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Student Attrition from Newfoundland and Labrador's Public College

Educators, administrators, and government officials alike are interested in reducing the rate of student withdrawal at Canadian postsecondary institutions. Aside from the loss of financial resources, there are other negative effects associated with early departure from community college or university. This article outlines research into first-semester student withdrawal from engineering technology programs at a campus of the College of the North Atlantic in St. John's, Newfoundland. The research was designed to investigate various aspects of withdrawal of first-semester students enrolled in Engineering Technology programs at the College. The research design incorporated focus groups, interviews, and the collection and statistical analysis of quantitative data. Results of this study showed that 24.9% of first-semester Engineering Technology students withdrew before the winter 2000 semester, and that students' academic difficulties play a significant role in their decisions to withdraw or persist at the College. These results were consistent with Tinto's (1993) Student Integration Model.

Tant les professeurs que les administrateurs et les fonctionnaires tiennent à réduire le taux d'abandon chez les étudiants canadiens inscrits à des institutions postsecondaires. La perte de ressources financières n'est pas la seule conséquence négative provoquée par le départ précoce d'un étudiant d'un collège communautaire ou d'une université. Cet article évoque les grandes lignes d'une étude sur l'abandon, au premier semestre, par des étudiants inscrits aux programmes en techniques de l'ingénieur à un campus du College of the North Atlantic à St. John's, à Terre-Neuve. Le projet de recherche a été conçu dans le but d'analyser divers aspects de cet abandon au premier semestre. Il a impliqué des groupes de discussions, des entrevues, ainsi que la cueillette et l'analyse quantitative de données provenant de l'emploi du «Freshman Integration and Tracking System» (système sur l'intégration et le suivi d'étudiants en première année). Selon les résultats de l'étude, 24,9% des étudiants en techniques de l'ingénieur abandonnent leurs études avant le deuxième semestre. Des difficultés académiques joueraient un rôle clé dans le choix entre la poursuite des études au collège et l'abandon de celles-ci. Ces résultats vont dans le même sens que ceux du modèle d'intégration des étudiants conçu par Tinto (1993).

Research conducted at Canadian postsecondary institutions has shown the rate of student withdrawal in Canada to be in the order of 30% to 50% (Deitsche, 1989; Stoll & Scarff, 1983). Considerable attention and significant research

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resources have been directed toward understanding the complexities of postsecondary student attrition given the loss of financial resources incurred by both student and institution and other negative effects that arise when dropouts occur (Deitsche, 1989; Gilbert & Gomme, 1986). The benefits of completing a tertiary level of education are substantial at present. Negative experiences with postsecondary studies may have a profound effect on students' attitudes toward future study.

Generally, student withdrawal is understood to be a complex interplay between many different intervening variables. For the most part, withdrawal and retention research has sought to explain why the attrition problem exists to the degree that it does (Bean, 1983; Cabrera, Nora, & Castaneda, 1993; Tinto, 1993), and in order to reach a resolution to the perceived problem, educators have been experimenting with various approaches aimed at reducing student withdrawal rates (Seidman, 1996; Tinto, 1996, 1997). Research studies have shown that a significant proportion of student withdrawal occurs in the first year of postsecondary programs followed, in descending order, by withdrawal of students enrolled in subsequent program years (Bryant, 1999; Johnson & Buck, 1995). Analogous to other studies of student attrition at Canadian postsecondary institutions, Deitsche (1989) found that 30% of students enrolled at Humber College in Toronto withdrew in their first year of study.

It is noteworthy that Canadian educators have often been critical of the fact that most published research on postsecondary student attrition research is of United States origin, and hence fails to characterize accurately the Canadian experience. Many US studies have been limited to the experience of traditional students at four-year baccalaureate colleges; however, an increasing volume of student attrition research is becoming available from research studies conducted in Canada's colleges and universities (Deitsche, 1989; Gilbert, 1994; Grayson, 1997; Johnson, 1994; Johnson & Buck, 1995; Sarkar, 1993; Sharpe & Spain, 1993).

