ASD office files included type of disability and type(s) of services received. Descriptive and Chi-square statistical analyses were conducted using SPSS to analyze the data.

Findings

The findings presented below respond to the research questions about students' characteristics, course enrollment and completion, and services received.

Students' Characteristics

Between April 1, 1998 and April 1, 2001, a total of 604 students with disabilities enrolled in Athabasca University. During the same period, a total of 40,863 students without disabilities enrolled. As such, students with disabilities represented 1.5% of the undergraduate university population during the period of study.

Nearly half (52.3%) of the students with disabilities had a physical disability (Figure 1). This broad category included mobility difficulties such as paraplegia; chronic illnesses such as multiple sclerosis or chronic fatigue syndrome; and other debilitating conditions with a physical or organic basis. Brain injury was also included in this category.

One fifth (20.5%) of the students had a learning disability, and nearly the same proportion (19.7%) had a psychological disability. Learning disabilities included conditions such as dyslexia, reading difficulties, and attentional disorders. Psychological disabilities included conditions such as depression, anxiety conditions, phobias, and bipolar disorder. In addition, 25 students with visual impairment (4.1%) and 18 students with a hearing disability (3.0%) were enrolled during this three-year period.

Of the 604 students with disabilities enrolled at Athabasca University between 1998 and 2001, two out of three (65.4%) were female. This gender distribution is similar to that of the general AU population (Athabasca University, 1999, 2000, 2001). Comparison of the age distribution (Table 1) reveals that students with disabilities tended to be older than the general AU undergraduate population during this three-year period (Athabasca University, 1999, 2000, 2001). Whereas 39.2% of the general AU population was 41 years of age or older, 50.6% of students with disabilities were in this age group. These results may be at least partly explained by the rela-

Table 1
Age Distribution of Students With Disabilities and the General Undergraduate Population at Athabasca University

	Students with disabilities (%)	*General AU population (%)*
20 years or less	7.3	6.7
21-30 years	42.1	54.1
31-40 years	30.6	25.7
41-50 years	15.3	11.2
51+	4.7	2.3

tionship between age and disability. As people get older they are more likely to be affected by a condition that limits their ability.

Course Enrollment

Over the period of this study, students with disabilities enrolled in a total of 2,426 courses, an average of approximately four courses per student. This enrollment rate is twice that of non-disabled students at Athabasca University during this same period. Between April 1, 1998 and April 1, 2001, 40,863 students without disabilities were enrolled in a total of 83,615 courses, representing a rate of two courses per student (personal communication, Institutional Studies, Athabasca University, 2003).

The higher rate of course enrollment for students with disabilities is probably at least partly attributable to the requirements of funding bodies such as the Student Finance Board. Many students with disabilities are full-time students and receive student loans to supplement their incomes. Until recently, regulations required them to take at least three courses per term to maintain their funding. As a result, in order to maintain an income, students registered at the rate of three courses per term even if they had not completed the previous courses in which they had enrolled. This

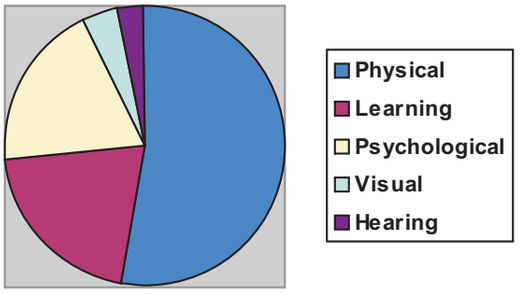

Figure 1. Types of disabilities.

meant that some students had a large number of incomplete courses. On the other hand, some students were able to complete an extensive number of courses. Indeed 17 students with disabilities graduated with a degree during this three-year period. For these students with disabilities, like many others, distance education is providing a means to employment and a career.

Course Completion

In order to study enrollment and completion patterns, students were categorized into two groups, as illustrated in Figure 2.

