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Factors Associated with University Students' Development and Success: Insights from Senior Undergraduates

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Factors Associated with University Students' Development and Success: Insights from Senior Undergraduates

Abstract

In order to effectively support students' learning and development at university, we need a better understanding of what helps undergraduate students thrive in the university environment. In this study, we surveyed 204 senior undergraduate students at a large research-intensive university in western Canada to explore factors related to thriving as a university student. We measured sense of belonging (including perceived faculty understanding, peer support, and classroom comfort), task value (students' perceptions of the value of their course content), and academic achievement (self-reported grade point average) for students' current year and their recollections of their first year at university. We also asked students to identify factors they considered integral to becoming a successful university learner. Both sense of belonging and perceived task value increased from first to senior year. Sense of belonging was consistently associated with academic achievement, whereas task value was associated with academic achievement in first year only. Two components of belonging (faculty understanding, classroom comfort) predicted academic achievement in first year; only one (classroom comfort) predicted academic achievement in the current year. Qualitative analysis of responses to open-ended questions identified themes in four categories as key contributors to students' development and success: personal development, social support, course design, and university resources and opportunities. Factors related to personal development (e.g., learning to prioritize health, improving time management skills, and developing self-regulated learning skills) were identified most frequently as key components in students' adaptation to university learning environments. Insights from this study can inform development of curricular and co-curricular strategies to better support undergraduate students' learning and development at university.

Afin de soutenir efficacement l'apprentissage et le développement des étudiants et des étudiantes d'université, nous devons mieux comprendre ce qui aide les étudiants et les étudiantes de premier cycle à s'épanouir dans l'environnement universitaire. Dans cette étude, nous avons interrogé 204 étudiants et étudiantes en fin de premier cycle inscrits dans une université axée sur la recherche située dans l'ouest du Canada dans le but d'explorer les facteurs liés à l'épanouissement en tant qu'étudiant et étudiante universitaire. Nous avons mesuré le sentiment d'appartenance (y compris la perception de la compréhension des professeurs et des professeures, le soutien des pairs et le confort en classe), la valeur des tâches (les perceptions des étudiants de la valeur du contenu de leurs cours) et la réussite académique (la moyenne générale des notes auto-déclarée) pour l'année en cours et leur souvenir de leur première année à l'université. Nous avons également demandé aux étudiants et aux étudiantes d'identifier les facteurs qui, selon eux, jouaient un rôle essentiel pour réussir en tant qu'apprenant et apprenante à l'université. Tant le sentiment d'appartenance que la valeur perçue des tâches avaient augmenté entre la première et la dernière années d'études. Le sentiment d'appartenance était considéré comme associé à la réussite académique, alors que la valeur des tâches était associée à la réussite académique seulement au cours de la première année. Deux composantes d'appartenance (compréhension des professeurs et des professeures, confort en classe) permettaient de prédire la réussite académique au cours de la première année; une seule composante (confort en classe) permettait de prédire la réussite académique au cours de l'année en cours. L'analyse qualitative des réponses aux questions ouvertes a identifié des thèmes dans quatre catégories en tant que contributeurs principaux au développement et à la réussite des étudiants et des étudiantes : le développement personnel, le soutien social, la conception des cours et les ressources et les opportunités de l'université. Les facteurs liés au développement personnel (par ex. l'apprentissage pour accorder la priorité à la santé, l'amélioration des compétences en gestion du temps et le développement de compétences d'apprentissage auto-régulées) ont été identifiés le plus fréquemment comme éléments clés dans l'adaptation des étudiants et des étudiantes aux environnements d'apprentissage universitaires. Les conclusions de cette étude peuvent contribuer à l'élaboration de

stratégies curriculaires et co-curriculaires dans le but de mieux soutenir l'apprentissage et le développement des étudiants et des étudiantes de premier cycle universitaire.

Keywords

sense of belonging, task value, undergraduate, thriving, mixed methods; sentiment d'appartenance, valeur des tâches, premier cycle, épanouissement, méthodes mixtes

Cover Page Footnote

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University students experience significant transitions and transformations over the course of their undergraduate studies. Beginning in first year, students are shaping and reshaping their identities as learners and contributors to society (Briggs et al., 2012). During this period of notable academic and personal development, it is crucial for undergraduate students to have access to appropriate support and resources to help them thrive in the university environment. Thriving students are engaged in their learning, can effectively manage their time, are optimistic about their future, and are dedicated to making a meaningful difference in the world (Schreiner et al., 2009; Schreiner, 2010). Given these notable benefits, we need a better understanding of what helps students to thrive during their undergraduate studies in order to best support their development and success at university.

