THE DRIVERS OF SUCCESS IN **GRADUATE STUDIES** IN THE UNIVERSITÉ DU QUÉBEC NETWORK

BRIEF FROM THE SCIENTIFIC COMMITTEE OF
LA GRANDE INITIATIVE RÉSEAU EN RÉUSSITE

Université du Québec

Brief from the Scientific Committee of La Grande initiative réseau en Réussite of Université du Québec

MARIE-PIERRE BARON
Université du Québec à Chicoutimi

SYLVIE BONIN
Université du Québec

FRÉDÉRIC DESCHENAUX
Université du Québec à Rimouski

SERGE GÉRIN-LAJOIE
Télé-université

EL HADJI YAYA KONÉ
Université du Québec en Abitibi-Témiscamingue

SÉVERINE PARENT
Université du Québec à Rimouski

CHANTAL ROYER
Université du Québec à Trois-Rivières

With the valued collaboration of

JULIE COURCY
Research agent

And of

VÉRONIQUE D'AMOURS
Université du Québec

CATHERINE ROY-BOULANGER
Université du Québec

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1. Context and problem

It is clear that the growth of Quebec society inevitably involves the development of cultural, economic, technological and scientific sectors (Université du Québec, 2013). In an ever-changing global context, the Université du Québec (UQ) network is pursuing its mandate to increase the level of education of the Quebec population, to ensure Quebec's scientific development, and to contribute to the development of its regions.

Social realities, democratization and accessibility of postsecondary education have widely contributed to the diversification of the student populations admitted to the network's universities.[1] This excitement surrounding the increase in school enrolment of the population at large was also addressed in a recent brief from the Conseil supérieur de l'éducation (CSÉ, 2019). At this level of education, students are seen as generally balancing multiple responsibilities (family, parental, and professional).

> Graduate education is one of the keys to the development of an educated, innovative, high-performing, and competitive society.

The network is seeing continuous growth in graduate enrolment and in the heterogeneity of the student population. Challenges in terms of support and study needs are increasing. The UQ network is aware of the new reality of this student population, and in its effort to meet today's professional and scientific requirements, is continually adjusting its educational offering and promoting access in a number of ways. In particular, these strategies make it possible to promote a better balance between university studies and student life (Université du Québec, 2020b). Thanks to the niches of excellence (Université du Québec, 2020a) developed in education and research by the 10 autonomous institutions of the UQ network,[2] more than 41,600 graduate students[3] contribute each year to the scientific advancement of Quebec society, its economic prosperity, its cultural and social development, the development of its communities and regions, and its international influence.

La Grande initiative réseau en réussite of Université du Québec

Given the diversity of the populations now entering graduate school; given the variable resources and services; given the context and needs of graduate students with regard to learning and supervision; given the lower graduation rates in the network's universities compared with the Quebec average; and given

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1. People living in (or coming from) remote areas, first-generation university students, members of Indigenous peoples, students from outside Quebec, people with disabilities (traditional or emerging), people from socioeconomic backgrounds historically absent from higher education.
2. Université du Québec à Montréal (UQAM), Université du Québec à Trois-Rivières (UQTR), Université du Québec à Chicoutimi (UQAC), Université du Québec à Rimouski (UQAR), Université du Québec en Outaouais (UQO), Université du Québec en Abitibi-Témiscamingue (UQAT), Institut national de la recherche scientifique (INRS), École nationale d'administration publique (ENAP), École de technologie supérieure (ÉTS), and Université TÉLUQ (TÉLUQ).
3. Student enrolment calculated based on UQ's PRISME database for the 2018-2019 academic year, which represents 22% of the network's student population enrolled in a graduate program at the master's or doctoral level (PRISME, Université du Québec).

the variability of the commitment and supervision by faculty members from a pedagogical standpoint, in 2018, the Direction des études et de la recherche (DER) proposed an action plan aimed at "increasing the graduation and retention rates of the network's master's research and doctoral students" (p.9). In line with this, in January 2019, the teaching and research vice-rectorates of the network's institutions launched la Grande initiative réseau en réussite (GIR Réussite). The aims of this initiative were to determine the present status, to support the academic path of graduate students, to support the supervisory staff in their role, and to strengthen the capacity of the network's institutions to support the student success process. As a turning point for this action plan, the network's institutions asked the DER to document this problem in order to inform their reflections on potential common courses of action (Couillard et al., 2017). Consequently, a scientific committee[4] was created with the mandate to review the most recent literature on factors that promote graduate success.