1. *0 Completions*: those who had completed none of the courses in which they had enrolled. This group represented 262 students (43.4%); they accounted for 22.9% (556 courses) of the course enrollments.
2. *1+ Completions*: those who had completed at least one course. This category represented 342 (56.6%) of the students and accounted for 77.1% (1,870 courses) of the course enrollments.

Of the enrollments in the latter group, 1,113 courses were completed, representing a completion rate of 59.5% in this group.

Students with various types of disability did not appear to have markedly different completion patterns. Approximately the same proportion of students with each type of disability was represented in the 0-completion group and in the 1+-course completion group (Table 2).

However, when considering completion rates (i.e., number of courses completed divided by number of courses taken), differences among the various groups became apparent (Table 3). For example, the completion rate of 40.4% for students with psychological disabilities was somewhat lower than average (45.9%), whereas completion rates for students with sensory disabilities—hearing and vision loss—were somewhat higher

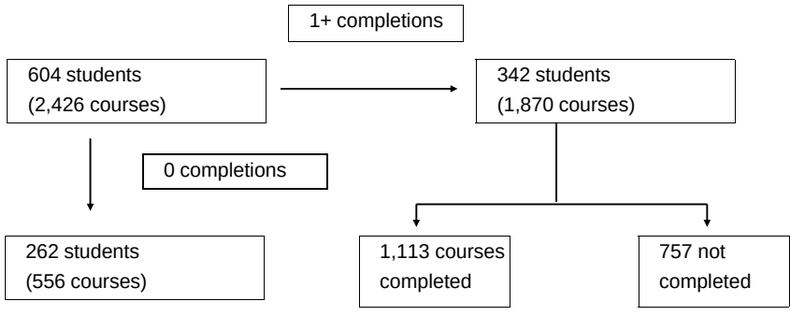

Figure 2. Course enrollments and completions for students with disabilities (1998-2001).

Table 2
Students With Disabilities Completing and not Completing Athabasca University Courses (1998-2001)

Type of Disability	*Students overall*		*0 Courses completed*		*1 or more courses completed*	
	%	*n*	*%*	*n*	*%*	*n*
Physical	52.3	316	51.1	134	53.2	182
Learning	20.5	124	19.8	52	21	72
Psychological	19.7	119	21.8	57	18.1	62
Visual	4.1	25	5.0	13	3.5	12
Hearing	3.0	18	2.3	6	3.5	12
Undetermined	.3	2	0	0	.6	2
Total		604		262		342

than average at 66.7% and 50.8% respectively. These latter figures should be interpreted cautiously, however, given the small size of these groups.

Overall, students with disabilities had a completion rate of 45.9%, which included early withdrawals (i.e., students who withdrew within 30 days of enrolling). This rate is somewhat lower than the completion rate for Athabasca University students without disabilities, which is 52.5% when early withdrawals are included, or 59.5% when early withdrawals are excluded (personal communication, Institutional Studies, Athabasca University, 2003).

Table 3
Completion Rates According to Type of Disability (1998-2001)

Type of Disability	*Courses taken*	*Courses completed*	*Completion rate*
Physical	1,268	578	45.6
Learning	471	229	48.6
Psychological	530	214	40.4
Visual	81	54	66.7
Hearing	65	33	50.8
Undetermined	11	5	45.4
Total	2,426	1,113	45.9*

*Comparative rate for general Athabasca University population is 52.5%.

Services Received

The study also examined the types of services that students received over the three-year period through the Office for Access for Students with Disabilities (ASD). Based on a review of student files, ASD services were categorized into four areas as described below.