Conceptual Models of Student Withdrawal

Two dominant conceptual models of student withdrawal have been proposed to provide a theoretical framework. These are Tinto's (1975, 1993) Student Integration Model and Bean's (1980, 1983) Student Attrition Model. The Student Integration Model, authenticated by research that has shown it to be reliable for different institutions with differing student populations (Pascarella & Chapman, 1983), attributes withdrawal to a lack of congruence between students and institutions. Commitment to personal educational goals and to a specific institution are shaped by a sufficient match between a student's motivation and academic ability and the academic and social characteristics of the educational institution. Tinto's model advances the idea that a higher degree of academic and social integration in the postsecondary setting leads to a lesser likelihood of withdrawal. Essentially, this model suggests that a better fit between student and institution will enhance academic and social integration and subsequently result in a higher likelihood of retention. The Student Attrition Model proposed by Bean (1980, 1983) advances that student attrition is analogous to personnel turnover experienced by many other types of organizations. The model focuses considerable attention on students' beliefs and attitudes and the influences these have on the decision to persist or terminate

enrollment. In this conceptual framework, students' beliefs are molded by the various academic and social aspects of their institution, in addition to various external factors such as the influence of significant others or employment-related responsibilities.

Recognizing a considerable degree of overlap between the Student Integration Model and the Student Attrition Model, Cabrera et al. (1993) simultaneously tested "all non-overlapping propositions underlying both conceptual frameworks" (p. 124). On achieving results consistent with the central propositions of each model, the researchers concluded that a combination of the two theories would provide "a more comprehensive understanding of the complex interplay among individual, environmental, and institutional factors" (p. 135).

Variables That Influence Withdrawal and Retention

As suggested, the research on postsecondary student withdrawal has generally sought to reveal the influence of particular variables on withdrawal and retention (Bean, 1983; Cabrera et al., 1993; Deitsche, 1989; Seidman, 1996; Sharpe & Spain, 1993; Tinto, 1996, 1997). Pre-enrollment variables (those that characterize student background before enrollment) include age, sex, socioeconomic status, prior academic performance and behavior, and commitment to completing postsecondary studies. Other variables of interest, termed post-enrollment variables, are in essence those that are products of students' experiences with the postsecondary environment following enrollment. These include social and academic integration (these include peer interaction experiences and experiences with faculty and program material respectively), enrollment status, financial concerns, and employment status (Sharpe & Spain, 1993). It is recognized that withdrawal occurs as a result of interactions among both types of variables.

Numerous studies of student attrition have examined the extent to which financial considerations influence students' decisions to persist. Financial difficulties have consistently ranked in the top three reasons for dropout decisions. St. John and Starkey (1995) suggest that regardless of institution or income, some students will terminate their enrollment in response to higher tuition fees. Increases in tuition have been shown to have a negative effect on student persistence at postsecondary institutions (Heller, 1997; Leslie & Brinkman, 1987; St. John, Andrieu, Oescher, & Starkey, 1994; St. John, Oescher, & Andrieu, 1992; St. John & Starkey, 1994). St. John, Kirshstein, and Noell (1991) found student financial aid to be positively associated with student persistence and that student loans promoted persistence. Gilbert and Auger (1988) also found that the available government student loan programs enhanced public participation in postsecondary education and that a lack of financial resources appeared related to students' premature departure. In contrast, other studies have not found financial considerations to be a significant contributor to attrition (Cabrera et al., 1993; Johnson, 1994).

The influence of students' sex and age have not generally been shown to be significant in most of the research into variables affecting student attrition. However, with respect to the influence of students' age on attrition, unlike most research studies on student persistence and withdrawal, Murtaugh, Burns, and Schuster (1999) found that the likelihood of persistence was lower

for the older students. And in the case of sex, Butlin (2000) found that males were more likely to drop out of community college.

Student pre-enrollment academic performance (e.g., high school grades) has consistently been a convincing indicator of the potential for persistence. An abundance of evidence signals that higher levels of academic achievement in high school correlate positively with student persistence in postsecondary studies (De Rome & Lewin, 1984; Johnson, 1994; Murtaugh et al., 1999). Deitsche (1989) found that in addition to having lower levels of previous education prior to college enrollment, dropouts came from a general-level high school program as opposed to an advanced high school program.