The Problem

Proud to provide access to education to as many people as possible – notably through a democratic and accessible recruitment and enrolment processes at all levels – UQ noted that the graduation rate was generally lower at the graduate level compared with other Quebec universities.

In 2010, a comparison of graduation rates and average durations of studies between Université du Québec (UQ) and G13[5] institutions revealed a worrisome situation with respect to graduate success [for example, the average graduation rate for a master's degree (research type) after five years for institutions in the UQ network was 55.6%, while the G13 average was 82.4%]. (Couillard et al., 2018b)
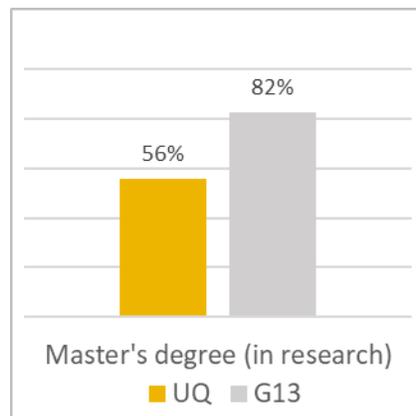
Figure 1. Graduation rate after 5 years

Considering that the network has a plurality of graduate student profiles, how can we ensure that each individual is in the best possible position to succeed in their chosen studies? What aspects of success should institutions focus on to promote the development of their students at these levels of study?

Objectives of the brief

The following guidelines were adopted by the scientific committee to guide the drafting of this brief on factors for graduate success (Université du Québec, 2019).

✓ Present an up-to-date portrait of what sets the graduate student populations in the institutions of the UQ network apart.

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4. Composed of six faculty members from network institutions, a representative from the Direction de la recherche institutionnelle (DRI), the GIR Réussite coordinator and a research professional.
5. Called the U15 since 2011. Until then, this group of Canadian research universities consisted of the following universities: University of Alberta, McGill University, University of Calgary, University of British Columbia, Dalhousie University, University of Ottawa, University of Toronto, McMaster University, Université Laval, University of Western Ontario, Université de Montréal, Queen's University and University of Waterloo.

- ✓ Outline the theoretical considerations for graduate student success.
- ✓ Explain the latest knowledge on the factors of graduate student success.
- ✓ Specify the roles and responsibilities of the actors involved in the common project of student success: the student, the supervising faculty, the program and the institution.
- ✓ For the benefit of the institutional management, detail the key success factors as well as the anticipated benefits of consolidating support measures for success.

At the end of this brief, it will be possible to 1) identify the external and internal factors that influence student success, particularly at the graduate level, 2) identify the roles and responsibilities of the actors involved in the success process, and 3) identify certain drivers of the common goal of student success.

Data sources

Considering the desired orientations of this brief, it was decided to focus exclusively on the factors that contribute to success in the graduate education pathway, rather than on risk, dropout or withdrawal factors. Aimed at shedding new light on and at understanding the complexity of the phenomenon of success and perseverance at the graduate level, this brief is based on a review of the most recent literature and makes use of several databases and survey data[6] that have made it possible to produce statistics specific to the UQ network.

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6. Canadian Graduate and Professional Student Survey (CGPSS), the network-wide study on support in graduate education, Indicateurs de COnditions de Poursuite des Études (ICOPE), the Gestion des données sur l'effectif universitaire of the Ministère de l'Éducation et de l'Enseignement supérieur (GDEU, MEES), the institutional database of Université du Québec (PRISME), the Postsecondary Student Information System (PSIS, StatCan).

2. The graduate student population of the Université du Québec network

As noted by the CSÉ in 2000, research in the United States and Europe has emphasized the unequal representation of various population groups at university, characterized by age, social origin, gender, ethnicity, disability or socioeconomic status. In 2019, the CSÉ reiterated the increasing complexity of student profiles on the Quebec scene – profiles that were previously rather homogeneous or more traditional; "the landscape in which universities operate [is] marked by the diversity of student profiles and educational pathways" (p. 16). The typical dominant profile is no longer a person "in their early twenties, involved almost exclusively in a training project and attending a university campus full time" (CSÉ, 2013, p. 86).