1. *Course accommodation*. These services included changes to the course that did not affect the course content. The most common type of accommodation involved extended contract time in the form of one or more extensions to the usual six months for completing the course. This category also included alternative formats for course materials (e.g., electronic file of text material, transcript for audiotaped materials).
2. *Exam accommodation*. This type of service included time accommodations for examinations such as additional time for the examination, deferrals, or break times during examinations. It also included assistance with presenting the questions and recording the student's response, for example, through the use of a reader or scribe or by printing the examination in a large-size font. Other examination accommodations included environmental changes (e.g., providing an especially distraction-free room, playing relaxing music). Still other accommodations involved format changes requiring content expertise (e.g., multiple-choice to short-answer questions, oral examination).
3. *External support service*. The use of an academic strategist, special content assistance, or educational aide (e.g., note-taker, interpreter) were included in this category. This category primarily involved contracting services external to the university.
4. *Assistive technology*. This type of service involved assessment of student needs for adaptive equipment or technology, arranging funding, procuring equipment, and organizing training. Common types of assistive technology included the use of text-to-speech, speech-to-text, and screen reader software, as well as specially set-up computers to accommodate difficulties such as low vision, fine motor limitations (e.g., hand tremors), and dexterity problems.

Most students with disabilities received some type of service; only 41 students (7%) received no services at all. Table 4 presents the types of services students obtained, categorized according to whether or not the recipient completed any courses.

The most commonly received service was extended contract time, with nearly 68% of students overall receiving this service; 69.3% of students who completed courses received this service. The second most commonly received service was extended examination time or exam deferral, with

Table 4
Services Received by Students With Disabilities at Athabasca University (1998-2001) Completing and Not Completing Courses

Type of Service	*Overall (n = 604)*		*Non-Completers (n = 262)*		*Completers (n = 342)*	
Course Accommodation	*n*	*%*	*n*	*%*	*n*	*%*
Contract time	410	67.9	173	66.0	237	69.3
Alternative format	8	1.3	3	0.4	5	1.5
Exam Accommodation						
Time	352	58.3	135	51.5	217	63.5
Communication mode	184	30.5	77	29.4	107	31.3
Environment	163	27.0	63	24.0	100	29.2
Format	5	0.8	3	0.4	2	0.6
External Support Service						
Academic strategist	20	3.3	9	3.4	11	3.2
Educational aide/tutor	19	3.1	6	2.3	13	3.8
Assistive Technology						
Assessment	55	9.1	25	9.5	30	8.8
Funding arrangement	54	8.9	24	9.2	30	8.8
Equipment procurement	55	9.1	25	9.5	30	8.8
Training	40	6.8	16	6.1	24	7.0
Total Services received	1,365		559		806	
Services per student	2.3		2.1		2.4	

approximately 58% of students overall receiving this service; 63.5% of students completing courses received this type of service.

Overall, students who received more services had more success in terms of course completions. For example, 69.3% of students who completed one or more courses had extensions to their contract time, compared with 65.6% of those who did not complete any courses. Similarly, 63.6% of students who completed one or more courses had accommodations made to the time of their examinations (e.g., more time allowed), compared with only 51.5% of those in the group who completed no courses.

Students received an average of 2.3 types of services through the ASD office. Students who completed one or more courses received slightly more types of services than those who did not complete any courses, 2.4 and 2.1 types of services respectively.

Further examination of type of disability and types of services received suggests that certain types of disabilities may be more amenable to certain types of assistance.

Table 5
Services Received by Students With Physical Disabilities at Athabasca University (1998-2001), Completing and Not Completing Courses

Type of Service	*0 Courses Completed (n = 134)*		*1+ Courses Completed (n = 182)*	
Course Accommodation	*n*	*%*	*n*	*%*
Contract time	98	73.1	138	75.8
Alternative format			2	1.1
Exam Accommodation				
Time	75	56.0	115	63.2
Communication mode	42	31.3	61	33.5
Environment	38	28.3	53	29.1
Format	2	1.5	1	0.5
External Support Service				
Academic strategist	6	4.5	3	1.6
Educational aide/tutor	4	3.0	3	1.6
Assistive Technology				
Assessment	21	15.7	14	7.7
Arrange funding	20	15.0	14	7.7
Procure equipment	21	15.7	14	7.7
Training	14	10.4	12	6.6
Total Services received	341		430	
Services per student	2.5		2.4	

Physical disabilities

Of the 316 students with physical disabilities (Table 5), 182 (57.6%) completed one or more of the courses in which they were enrolled. These students received an average of 2.4 types of support services. Somewhat surprisingly, students with physical disabilities who completed no courses received slightly more support services: an average of 2.5 types of services.

