The Application of American Models to the Experiences and Outcomes of Canadian and International Students Studying in Canada

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Introduction

The presence of international students in universities has several benefits for the economies of students' countries of origin, the host country's economy, and international and domestic students themselves. First, by acquiring knowledge in highly reputable universities, international students return to their home countries with skills and knowledge that will enable them to contribute to the development of their home society and economy. Second, the networks that international students develop while studying overseas could facilitate the eventual development of economic and trade links between the host country and international students' countries of origin. Third, international students studying overseas often benefit from their acquisition of a first-class education. Fourth, in their interactions, both international and domestic students may acquire insights into different cultures and develop personal connections that may endure long after the completion of studies. Fifth, international students bring to the host universities financial resources that otherwise would be unavailable.

Although increasing the number of international students may be a desirable objective, figures analyzed by the Canadian Bureau of International Education (CBIE) suggest that Canada is falling behind other countries in attracting foreign students. In 1999–2000 there were 58,845 international students studying in Canadian universities. This figure represents a 10% increase over 1993–94. Over roughly the same time period, increases in the enrollment of international students in the United Kingdom, Australia, and the United States were 119%, 150%, and 14% respectively (Bartlett, 2002). In comparison to the other Anglo-American democracies, Canada may acquire relatively few of any benefits associated with the presence of international students in universities.

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In view of findings such as these, CBIE argues "the adoption of a national strategy becomes even more critical in order to give Canada a boost in the international education arena and allow us to regain a foothold as a key player in the hosting of international students" (Bartlett, 2002, p. 8). It can be argued that an important aspect of this strategy would involve studies of international students with the objective of determining the extent to which their experiences while in university contribute to positive outcomes such as academic achievement, credit completion, and program satisfaction.

American studies have shown that a number of factors affect a variety of outcomes of domestic students such as achievement, credit completion, and program satisfaction. For example, a considerable amount of research has pointed to the fact that successful adjustment to the first year of university has consequences for subsequent academic achievement, generic skill development, maximum credit completion, and retention (Fidler & Moore, 1996; Huff, Cook & Price, 1996; Hyers & Joslin, 1998; Levitz & Noel, 1989).

Many of the insights of research on the first and subsequent years of university for American domestic students have been systemized into conceptual models that relate student experiences inside and outside of the classroom, and in a broader environment, to desired educational outcomes. For example, the 'student integration model' (Tinto, 1993) involves the notions that persistence in university is a function of: the pre-entry characteristics of students (high school grades, family income, etc.); initial career goals and commitment to the university; academic and social integration of students over the course of the academic year; emergent career goals and institutional commitment over the course of the academic year; and final commitments at the end of the academic year to either remain in, or leave, the institution. In commuter institutions academic integration, and particularly academic achievement, is more important than social integration in ensuring first year persistence. Indeed, social involvement is sometimes at odds with retention (Braxton and Brier, 1989; Dietsche, 1990; Grayson, 1998; Pascarella and Chapman, 1983; Pascarella et al., 1981; Pascarella et al., 1983).

In the 'college impact model,' Terenzini, Springer, Yaeger, Pascarella and Nora (1996) postulate that with student pre-college traits (e.g., high school grades) held constant, coursework and curricular patterns, positive classroom experiences, as well as positive out-of-class experiences (that collectively can be viewed as institutional experiences), contribute to various learning outcomes, such as the development of analytic, communication, and organizing skills, and the acquisition of subject matter expertise. Research has consistently shown

that the experiences dealt with in this model have various levels of effect on many outcomes (Terenzini, Springer, Pascarella & Nora, 1995; Grayson, 1995; 1997a; 1997b; 1998; 1999a; 1999b; 2003), including openness to cultural diversity and challenge (Pascarella, Edison, Nora, Hagedorn & Terenzini, 1996).

In the 'input-environment-outcome' (I-E-O) model, "inputs refer to the characteristics of the student at the time of initial entry to the institution; environment refers to the various programs, policies, faculty, peers and educational experiences to which the student is exposed; and outcome refers to the student's characteristics after exposure to the environment" (Astin, 1993, p. 7). As learning occurs not only in formal classroom situations, all else being equal, students who adjust to university life in the sense that they are involved in various activities are more likely, for example, to achieve high grades, and be more satisfied, than students who are not involved.

Other models (e.g., Benjamin, 1994; Benjamin & Hollings, 1995) address the complexity of students' experiences and incorporate other factors, both within and outside post-secondary institutions, which have consequences for students' lives. Johnson (1991) has extended those factors categorized as exogenous to include disadvantaged- and outside-community support.

Despite the fact that models such as the foregoing are often used in examinations of American educational outcomes, they have not been employed in studies of international students, nor have they been used extensively in Canada (exceptions include Grayson, 1998, 1999a; and Dietsche, 1990, in which the impact of students' formal and informal experiences on outcomes such as skill development and retention has been assessed). As a result, we have little systematic information on the experiences of international and Canadian students and the relationship of these experiences to educational outcomes. What we do have from both the United States and Canada is some evidence that in addition to the usual problems of adjustment to university, international students also must face difficulties associated with coming to a new country, such as loneliness and depression (Church, 1982; Uehara and Hicks, 1989).

While research carried out in connection with the models outlined above indicates that interactions with peers and involvement in campus activities can have positive effects on educational outcomes, a number of studies indicate that interaction with domestic students and other members of the community is a major problem for international students. For example, in a study of international students from 139 countries studying in 11 countries, Klineberg and Hull (1979) found that lack of contact with student nationals and members of the local community was a problem in all countries. A general

finding of both Canadian and American research is that international students have difficulty in making friends in the host university (Antonio, 1991; Finsterbusch, 1992; Mickle, 1985; Rohrlich & Martin, 1991). Consistent with these findings, a national study of international students studying in Canada found that the three areas in which students had problems were making friends with Canadian students, performing in courses that required mathematics, and getting involved in campus activities (Walker, 1999, p.16).