Students' academic and social integration at postsecondary institutions have proved to be adequate predictors of persistence. In many cases, cumulative grade point average, study habits, and student-faculty interaction have frequently been used as measures of academic integration. Predictably, higher levels of academic integration have been noted in those students who persist (Cabrera et al., 1993; Deitsche, 1989; Johnson, 1994; Pascarella & Chapman, 1983; Romano, 1995; Tinto, 1997). A significantly influential role is played by student-faculty interactions outside of the classroom in fostering persistence. Frequent, meaningful contact with faculty members, especially contact that focuses on academic or career-related issues, appears to heighten students' involvement and motivation (Astin, 1993; Pascarella, 1985; Terenzini, Pascarella, & Lorang, 1982; Tinto, 1997). In addition, students who are actively involved in on-campus activities and as a result experience a heightened sense of community in their institution are more likely to persist (Astin, 1993; Naretto, 1995; Tinto, 1993).

Students' occupational status and enrollment status also influence persistence decisions. Fralick (1993) found that 82% of nonreturning students had worked while attending college. Thirty-six percent of these students had worked more than 40 hours per week. There is also evidence that full-time students are more likely to persist than part-time students. Lam (1984) reported an attrition rate that was 80% higher for part-time students as opposed to full-time students at one institution. Similarly, Windham (1994) found that part-time students and those who worked full-time during their study period were less likely to continue their studies.

Students' goal commitment, that is, their commitment to completing a postsecondary education and meeting their educational goals, has consistently been shown to affect their decisions to persist (Deitsche, 1989; Sarkar, 1993). A study of student attrition conducted by Bryant (1999) at Memorial University of Newfoundland found that one of the major reasons given by students for not returning was that they were uncertain of their educational goals. In general, students who express a higher commitment to the completion of their postsecondary studies, and who put a higher value on it, are more likely to persist. The influence of significant others on student educational and goal commitments is also well documented in the literature on postsecondary student attrition (Bean, 1983; Cabrera, Stampden, & Hansen, 1990; Cabrera et al., 1993; Nora, Hinasi, & Matonak, 1990). The encouragement and emotional support of others has consistently been shown to have positive direct and indirect effects on student decisions to persist. Parents' level of education has

been shown to be a useful predictor of student persistence (Butlin, 2000; Gilbert, 1994). For example, Butlin (2000) found that students whose parents did not complete high school were more likely to leave community college early than students whose parents were high school graduates.

It is apparent that student withdrawal from postsecondary programs is a result of the complex interplay of a number of variables. No single combination of these variables has shown to account entirely for the variance experienced in research into student withdrawal. A review of the research literature relating to postsecondary student attrition suggests that many of the research findings are contradictory (Bean, 1983; Cabrera et al., 1993; Deitsche, 1989; Gilbert, 1994; Grayson, 1997; Johnson, 1994; Johnson & Buck, 1995; Sarkar, 1993; Seidman, 1996; Sharpe & Spain, 1993; Tinto, 1996, 1997). As a result, the specific causes of the attrition phenomenon are variable and still remain largely unclear. Despite this, the conceptual models of Tinto (1975, 1993), Bean (1980, 1983), and other educational researchers have proven to be a valuable resource and guide for investigating postsecondary student attrition. The purpose of the current study was to investigate the variables that contribute to student withdrawal in the first semester of engineering technology programs offered at the College of the North Atlantic. Here attrition was defined as a student's failure to resume his or her program of study in the second semester of the program in which he or she had initially enrolled.

Research Methodology

Standardized questionnaires, focus groups, and interviews were incorporated into the methodology of this study. This tripartite approach to information gathering was employed in order to provide a higher level of clarity in the research results.

Freshman Integration and Tracking System

The two standardized questionnaires that comprise the Freshman Integration and Tracking System (developed at the Humber College of Applied Arts and Technology) were incorporated into this study. A large amount of information about students was collected using these questionnaires, and additional information was acquired from the College of the North Atlantic's records of student admissions and subsequent academic profiles. Quantitative data analysis procedures were used in an attempt to distinguish differences between early leavers and persisters based on a number of predetermined background, entry-level, and mid-term characteristics.

