

Associations of Student Characteristics and Course Organization Factors with Dropping out of University Distance and Online Learning

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Abstract: Distance and online learning (DOL) is becoming a must for university education in times of pandemic. In this context, it is important to take into account the factors that can influence students' perseverance in, or dropout from, university studies. Not all of these factors are unanimously accepted in DOL research. This study, of 791 undergraduate students in 2018-19 enrolled in a francophone DOL institution, concludes that the factors influencing dropout from DOL are as much related to the personal characteristics of the students and to their learning strategies as to the pedagogical design of the course.

1 INTRODUCTION

Distance and Online Learning (DOL), which had become an important course offering component for higher education institutions before the current pandemic, is now a crucial way for their students to complete their studies. However, research indicates that the dropout rate for DOL students is higher than for on-campus students (Fortin, Joanis, & Ragued, 2019).

Longstanding research on university dropouts has mainly studied on-campus learning, identifying multiple conditions likely to influence student attrition, including student-related factors, environmental factors, and course and program-related factors (Sauvé, Papi, Gérin-Lajoie, & Desjardins, 2020).

Research on DOL has identified variables that are similar to those for on-campus learning but with effects that differ in importance (Facchin & Boisvert, 2019; Li, & Wong, 2019). Moreover, these studies often consider only a few of the many dimensions influencing a student's life and path (McDougall, 2019). No scholar has examined all relevant factors, although they have recommended doing so when their results were not significant.

For this study, we hypothesized that the learner's decision to interrupt his or her DOL studies is the result of a complex process that cannot be attributed to a single cause, but rather to a set of factors whose weights vary according to the learner's characteristics. Based on this hypothesis, we formulated the following question: "Are there associations between students' background and academic characteristics, the environment in which they are studying, their learning strategies, the ways in which their courses are organized, and their decision to drop a course or not to re-enroll after two sessions of undergraduate studies?"

To answer this question, we analyzed the respective associations between students' dropping out and their socio-demographic characteristics (e.g., age, gender, marital status, family situation, mother tongue, citizenship), academic variables (e.g., study regime, parental education, distance from home, disability), environmental characteristics (e.g., support from family and friends, financial and work situations), learning strategies, and pedagogical organization of their DOL courses.

We begin this paper with a brief review of the DOL literature on variables found to be associated with dropping out of university courses or of school

altogether. We then present the methodology and results of the study.

2 DROPPING OUT OF DOL

Although dropping out of university is an important issue, data on DOL dropout rates are not consistently published by Canadian universities. Most studies indicate that student perseverance is lower in distance education than in face-to-face learning (Sauvé et al., 2020).

Reported DOL dropout rates can vary greatly, depending on the definitions on which they are based and whether they relate to programs or courses, the time of data collection, the time period studied, and the calculation methods used. As a result, authors have suggested that the DOL dropout rate varies from 25% to 40% (Bistodeau, & Mottet, 2017; Bonin, 2018).

Similarly, limited data are available on dropout rates for individual DOL university courses. Xu, & Jaggars (2011) indicate rates of 8% to 14% while Paquelin (2016) finds that 9.5% of distance students drop out, compared to 5.3% of on-campus students.

3 VARIABLES ASSOCIATED WITH DROPPING OUT

Much of the research on university dropouts uses socio-demographic and academic variables to describe study populations. Some studies examine these variables in relation to dimensions such as learning strategies, environmental conditions or the DOL learning environment (Audet, 2008; Lee, Choi, & Kim, 2013). To better identify associations with student attrition, we selected the variables that seem to have the greatest impact on dropping out of DOL, as follows.

3.1 Socio-demographic Variables

Age. Stone (2017) reports DOL studies in which older age is correlated with success in distance education, perhaps due to greater maturity and self-regulation. Conversely, Prinsloo, Muller, and Du Plessis (2010) consider students over the age of thirty to be at risk of dropping out, possibly due to a higher overall workload. Finally, Bonin (2018) argues that since persistence decreases with age: younger students have a better chance of continuing on to graduation.