In addition to the possible implications of findings such as the above for educational outcomes, research shows that there may be negative psychosocial aspects of the international student experience. For example, a study of Malay students at the University of Waterloo found that students who had few Canadian friends, or who spent little time with Canadians, had higher levels of stress than other Malay students (Berry & Kostovick, 1983). Similarly, a study conducted at Queen's University found that Asian students who were isolated had more personal problems than those who interacted with Canadians (Chataway & Berry, 1989). In many instances, it appears that relative lack of involvement of international students in formal and informal activities in the university is related to their lack of facility in English (Chen, 1990; Fradd & Weismantel, 1989; Perrucci and Hu, 1995).

When examining the experiences of international students, it is important to keep in mind that despite some common problems associated with studying in a foreign country the experiences of international students are not uniform (Heifinheimo & Shute 1985). In addition, the experiences of international students may vary from one university to the next (Mickle, 1985). It is also important to note that the experiences of male and female international students may differ (Dyal & Chan, 1985). In addition to problems of adjustment, international students frequently report difficulty in dealing with discrimination in their host societies; however, the same type of discrimination is not experienced by all international students (Sodowksy and Plake 1992).

In summary, while there is some international and Canadian information available on the problems confronted by international students, we have no systematic information on matters like the academic achievement, credit completion, and program satisfaction of international compared to domestic students. Moreover, consistent with the models discussed earlier, we do not know how the in- and out-of-class experiences of international students compare to those of domestic students. Nor do we understand the relationship of these experiences and student experiences in a broader environment to educational and other outcomes.

In order to test the general utility of models developed in the US for explaining university outcomes of Canadian and international students, a three-year study is currently under way at four Canadian universities. As a first step in this research, a pilot study with two objectives was conducted at York University in Toronto. The first objective is to compare the experiences and outcomes of domestic and international students in their first year of study. The second objective is to test the applicability of a parsimonious general model of student outcomes derived from examinations of American students to Canadian and international students studying in Canada. The specific outcomes examined are academic achievement, credit completion, and program satisfaction in the first year of study.
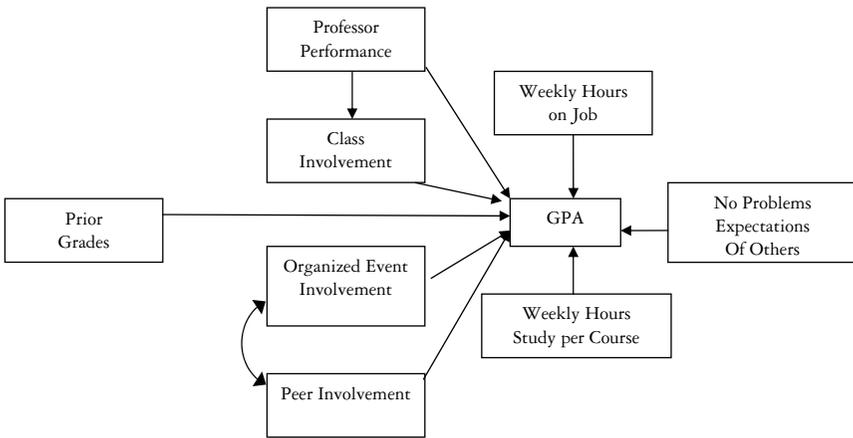
H y p o t h e s I z e d   M o d e l

The 'student integration,' 'college impact,' and 'input-environment-outcome' models referenced in the previous section can claim distinct ontological statuses. Nonetheless, at a minimum, each distinguishes among pre-entry characteristics, students' activities within the university, and the relationship of both to particular outcomes. In general it is found that the more integrated/involved the student is in various formal and informal university activities, the more likely the realization of desired educational outcomes. In commuter universities, classroom events are particularly important in the realization of outcomes. As pointed out by Tinto (1997, p. 559) , "for students who commute to college, especially those who have multiple obligations outside the college, the classroom may be the only place where students and faculty meet, where education in the formal sense is experienced." Tinto added that, "for [commuter] students in particular, the classroom is the crossroads where the social and the academic meet."

The current examination of academic achievement, credit completion, and satisfaction of domestic and international students in a Canadian university will be carried out within the macro framework common to all three models. More specifically, attention will focus on relationships among pre-entry characteristics (high school grades), formal institutional experiences (like having effective professors), informal experiences (such as involvement in extracurricular student activities and maintaining connections with other students), and specific educational outcomes. Although largely absent from the original formulations of the three models, attention will also be paid to the impact of external factors on educational outcomes. In recent research on retention, for example, the inclusion in analyses of factors external to the university has contributed to an understanding of student dropout (Sandler, 2000).

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The hypothesized model that will be used in the analysis of first year academic achievement, credit completion, and program satisfaction is found in Diagram 1. Given that the objective of the current research is not to replicate American studies but to gain an initial understanding of differences between domestic and international students, and to test the general applicability of the conceptual underpinnings of some American models, the number of variables in the model is limited. The development of more complex models awaits the collection of data from all of the universities involved in the project.

Diagram 1: Hypothesized Model

The pre-entry characteristic under consideration in the hypothesized model is prior grades. The formal institutional experience represented in the model is 'professor performance' in the classroom. Informal institutional experiences that may contribute to educational outcomes are 'organized event involvement' and 'peer involvement.' As the attainment of educational outcomes is often connected to the amount of effort expended by students, 'class involvement' and 'weekly hours of study per course' are also included. The fact that external events can affect educational outcomes is recognized by the inclusion of 'weekly hours on the job' and the degree to which students have no difficulty meeting the expectations of others, like family ('no problems expectations of others').

The assumption underlying the model is that with the exception of 'weekly hours on job' and 'problems expectations of others,' all variables included potentially have a direct positive effect on the educational outcomes under study. The two exclusions detract from the realization of educational outcomes. In addition to affecting outcomes, professor performance can directly affect class involvement.