While the following describes population characteristics based on different graduation rates, among others, it is important to keep in mind that this indicator is not sufficient to explain the complexity of the phenomenon of success. This aspect will be addressed in detail in the next section.

A distinctive student profile

To our knowledge, very little in the literature provides the characteristics of graduate student profiles. Using the various databases and surveys available,[7] a description of the main population attributes of graduate students in the UQ network is provided below.

The type of credentials (degrees) sought at the graduate level

Data from Statistics Canada's Postsecondary Student Information System (PSIS) show that Quebec accounts for 35% of Canada's graduate enrolment, much higher than its representation in the Canadian population (23%) (StatCan, 2019). Specifically for the UQ network, eight out of ten graduate students are enrolled at the master's level (Figure 2). The majority of graduate students opt for degree programs,[8] representing 73% of the Fall 2019 enrolment [9] (PRISME, UQ; GDEU, ministère de l'Éducation et de l'Enseignement supérieur (MEES)).
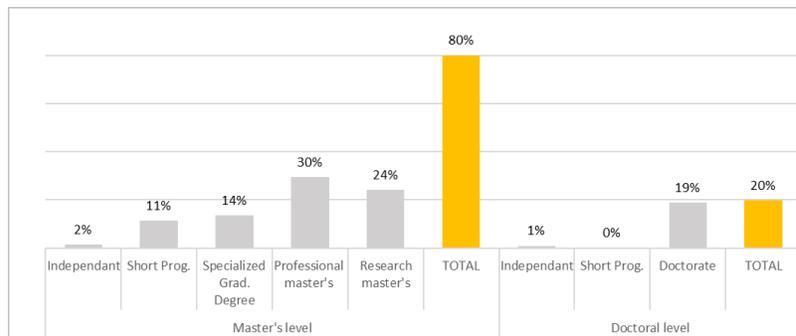
Figure 2. Distribution of graduate student enrolment at UQ for Fall 2019

Other enrolments tend to be in short programs, specialized graduate degrees or independent studies.

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7. See Section 2 – Population.
8. According to the definition in the *Règlements généraux aux cycles supérieurs* of Université du Québec, a graduate degree program refers to "a title conferred by Université du Québec or by Université du Québec à Montréal and attested by a diploma. The degree is obtained upon successful completion of a master's or doctoral program" (2018, p. 5).
9. Breakdown of this statistic: 30% for the professional master's degree, 24% for the research master's degree and 19% for the doctorate.

Age of graduate students

Compared with universities outside the network, students entering graduate studies at UQ are often older. In the fall of 2019, 81% of UQ students entering a master's program were 25 years of age or older. Excluding international students, the proportion increased to 88% (GDEU system, MEES). More specifically, the average age of the student population at UQ is 34 at the master's level (36 for the specialized graduate degree, 38 for short master's programs) and 36 at the doctoral level (PRISME, UQ) (Figure 3). Data from UQ show that the graduation rate of full-time students declines with age, regardless of the level of education (Bonin, in press). The data also indicate that the graduation rates of those who begin their master's studies (specialized graduate degree or master's degree) before the age of 25 are at least 10 points higher

Figure 3. Average age of the UQ student population by type of program (PRISME, UQ)

than those of persons aged 25 and over. The gap reaches 30 percentage points compared with those who return to school even later (at age 40 or older). Similarly, students who begin a doctoral program before the age of 25 graduate in a higher proportion than either those entering after age 25 (20 points higher) or those entering after the age of 40 (40 points higher).

Gender of graduate students

According to MEES data, in the fall of 2019, women accounted for 56% of graduate students at UQ. Moreover, the data show that the proportion of women gradually decreases as the study cycles progress, from 61% at the undergraduate level, to 57% at the master's level, to 52% at the doctoral level, to only 28% at the post-doctoral level.