All students entering the first semester of engineering technology programs offered at the Engineering Technology Centre of the College of the North Atlantic in the fall of 1999 were participants in this component of the research study. The total number of new entrants was 337. A day before the start of the first semester classes, all first-semester students completed the first questionnaire in the Freshman Integration and Tracking System entitled the Partners in Education Inventory. The number of students who completed the Partners in Education Inventory was 292 (86.6% of total). The Partners in Education Inventory collects information about students' demographic characteristics, academic background, support service needs, attitudes, and educational goals. At mid-semester, participating students were asked to complete the Student

Experience Inventory, the second questionnaire. The number of students who completed the Student Experience Inventory was 141 (41.8% of total). The Student Experience Inventory collects information about students' support needs, academic and extracurricular behavior, perceptions, and attitudes subsequent to their enrollment. During the fall semester and at the beginning of the winter 2000 semester a variety of information was extracted from the College's student records database. This information included student age, sex, high school grades, and other demographic and academic information.

For the purposes of analysis, two groups of students were differentiated: the withdrawal group and the persister group. Students who did not reregister at the College for a second semester in January 2000 comprised the withdrawal group. Persisters were defined as those who did register for a second semester.

Three categories of independent variables were operationalized for data analysis purposes. These categories were background characteristics, entry-level characteristics, and mid-term characteristics. Some of the independent variables were assigned operational values based on an arbitrary coding scheme. Responses to selected questionnaire items from the Partners in Education Inventory and the Student Experience Inventory were based on response values from 1 to 5 based on a Likert-type scale that required respondents to indicate whether they strongly agreed, agreed, were neutral, disagreed, or strongly disagreed with a statement. For some of the questionnaire items the response values were later reversed in order to produce a unidirectional scale. The mean student response values for questionnaire items measuring the same construct were calculated to provide a single, composite numerical value for each of the independent variables.

The background characteristics examined were sex, age, student's highest level of prior education, mother's highest level of education, father's highest level of education, cumulative average of all high school courses attempted, final grade in grade 12 mathematics, type of mathematics program taken in grade 12, and marital status. Entry-level characteristics were enrollment status, student aid status, employment insurance status, and seven attitudinal constructs assessed from responses to questionnaire items on the Partners in Education Inventory. These constructs were confidence in success, occupational uncertainty, value of education, job orientation, concern for finances, educational commitment, and institutional commitment. Mid-term characteristics consisted of the following 11 attitudinal and behavioral constructs assessed from responses to questionnaire items on the Student Experience Inventory: confidence in success, occupational uncertainty, value of education, job orientation, concern for finances, educational commitment, institutional commitment, perception of program, intent to leave, peer interaction, and faculty interaction.

All data were analyzed using the Statistical Package for Social Sciences (SPSS) version 10.0 for Windows. Analysis was completed for each of the independent variables.

Focus Groups

Focus groups of faculty and students were organized with the anticipation that focus group interactions would provide information about student attrition that would not be acquired through quantitative data analysis or from the

analysis of interview responses. One group consisted of 17 full-time first-semester students and another comprised five faculty members who had been assigned by the College administration to act as academic advisors to first-year students.

The line of questioning for the focus groups followed a semistructured format in order to allow enough latitude to ask questions that could arise from the focus group discussions themselves. Both sessions were 50 minutes in duration. The focus group discussions, recorded on an audiocassette, were later transcribed and coded. The results were examined in order to provide a representation of the perspectives of first-semester students and their instructors regarding first-semester student withdrawal at the College. Significant themes were supported by participants' responses.

Interviews

Following registration for the winter 2000 semester, all 84 individuals in the withdrawal group were telephoned for a brief interview. The number of early leavers represented 24.9% of the 337 engineering technology students who were originally registered at the College for the fall 1999 semester. The number of former students successfully contacted was 51. The number of individuals who agreed to be interviewed was 44 (52.4% of the withdrawal group). The interviews concentrated on students' rationale for deciding to discontinue their studies. As with the focus groups, responses to the interview questions were recorded on an audiocassette and were later transcribed and coded. The individual responses of interviewees were grouped together to provide a representative summary of the major influences that contributed to students' decisions to withdraw from the College. In addition, a summary of withdrawing students' intentions for future postsecondary study was compiled.

Results

Freshman Integration and Tracking System

It should be noted that in some cases complete sets of data for some variables were not available from the College student record database. Also, of the 337 study participants, 292 completed the Partners in Education Inventory and only 141 completed the Student Experience Inventory. In addition, some students did not complete all items on each of the inventories.

Background Characteristics.