In essence, it is hypothesized that students will be motivated to attend the classes of professors who perform well. It is also hypothesized that students who are involved with their peers will be involved in informal organized events.

S a m p l e

In 2001/2, international students comprised approximately 7% of the 40,000 students studying at York University in Toronto. In February 2003, the 477 international students 30 years of age or under who enrolled in their first year in the Faculty of Arts and the Atkinson Faculty of Liberal and Professional Studies in September 2002 were mailed a questionnaire dealing with various aspects of their experiences since the beginning of classes. For comparison purposes, exactly the same questionnaire was sent to 781 domestic students entering the two faculties. After four contacts, the response rate for international students was 46%; for domestic students, 37%. The total response rate for international and domestic students was 40%. Although this response rate is much lower than achieved by the author in previous studies at the same university, it is comparable to the 42% attained in a large national survey of university and college students in the United States (Zhao, 2002).

The vast majority of international students in the sample, 53%, were citizens of the Peoples' Republic of China. The next largest group were Korean students, who made up 6% of the sample. The numbers of international students from India, Russia, and Vietnam were 5%, 2%, and 2% respectively.

M e a s u r e s

'Prior grades,' the basis on which students in the sample were admitted to their first year of study at York, were obtained from university records. GPA and the number of completed credits in the first year were also available from administrative records. All other information was collected via the survey.

Program satisfaction was measured by a scale comprised of seven questions in which students were asked how satisfied they were with: the content of courses, the amount of work required in courses, their program or major, grades, student services, the quality of classroom instruction, and class size. Scores ranged from 1 meaning 'very dissatisfied' to 5 indicating 'very satisfied' (Cronbach's alpha = .72).

A review of the literature reveals that teaching effectiveness has been operationalized in many different ways. One characteristic of many of these operationalizations is that they are uninspired by theories of teaching and learning (Marsh & Dunkin, 1992, page 153). Moreover, there is reason to

believe that what students view as the characteristics of effective teachers is related to what is being assessed: quality of instruction, quality of lectures, or the value of a course (Mason, Steagall, & Fabritius, 1995). This said, an early review of the literature indicates that specific teaching dimensions having the highest correlations with overall teaching evaluations are the stimulation of interest, clarity of explanation, the provision of intellectual challenge, sensitivity to class level, and being prepared (Feldman, 1976). Somewhat consistent with these findings, more recent research has found that a sample of graduates identified effective communication, organization, and preparation as the most important characteristics of effective teachers (Rice, Stewart, & Hujber, 2000).

In the current study, questions focusing on exemplary performance by professors were derived from a study of students in which participants kept diaries of their first year experiences and participated in interviews with researchers. The aspects of classroom performance by professors that were identified as exemplary in this way were: having adequate technical expertise with regard to teaching; having knowledge of subject matter; being responsive to the class; caring about students in the class; having a sense of humour; and being well organized (Benjamin, 1990). In the current study, students were asked how many of the instructors in the courses in which they were currently enrolled had each of the foregoing characteristics. Using the total number of professors reported by the student as a base, a calculation was then made of the percentage of professors with each of the characteristics. An average professor performance score was then calculated (Cronbach's alpha = .83).

Class involvement was measured by two questions in which students were asked what percentage of their lectures/seminars; and tutorials, labs, and studios they attended. The z-scores for each were averaged into a single index.

A measure of non-academic organized event involvement was calculated from responses to questions in which students were asked how many: 1) campus organizations or student councils they belonged to; 2) organized sports they participated in; 3) unorganized sports and/or exercise activities they engaged in; 4) organized campus sports events thy had watched since September; 5) arts or cultural events they had been involved in since September; 6) cultural or arts events they had attended since September; and 7), monthly visits they had made to campus pubs (Cronbach's alpha = .62). The z-scores for each question were averaged into an overall index.

Peer involvement was measured by questions from the College Student Experiences Questionnaire (CESQ) in which students were asked how often

they: 1) sat around in a student area on campus talking with other students about classes or other university activities; 2) used common rooms, meeting rooms, etc. to meet with a group of students for a discussion; 3) told a friend why they reacted to another person in the way they did; 4) discussed with other students why some groups got along smoothly and other groups didn't; 5) sought out another student who was a friend to say what they thought about you; 6) had been in a group of students in which each person talked about personal problems; and 7), asked other people to read something to see if it was clear to them. Response options ranged from 1 meaning 'daily' to 5 indicating 'never' (Cronbach's alpha = .87). Note that low scores indicate a high degree of peer involvement.

The number of weekly hours students spend studying per course was assessed by a question in which survey respondents were asked: "In an average week, how much time, in hours, do you spend outside of classes, labs, and studios on your studies." The number obtained was then divided by the number of courses completed as found in administrative records to obtain the average number of hours spent studying per course. Information on the amount of time students spent on a job was obtained through the question: How many hours per week do you spend at a job (include any work in a family business)?

A measurement of the extent to which students faced no problems meeting the expectation of others was obtained by asking students how problematic a series of issues had been for them over the past academic year. One issue was, "doing well enough in university to satisfy the expectations of family." A related issue was "doing well enough in university to satisfy the expectations of close friends." A response of 1 indicated that the issue was 'very problematic' and 5 meant 'no problem at all.' Cronbach's alpha for the two items, which were combined into one measure, was .73.

A n a l y s i s

D i f f e r e n c e s   B e t w e e n   D o m e s t i c   a n d   I n t e r n a t i o n a l   S t u d e n t s

The first objective of the research was obtained by carrying out analyses of variance in which student status, domestic or international, was the independent variable. Analyses were carried out on the three outcome measures (GPA, number of completed credits, and program satisfaction) as well as on each of the independent variables in the model outlined in Diagram 1. The results are summarized in Table 1.