Gender. Gender seems to be more important than age or location in the attrition of post-secondary students (Vogel et al., 2018). More specifically, men drop out of DOL courses or university studies at greater rates than women (Bonin, 2018; Paquelin, 2016). Mixed results regarding gender have also been obtained (Eliasquevici, Seruffo, & Resque, 2017).

Marital and Family Status. Married or common-law students with dependent children are more likely to drop out of their post-secondary DOL programs than are single students without dependent children (Bonin, 2018; Shah, & Cheng, 2019).

The variables **citizenship and first language** seem not to have been addressed in DOL persistence research. In one study, however, language or a language barrier is cited as the main obstacle to success in courses for immigrants (Stoessel, Ihme, Barbarino, Fisseler, & Stürmer, 2015).

3.2 Academic Variables

Study Regime. Before the pandemic, DOL students were generally adults whose living situations (employment, family commitments, etc.) lead them to enroll in only a limited number of courses per year. Their learning program therefore extended over a longer period, which is more conducive to dropping out of school (Sauvé, Fortin, Landry, & Viger, 2015). Bonin (2018) concluded that under similar living and study conditions, taking distance education courses at the undergraduate level on a part-time basis is associated with a greater risk of dropping out.

Parents' Level of Education. Since we could not find any studies on this variable in relation to dropping out of university-level DOL, we examined what the research on this variable says in the context of face-to-face, on-campus learning.

Higher parental education level is correlated with the likelihood that the student will pursue post-secondary education. (Murdoch, Kamanzi, & Doray, 2011; Organisation for Economic Co-operation and Development, 2017). In fact, it seems that this factor is more of a determinant than family income and living environment (Murdoch et al., 2011). A nuanced conclusion is provided by Berger, Motte, and Parkin (2009), who link parental education level with family income to explain dropping out of school.

Disability. In 2019-2020, more than 19,000 students who declared themselves to be disabled were pursuing studies in Quebec universities (Gagné, & Bussièrès, 2019-2020). We have found that university students with disabilities have a higher DOL dropout rate than other students (James, Swan, & Daston, 2016; Sauvé, Racette, Bégin, & Mendoza, 2016).

Diploma Obtained Before Studying via DOL. The level of education attained before enrolling in DOL studies and past higher education experience are factors that influence dropout (Yoo, & Huang, 2013). Fortin, Sauvé, Viger, and Landry (2016) indicate that distance education students are more likely to drop out if they have previous university education.

3.3 Environmental Conditions

Conditions in a student's life have more influence in DOL than in face-to-face learning, since students enrolled in DOL are often older, have to balance a busy schedule that includes work and family commitments, and are more often isolated from their peers and instructors (Park, & Choi, 2009).

Four of these factors are generally examined in DOL in relation to dropping out of post-secondary education: (1) family support (Dussarps, 2015; Kaddouri, De Villiers, Barbier, & Bourgeois, 2006); (2) support from friends (Dussarps, 2015); (3) the burden of work (Loisier, 2013; Moore, & Greenland, 2017; Shah, & Cheng, 2019); and (4) financial issues (Fortin et al., 2016; Vogel et al., 2018).

The results of these studies indicate that the more a student feels supported by those close to him or her, the less he or she will be tempted to drop out. As for employment and hours worked, these variables are part of a multifactorial phenomenon and are not the sole cause of dropping out (Sauvé et al., 2015).

3.4 Learning Strategies

Various studies point out that self-regulatory learning strategies are more important in distance and online learning than in face-to-face courses, since DOL students face many challenges not experienced when they are physically present on campus. For example, they must learn to manage conditions such as asynchronous classes, written rather than verbal discussions, and isolation from other students and instructors, mastering new strategies and skills that are appropriate to their virtual learning environment (Wan, Compeau, & Haggerty, 2012). Students who use the weakest learning strategies are most at risk of dropping out of school (Kizilcec, Perez-Sanagustin, & Maldonado, 2017).