That being said, because of its recruitment activities, the type of programs offered, etc. the realities with respect to female and male enrolment are different for each institution in the network. In most Canadian provinces, the challenge of under-representation of women "in certain mathematics, computer science and engineering subjects" (Conference Board of Canada (CBC), 2020) persists: women are more likely to enrol in the humanities, social sciences or education and men are more present in engineering, mathematics and computer and information sciences (CBC, 2020). This reality is also observed at UQ where, in the fall of 2019, women represented only between 20% and 25% of graduate students in computer science and engineering and about 40% of those in mathematics, earth sciences and atmospheric sciences (GDEU system, MEES). In terms of male representation, men in the network appear to be less present in fields of study such as health sciences,[10] representing less than 20% of the graduate population in this field. The same is true for education, where the ratio is only one man to every three women, at both the undergraduate and graduate levels.

Irrespective of the registration status or program type, women enrolled in a master's research or doctoral program obtain a degree in a higher proportion than men. On the other hand, a higher proportion of men

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10. Nursing, occupational therapy, community health and epidemiology as well as speech-language pathology and audiology.

are graduating part time from graduate professional programmes (specialized graduate degree and professional master's degrees) (Bonin, in press). Moreover, in terms of success for both women and men, the gender variable is more relevant when considering other determinants (responsibilities, balancing studies, family and work, type of programs, registration status, etc.).

First-generation university students (FGUSs) enrolled in graduate studies

First-generation university students (FGUSs) are designated as "students from families with low educational capital and are part of groups that are under-represented in higher education" (CAPRES, 2015). More specifically, the term FGUS refers to students whose parents did not achieve higher education. Just like the network population, FGUSs include a variety of student profiles: members of Indigenous peoples, people with traditional or emerging disabilities, people from rural areas and low-income families, etc. (CAPRES, 2016). Bonin et al., (2015) point out that a particular quality of FGUSs was their lack of support (academic, financial, etc.). from parents, lower educational aspirations, more frequent interruptions of studies, later access to university, and greater family and financial responsibilities. The authors explain that FGUSs are more often required to define their study project alone and to use [meaningful] models [other] than that of the family environment (p. 15).

Average age at entry	34
Employed	70%
Women	59%
Family responsibilities	40%
Interruption of previous studies	40%
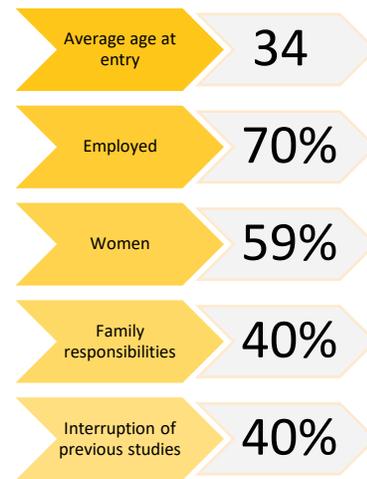
Figure 4. Summary of population characteristics of FGUSs enrolled in graduate studies in the UQ system

Forty-five percent of UQ's graduate population consists of first-generation university students FGUSs (Bonin and Girard, 2017), 59% of whom are women. The data show that FGUSs enter higher education at an older age than other students (at age 34, on average, compared with age 30) (ICOPE Survey, 2016); that close to 40% of FGUSs at the graduate level have already interrupted previous studies; close to 70% are employed during their studies; more than a third will finance their studies by working full time; and close to 40% also have family responsibilities in addition to their studies (Figure 4). FGUSs enrolled full time in master's and doctoral programs at UQ graduate in a smaller proportion than students whose parents have undertaken university studies[11].

Graduate students with disabilities or with emerging disabilities

Thanks in particular to institutions that are increasingly taking into account the specific needs (Marcellini, 2017) of students with traditional or emerging disabilities,[12] the proportion of people with learning problems or difficulties, due to a health problem or functional impairment, has increased considerably in recent years (Bonin and Girard, 2017; Prud'homme et al., 2013). Constantly growing, this proportion has

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11. Those who are also first-generation college graduates, i.e., whose parents' education does not go beyond high school (including vocational training programs), have even lower graduation rates. The importance for university success of at least one model of college education at home has been documented (Bonin, 2019b, in press).
12. "Traditional disability" refers to severe hearing and visual impairments, to motor and organic impairments, language, and speech disorders. "Emerging disability" refers to learning disabilities, attention-deficit hyperactivity disorder (ADHD), mental health disorder or autism spectrum disorder (GT-ESHÉ, 2014).