The results show that GPAs for domestic and international students were 5.08 and 5.36 respectively. The difference between the two groups was not statistically significant. In short, domestic and international students obtain the same grades. This finding is consistent with research at the University of British Columbia indicating that there were no differences in the first year grades of international and domestic students (UBC, 2001).

Table 1 also shows that while domestic students completed an average of 23.28 credits, international students completed only 20.42. These differences are statistically significant. For program satisfaction, the scores on the original index were collapsed so that 1 meant dissatisfied, 3 meant satisfied, and 2 neither satisfied nor dissatisfied. Domestic and international students were 2.44 and 2.42 respectively. Differences between these scores, which express a high level of overall satisfaction, are not statistically significant. This finding is inconsistent with the results of a large US study of domestic and international students in which international students were found to be less satisfied than their American counterparts (Zhao, Khu, Carini, & Bunnage, 2002).

Table 1 indicates that the z-score for prior grades, the first of the independent variables, was –.09 for domestic, and 0.23 for international students — a difference of 13 percentile points. These statistically significant differences

Table 1: Means of Outcomes and Independent Variables for Domestic and International Students

	Mean		Sig. F	Number		
Outcomes	Domestic	Int'l		Domestic	Int'l	
GPA	5.08	5.36	0.100	273	183	
Credits	23.28	20.42	0.000	273	183	
Satisfaction	2.44	2.42	0.709	281	190	
Independent Variables						
Prior grades (z-score)	–0.09	0.23	0.001	269	159	
Professor performance	2.19	2.04	0.004	281	190	
Class involvement	0.10	–0.22	0.000	278	185	
Organized event involvement (z-score)	–0.12	0.20	0.000	279	182	
Peer involvement (reverse scored)	3.66	3.38	0.001	279	189	
Weekly hrs study per course	4.24	5.21	0.004	262	174	
Weekly hrs on job	13.01	3.85	0.000	272	174	
No problems meeting others' expectations	3.57	3.63	0.506	271	187	

indicate that international students enter York with higher prior grades than domestic students; however, it is important to note that it is impossible to assess adequately the comparability of Canadian and overseas grades.

For professor performance, original index scores were collapsed into 1 meaning low, 2 indicating average, and 3 meaning high. As seen from Table 1, the score of domestic students on this measure, 2.19, is slightly higher than the 2.04 score of international students. These differences are statistically significant. Overall, while both domestic and international students view the performance of their professors as better than average, domestic students are more appreciative of the teaching of their professors than international students.

Table 1 shows that international students are less involved in their classes than domestic students. The z-score for domestic students is .10 while it is −.22 for international students — again a difference of 13 percentile points. These differences are statistically significant. Because, as will be seen later, class involvement is directly related to GPA, differences of this magnitude are disturbing.

Although international students are less involved than domestic students in their classes, Table data show that international students are more involved in organized non-academic campus events than domestic students. While the z-score for this form of involvement for domestic students is −12, it is .20 for international students – another 13 percentile point difference. Moreover, these differences are statistically significant. The same is true for peer involvement.

	Range		SD		% Missing	
	Domestic	Int'l	Domestic	Int'l	Domestic	Int'l
	8.50	8.75	1.71	1.85	3%	4%
	30.00	30.00	7.03	7.68	3%	4%
	2.00	1.75	0.44	0.40	0%	0%
	6.79	5.09	0.97	0.86	4%	16%
	2.00	2.00	0.54	0.55	0%	0%
	4.24	4.71	0.79	1.11	1%	3%
	2.72	3.51	0.54	0.80	1%	4%
	3.88	3.38	0.86	0.85	1%	1%
	48.00	30.00	5.13	4.56	7%	8%
	40.00	40.00	11.88	8.53	3%	8%
	4.00	4.00	0.95	0.98	4%	2%

For domestic students the average score is 3.66 while for international students the score is 3.38 (remember that because of reverse scaling the lower the score the greater the involvement), and differences are statistically significant.

Although they are less involved in their classes, international students devote more out-of-class time to their studies than domestic students — 5.21 vs 4.24 hours per course a week. These differences are statistically significant. Perhaps because of adjustment and language problems international students must spend more time on their studies in order to achieve grades similar to those of domestic students. This hypothesis is consistent with the finding reported above that international students complete fewer credits than their domestic peers.

Not surprisingly, because they are prohibited from working off campus, international students report only 3.85 hours of paid work a week compared to 13.01 hours for domestic students. These differences are statistically significant. There are no statistically significant differences, however, between domestic and international students in terms of having no problems meeting the expectations of others. For the former the score is 3.57; for the latter, 3.63. In addition, as 5 means no problem at all, these scores indicate that meeting the expectations of others is unproblematic for both groups.

In terms of the model outlined in Diagram 1, domestic students are advantaged in terms of their experiencing their professors as more effective than international students; in addition, they are more involved than international students in their classes. Neither group is advantaged in terms of having no problems in meeting the expectations of others. International students appear to be advantaged as they are more involved in extracurricular events and engage more with their peers than domestic students. In one way international students might also be advantaged as their relatively low commitment to paid employment means that more time can be devoted to studies.

A p p l i c a t i o n   o f   M o d e l s

The data in Table 1 have indicated that there are some differences in the outcomes and experiences of domestic and international students in their first year of study. Structural equation modelling will now be employed to determine if the experiences of domestic and international students have implications for GPA, credit completion, and program satisfaction.

AMOS 4 was used for structural equation modelling. Variables described in Table 1 that were used in the analysis were normally distributed. As seen in Table 1, the amount of missing data ranged from a low of 0% to a high of

16% with an average of 5% per variable. Missing data were estimated using the maximum likelihood method.