Thriving as a Conceptual Framework for Undergraduate Student Success

Schreiner's (2010) description of university student thriving has provided the foundation for much of the current research on thriving in undergraduate students (e.g., Pérez & Sáenz, 2017; Soria et al., 2015; Stebleton et al., 2012). Schreiner (2010) describes thriving as comprising three domains: interpersonal thriving, intrapersonal thriving, and academic thriving. Interpersonal thriving includes experiencing a sense of community on campus and establishing supportive relationships that can help students succeed (Richardson et al., 2012; Schreiner, 2013). A student's sense of belonging, which is their sense of affiliation and identification with their university community (Hoffman et al., 2002), is an important component of interpersonal thriving. Intrapersonal thriving is having a positive attitude toward oneself and the learning process (Schreiner, 2010). Positive sense of self can contribute to the development of supportive relationships with others (Schreiner et al., 2009). Thus, students who are thriving intrapersonally may also be more likely to be socially integrated and have a stronger sense of belonging in the university community. Students who are thriving in the academic domain are engaged in their learning and process classroom material in meaningful ways (Schreiner, 2010). This is more likely to occur if students have a strong sense of task value, which refers to students' perceptions of the inherent interest of course material and its relevance to their goals (Pintrich et al., 1991). It is clear that students' sense of belonging and their perceptions of task value are clearly related to important aspects of students' thriving and, as a result, are important factors to consider when evaluating the undergraduate student experience.

Interpersonal Thriving and Sense of Belonging

Interpersonal relationships are a key part of the university experience and several theories have long acknowledged the importance of social integration in student retention (Astin, 1984; Bean & Metzner, 1985; Tinto, 1993). Thus, it is not surprising that students' sense of belonging in their university community has been associated with both their intention to persist and their actual persistence in their studies (Gopalan & Brady, 2020; Hausmann et al., 2009). Beyond mere persistence in undergraduate studies, however, sense of belonging also appears to be associated with academic motivation (Freeman et al., 2007) and, ultimately, academic achievement (Zumbrunn et al., 2014).

Various factors appear to influence the degree to which students develop a sense of belonging at university. For example, Hurtado and Carter (1997) found that factors like ease of transition to university studies, campus racial climate, and student characteristics (e.g., gender,

academic ability) affected Latinx students' sense of belonging at university. Students' perceptions of faculty members also appear to play a role. Notably, sense of belonging appears to increase when students perceive faculty members as being interested in students' development (Maestas et al., 2007) and instructors create supportive classroom environments (Zumbrunn et al., 2014). In a survey of first-year students, the key predictors of students' sense of belonging in a particular class were instructor characteristics such as organization, warmth, openness, and especially encouragement of students' participation in class (Freeman et al., 2007). Other factors that have been shown to increase students' sense of belonging in the university environment include participating in academic support programs (Maestas et al., 2007) and taking several courses together in first year with the same group of peers through co-scheduling classes in learning communities (Hoffman et al., 2002). These studies demonstrate that students' direct interactions with faculty and peers may be especially relevant in establishing a high sense of belonging.

Academic Thriving and Task Value

In his Model of Student Involvement, Astin (1984) described factors that influence university student retention, proposing that students who are more involved in the academic and social aspects of university will be more academically and socially proficient. This model informed subsequent studies exploring relationships among student engagement, academic achievement, school satisfaction, and sense of belonging (Heng, 2014; Kim & Lundberg, 2016; Van Horne et al., 2018; Zhao & Kuh, 2004). Astin (1984) also stated that students' involvement could be increased if they could engage in academic work and other activities with direct relevance to their goals and lives. Engaging in relevant coursework also appears to affect students' academic achievement. For example, Introductory Psychology students' perceptions of utility task value (how useful a topic is perceived to be to a students' future) positively predicted their final grades in the course (Hulleman et al., 2008). University students who report perceptions of interest, usefulness, and importance in their courses are also more likely to use effective learning strategies such as elaboration (connecting new information to existing concepts) and metacognitive control (regulating one's own learning) (Pintrich et al., 1993). Thus, increasing perceptions of the relevance and usefulness of course material (task value) among students could be an effective way to help them thrive academically.

Purpose and Research Objectives

By exploring sense of belonging and task value among undergraduate students, we can gain insights into factors related to students' thriving at university. Given the notable changes students experience over the course of their undergraduate studies, perceptions of belonging and task value (and their associations with academic achievement) may vary as students progress through their degree. Senior undergraduate students' perspectives regarding what contributed to their academic development over time could also provide important insights regarding conditions that can promote thriving at university. Thus, we aimed to assess what senior students considered to be key factors in their academic development and explore how sense of belonging and task value may affect academic achievement (for students' current year and their first year at university). Our specific objectives were to:

1. Explore associations among sense of belonging, task value, and academic achievement in senior undergraduate students, for both the current academic year and students' recollections of their first year at university.
2. Determine if aspects of sense of belonging (perceived faculty understanding, peer support, classroom comfort) and/or task value predict students' academic achievement, in their current senior year and/or in their first year of undergraduate studies.
3. Examine senior undergraduate students' perspectives regarding factors that made important contributions to their academic development and success at university.