No significant differences were found between the withdrawal and persister groups based on sex, age, highest level of prior education, and their parents' highest level of education (see Table 1). The sample of participants was sufficiently homogeneous with respect to marital status that no analysis based on this variable was warranted.

The groups were significantly different with respect to factors related to pre-enrollment academic performance (see Table 2). The results of a one-way analysis of variance indicated that students in the persister group had achieved significantly higher math grades in grade 12 than those in the withdrawal group, $F(1, 270)=20.147, p<.01$. In addition, a one-way analysis of variance showed that the cumulative averages of all high school courses attempted were significantly higher for those students in the persister group, $F(1, 270)=8.882, p<.01$. The results of a chi-square analysis indicated that there was a significant

Table 1
Selected Background and Entry-Level Characteristics of First-Semester Engineering Technology Students Registered at the College of the North Atlantic During the Fall 1999 Semester

Characteristic	Registration Status			
	Return		Withdraw	
	Freq.	%	Freq.	%
<i>Sex</i>				
$\chi^2=.899, p=.343$				
Male	202	79.8	71	84.5
Female	51	20.2	13	15.5
<i>Age^a</i>				
$\chi^2=2.768, p=.429$				
17-18	79	31.5	24	28.2
19-20	88	35.1	34	40
21-22	43	17.1	10	11.8
>22	41	16.3	17	20
<i>Students' Highest Level of Prior Education^b</i>				
$\chi^2=2.037, p=.565$				
Less than High School Diploma	36	16.7	17	23.9
High School Diploma	101	46.8	29	48.8
Some Postsecondary	68	31.5	21	29.6
Postsecondary Degree/Diploma	11	5.1	4	5.6
<i>Mothers' Highest Level of Education^b</i>				
$\chi^2=.377, p=.953$				
Less than High School Diploma	43	20	13	18.1
High School Diploma	62	28.8	22	30.6
Some Postsecondary	59	27.4	18	25
Postsecondary Degree/Diploma	51	23.7	19	26.3
<i>Fathers' Highest Level of Prior Education^c</i>				
$\chi^2=1.340, p=.720$				
Less than High School Diploma	62	29.2	19	26.8
High School Diploma	39	18.4	10	14.1
Some Postsecondary	59	27.8	24	33.8
Postsecondary Degree/Diploma	52	24.5	18	25.4
<i>Type of Mathematics^d</i>				
$\chi^2=15.998, p=.000$				
Basic	2	1	1	1.5
Academic	137	66.5	60	90.9
Advanced	67	32.5	5	7.6
<i>Enrollment Status</i>				
$\chi^2=4.908, p=.027$				
Full-time	246	97.2	77	91.7
Part-time	7	2.8	7	8.3
<i>Student Aid Status</i>				
$\chi^2=.621, p=.431$				
Receiving Student Aid	127	50.2	38	45.2
Not Receiving Student Aid	126	49.8	46	54.8

Table 1 (continued)

Characteristic	Registration Status			
	Return		Withdraw	
	Freq.	%	Freq.	%
<i>Employment Insurance Status</i>				
$\chi^2=.162, p=.687$				
Receiving Employment Insurance	52	20.6	19	22.6
Not Receiving Employment Insurance	201	79.4	65	77.4

^aData for one study participant were unavailable.

^bData for 50 study participants were unavailable.

^cData for 54 study participants were unavailable.

^dData for 65 study participants were unavailable.

difference between the withdrawal and persister groups with respect to the type of math course they completed in grade 12 ($\chi^2(2, 272) = 15.998, p < .05$). This indicated that students who completed a more advanced math course were more likely to persist.

Entry-Level Characteristics.

The results of a chi-square analysis indicated that there was a significant difference between the withdrawal and persister groups with respect to their enrollment status ($\chi^2(1, 337) = 4.908, p < .05$, see Table 1). Although this result indicated that part-time students were more likely to withdraw than full-time students, the result should be interpreted with caution given the small number of students in the part-time group ($n=14$).

A chi-square analysis showed that there was no significant difference between the withdrawal and persister groups based on student aid status or Employment Insurance status (see Table 1). An analysis of variance was carried out for each of the constructs assessed using the Partners in Education Inventory. For each of the constructs there was no significant difference between the withdrawal group and the persister group (see Table 2).