As a first step in analysis the model in Diagram 1 was estimated for each of the outcome measures for domestic and international students separately, e.g., for GPA separate models were estimated for domestic and international students. Over the six models thus produced, RMSEA ranged from a low of .071 to a high of .079. In evaluating the models, RMSEA values up to .050 indicate a good fit and values more than .050 but less than .080 represent a reasonable fit (Browne & Cudeck, 1993). Values between .080 and .100 indicate a mediocre fit and values of .100 or more indicate a poor fit (MacCallum, Browne, & Sugawara, 1996). Using this criterion, models estimated separately for GPA, completed credits, and satisfaction for each of domestic and international students had a reasonable fit.

As a second step, for each outcome, models for domestic and international students were estimated simultaneously so that it would be possible to assess the degree of invariance between models for the two groups of students. With GPA as the outcome, when a model was estimated for domestic and international students simultaneously, chi-square was 120.6 with 52 degrees of freedom. RMSEA equalled .052 with a 90% confidence interval between .041 and .065. The p test for close fit was .327, CFI was .989, and AIC equalled 232.9. Despite the low p test, these values suggest a reasonable fit of the model.

The results of the unconstrained model were compared to the results of a fully constrained model. The chi-square difference between the unconstrained and constrained models of 14.9 with 10 degrees of freedom is not statistically significant at the .05 level; therefore, we can conclude that no differences exist between domestic and international students for the model with GPA as the outcome.

The results of the unconstrained simultaneously estimated model for domestic and international students are found in Diagrams 2 and 3. In these and subsequent diagrams and solid lines represent statistically significant paths between variables. Dashed lines indicate that paths are not statistically significant. Standardized regression coefficients are on, or near to, arrows. Explained variance in GPA is in italics.

For domestic students (Diagram 2) consistent with the meta assumptions underlying models discussed earlier, a pre-entry characteristic, prior grades, has the greatest single impact on GPA (.36). Formal institutional experiences in the form of positive assessments of professor performance also have positive consequences for GPA (.12). Note that the path between professor
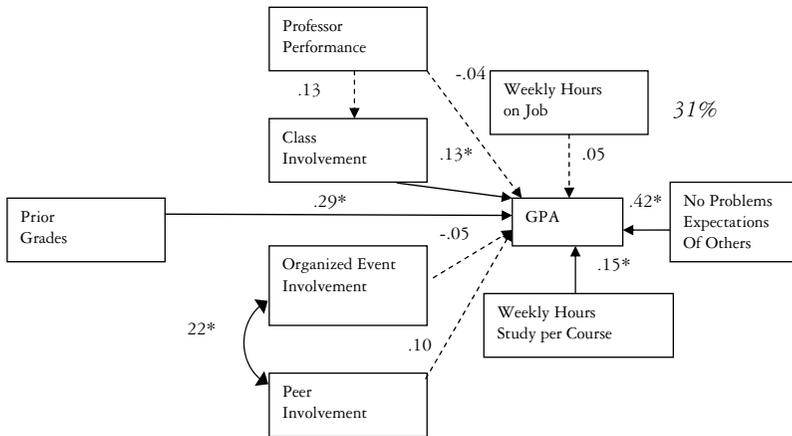
Diagram 2: Domestic Grades
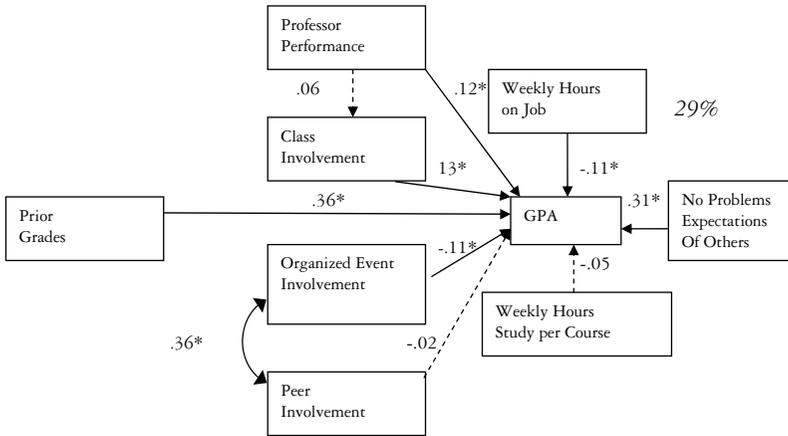
Chi-square = 120.6, df=52, RMSEA=.052, lower boundary = .041, upper boundary = .065, P
test = .327, CFI = .988. AIC = 232.9

performance and classroom involvement, a measure of academic involvement,
is not statistically significant. In essence, students are not more likely to be
involved in the classes of good teachers; however, classroom involvement (.13)
contributes positively to GPA. Weekly hours of study per course, the other
academic involvement variable in the model, has no statistically significant
effect on GPA.

Informal institutional experiences also have consequences for GPA. The
double headed arrow between organized event involvement and peer involve-
ment (.36) shows that domestic students who are highly involved in formal
activities are also likely to be involved with their peers. The diagram also shows
that involvement in organized events detracts from GPA (–.11) while peer in-
volvement is of no statistically significant consequence.

Of the two external influences included in the model, weekly hours on
the job and having no problems meeting the expectations of others, the former
is statistically significant. The negative coefficient for weekly hours on the
job (–.11) indicates that work has somewhat of a negative effect on grades for
domestic students. The positive coefficient for no problems with others' ex-
pectations (.31) shows that students who do not feel that they are having
difficulty meeting others' expectations are more likely to achieve high grades.
This finding can be interpreted in two ways. First, it could be that students
who have relatives and friends who make relatively few demands experience
less anxiety and therefore feel supported and do well academically. Alternately,

Diagram 3:   International Grades

Chi-square = 120.6, df=52, RMSEA=.052, lower boundary = .041, upper boundary = .065, P test = .327, CFI = .988. AIC = 232.9

it is possible that if students are doing well there is relatively little pressure exerted by family and friends. Within the context of the current model, the former explanation makes the most sense.

The overall amount of variance in GPA explained by the model for domestic students is 29%.