A key purpose of this study was to gather insights to inform the design of a first-year course created by the second author to support first-year students' development as successful university learners.

Method

Recruitment

Upper-year undergraduate students at a large research-intensive university in western Canada who had completed at least three years of university studies were invited to complete an anonymous online survey through recruitment posters placed in campus buildings, notices posted on social media (e.g., Facebook, Instagram, Twitter), and brief in-classroom announcements at the beginning of a class in six different medium- to large-enrolment upper-year courses in the Faculties of Arts, Science, and Land and Food Systems (six in-class recruitment announcements, reaching approximately 550 students). Recruitment took place over a four-week period starting late October, 2017. As a token of appreciation for their involvement in the study, participants were offered the chance to win one of four \$25 gift cards to the university bookstore by entering their email address in an online form separate from the survey. The study was approved by the university's behavioural research ethics review board.

Data Collection

The online survey was administered using Qualtrics survey software (Qualtrics, Provo, UT). Questions measured key variables (sense of belonging, task value, and academic achievement; described below) for both the current year and for respondents' first year of university. Questions pertaining to the current year appeared first in the survey and were preceded by the instruction, "Read each item carefully and rate your agreement with each statement, based on your experience at the university during the **current school year**." Questions regarding respondents' first year at university appeared next and were preceded by the instruction "Read each item carefully and rate your agreement with each statement, based on your experience at the university during **First Year**."

Sense of Belonging

To assess students' sense of belonging in the university context, we used the revised sense of belonging scale (Tovar & Simon, 2010). This scale includes 16 items to assess three aspects of belonging: (a) seven items assess perceived faculty understanding/comfort (e.g., "I feel that a

faculty member would be sensitive to my difficulties if I shared them”), (b) six items assess perceived peer support (e.g., “I have met with classmates outside of class to study for an exam”), and (c) three items assess perceived classroom comfort (e.g., “I feel comfortable asking a question in class”). For each item, respondents were asked to indicate whether the statement was 1 = completely true, 2 = mostly true, 3 = equally true and untrue, 4 = mostly untrue, or 5 = completely untrue. Two items in the perceived peer support subscale were reverse-scored (“No one in my classes knows anything personal about me” and “I know very few people in my classes”). Scores for sense of belonging (overall and each subscale) are calculated by adding respondents’ scores for each item within the respective scale; thus, lower scores (overall and for each subscale) indicate a greater sense of belonging. The scale appeared twice in our survey: first in the section of questions regarding the current school year, written in the present tense as in Tovar and Simon (2010), to assess current sense of belonging; second, in the section of questions regarding respondents’ first year at university, written in the past tense to assess participants’ recollection of their sense of belonging in their first year of their undergraduate studies (e.g., “I felt comfortable asking a question in class”).

Task Value

We used the task value scale from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1991) to assess students’ perceptions of the value of their course content. This scale contains six items (e.g., “I think the course material in this class is useful for me to learn”), with response options for each item ranging from 1 = “not at all true of me” to 7 = “very true of me.” Scores for task value are calculated as respondents’ mean score on the six items in the scale; thus, higher scores indicate greater perceived task value. As was the case above, our survey included two versions of this scale. The first was administered to assess respondents’ perceptions of task value for their current courses by making a small change to the wording of the original items from the MSLQ: items’ reference to one particular class was changed in order to refer to respondents’ current courses more broadly (e.g., “I like the subject matter of this course” was changed to “I like the subject matter of my current courses”). In the second administration of the task value scale, in the section of questions related to respondents’ experience in first year, we modified the wording slightly to assess respondents’ recollections of the task value of their first-year courses (e.g., the statement “It is important for me to learn the course material in my current classes” was changed to “It was important for me to learn the course material in my First Year classes”).

Academic Achievement

Respondents’ self-reported current grade point average (GPA) and recalled first-year GPA were used as indicators of academic achievement during each of those times. The survey included the questions, “What is your current GPA?” and “To the best of your recollection, what was your GPA at the end of First Year?” Multiple-choice responses for these two questions were letter grades from A+ to F, with the corresponding grade percentage intervals indicated. For each question, respondents were also given the response option “prefer not to say.” Previous research has shown that students’ self-reported GPAs are highly correlated with their GPAs as they appear in university records (van der Zanden et al., 2018), and students at the institution where this study took place can always view their GPA for each year of study in the institution’s online student

information system. Thus, students' self-report of current and first year GPA should be a reasonable proxy for academic achievement during those time periods.

Open-ended Questions

To explore important aspects of the university experience that may be useful for students' development as university learners, participants were asked to give text responses to the following two prompts: "Reflecting on your undergraduate experience thus far, please identify 1-3 things (e.g., experience, decision) that have made an important contribution to your development as a learner" and "Identify 1-3 things that have helped you adapt to the demands of being an undergraduate student."