more than doubled in 5 years at the graduate level at UQ, increasing from 3% in 2011 to 7% in 2016 (ICOPE survey, 2011, 2016). Since disclosing one's disability status is not a legal obligation, but a personal choice (AQICESH)[13], it is possible to assume that mental health disorders (MHDs) or neurocognitive disorders[14] influence the university path of more students than identified. This situation, associated with lower enrolment, makes it difficult to accurately measure the graduation rates of graduate students with disabilities or emerging disabilities.[15] Finally, it is important to note that the overall average does not appear to be the only indicator of success for these students; students with learning and attention disorders appear to have lower averages without any impact on their perseverance or graduation (Robert, Debeurme and Joly, 2016).

Indigenous graduate students

Like FGUSs and students with disabilities or with emerging disabilities, Indigenous students are a population with unique characteristics and challenges in terms of socioeconomic, geographic and cultural factors (Université du Québec, 2017) that require separate examination. Prior to the addition of a question to the ICOPE survey in 2016, institutional data from institutions did not accurately measure the Indigenous presence. Since then, respondents have been able to voluntarily identify themselves as Indigenous. Currently, it is estimated that Indigenous peoples represent 2% of the graduate student population at UQ. Although there are relatively fewer Indigenous people attending university, the proportion that perseveres and graduates is comparable to that of the non-Indigenous student population (Council of Ministers of Education (Canada), 2012; Hango and De Broucker, 2007; Maxim and White, 2006). Although it is not possible to determine graduation rates at UQ at this time[16], Bonin's analysis (2019a) nonetheless points out that certain obstacles encountered by Indigenous students could have repercussions on their perseverance and graduation. For example, compared with non-Indigenous students, a larger proportion have children in their care as well as take care of their children alone. Access to education also occurs at a later age, even among those who are not parents. A high number of them being FGUSs, many Indigenous students come from families where their parents' education does not go beyond high school. Also, this group of students self-evaluates as having poorer language skills (French and English) and their results in the first semester are lower[17]. It should be noted, however, that only 11% of Indigenous students at UQ are pursuing graduate studies, compared with 23% of the general student population.

International students

The Government of Canada (2020) defines international students as persons who are not Canadian citizens and who are authorized to enter Canada temporarily for the purpose of study. In the provincial

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13. AQICESH's 2018-2019 statistical report indicates that 5,745 students with disabilities attending UQ contacted their institution's reception and support services during the past year. The report does not, however, provide the corresponding number for graduate cycles specifically.
14. Including learning disabilities (LDs), autism spectrum disorders (ASDs) and attention-deficit hyperactivity disorder (ADHD).
15. However, undergraduate data at UQ still suggest that shorter programs (e.g., a certificate rather than a bachelor's degree) appear to promote persistence in students with disabilities (Bonin, in press).
16. It will be a few more years before students who began their training program in the fall of 2016 can be considered for graduation analysis.
17. The indicators of success in the first quarter analyzed are the cumulative average and the proportion of courses successfully completed of the total courses taken.

data, international students are described as "persons registered in the Quebec education system who do not have the legal status as a Canadian citizen, permanent resident or registered Indian (under the *Indian Act*)" (MEES, 2020b).

The international student population has experienced strong growth in recent years at Quebec universities, particularly at the graduate level. This facilitated access can be explained by various government and institutional measures (MEES, 2020b). At UQ, the representation of this type of student at the graduate level has doubled in 10 years, from 13% in the fall of 2009 to 26% in the fall of 2019 (GDEU system, MEES). Their participation is even more pronounced at the doctoral level, where they represent 36% of the total student population. Due to their more traditional education profile, the increased presence of these graduate students is changing the overall picture of the network's population. In fact, data from the ICOPE 2016 survey show that compared with the local population, the international student population is predominantly male, younger on average, more likely to be enrolled full time in a relatively continuous path, and assumes fewer personal responsibilities (parenthood, employment) in parallel with their higher education. In terms of graduation, these students generally graduate in a higher proportion than Canadian citizens.