As noted earlier, while differences between the models for domestic and international students cannot be viewed as statistically significant, it is important to note what they have in common and where they differ. Information in Diagram 3 for international students shows that as for domestic students, prior grades (.29), class involvement (.13), and not having problems meeting others' expectations have positive consequences for GPA. The diagrams differ in that for international students professor performance, organized event involvement, and working at a job are of no statistically significant consequence for grades. (It should be noted that international students are prohibited by law from working outside of the university.) By comparison with domestic students, international students who spend a lot of time on their studies tend to get low grades (–.15). This finding may indicate that because of literacy and other problems international students must spend more time studying than their domestic peers to achieve the same grades. Despite some differences, it can be argued that for both domestic and international students the model based on the meta assumptions of American models is useful in explaining the GPA of Canadian and international students studying in Canada.

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The amount of variance in GPA for international students explained by the model is 31%.

With number of completed credits as the outcome, when a model was estimated for domestic and international students simultaneously, chi-square was 122.2 with 52 degrees of freedom. RMSEA equalled .054 with a 90% confidence interval between .041 and .066. The p test for close fit was .279, CFI was .988, and AIC equalled 234.2. Despite the low p test, these values suggest a reasonable fit of the model.

The results of the unconstrained model were compared to the results of a fully constrained model. The chi-square difference of 9.9 with 10 degrees of freedom is not statistically significant at the .05 level; therefore, we can again conclude that no differences exist between domestic and international students for a model with number of completed credits as the outcome.

The results of the unconstrained simultaneously estimated model for domestic and international students are found in Diagrams 4 and 5. In the examination of GPA for domestic students, it was seen that weekly hours on the job detracted somewhat from GPA. From Diagram 4 it is clear that the same variable has a greater negative impact on number of completed credits (−.35). The negative relationship between hours of study per course and completed credits is even greater (−.47). This size of this coefficient suggests that students who must devote a considerable amount of time to maintain a certain GPA likely cut back on the number of courses they are taking. In contrast
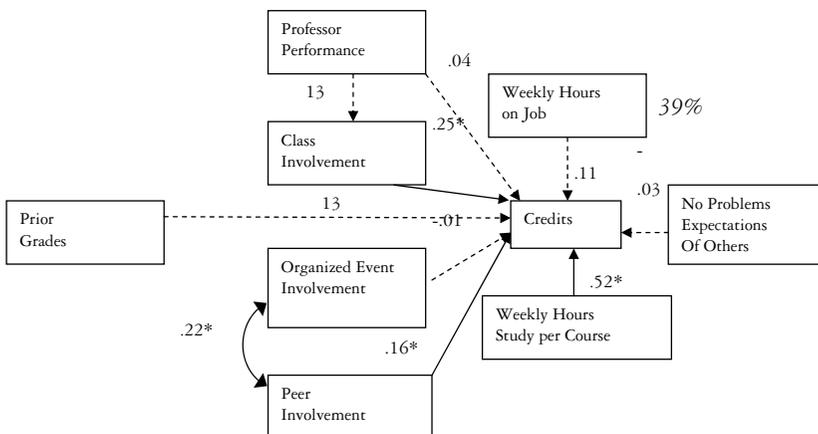
Diagram 4: Domestic Credits
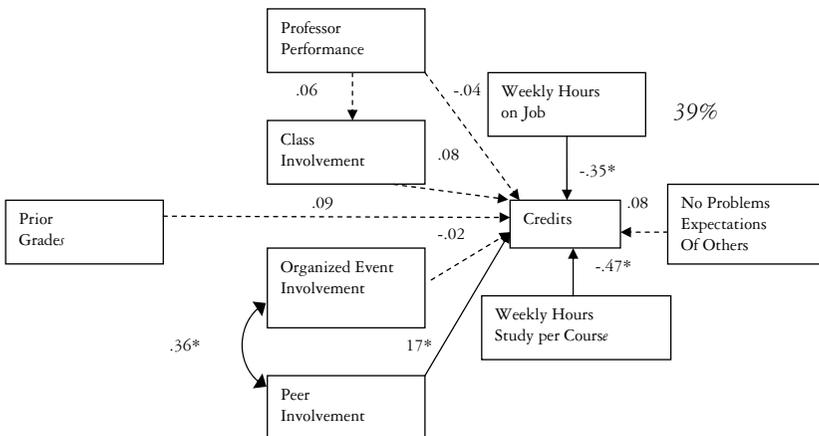
Chi-square = 120.6, df=52, RMSEA=.052, lower boundary = .041, upper boundary = .065, P test = .327, CFI = .988. AIC = 232.9

to the model with GPA as the outcome, students who are involved with their peers complete more credits than the uninvolved (.17). Pre-university characteristics, as represented by prior grades; formal academic experiences, in the form of professor performance; classroom involvement; and having no problems meeting the expectations of others are of no statistically significant consequence for credit completion. The fact that students who are involved in organized events are also involved with their peers as observed in the GPA model is evident for credit completion (.36). The overall amount of variance in number of completed credits for domestic students is 39%.

Again, although the differences between the models for domestic and international students are not statistically significant, it is helpful to examine similarities and differences between the two groups of students. From Diagram 5 it is seen that as for domestic students, peer involvement (.16) and weekly hours of study (−.52) are of consequence for credit completion. Whereas those involved with their peers complete more credits, international students who spend a lot of time per course on their studies are more likely than others to complete few credits. Once again it is likely that those who need to spend a lot of time on courses compensate by limiting the number of courses they take. In contrast to domestic students, for international students class involvement has a positive impact on number of completed credits (.25). Among international students, those who are involved in organized events are likely also to be involved with their peers (.22).