As shown in Table 5, receiving services did not appear to make a great deal of difference for improving the likelihood of course completion.

Course and exam accommodations showed a slight, but not statistically significant, increase in completions. For example, 73.1% of students who completed no courses received extensions to their contract time, compared with 75.8% of those who completed at least some of the courses in which they were enrolled. Similarly, 51.5% of students who completed no courses received accommodations to their examination time, compared with 63.5% of those who completed at least some of the courses in which they were enrolled. On the other hand, more students receiving external

Table 6
Services Received by Students With Learning Disabilities at Athabasca University (1998-2001), Completing and Not Completing Courses

Type of Service	*0 Courses Completed (n = 52)*		*1+ Courses Completed (n = 72)*	
Course Accommodation	*n*	*%*	*n*	*%*
Contract time	27	52.0	35	48.6
Alternative format				
Exam Accommodation				
Time	32	61.5	52	72.2
Communication mode	22	42.3	28	38.9
Environment	12	23.1	28	38.9
Format	1	2.0		
External Support Service				
Academic strategist	3	5.8	8	11.1
Educational aide/tutor	1	2.0	7	9.7
Assistive Technology				
Assessment	1	2.0	12	16.7
Arrange funding	1	2.0	12	16.7
Procure equipment	1	2.0	12	16.7
Training	1	2.0	10	13.9
Total Services received	102		204	
Services per student	2.0		2.8	

study support or assistive technology were in the group that completed none of the courses in which they were enrolled.

Learning disabilities

In contrast, students with learning difficulties received somewhat more types of support services (Table 6). Of the 124 students with learning disabilities, 72 (58.1%) completed one or more of the courses in which they were enrolled. Students in this group received an average of 2.8 types of support services, compared with 2.0 types of services for those in the non-completion group.

With the exception of extended contract time, these additional types of support services increased the likelihood of course completion for students with learning disabilities. This was particularly true for students who received assistive technology. As shown in Table 6 of 13 students who received assistive technology, 12 completed at least one course.

Table 7
Services Received by Students With Psychological Disabilities at Athabasca University (1998-2001), Completing and Not Completing Courses

Type of Service	*0 Courses Completed (n = 57)*		*1+ Courses Completed (n = 62)*	
Course Accommodation	*n*	*%*	*n*	*%*
Contract time	40	70.2	51	82.3
Exam Accommodation				
Time	21	36.8	34	54.8
Communication mode	4	7.0	6	9.7
Environment	8	14.0	12	19.3
Format	1	1.7		
External Support Service				
Educational aide/tutor	1	1.7	2	3.2
Assistive Technology				
Assessment	3	5.3	2	8.2
Arrange funding	3	5.3	2	8.2
Procure equipment	3	5.3	2	8.2
Training	1	1.7	2	6.0
Total Services received	85		113	
Services per student	1.5		1.8	

Psychological disabilities

Of the 119 students with psychological disabilities, 62 (52.1%) completed one or more of the courses in which they were enrolled (Table 7). Students in this group received an average of 1.8 types of support services, in comparison with 1.5 types of services received by students who completed none of the courses in which they enrolled. In comparison with the other types of disabilities discussed above, students with psychological disabilities received the fewest types of services. None of the services they received appeared to make a significant difference in course completion.

Hearing disabilities

Of the 18 students with hearing disabilities, 12 (66.7%) completed one or more courses in which they were enrolled. As shown in Table 8, students in this group received an average of 1.8 types of support services, somewhat higher than the 1.0 type of services for students who completed none of the courses in which they were enrolled. Due to the small number of students in this group, it is difficult to draw conclusions; however, accommodations appeared to have a positive (but nonsignificant) effect on course completion.