Permanent residents

Permanent residents have a distinct profile. At the graduate level at UQ, the relative proportion of this population has declined from 14% to 7% over the last decade (GDEU system, MEES). This student population is mainly male, as female students with permanent residence are on average older, with major family responsibilities (more than 50% have children, almost 15% also take care of other family members) and financial responsibilities (60% work more than 30 hours a week in addition to their studies, often part time). The challenges associated with the realities of this profile result in lower graduation rates than those of other students (Bonin, in press; ICOPE survey, 2016).

Financial and family responsibilities of graduate students

Historically, graduate students have come from the intellectual and financial elite. When the constituents of the UQ and its associated study centres were created throughout Quebec, people from various backgrounds with varying assets (socioeconomic and cultural) gained access to university and graduate studies. Today, this diversification of the student population in the network's institutions is becoming more pronounced, where students largely reconcile their studies with family, financial, personal, or professional obligations.

For example (Figure 5), according to the 2019 Canadian Graduate and Professional Student Survey (CGPSS)*,* 37% of students in a research profile at UQ indicate that they finance their studies primarily through off-campus employment. Other sources of financial support identified by respondents were, in order of importance, loans from various sources, family savings or assistance (18%), provincial bursaries

based on financial need (18%), and grants and bursaries from provincial (13%) and federal (13%) granting agencies. Only 10% of respondents said that they finance their studies mainly through graduate research assistantships and 6% as graduate teaching assistants[18].

Figure 5. Type of financial support (CGPSS)
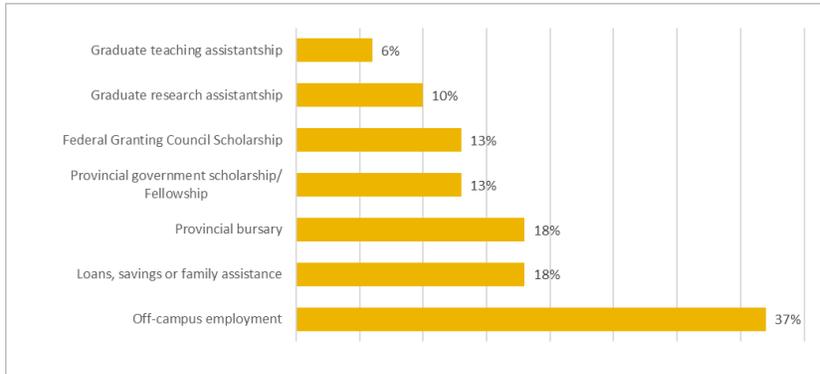
Despite these multiple sources of funding, just over one-third of students (36%) in a research program (master's or doctoral) describe their financial situation as precarious. This large proportion can be explained, in part, by the responsibilities inherent in their family situation (Bonin, 2014). Although it varies from one institution to another[19], generally speaking, nearly 30% of people enrolled in graduate studies at UQ have children in their care (Bonin and Girard, 2017). For example, the data indicate that 73% of graduate students who are parents hold paid employment during their studies, of which 71% work more than 30 hours per week. By comparison, only 59% of the student population without children are employed in such jobs, with 37% spending more than 30 hours per week in such jobs.

The comments gathered by the ICOPE survey attest to the financial difficulties experienced by those with family responsibilities; "they are obviously among the first points mentioned. In addition to the decline in income, which often goes hand-in-hand with education, there is also a decline in access to scholarships, increased debt loads, and the cost of childcare" (Bonin, 2014, p. 1-2).

The ICOPE (2016) data enable us to observe distinctive program choices among students with significant family and financial responsibilities (Figure 6). The majority (65%) of students with children opted for a program in Business Administration (48%) or Education (17%), while these two disciplinary sectors were chosen by just 29% and 8% of non-parents, respectively.