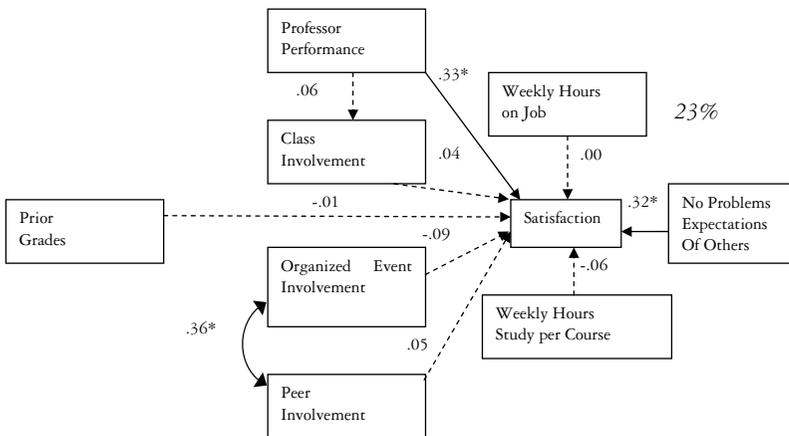**Diagram 5:   International Credits**

Chi-square = 120.6, df=52, RMSEA=.052, lower boundary = .041, upper boundary = .065, P test = .327, CFI = .988. AIC = 232.9

For both domestic and international students, the number of completed credits has little to do with formal institutional experiences represented by professor performance. Informal institutional experiences, in the form of peer involvement, are important for the credit completion of each group. To this extent, it makes sense for the university to promote situations in which students become involved with their peers. Given the relationship between class involvement and credit completion for international students it also makes sense for the university to take steps to encourage students to attend classes. (Recall from Table 1 that the degree of classroom involvement of international students was relatively low.) In comparison to domestic students, for international students hours on the job has no statistically significant implications for number of completed credits. The amount of explained variance in number of completed credits for both groups of students is 39%.

With program satisfaction as the outcome, when a model was estimated for domestic and international students simultaneously, chi-square was 122.3 with 52 degrees of freedom. RMSEA equalled .054 with a 90% confidence interval between .041 and .066. The p test for close fit was .296, CFI was .989, and AIC equalled 234.3. As in the cases of the previous two models, despite the low p test, these values suggest a reasonable fit of the model.

The results of the unconstrained model were compared to the results of a fully constrained model. The chi-square difference between the unconstrained and constrained models of 8.2 with 10 degrees of freedom is not statistically

Diagram 6:   Domestic Satisfaction

Chi-square = 120.6, df=52, RMSEA=.052, lower boundary = .041, upper boundary = .065, P test = .327, CFI = .988. AIC = 232.9

significant at the .05 level; therefore, we can conclude that no differences exist between domestic and international students for the model with program satisfaction as the outcome.

The results of the unconstrained simultaneously estimated model for domestic and international students are found in Diagrams 6 and 7. An examination of Diagram 6 indicates that only the formal institutional experience of professor performance (.33) and having no problems meeting the expectations of others (.32) have positive connections to satisfaction for domestic students. As in the previous models (and as can be expected), organized event involvement and peer involvement are related (.36). The amount of variance in satisfaction explained by the model is 23%.

For international students, as seen in Diagram 7, the overall picture is the same as that of domestic students: professor performance (.36) and not having problems meeting the expectations of others (.28) have positive implications for satisfaction. Other variables are of no statistically significant consequence.

For both groups it would seem that positive classroom and external experiences in the form of others' expectations contribute to satisfaction. This being the case, if student satisfaction is an objective, it is in the university's best interests to promote effective teaching. The amount of variance in satisfaction explained by the model for this group is 24%. Clearly, the similarities between domestic and international students are more evident in the satisfaction model than in any other.

Diagram 7: International Satisfaction
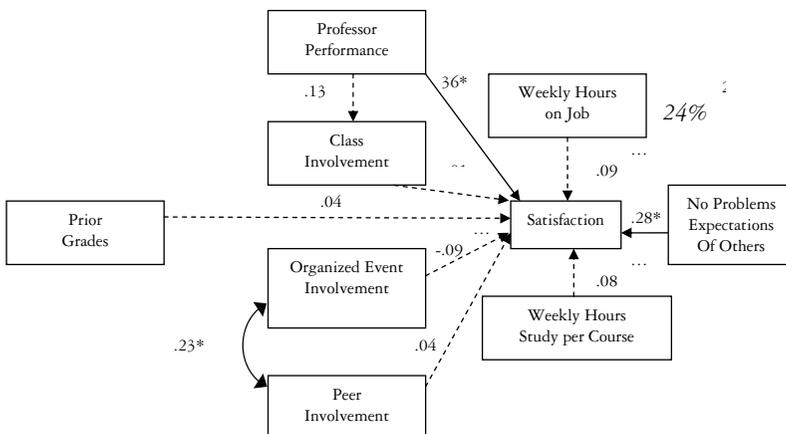
Chi-square = 120.6, df=52, RMSEA=.052, lower boundary = .041, upper boundary = .065, P test = .327, CFI = .988. AIC = 232.9

O v e r a l l   A s s e s s m e n t

Information in Table 2 facilitates an examination of the relationship between independent and outcome variables in each of the foregoing models. Reading across rows, it is seen that the pre-entry characteristic, prior grades, has a positive effect on GPA for both domestic and international students; however, it is of no consequence for other outcomes. By comparison, the formal institutional experience, professor performance, positively affects the grades of domestic students and the satisfaction of both groups of students. This finding is consistent with previous analyses that have pointed out that in commuter universities what goes on in the classroom is central to the educational experience. Class involvement only affects the grades of domestic and international students while organized event involvement has negative consequences for the GPA of domestic students. Peer involvement has positive consequences for the number of credits completed by both groups of students. There is an inverse relationship between number of hours a week international students spend on their studies and grades, and the number of hours devoted to studies by both groups of students and completed credits. This finding likely reflects the fact that international students who achieve high grades may actually have to spend less time on their studies than poor performers. Similarly, the need to devote considerable time to studies may reduce the number of credits that can be effectively completed. The number

Table 2:   *Impact of Variables on Outcomes of Domestic and International Students*

Variable	GPA		Ideas		Satisfaction	
	Domestic	Int'l	Domestic	Int'l	Domestic	Int'l
Prior grades	+	+				
Professor performance	+				+	+
Class involvement	+	+				
Organized event involvement	—					
Peer involvement			+	+		
Weekly hrs study per course		—	—	—		
Weekly hrs on job	—		—			
No problems meeting expectations of others	+	+			+	+

of hours spent working has negative consequences for the grades and completed credits of domestic students while not having problems meeting others' expectations positively affects the GPA and satisfaction of domestic and international students.