Mid-Term Characteristics.

An analysis of variance was carried out for each of the constructs assessed using the Student Experience Inventory (see Table 3). The statistical analysis showed that the withdrawal and the persister group differed only with respect to the construct *occupational uncertainty*, $F(1, 138)=4.876, p < .05$. The significant difference between the withdrawal group and the persister group based on the occupational uncertainty construct indicated that the study participants in the withdrawal group had a higher degree of occupational uncertainty at mid-semester. With the exception of occupational uncertainty, there was no significant difference between the withdrawal group and the persister group based on the mid-term characteristics.

Focus Groups

When asked about potential reasons for first-semester student withdrawal from the engineering technology programs at the College of the North Atlantic, participants in the student focus group gave a number of potential reasons.

Table 2
 Analysis of Variance Results for Selected Background and Entry-Level
 Characteristics of First-Semester Engineering Technology Students
 Registered at the College of the North Atlantic During the Fall 1999 Semester

<i>Source</i>	<i>SS</i>	<i>DF</i>	<i>MS</i>	<i>F</i>
<i>High School Grades</i>				
Between Groups	1161.670	1	1161.670	20.147*
Within Groups	15568.200	270	57.660	
Total	16729.870	271		
<i>Grade 12 Math</i>				
Between Groups	1265.565	1	1265.565	8.882*
Within Groups	11472.300	270	42.490	
Total	12737.865	271		
<i>Confidence in Success</i>				
Between Groups	.005	1	.005	.192
Within Groups	76.362	286	.267	
Total	76.367	287		
<i>Occupational Uncertainty</i>				
Between Groups	.123	1	.123	.277
Within Groups	38.184	286	.444	
Total	38.307	287		
<i>Value of Education</i>				
Between Groups	.251	1	.251	1.393
Within Groups	52.200	290	.180	
Total	52.451	291		
<i>Job Orientation</i>				
Between Groups	.002	1	.002	.070
Within Groups	109.252	286	.328	
Total	109.254	287		
<i>Concern for Finances</i>				
Between Groups	1.398	1	1.398	2.191
Within Groups	185.020	290	.638	
Total	186.418	291		
<i>Educational Commitment</i>				
Between Groups	.003	1	.003	.322
Within Groups	30.281	283	.107	
Total	30.284	284		
<i>Institutional Commitment</i>				
Between Groups	.009	1	.009	.387
Within Groups	65.025	289	.225	
Total	65.034	290		

* $p < .01$.

Most of these in some way related to academic difficulties experienced by students.

The students said that one reason for first-semester student withdrawal was the highly demanding workload and high degree of difficulty associated with the math and science courses in the program.

Table 3
 Analysis of Variance Results for Mid-Term Characteristics of First-Semester
 Engineering Technology Students Registered at the College of the North
 Atlantic During the Fall 1999 Semester

<i>Source</i>	<i>SS</i>	<i>DF</i>	<i>MS</i>	<i>F</i>
<i>Confidence in Success</i>				
Between Groups	.285	1	.285	.611
Within Groups	63.512	136	.467	
Total	63.797	137		
<i>Occupational Uncertainty</i>				
Between Groups	2.701	1	2.701	4.876*
Within Groups	75.898	137	.554	
Total	78.599	138		
<i>Value of Education</i>				
Between Groups	.176	1	.176	.761
Within Groups	32.109	139	.231	
Total	32.285	140		
<i>Job Orientation</i>				
Between Groups	.661	1	.661	1.298
Within Groups	68.850	135	.510	
Total	69.511	136		
<i>Concern for Finances</i>				
Between Groups	.002	1	.002	.022
Within Groups	111.224	137	.812	
Total	111.226	138		
<i>Educational Commitment</i>				
Between Groups	.001	1	.001	.043
Within Groups	33.017	137	.241	
Total	33.018	138		
<i>Institutional Commitment</i>				
Between Groups	.322	1	.322	1.506
Within Groups	28.890	135	.214	
Total	29.212	136		
<i>Perception of Program</i>				
Between Groups	.164	1	.164	.399
Within Groups	56.580	138	.410	
Total	56.744	139		
<i>Intent to Leave</i>				
Between Groups	.770	1	.770	1.329
Within Groups	79.902	138	.579	
Total	80.672	139		
<i>Peer Interaction</i>				
Between Groups	.738	1	.738	2.810
Within Groups	36.294	138	.263	
Total	37.032	139		
<i>Faculty Interaction</i>				
Between Groups	1.578	1	1.578	3.700
Within Groups	58.788	138	.426	
Total	60.366	139		

* $p < .05$.