Finally, at UQ, the graduation rates in research programs for full-time graduate students who are parents are on average 25 to 30 percentage points lower than those of students without children[20]. To explain the possible connections between perseverance, success and the number of children, for
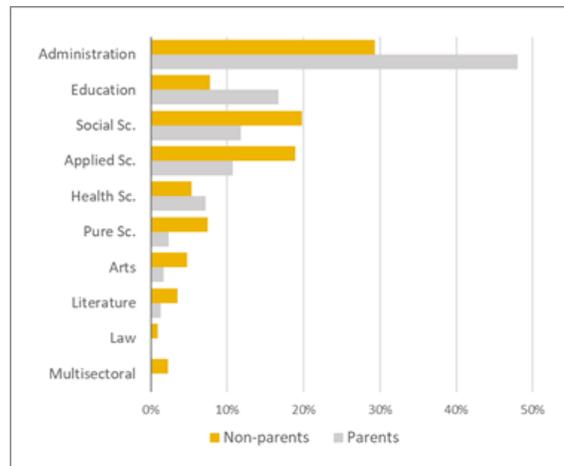
Figure 6. Distribution of graduate students by field of study

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18. Respondents could check more than one box for the same question.
19. The proportion ranges from 17-18% at ÉTS, INRS and UQAC, to 46% at TÉLUQ and 58% at ENAP (ICOPE Survey, 2016).
20. For populations with children who are enrolled in part-time studies, it should however be noted that the differences between the two student groups are quite small, if not insignificant (Bonin, in press).

example, it is essential to take into account other explanatory factors related to the family such as the age of the children, their age gap, support from relatives, etc. (Bonin, in press). In other words, the impact of parenting on student retention varies from one person to the next.

Registration status chosen by graduate students

The preferred registration status at the graduate level seems to differ from that of students at other Quebec universities. In the fall of 2019, data from the MEES (GDEU system) indicate that 44% of graduate enrolments in the network were in a part-time program compared with 35% for other Quebec universities. Not counting international students (who are mainly full time) [21] , the proportion of part-time students is 54% at the graduate level at UQ, and, more precisely, 63.5% at the master's level.

In terms of graduation, part-time students have lower graduation rates than full-time students regardless of the type of program (Duchaine et al., 2014). Recent UQ data confirm that those who start their studies part time graduate in a lower proportion than those who start full time. For professional programs (specialized graduate degree and master's degree without dissertation), the

Figure 7. Proportion of graduate students studying part time (excluding international students)

part-time graduation rate is about 20 percentage points lower than the full-time rate. For research programs, the gap is even greater (45 points at the master's level with dissertation and 34 points at the doctoral level) (Bonin, in press).

Modes of training offered at the graduate level

Several initiatives implemented by the network aim to support the diversity of the needs of the student population in terms of training modalities (Université du Québec, 2020b). Institutions offer, for example, short programs that facilitate a step-by-step path, tailor-made graduate programs with modular and flexible course schedules to meet the professional and family realities of the students, or partial or complete distance education paths. As indicated by Bonin and Girard (2017): "For UQ's clientele, which is made up largely of adult students, many of whom have parental responsibilities, the distance course offering makes perfect sense."

In person is no longer the only way to pursue graduate education.

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21. Registration status generally conditional upon obtaining a study visa.

UQ institutions are increasingly encouraging and supporting (synchronous[22], asynchronous[23], mixed[24], comodal)[25] or hybrid[26], distance education (DLE), in particular through efforts to support access to digital and technological tools. It is important to note that the institutional data from the network's institutions (PRISME, UQ) and, consequently, the data transmitted to MEES (GDEU system) do not, for the time being, allow for a complete inventory of DLE activities[27]. It is also very likely that the 2020-2021 situation related to the COVID-19 pandemic will modify future data and analyses regarding the place of DLE in the UQ network.

That being said, according to the sources consulted (Bonin and Girard, 2017; ICOPE Survey, 2016), compared with the graduate student population exclusively attending classes, the 10% of graduate students with at least one distance education course[28] have a higher rate of enrolment in part-time studies (64% versus 36%) and are more likely to be employed (74% versus 61%), with a higher proportion working more than 30 hours per week (69% versus 43%). This population also experienced more interruptions from previous studies (44% versus 35%); these students enter higher education on average at an older age (36 versus 31) and assume parental responsibilities more frequently (50% versus 26%).

Graduate student population at a glance

The section above has highlighted the main characteristics of graduate students in the UQ network. Highlights of this section are illustrated in Figure 7. Given these dominant population characteristics, a number of committees and organizations internal and external to the institutions and the UQ network are already asking pertinent questions about university success according to the different student profiles. From an inclusive perspective, this third section aims to present factors that promote success across all student profiles.