Demographic Variables

Students were asked to indicate their gender ("What gender do you identify as?") with the options of male, female, trans, other, and prefer not to say. Students were also asked to indicate their age (by entering a numeric response to the question, "How old are you?"), if they were an international student (yes/no), and how many years of undergraduate studies they had completed (< 3 years, 3 years, 4 years, > 4 years).

Data Analysis

Surveys were first evaluated for completeness and those containing responses for at least 90% of the items in each of sense of belonging and task value subscales were judged to have been meaningfully completed. Surveys that did not meet the criterion for meaningful completion were marked as incomplete and not included in further analysis. Any missing responses for individual items in meaningfully completed surveys were replaced with the median response for that question.

Quantitative data were analyzed using SPSS (Version 25.0 for Mac). Descriptive statistics were calculated for key variables. We used paired *t* tests to compare current and first-year sense of belonging (overall and for each subscale), task value, and GPA. Independent samples *t* tests were used to examine differences in those variables between males and females, and international and domestic students. Associations between continuous variables were assessed using Pearson's correlations. Associations between continuous variables and current and first-year self-reported GPA were calculated using Spearman's rho. Two stepwise regression analyses were conducted to determine which variables may predict academic achievement (self-reported GPA). For each regression, variables were assessed for inclusion using a combination of forward and backward stepwise selection, with significance levels of $p < 0.05$ used for variable entry and $p < 0.10$ for variable removal. First, to examine predictors of academic achievement (GPA) in students' first year, the following variables were entered stepwise into the regression: scores for first-year perceived faculty understanding/comfort, peer support and classroom comfort (i.e., each of the sense of belonging subscale scores for first year); first year task value score; gender; and international versus domestic student status. Second, to identify variables predicting current academic achievement (GPA), the following variables were entered stepwise into the regression: scores for current perceived faculty understanding/comfort, peer support and classroom comfort (i.e., each of the sense of belonging subscale scores for the current year); current task value score;

gender; and international versus domestic student status. In both regressions, scores for task value and the three sense of belonging subscales were entered as z-scores in order to create meaningful zeros to determine effect on GPA. Mean-centering (subtraction of the mean from values) was performed on the dependent variables (reported current GPA and recalled first-year GPA) before running the regressions, which is a useful method for overcoming the arbitrary origin of interval scales (Vosgerau & Gatignon, 2007).

Text responses to open-ended questions were imported into NVivo (Version 11.4.3 for Mac). Qualitative analysis of responses to open-ended questions was undertaken using a phenomenographic approach. Phenomenography has primarily been used to explore questions related to the experience of learning (Yates et al., 2012). It takes a second-order perspective to examine how people understand and interpret their experiences (Marton, 1981). To explore factors students perceived as having been important to their development as university learners, both authors independently completed a first cycle of coding of responses to the two open-ended questions, primarily using *in vivo* codes, and then met to discuss, refine, and consolidate codes. Second cycle coding using pattern coding (Saldaña, 2015) was then conducted collaboratively to group ideas into major themes. The number of mentions for each key theme was tabulated.

Results

A total of 232 surveys were received. Eighteen surveys were submitted by students who had completed less than three years of undergraduate studies and were therefore not included in our analysis. Of the remaining 214 surveys, 204 (95%) were meaningfully completed. The sample was 69% ($n = 141$) female, 12% ($n = 25$) male, and 1% ($n = 2$) transgender; 18% ($n = 36$) did not indicate their gender. Participants ranged in age from 18 to 41 years, with a mean age of 22.6 years (82% were 20–24 years old). The sample consisted of 74% ($n = 150$) domestic students and 10% ($n = 21$) international students; 17% ($n = 33$) did not answer this question. Compared to all undergraduate students at the university, our sample included a higher proportion of females (69% of our sample versus 55% of the undergraduate population of the university) and a lower proportion of international students (10% of our sample compared to 25% of the undergraduate population of the university).

Differences in Sense of Belonging, Task Value, and Academic Achievement

Participants' scores for sense of belonging and perceived task value were higher for the current year than for their recollections of their first year (see Table 1). There were improvements in each component of sense of belonging, with perceived faculty understanding/comfort and perceived classroom comfort increasing to a greater extent than perceived peer support.

Table 1
Comparison of Current and Recalled Perceptions in Key Variables

Variable	Possible range of scores	Mean		Mean difference (current year - first year)
		First year recalled	Current year	
Sense of Belonging (total)	16-80	51.7	40.2	-11.5***
Perceived Faculty Understanding	7-35	23.4	17.3	-6.1***
Perceived Peer Support	6-30	17.2	14.1	-3.1***
Perceived Classroom Comfort	3-15	11.1	8.9	-2.2***
Task Value	1-7	4.3	5.4	1.1***

Note. Lower values for sense of belonging (overall and each of its subscales) indicate greater sense of belonging. Higher values for task value indicate greater perceived task value. *** $p < .001$

Current and first-year sense of belonging and its subscales, task value, and GPA were compared between males and females, and international and domestic students. Only one variable differed significantly between groups in these comparisons: males reported a first-year GPA that was 6.6% higher than females ($t(155) = 2.932, p < .01$).