From day one you are just bombarded with material ... and a lot of people just get overwhelmed by it. We thought this was going to be just a regular, basic course. Some of them just end up leaving because they can't keep up with the pace of the courses, they neglect some courses, and fall too far behind.

The participants in this focus group agreed that many of the students who left due to academic difficulties did so partly because they were unsure of the academic demands of the engineering technology programs at the College. The student group also suggested that students who have been out of high school for a number of years experience the greatest degree of academic difficulty and are least likely to persist. It was also suggested that students who have poor attendance, those who do not study enough after classes, and those who work part-time are less likely to persist because of the academic problems this behavior causes.

The students believed that having positive relationships with faculty members and their fellow students was important for persistence in their program of study. The group perceived that positive relationships with faculty and their peers helped them academically.

The College instructors introduced and discussed a number of potential reasons for first-semester student withdrawal at the College. Like the student group, the discussion of first-semester student attrition among the first-year student instructors in the faculty group consisted of a number of major points mainly related to academic difficulty.

The faculty members suggested that a major reason for first-semester student withdrawal at the College was that new entrants generally have a low level of awareness of the academic requirements of their selected program of study before enrollment:

I think our new students assumed that the programs at the College would be easier than university. They end up being shocked by how much math and science is involved.

It was suggested that some students experience academic difficulties as a result of the transition from high school to college. The instructors perceive that less than average performance in high school makes the academic transition even more difficult.

If they didn't do well in high school, then they have to make that up here. The workload is extremely demanding ... 6 hours a day between 9:00 a.m. and 5:00 p.m. plus homework assignments.

The faculty suggested that in general students who have been out of high school for a number of years and have not been enrolled in another postsecondary institution before enrolling at the College face greater academic difficulty and as a result are less unlikely to persist in their chosen program of study. Another factor that influenced student persistence that was discussed was motivation. Because of the academic demands placed on students, the instructors felt that those who had a high level of motivation and commitment to succeed would be more likely to persist. The faculty members also suggested that many first-semester students experience a high level of stress because of the personal and lifestyle changes they experience when making the transition from high school to college.

Interviews

When asked why they had decided to withdraw from the College, interview participants gave varying responses. Former students gave five distinct categories of reasons to explain their decision to withdraw from the College of the North Atlantic. These were academic, employment, institutional, personal, and financial. A majority (45%) of the 44 students who participated in interviews stated that the major reason contributing to their decision to withdraw was academic in nature. The second most frequent reason was related to employment (21%).

Of those interviewed, 20 participants (45%) stated that their decision to withdraw was influenced by academic reasons, 9 participants (21%) stated that the reason for their withdrawal was related to employment, 7 (16%) were influenced by institutional factors, 5 (11%) cited personal reasons, and 3 (7%) said their reason was financial.

When asked if they intended to return to a postsecondary institution in the future, 30 (68%) of the interview participants indicated that they did intend to return.

Discussion

Earlier studies of postsecondary student attrition found that, depending on the institution, student attrition varies from approximately 30% to 50% (Bryant, 1999; Deitsche, 1989; Johnson & Buck, 1995). Research studies have also indicated that a significant proportion of student withdrawal occurs in the first year of postsecondary programs (Bryant, 1999; Johnson & Buck, 1995). Considering these findings, the results of this study, which show a 24.9% first-semester student attrition rate for the engineering technology programs at the College of the North Atlantic, appear to be on a par with those observed at other postsecondary institutions.