Self-regulation is a key concept that refers to the process by which the learner activates and supports cognition, affects, and behaviors that are oriented toward the achievement of learning goals (Schunk & Zimmerman, 2012). For example, managing resources such as time, the study environment, effort, help-seeking, and peer learning, plays a particularly

important role in student retention (Mottet, & Rouissi, 2013).

Based on Zimmerman's (2000) cyclical model of self-regulation, which is the most widely used one in studies of post-secondary DOL, we group 56 learning strategies into three phases: planning, performance, and reflection. These strategies have been identified in the literature as potentially influencing student persistence (Sauvé et al., 2020). For example, a student who is not confident in his or her ability to use effective study strategies, who feels unable to do well on exams and assignments, or feels unable to meet deadlines for the submission of assignments, will be more likely to drop out of school.

3.5 Pedagogical Organization

Following Allen and Seaman (2017, p. 41), we define DOL as "teaching that uses one or more technologies to deliver instruction to students who are separated from the instructor and to support regular and substantial interaction between students and the instructor in a synchronous or asynchronous manner."

Studies on the impact of DOL pedagogical organization on dropout rates are still rare and inconsistent (Sauvé et al., 2020). In addition to precisely defining the types of pedagogical organization studied, these projects are often case studies or student satisfaction surveys (Deschryver, & Lebrun, 2014). Moreover, they take little or no account of possible differences in students' personal characteristics (Loisier, 2013; Xu, & Jaggars, 2013).

To identify types of pedagogical organization in the DOL courses under study, we examined the instructional design that structures and organizes the online learning environment, making available to the learner and to the facilitator, tutor, or teacher the technological and human resources necessary for learning (Sauvé, 2019). This design is generally based on a pedagogical scenario (Pernin, & Lejeune, 2004) that varies according to the components made available to the learner: technological tools, pedagogical treatment (the educational approach as well as formative and/ or summative evaluation), navigational tools (contextual help, guides), study tools (e.g., a path set out in modules or weekly sessions), and supervision methods (e.g., types of interactions and communication tools). We used these components to build an analysis grid with the objective of defining course models or archetypes for comparative analyses.

4 METHODOLOGY

This exploratory study was carried out in the context of distance and online undergraduate studies in the province of Quebec, Canada. Quantitative data were collected using: (1) a 25-item online questionnaire to collect data on students' personal characteristics and their perception of the course organization and learning supervision offered in their DOL courses; and (2) a course analysis grid to determine the course models used in the DOL courses taken by respondents. This grid made it possible to quantify the technological tools, the pedagogical components of the course, the learning activities in the course sessions or modules, the navigation and learning aids, and the courses' learning support modes.

4.1 Sample

In order to establish our population, we selected students enrolled in 19 DOL courses offered by a francophone distance education institution in Quebec, Canada. These courses were chosen based on three criteria: (1) inclusion of at least three different disciplinary fields (education, human sciences and languages, and administrative sciences); (2) the number of students per course (from 312 to 900 annual enrollments); and (3) the variability in the course failure rates, ranging from 4.35% to 26.51%, and dropout rates, varying between 4.3% and 26.35% according to departmental data. A total of 3,578 students were solicited over four sessions of study in 2018 and 2019.

4.2 Research Questions and Analyses

Analyses were carried out to answer the following questions: (1) Are socio-demographic, academic, and environmental variables (family, finance, work) associated with dropping out of a course and not re-enrolling after two university sessions of an undergraduate program? (2) Is the relationship between socio-demographic and academic variables, environmental conditions and the use of learning strategies associated with dropping a course and not re-enrolling after two university sessions of an undergraduate program? (3) Is the relationship between socio-demographic and academic variables, environmental conditions, and modes of pedagogical organization associated with course dropout and non-re-enrolment after two sessions of undergraduate university studies?