Correlations Between Sense of Belonging, Task Value, and Academic Achievement

Scores for overall sense of belonging were associated with GPA; current overall sense of belonging was associated with current GPA ($\rho = -0.159, p < .05$) and overall sense of belonging in first year was associated with first-year GPA ($\rho = -0.332, p < .001$). Note that lower scores for sense of belonging actually indicate a greater (or higher) sense of belonging; thus, these correlations indicate that students with a greater sense of belonging overall reported a higher GPA, for both the current year and their first year at university. For first year, two sense of belonging subscales showed significant associations with GPA: faculty understanding/comfort ($\rho = -0.378, p < .01$) and classroom comfort ($\rho = -0.316, p < .01$). Only one sense of belonging subscale (classroom comfort) was significantly associated with GPA for the current year ($\rho = -0.220, p < .01$). Current overall sense of belonging was associated with current task value ($r = -0.221, p < .01$), indicating that participants with poorer sense of belonging had lower perceptions of the value of their course content. No significant relationship was found between sense of belonging in first year and perceived task value for first-year courses. In first year, task value was positively associated with GPA ($\rho = 0.324, p < .001$), but a similar association was not observed for the current year. Overall, correlation analyses revealed that a lower sense of belonging was associated

with lower GPA in both the current year and first year, a lower sense of belonging was associated with lower task value in the current year, and higher perceived task value in first year was associated with higher GPA in first year.

Regression Analyses to Examine Variables Predicting Academic Achievement

The regression analysis to determine which variables may predict academic achievement in first year resulted in a model which explained 17.0% of the variance in self-reported first year GPA (see Table 2). Three variables emerged as significant predictors of higher academic achievement in first year: greater perceived faculty understanding/comfort, greater perceived classroom comfort, and being male. A similar regression analysis conducted to examine predictors of current academic achievement resulted in a model which accounted for only 5.4% of the variation in self-reported current GPA (see Table 2). Only one variable made a significant contribution to the variance in current self-reported GPA: perceived classroom comfort.

Qualitative Analysis of Factors Students Identified as Important to their Development

Themes derived from the two open-ended questions were very similar, indicating that students perceived overlap between factors which contributed to their development as a university learner and factors which helped them adapt to the demands of being an undergraduate student overall. Thus, responses to both prompts were analyzed together to identify factors that contributed to students' successful adaptation to undergraduate studies. The factors students identified as important could be classified into four broad categories: (a) personal development (368 mentions), (b) social support (peer and faculty) (116 mentions), (c) course design (65 mentions), and (d) university resources and opportunities (48 mentions). Key themes in each of these areas and examples of participants' responses substantiating each theme are provided in Table 3.

Personal Development

One particular aspect of personal development—learning to prioritize personal health and wellbeing—was the most common theme in students' responses overall, with 104 separate mentions (see Table 3). Many students noted that they had learned that prioritizing their own wellbeing benefited their overall academic performance. For example, one participant indicated the following was an important factor in her adjustment to the demands of being an undergraduate student: “SLEEP. I underestimated the importance of it in first year, but it is crucial for success. Between sleep or studying I pick sleep every time, and I usually end up performing better anyway.” Learning better time management and developing self-regulated learning skills were also important for many students' academic development. For example, one participant spoke of developing better self-regulated learning skills with her response, “I note down environments in which I study better.... I've tried to follow that whenever I study rather than forcing myself into areas I know I will not do well in.” Additional factors related to personal development which emerged as important in students' adjustment to a university learning environment included developing a deeper understanding of oneself, interest in course material, gaining insights about university learning, and overcoming failures.

Table 2
Stepwise Regression Models for First Year GPA and Current GPA

Predictor	First year GPA							Current GPA						
	β	F	ΔR^2	R^2	R^2_{Adj}	df	t	β	F	ΔR^2	R^2	R^2_{Adj}	df	t
Faculty comfort/ understanding	-0.262**		0.129				-3.071							
Classroom comfort	-0.187*		0.031				-2.189	-0.243**		0.060				-3.126
Gender	0.169*		0.027				2.266							
Final model		4.79*		0.186	0.170	3			9.770**		0.060	0.054	1	

Note. Non-significant variables for both first year and current GPA: task value, peer support, domestic vs. international student status. Lower scores for sense of belonging subscales (faculty comfort/understanding, classroom comfort) indicate higher sense of belonging. * $p < .05$, ** $p < .01$