The most striking aspect of this study was the amount of emphasis on academic background and/or ability that was exhibited in the results. First, the feedback provided by both focus groups indicated that both faculty and students felt that the engineering technology programs at the College of the North Atlantic have a high degree of academic difficulty and that students' academic problems are the most significant contributor to withdrawal at the College. By far the most discussion by each of the focus groups centered on students' academic difficulties at the College. Second, 45% of the early leavers interviewed for this study stated that their decision to withdraw was influenced by academic reasons. This was the most frequently cited reason for withdrawal. Third, the quantitative analysis component of this study showed that students who withdrew were significantly different from persisters with respect to: (a) the type of mathematics course they completed in grade 12; (b) their final grade in grade 12 mathematics; and (c) their overall high school cumulative average. Compared with those who withdrew, persisters were more likely to have attained a higher overall high school cumulative average and a higher final grade in grade 12 mathematics. And compared with students who withdrew, persisters were likely to have completed a more advanced mathematics course in grade 12. These results mirror the conclusions of numerous other studies that indicate that higher levels of academic achievement in high school (De Rome & Lewin, 1984; Deitsche, 1989; Johnson, 1994; Murtaugh et al., 1999;

Sharpe & Spain, 1993) and that higher levels of academic integration in college are positively correlated with persistence in postsecondary programs (Cabrera et al., 1993; Pascarella & Chapman, 1983; Romano, 1995; Tinto, 1993). In addition to the above findings, this study corresponded to the results of Lam (1984) and Windham (1994), who found that part-time students were more likely to withdraw than full-time students. Although these results may be questionable due to the small percentage of part-time students in the sample, it is possible that, for family or employment reasons, part-time students have less time to dedicate to their program than full-time students. This is plausible, considering the emphasis that both the student and faculty focus groups placed on the academic demands of the engineering technology programs.

The quantitative data analysis in this study suggest that students who withdraw are more likely to have been uncertain about their future employment opportunities than those who persist. This result is consistent with the responses given in the faculty focus group. The faculty who participated in the focus group session believed that high school graduates who have a high level of uncertainty about their future occupation are less likely to persist in a postsecondary program.

As well as suggesting that academic problems are a significant cause of student withdrawal at the College of the North Atlantic, the student and faculty focus groups both identified other factors that influence withdrawal. Both groups suggested that students who have been away from high school for some time before enrolling in a postsecondary program are more likely to withdraw early. Although this is not substantiated by the postsecondary attrition literature, this suggestion is worth investigating through further research (Bean, 1983; Cabrera et al., 1993; Deitsche, 1989; Gilbert, 1994; Grayson, 1997; Johnson, 1994; Johnson & Buck, 1995; Sarkar, 1993; Seidman, 1996; Sharpe & Spain, 1993; Tinto, 1996, 1997). Both focus groups also indicated that students with greater motivation to succeed are more likely to persist. A number of research studies have found that student goal commitment has a significant impact on their decision to persist or withdraw (Deitsche, 1989; Sarkar, 1993). The student focus group also indicated that working while attending college is a potential cause for postsecondary student attrition because it results in reduced time for studying. The results of studies conducted by both Fralick (1993) and Windham (1994) correspond with this assessment.

In addition to seeking to explain postsecondary student attrition, educators have been concerned about its effects. It has been suggested that a negative experience with postsecondary education is often a disincentive to pursue further postsecondary study. However, in this research study, 68% of the early leavers interviewed indicated that they intended to pursue postsecondary education in the future.

Of the two dominant conceptual models of student attrition, Tinto's (1975, 1993) Student Integration Model and Bean's (1980, 1983) Student Attrition Model, the results of this research study correspond best with the model of student attrition put forward by Tinto. Tinto's model proposes that a better fit between student and institution results in greater academic and social integration and in turn increases the likelihood that students will persist. The results of this study suggest that a lack of congruence between students' academic

ability, and perhaps motivation, and the academic expectations of the College increase the overall likelihood of withdrawal. In general, unlike the Student Attrition Model proposed by Bean, the results of this study did not indicate that external factors play a significant role in the attrition process. However, the results do suggest that students' beliefs and attitudes, such as those influenced by their perception of faculty members, possibly play a role in their dropout decisions. But this aspect of the attrition process is also encompassed by Tinto's theoretical model.

Although the results of the quantitative component of this study did find several of the independent variables to be significant, many of the variables that had been found to contribute to postsecondary student withdrawal in the past were not significant. Because the issue of student attrition is an ongoing concern, it will be useful to continue to track the cohort of students who participated in this research study. This research, which is currently underway, is longitudinal in design and will be conducted over the three-year study period required for the engineering technology programs at the College of the North Atlantic.

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