Various statistical models were used, depending on their purpose in relation to the study questions. All

analyses used an alpha of 5% ($\alpha = .05$). Analyses were carried out between categories in relation to the 25 socio-demographic, academic and environmental variables in order to identify the variables that influence drop-out. A two-step cluster analysis was used to group the variables into categories that were internally consistent, yet different from each other. Analyses included independent samples t-tests and univariate ANOVA for more than two groups. Chi-square analyses was employed on variables for learning strategies and course types. Post-hoc analyses were also conducted with the Tukey test.

5 RESULTS

5.1 Description of the Study Sample

Of the 791 students who responded to the questionnaire, 77.9% were female. Similarly, 46.1% of respondents were 25-34 years old, 28.4% were between 35-44 years old, 11.6% were over 45 years old and 13.8% were under 25 years of age. In addition, 71.2% lived in a couple (married or common-law). French was the first language for the vast majority (91.4%) of respondents.

Academically, 82.6% of respondents were enrolled in part-time study, while 56.3% were enrolled in a 30-credit certificate program. More than half of the sample (54%) were in their first year of university study. A total of 71.4% of students had earned a post-secondary diploma or degree before beginning their studies in DOL. Finally, 53.5% of the respondents' mothers and 49% of their fathers had a high school or vocational diploma, while 23.2% of the students noted that their father had a university degree, compared to 19.5% for their mother.

In terms of finances, 54.5% of respondents reported working to pay for their education, while 22.3% reported financing their education through loans and 18.3% through grants. Students rated their financial situation as excellent (10.4%), good (38.7%) or acceptable (43.4%).

Of the 791 respondents, 16.9% dropped out of their course during the data collection semester, and 10% of these did not re-enroll after two study sessions.

An analysis of the representativeness of the sample, carried out on the 25 socio-demographic, academic and environmental variables used, confirmed that our sample was representative of the student population except for two variables (gender and study regime). These were found to be minor in explaining students' propensity to drop out.

5.2 Students' Socio-demographic and Academic Variables

Certain variables can be grouped into factors when we attempt to explain the student's propensity to drop out of a course. Seven factors account for 47.58% of a student's propensity to drop out of a course. Subsequent analyses were conducted on these seven factors to examine their meaning. Three of the seven factors indicate that a student is more likely to drop a course if: 1) his or her first language is English and he or she is enrolled in a short program; 2) he or she is a common-law partner or lives with both parents; and 3) his or her mother has no schooling, and the father has a vocational diploma or the mother has only completed elementary school and the father has no schooling.

Similarly, an analysis was done to explain the tendency of students to re-enrol or not after two sessions. Seven factors explain up to 66.75% of the propensity of students to withdraw after two consecutive sessions. Subsequent analyses were conducted on these seven factors to examine their meaning. Five of the seven variables indicate that a student is at risk of not re-enrolling after two semesters of study: 1) financing of the student's studies is based primarily on loans and grants or on loans and working more than 21 hours per week; 2) parental education: a) the mother has a vocational training diploma and the father has no schooling, b) the mother has completed high school and the father has an undergraduate university degree, or c) the mother has no schooling and the father has completed high school; 3) the student is a woman and considers her financial situation "acceptable" or "unacceptable"; 4) the student is a permanent resident student with an undergraduate university degree whose education is financed from personal savings; 5) the student's place of residence is located 31 to 45 minutes from the place of instruction.

5.3 Learning Strategies

By grouping learning strategies according to Zimmerman's (2000) typology of self-regulation, a single-factor ANOVA analysis identified differences between certain student socio-demographic and academic variables and the likelihood of using or not using these same strategies. For foresight strategies, only marital status was found to be statistically significant. For performance strategies, family status, gender, marital status, maternal education, distance, parental funding of education, dyslexia, and physical disability were found to be statistically significant.

For reflection strategies, marital status, language, and financial judgment were found to be statistically significant.

According to Student's t-tests, the scores obtained in the three Zimmerman phases were not statistically significantly and therefore did not affect course dropout. However, in terms of non-re-enrolment, the reflection phase makes a statistically significant difference. In other words, the more strategies are reported to be little used by students in the reflection phase, the more likely they are not to re-enrol after two consecutive sessions. For example, the more dissatisfied students are with the quality of their courses, their academic results, and their decision to study at university, the more likely they are to drop out.