Table 3*Factors Contributing to Undergraduate Students' Successful Adjustment to University*

Category	Theme	Number of mentions	Examples of responses substantiating theme
Personal development	Prioritizing health and wellbeing	104	<p>“I need to get some form of exercise everyday otherwise I don’t think I enjoy life as much”</p> <p>“Always prioritizing self-care over grades”</p>
	Learning to manage time	91	<p>“Each year of my undergrad I got better at prioritizing and managing my time which definitely helped with the success in my classes”</p> <p>“The importance of making a study schedule and keeping due dates organized in a planner”</p>
	Developing self-regulated learning skills	66	<p>“Learning how to study – taking better notes (using OneNote), giving myself time, doing questions, not just copying things out”</p> <p>“Active learning, not just reading notes but quizzing myself, writing things down etc.”</p>
	Understanding self	48	<p>“Self-awareness”</p> <p>“Knowing my mental and physical capacity”</p>
	Developed interest in classes	35	<p>“I found classes that interested me”</p> <p>“I was finally taking classes that I enjoyed which made studying for them a lot easier”</p>
	Gaining insights about university learning	16	<p>“Realizing the difference between university life and high school life.”</p> <p>“Use learning skills that are compatible with the professor’s teaching style and the course demand.”</p>

Category	Theme	Number of mentions	Examples of responses substantiating theme
	Overcoming failure	8	<p>“From failing/doing poorly on exams and assignments (mainly during the first two years of undergrad), I have learnt how I study best”</p> <p>“Failing classes made me take responsibility for my own learning”</p>
Social support (peer and faculty)	Friendships provide personal and academic support	39	<p>“Socializing with my friends when I can make the time, to alleviate stress and allow time for myself”</p> <p>“Using friends to get through classes, either by doing homework or studying with them, asking for help, notes, etc. I could not have done as well as I have without my friends”</p>
	Connecting with class peers is useful	31	<p>“Talking to classmates about homework really helps”</p> <p>“Talking to other students when possible to see that I’m not alone in having difficulty understanding a concept”</p>
	Studying in groups increase understanding of content	20	<p>“Studying in groups/explaining concepts in group study sessions has deepened my learning and understanding of topics”</p> <p>“Being a part of an online study group answers my questions and the presence of other students equally confused and stressed as I am comforts me”</p>
	Interacting with supportive faculty	14	<p>“Faculty members are approachable”</p> <p>“Profs that care about student’s learning has helped me as a learner as they take lots of time for you”</p>
	Inspiring friends, peers, and faculty	12	<p>“Being exposed to other students that could serve as a role-model for me”</p> <p>“I made more friends who also had a career/academic goal they were working towards. These friends would then keep my motivation to do well in school going too”</p>

Category	Theme	Number of mentions	Examples of responses substantiating theme
Course design	Experiential learning opportunities	32	“Hands on experiences such as farm trips/labs” “Completing a practicum.... This is a nice way to get experience and help narrow down what field you want to go into”
	Smaller class sizes promote interpersonal relationships and learning	9	“Being in small classes” “Taking courses with smaller numbers of students enrolled is always nice. You have to get to know people and the prof as well”
	Opportunities to interact with faculty outside of lecture time	24	“Going to office hours more and speaking with instructor after class” “Working directly with faculty on research projects... allowing me to pursue my own research interest”
University resources and opportunities	Involvement in extracurricular activities	20	“Campus volunteer opportunities” “Joining a club”
	Academic and mental health resources	16	“Asking for help from writing center or free tutors” “Knowing the resources on campus for mental health”
	Co-operative or international learning opportunities	12	“Co-op jobs exposing me to policy work” “I think going on exchange was very beneficial for me. It made me a lot more open-minded and aware of my environment in several aspects of life”

Social Support (Peers and Faculty)

Support from faculty members, friends, family and peers helped students adapt to the demands of being an undergraduate student. Friendships with peers, which provided both social and academic support, were commonly identified as important. Two other types of connections with peers were also identified as useful: connecting with peers in class and studying with other students. It was clear that social connections with peers provided participants with reassurance that they were not alone in their struggles. As one participant indicated, a key factor in her development as a university student was “sharing and talking through my problems with fellow classmates, and [realising] how we are all struggling in our own ways.” Respondents also identified benefits of studying with peers, including achieving a deeper understanding of the material and learning how to study more effectively. As one participant indicated, “[studying with others] helped me understand materials better and seeing different strategies to tackle different subject has helped me as a learner.” Interactions with supportive faculty members were also cited as important components of students’ development. For example, one participant noted, “Having positive reactions from teachers when I asked for help or leniency when I was struggling with my mental health was very affirmative, made me much more comfortable and confident as a student.” A final aspect of social support that served as important elements of students’ development as university learners was exposure to inspiring peers and faculty.