Table 8
Services Received by Students With Hearing Loss at Athabasca University (1998-2001), Completing and Not Completing Courses

Type of Service	*0 Courses Completed (n = 6)*		*1+ Courses Completed (n = 12)*	
Course Accommodation	*n*	*%*	*n*	*%*
Contract time	1	16.7	5	41.7
Alternative format	1	16.7	1	8.3
Exam Accommodation				
Time	1	16.7	6	50.0
Communication mode	3	50.0	4	33.3
Environment			1	8.3
Format				
External Support Service				
Academic strategist				
Educational aide/tutor			2	16.7
Assistive Technology				
Assessment			1	8.3
Arrange funding			1	8.3
Procure equipment			1	8.3
Training				
Total Services received	6		22	
Services per student	1.0		1.8	

Visual disabilities

Of the 25 students with visual disabilities, 12 (48.0%) completed one or more of the courses in which they were enrolled (Table 9). Students in this group received an average of 3.0 types of services, somewhat higher than the 1.9 types of services received by students who completed none of the courses in which they enrolled. Like the group with hearing loss, it is difficult to draw conclusions about accommodations due to the small numbers of students; however, overall, accommodations appeared to have a positive (but not significant) effect on course completion.

Summary

As shown in Table 10, students with certain disabilities appear to be more or less amenable to certain types of support services. Assistive technology in particular appears to be especially effective for students with learning disabilities, as does assistance provided by a study strategist or special tutor. However, extended course contract time alone does not appear to be helpful for these students in completing their courses. On the other hand,

Table 9
Services Received by Students With Vision Loss, Completing and Not Completing Courses

Type of Service	*0 Courses Completed (n = 13)*		*1+ Courses Completed (n = 12)*	
Course Accommodation	*n*	*%*	*n*	*%*
Contract time	7	53.8	7	58.3
Alternative format	1	7.7	1	8.3
Exam Accommodation				
Time	6	46.1	9	75.0
Communication mode	6	46.1	8	66.7
Environment	5	38.5	6	50.0
Format				
External Support Service				
Academic strategist			1	8.3
Educational aide/tutor			1	8.3
Assistive Technology				
Assessment			1	8.3
Arrange funding			1	8.3
Procure equipment			1	8.3
Training				
Total Services received	25		36	
Services per student	1.9		3.0	

extended contract time appears to help students with psychological disabilities to complete their courses.

Similarly, more types of support services provided seem to be related to more success in terms of course completions. The group with the lowest completion rate—students with psychological disabilities—also received the fewest services. Similarly, those with the highest completion rates—those with learning disabilities, hearing loss, or visual disabilities—received more types of assistance. Further study is required to explore the relationship between type of disability and support services in order to determine the optimal forms of support and assistance for students with disabilities.

Discussion

As noted above, comparatively little is known about the participation of students with disabilities in distance education, the services they access, and the success they experience in their studies. To address this knowledge gap, a case study reflecting the experience of the first three years in

Table 10
Percentage of Students Completing One or More Courses by Types of Services Received, Services per Student, and Completion Rate (1998-2001)

Type of Service	*Type of Disability*					
	Overall %	*Physical* %	*Learning* %	*Psych* %	*Hearing* %	*Visual* %
Course Accommodation						
Contract time	69.8	76.4	48.6	83.9	41.7	58.3
Alternative format	1.8	3.3	0.0	0.0	8.3	8.3
Exam Accommodation						
Time	64.6	63.7	76.4	54.8	50.0	75.0
Communication mode	31.9	34.6	38.9	9.7	33.4	66.7
Environment	29.2	29.1	38.9	19.3	8.3	50.0
Format	0.3	0.5	0.0	0.0	0.0	0.0
External Support Service						
Academic strategist	3.2	1.6	11.1	0.0	0.0	8.3
Educational aide/tutor	3.8	1.6	9.7	3.2	16.7	8.3
Assistive Technology						
Assessment	9.1	8.2	16.7	8.2	8.3	8.3
Arrange funding	9.1	8.2	16.7	8.2	8.3	8.3
Procure equipment	9.1	8.2	16.7	8.2	8.3	8.3
Training	6.7	6.0	13.9	6.0	0.0	0.0
Types of services/student	2.4	2.4	2.9	1.8	3.0	3.0
Completion rate	45.9	45.6	48.6	40.4	50.8	66.7
Number of students	604	316	124	119	18	25

the operation of Athabasca University's Office for Access for Students with Disabilities (ASD) was presented.