5.4 Type of Pedagogical Organization

To identify course types in DOL, we used two-step cluster analysis to interpret the data from the course analysis grid. This method made it possible to move from disparate courses to identify course models or course archetypes that remain theoretical constructs. Five course models (clusters) were characterized by a set of 22 variables likely to influence student attrition, such as activities for acquiring new knowledge, carrying out learning exercises, and completing summative evaluations. It is important to understand that the 22 variables must be taken as a whole, rather than individually, to characterize the course models. The following is a simplified description of the course models:

- Course Model 1 - Moderately focused on reading and practical exercises aimed at the acquisition of knowledge, with some formative assessments.
- Course Model 2 - Very much focused on knowledge acquisition activities through visits to external websites and formative evaluation activities. More moderate on reading activities.
- Course Model 3 - Very focused on knowledge acquisition activities through reading and practical exercises. Moderate on web site visiting and formative evaluation activities.
- Course Model 4 - Very focused on practical exercises and formative evaluation activities aimed at knowledge acquisition. Little reading.
- Course Model 5 - Focused on both acquisition and discovery activities through reading and formative evaluation activities. Few practical exercises.

By crossing the socio-demographic, academic and environmental variables with the five course models,

we were able to make certain observations regarding course dropouts.

For example, for a student in Course Model 2, being single or living alone is associated with a greater propensity to drop out of the course. In contrast, being married/ having a common-law partner or living with a spouse and children is associated with a lower propensity to drop out of the course.

Students who rate their financial situation as "excellent" and "good" are less likely to drop out of a Model 3 course. In contrast, students who rate their financial situation as "acceptable" or "unacceptable" are more likely to drop the course.

For Course Model 4, being single is associated with a higher propensity to drop out of the course. In contrast, being married, living with both parents, or living with a spouse is associated with a lower propensity to drop out of the course.

Finally, for Course Models 1 and 5, no variables could be associated with dropping out of a course.

In short, the results of the study indicate that the design of the course taken by itself does not affect course dropout, unless it can be linked to students' personal characteristics and appropriate interventions to promote perseverance in their studies.

6 DISCUSSION

For our sample of 791 students, **socio-demographic variables** largely explained their propensity to drop out. These results reiterate the conclusions of Xavier, and Meneses (2020). Learning strategies did not seem to be associated with dropping out of the course but were associated with not re-enrolling. As in James et al., (2016), analysis of learning strategies in relation to socio-demographic, academic, and environmental variables identified certain predictive variables in the case of students who did not re-enrol after two sessions of study: financing of studies, parental education, financial situation, marital status, and distance of residence from the educational institution.

The distribution of variables related to **online course design** is not random. In fact, the study identified five types of courses with internally consistent and distinct distributions in terms of instructional organization. The design of these five course models, when taken out of context, cannot explain the propensity of students to drop out of the course, but it does contribute when we control for the socio-demographic and academic variables of the sample as outlined by Vogel et al. (2018). For

example, the study found that marital status and family situation are two factors specific to the student that are at risk of causing him or her to drop out of a course, but only in courses that are close to the Type 2 and Type 4 models. In the other course models (types 1, 3, and 5), these variables do not play a significant role in explaining dropout.

7 CONCLUSIONS

A growing number of studies conclude that it is difficult to identify predictive factors without a holistic view of the problems and obstacles encountered by those who drop out. It is in this context that our study examined the interrelationship of a multitude of factors that can influence dropping out of a DOL course or not re-enrolling after two study sessions.

Although this study has limitations, the results provide an answer to our research questions, namely that socio-demographic, academic, and environmental factors that explain dropping out cannot be analyzed in themselves but should be considered in relation to learning strategies as well as the pedagogical design of courses. Finally, this research focused on courses in the social and administrative sciences. It would be interesting and useful to do a similar study on students of technical specializations.

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