Course Design

Respondents specifically identified three aspects of course design that had notable impacts on their academic development: having experiential learning experiences, smaller class size, and opportunities to interact with faculty members outside of class time. Drop-in office hours, in particular, were frequently mentioned as a chance to interact with faculty outside of the classroom, which respondents indicated was useful in clarifying expectations and establishing connections with professors.

University Resources and Opportunities

Various university resources and opportunities were cited as important contributors to students’ development, including extracurricular activities, academic and mental health resources, and the opportunity to engage in co-operative or international education. Creating degree plans that allow for the possibility of learning in different environments, such as a “co-op” semester or international exchange, provided students with additional perspective and motivation. As one participant noted, “After completing consecutive co-op terms and coming back to school, I felt more engaged as a student and was eager to attend classes because I felt that I could utilize the knowledge gained from industry experience in the classroom setting.”

Discussion

Our results provide useful insights about senior university students’ academic development and success over the course of their undergraduate studies. Several findings were particularly noteworthy. First, we found that participants’ sense of belonging and task value for the current year were higher than their recollections of their sense of belonging and task value in their first

year. Given what contributes to undergraduate students' thriving (Schreiner, 2010), this suggests that upper-year students are more likely to experience conditions that would promote greater thriving than first-year students. Second, similar to others (Freeman et al., 2007; Zumbunn et al., 2014), we found that students' sense of belonging was associated with better academic achievement. Our findings extend previous reports by examining meaningful components of belonging (perceived faculty understanding, peer support, and classroom comfort) and showing that associations between overall sense of belonging and academic achievement appear to persist over time. Third, our regression analyses yielded important insights regarding factors related to students' academic achievement. Three variables emerged as significant predictors of first-year GPA: two aspects of sense of belonging (perceived faculty understanding and classroom comfort) and being male, altogether explaining 17.0% of the variance in first-year GPA. The particular importance of perceived faculty understanding, which explained 12.9% of the variance in students' reported first-year GPA, highlights the fact that students' perceptions of their first-year instructors have meaningful implications for their academic achievement in first year. However, only one of the variables we measured (perceived classroom comfort) predicted students' academic achievement in their senior year, explaining approximately 5% of the variance in current GPA. Overall, the results of our quantitative analyses provide important insights into undergraduate students' development over time.

Our qualitative analysis of factors participants considered critical to their development as university students revealed four categories of influence: personal development, social support, course design, and university resources and opportunities. Factors related to personal development (such as learning to prioritize health and improving time management skills) were identified most frequently as key elements of becoming an effective learner in a challenging undergraduate context, reflecting students' inclination to take individual responsibility for their development. Participants also identified factors related to their sense of belonging and the perceived task value of their courses as important aspects of their academic development. For example, students identified benefits of the social and academic support that peers provided, consistent with known benefits of successful social integration and peer learning (Hanson et al., 2016; Tinto, 1993). The importance of perceived task value was also identified as important in students' academic development, with 35 mentions of how interest in course material supported students' development as learners. The fact that students considered individual, social, and institutional factors as key contributors to their development as undergraduate students over time was an important insight from our qualitative analysis. It underscores the importance of leveraging institutional resources and course design to provide deep learning experiences, bring students together to create meaningful community, and provide opportunities for students' individual development.

The influential role of faculty members in undergraduate students' experience was an important finding from both the quantitative and qualitative components of our study. The importance of quality interactions with caring faculty members has long been recognized as an important element of effective undergraduate education (Astin, 1984; Chickering & Gamson, 1987; Umbach & Wawrzynski, 2005). Our participants' comments highlighted the ongoing impact of decisions faculty make about matters ranging from course design to their availability to students' outside the classroom (e.g., in office hours and supplemental research opportunities). It was clear from participants' comments that inspiring and engaging instructors were important throughout students' undergraduate studies. Yet, perceptions of faculty members as supportive and caring was an important predictor of academic achievement (GPA) for participants' first year of studies only; it did not enter the regression to predict current GPA in their senior year. The first

year of university studies is a time of extraordinary transition and adjustment (Briggs et al., 2012). Students may be more vulnerable and impressionable during this time as they navigate complex new learning environments. Our findings suggest that students' perceptions of faculty members' support during this time of transition has a particular impact on their academic achievement. Although perceived faculty understanding was not a significant predictor of participants' current GPA, faculty members still exert notable influence over the only variable which predicted students' current academic achievement: perceived classroom comfort. The extent to which students feel comfortable asking questions or participating in class discussions is determined, in part, by the classroom climate established by the instructor. Previous work has identified classrooms as an important area to promote sense of belonging, especially for students who do not live in on-campus residences and thus do not have access to the opportunities to develop social networks provided by living in university residence (Whitten et al., 2020; Wilcox et al., 2005). Thus, faculty members play a central role in students' development as well-adjusted university learners throughout the course of their undergraduate studies, but their impact on academic achievement in first year may be particularly important.