Between 1998 and 2001, 604 students with disabilities enrolled in undergraduate courses at Athabasca University, representing 1.5% of the student population. This finding raised questions about the participation of students with disabilities at Athabasca University as their enrollment during the period of the study was somewhat less than expected. Estimates of the number of students with disabilities in postsecondary institutions tend to range between 4% and 6% (Taillon & Paju, 2000; and Horn & Berktold, 1999, as cited in Fichten et al., 2003). Such estimates, however, can range from as high as 9% as suggested Henderson (1995), who surveyed first-year students in 469 US-based universities and colleges, to as low as 2%. This figure was suggested by Ommerborn and Schumer (2001), who reported results from a 1994 survey of students

enrolled in the FernUniversität, a distance education university in Germany.

However, since this study, the number of students with disabilities enrolled at Athabasca University has increased. Recent figures from Institutional Studies and the Office for Access for Students with Disabilities (personal communication, April 14, 2004) indicate that in March 2004 a total of 26,678 students were registered in courses at Athabasca University. Of these students, 912 had a self-registered with a disability, representing 3.4% of the population. Nevertheless, participation remains a concern. If distance education indeed provides particular benefits to students with disabilities in terms of flexibility of time, location, instructional mode, and so forth, then rates of participation higher than that in conventional campus-based programs may be expected. Such rates have yet to be reported, however.

Success is also a concern. The study found that students with disabilities took courses at a much higher rate than their non-disabled counterparts: an average of four courses over the three-year period of the study compared with with two courses for the general undergraduate population. However, students with disabilities experienced somewhat less success in these courses. Their overall course completion rate (including early withdrawals) of 45.9% was lower than that of the general AU population (52.5% when early withdrawals are included; 59.5% when early withdrawals are excluded). Moreover, completion rates ranged from 40% for students with psychological disabilities to more than 65% for students with sensory disabilities. Further study of enrollment patterns and success rates is required, particularly with regard to the differential success rates that appear to exist among students with varying types of disabilities. The removal of the requirement to be registered in three courses as a full-time student when receiving a student loan may also have a positive effect on these outcomes.

This review suggests that disability-specific support services are indeed helping students in their studies. Remarkably, only 7% of the students with disabilities did not receive some form of assistance and accommodation. Overall, students who received more types of services tended to have more success in terms of course completions. Students with certain types of disabilities tended to receive varying degrees of services. Students received an average of 2.2 types of support services, ranging from a low of 1.8 for students with psychological disabilities to 3.0 for students with sensory disabilities.

Certain types of disabilities appear to be more amendable to assistance. For example, nearly all students with learning disabilities who received assistive technology completed their courses compared with about half of students with other types of disabilities who received this type of service.

On the other hand, course extensions did not appear to be helpful for this group; whereas for students with physical or psychological disabilities, extensions to the contract date appeared to assist with course completion. Further study is required to explore the relationship between course completion and type of disability and support services received.

In describing the experience of students with disabilities at Athabasca University, this study has perhaps provided more questions than answers. More answers are needed about the participation of students with disabilities in distance education, the services they access, and the success they experience in their studies. There is little doubt that distance education can enhance access to students with disabilities and that disability-specific support services can enhance success. The next step is to ensure that students with disabilities are findings our doors and finding success when they arrive.

Acknowledgments

The author gratefully acknowledges the assistance of Brenda Moore, Coordinator, Office for Access for Students with Disabilities, Athabasca University, and Shannon Dean and Pamela Quon, research assistants, for their assistance in this study. This research was supported by a grant from the Mission-Critical Research Fund at Athabasca University.

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