Collectively, these findings point to two conclusions. First, the model utilized in this study has applicability to both domestic and international students. Second, professor performance (formal institutional experience) and not having problems in meeting others' expectations (external event) are very important in the three models under consideration. The importance of other variables changes by model. While the expectations are beyond the university's control, there are steps that it can take to enhance the classroom performance of professors.

While the current study suggests that the models employed in the study of first year outcomes may be applicable to both domestic and international students, it is also important to know how the results of the current research compare to those of other studies focusing on educational outcomes. Unfortunately, data are not always presented in ways that facilitate comparisons. Even when data are adequately presented, different operationalizations of similar concepts often makes comparisons risky. This said, the amount of variance in retention explained by variations of the student integration model has varied from a low of 11% to a high of 46% (Grayson and Grayson, 2003).

Research employing the college impact model indicates that the amount of variance explained in various outcomes by experiences both inside and outside the classroom is small. In a study of critical thinking, Terenzini, Springer, Pascarella and Nora (1995) found that first year out-of-class experiences explained only 3% of the variance and in-class experiences explained another 3%. An analysis of openness to diversity and challenge by Pascarella, Edison, Nora, Hagedorn and Terenzini (1996) revealed that, conservatively estimated, first year student academic and social experiences explained only 1% and 4% of the variance respectively. Grayson (1997) found that only 4% of the variance in first year grade point averages obtained from administrative records was explained by student experience variables suggested by the college impact model. By way of comparison, even at the end of third year, the final year of high school grades (a pre-university characteristic) explained 28% of the variance in grade point average (Grayson, 1999).

A study of 24,847 students based on the I-E-O model using 192 'environment' and 146 'input' variables (Astin, 1993) shows that the amount of variance in outcomes that can be explained by the model varies considerably. It was found that once adjustments were made for entering Scholastic Aptitude

Test (SAT) scores and other background characteristics of students, the amounts of variance in various GRE scores, and Medical College Admission Test (MCAT) and LSAT scores explained by institutional context factors were small. For example, such factors explained only 3% of the variance in verbal GRE scores, 1% of GRE quantitative scores, 1% of GRE analytical scores, 1% of GRE composite scores, 4% of MCAT scores, and 3% of the variance in LSAT scores. Astin (1993) also showed that the amount of variance explained for self-reported gains in various skills was greater than for cognitive gains measured through standardized tests: institutional context variables explained 17% of the variance in self-reported academic development; 19% of the variance in self-reported writing skills; and 12% of the variance in self-reported critical thinking ability.

In view of the objectives of the current study, most important is Astin's finding that the I-E-O model explained 42% of the variance in GPA and 24% of the variance in overall college satisfaction (not program satisfaction as in this study). While the GPA model employed in the current study explained 29% and 31% of the variance in domestic and international GPA respectively, it is much more parsimonious than the one employed by Astin. The current model for program satisfaction is similarly parsimonious and explains 23% and 24% of the respective program satisfaction of domestic and international students. In essence, what the current GPA model lacks in terms of explanatory power, it perhaps compensates for in terms of parsimony. The current satisfaction model explains as much variance as Astin's and is much more parsimonious. Unfortunately, no research could be found that would allow an assessment of the explanatory power of the completed credits model.

C o n c l u s i o n s

The current study is a pilot for a three-year study of the experiences and outcomes of domestic and international students in four Canadian universities. It's objectives were: 1) to compare the experiences and outcomes of domestic and international students; 2) to test the applicability of a general model based on American research to the relationship between experiences and outcomes.

With regard to objective one, it was found that in terms of outcomes, in the first year of study, there were no differences in the GPA and program satisfaction of domestic and international students; however, domestic students completed more credits than international students. With respect to the second objective, it was found that a general model based on American models emphasizing the importance of pre-entry characteristics, formal and informal

institutional experiences, and external events had utility in explaining the outcomes under consideration. Importantly, there were no statistically significant differences in the models that related to domestic or international status. In terms of explained variance, the model was of most use in explaining, in descending order, completed credits (35% of variance), grades (28%) and program satisfaction (23%). While different outcomes were affected by different variables in the models, professor performance and not having problems meeting the expectations of others had the most consistent explanatory power. Findings such as these indicate that continually attempting to increase the quality of classroom instruction has multiple benefits for students.

L i m i t a t i o n s

The current study was concerned with whether or not it was possible to establish a *prima facia* case for the utility of models for Canadian and international students studying in Canada based on the relationship between the experiences and outcomes of American students. The results of the research suggest that the American developed models do have such utility. There are, however, a number of limitations of the current research that can be dealt with in a three-year study of four Canadian universities.

First, the literature suggests that the experiences of international students vary by country of origin and sex. In the proposed three-year study of four Canadian universities it will be possible to see if models similar to the ones discussed here apply to international students of different origins and sexes. Second, the experiences of students vary by faculty. As a result, it is important to know if these different experiences have implications for the utility of models based on considerations such as those employed in this study. Third, it is important to determine if potentially different policies of universities have consequences for the experiences and outcomes of domestic and international students. Finally, it is important to know if models based on considerations raised in this study apply to other outcomes such as retention, skills development, and increased facility in the English language. Once these broader objectives have been achieved, Canadian universities will be in a better position to implement policies that will have the effect of enhancing educational outcomes.

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