It was interesting to note that while the qualitative data indicated students identify friendships and making connections with classroom peers to be important, perceived peer support (Tovar & Simon, 2010) did not enter the regressions to predict GPA (for the current year or for students' first year; Table 2). Participants' responses to the open-ended questions described factors they felt were most important in their overall development as a learner and their adaptation to the demands of the university context. When the university experience is considered in this broad context, it is not surprising that students would identify peer support as important and helpful. However, the regression analyses were undertaken to explore variables which may predict one particular component of the university experience: academic achievement (GPA). In this more narrow context, peer support did not have a significant impact. This may indicate that peer support has less effect on grades (which reflect course-specific learning) than it does on the broader learning that occurs at university (e.g., learning about self, interests, and values). Yet, first-year students are more likely to develop a sense of identity as a university learner when they have strong social relationships with other students and study with peers (Briggs et al., 2012). Therefore, it is worth considering how peer support could be encouraged in course-based activities in order to enhance learning. This could be done through integrating more opportunities to get to know peers in class settings, including discussions, small group activities, and teamwork.

Several aspects of this study should be considered when interpreting our findings. We assessed students' sense of belonging using the revised sense of belonging scale (Tovar & Simon, 2010). This scale was developed for use with diverse university student samples and assesses three important components of university students' sense of belonging (perceived faculty understanding/comfort, perceived peer support, and perceived classroom comfort). However, it is important to note that sense of belonging has been assessed in a variety of ways across different studies. For example, Freeman et al. (2007) and Zumbrunn et al. (2014) each used a different adaptation of the Psychological Sense of School Membership (PSSM) scale (Goodenow, 1993), which was initially created to assess perceptions of class- and school-level belonging among middle school and junior high school students. The different ways in which university students' perceptions of belonging has been operationalized in different studies precludes direct comparisons among studies regarding particular sub-components of sense of belonging. It is also important to note that we recruited a convenience sample and gathered self-report data, both of which are susceptible to bias. For example, our sample is a small proportion of approximately

11,000 eligible students at the university (of which we estimate approximately 1,500 may have been exposed to recruitment notices) and motivated students are more likely to respond to an invitation to participate in a study, contributing to selection bias. Also, our assessment of sense of belonging and task value in first year relied on upper-year students' memory of their experience in first year, which may be affected by recall bias. Ideally, future research in this area would use a longitudinal design to follow a representative sample of students over the course of their undergraduate studies, to reduce the potential influence of bias, including survivorship bias. Also, due to the cross-sectional design of this study, we cannot infer causality among the variables we assessed. In particular, while it is plausible that a greater sense of belonging may lead to higher academic achievement, it is similarly plausible that a higher GPA may lead to a greater sense of belonging at the university. We cannot infer causal or temporal relationships among the variables we assessed in this cross-sectional study. However, despite the limitations associated with cross-sectional studies and convenience samples, the findings of this study can be applied to inform the development of useful strategies to support university students' thriving. For example, our findings have informed the second author's design of a first-year experience course, resulting in integration of strategies and activities to promote students' sense of belonging, social support, perceived value of first-year courses, and personal development (including many of the themes listed in Table 3).

Conclusion

Through analysis of quantitative and qualitative data provided by 204 senior undergraduate students, we identified several important components of university students' development over the course of their undergraduate studies. Students' sense of belonging was consistently related to their academic achievement; students with higher sense of belonging had higher reported GPAs, both in their first year and in their current senior year. All three variables (sense of belonging, task value, and GPA) increased from students' first-year to their senior year, suggesting upper-level undergraduate students may be more likely to experience conditions associated with university students' thriving (Schreiner, 2010). Sense of belonging in terms of perceived faculty support appears to play a particularly important role in predicting students' academic achievement in first year. This suggests that implementing strategies which enable first-year students to feel more connected to their instructors would be beneficial. Students identified a variety of factors as having been key contributors to their development as university learners and their adjustment to the demands of being an undergraduate student, including personal development, social support, course design, and university resources and opportunities. Factors related to personal development (such as prioritizing health, learning to manage time, and developing self-regulated learning skills) were mentioned most frequently as being important in their overall development as university students.

The results of this study can be applied to inform efforts to promote academic, intrapersonal, and interpersonal thriving in undergraduate students. For example, our findings suggest undergraduate students would benefit from positive experiences with supportive instructors (especially in their first year of university studies) and from opportunities to integrate socially and academically (in classroom settings and beyond). These insights have been applied in our own Faculty context to inform both the recent redesign of a mandatory first-year course (with an aim to increase students' sense of belonging and their perceptions of the relevance of their first-year coursework) and the development of a year-long co-curricular initiative to support first-year

students' transition to university studies (first offered in a preliminary pilot version in the 2020/21 academic year).

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