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22. "Synchronous online teaching (telepresence) is based on multimedia training systems that reproduce the face-to-face teaching model where the teacher is in direct media contact in real time with the learners" (Sauvé, Villardier and Prost, 2008, p. 69).
23. "Asynchronous e-learning is built using e-learning platforms that allow all the resources needed to achieve learning objectives or develop competencies to be indexed and made available in one place" (Sauvé et al., 2008, p. 69).
24. "When both synchronous and asynchronous web technologies are integrated into online learning environments, the concept of blended online learning becomes established" (Sauvé et al., 2008, p. 70).
25. Courses or training offered both in classrooms and remotely (usually synchronous).
26. Alternating of classroom and distance instruction (synchronous or asynchronous).
27. "In the institutional data, the Distance Education Indicator (DEI) is at the level of individual teaching activities rather than at the program or student level. Only autonomous distance learning activities, of the asynchronous type, which do not require a specific training space, are thus identified. This indicator, reported to the GDEU system of the Ministère de l'Éducation et de l'Enseignement supérieur (MEES), was designed to calculate space financing. It only allows us to identify a portion of distance learning activities" (Bonin, 2018, p. 4). It should be noted that improvements to the student reporting system are planned for 2020-2021, with a view to also collecting information on synchronous training activities. Despite these adjustments, since the results of this survey are based on respondents (and not on the entire population), it is not possible to obtain a total number of people in this situation, but rather the proportion of people who are in graduate distance education.
28. The statistics in this section exclude TÉLUQ, since all of the institution's courses are distance education. Consequently, except for TÉLUQ, whose entire student population is enrolled in distance education, at the graduate level, ENAP is the network institution with the largest proportion of students taking at least one DLE course (38%). UQAT ranks second, with a proportion of 25%. Next come UQAC, UQTR and UQAR, each with a proportion of 10% (Bonin, 2018).

56% women

• 56% of the student population consists of women, although this proportion decreases as the level of education increases;

54% part time

• the registration status of the student population (excluding international students and permanent residents) is predominantly part time (54%);

27% in a non-degree program

• more than a quarter (27%) of students are in a non-graduate program (other than master's or doctoral programs);

80% over 25 when they start their graduate studies

• Eight out of ten people beginning master's studies are 25 or older;

34 and 36 years old on average at the master's and doctoral levels

• The average age of the UQ student population is 34 at the master's level and 36 at the doctoral level;

45% FGUSs

• 45% of the student population is composed of first-generation university students (FGUSs);

7% students with disabilities or with emerging disabilities

• 7% of the student population self-declare themselves to be disabled, 80% with an emerging disability;

2% members of Indigenous peoples

• 2% of the student population self-identify as Indigenous;

26% international students

• More than a quarter of the graduate population (26%) now consists of international students, with a more traditional study profile;

7% permanent residents

• Permanent residents represent 7% of the total student population;

36% in a precarious financial situation

• 36% of students consider themselves to be in a precarious financial situation;

30% with at least one dependent child

• Close to 30% of the population has at least one child in its care;

75% employed

• Nearly three-quarters of students who are parents are employed; the majority of them full time;

10% in distance education

• 10% of the student population take at least one distance education course.

Figure 8. Summary of population characteristics of graduate students in the UQ network

3. Success at university

Changes in student and faculty numbers, the rapid development of knowledge and social competition for material, human and financial resources (Halse and Malfoy, 2010; Lessard, 2007, in Denis and Lison, 2016) certainly accelerate the transformation of the university environment. As a result, scientific and social expectations regarding the production, dissemination and access to or mastery of high-level skills and competencies are increasing.

A recent review of the literature has identified a significant range of empirical studies that attempt to explain, in this context, the various factors that contribute to university student success. In addition, a limited number of studies have taken a detailed look at the determinants of success specific to graduate populations (Litalien and Guay, 2015). Despite this limitation, this section provides an overview of how the scientific literature explains the phenomenon of success and identifies the main influencing factors that promote the completion of graduate studies.

Perseverance and success, a process

Success at university has long been explained in the literature by the concepts of efficiency and graduation. The CSÉ report (2000)[29] expresses a perspective that is becoming increasingly prevalent in research: graduation is no longer enough to explain success. Gradually, a systemic perspective has emerged (CSÉ, 2019). Currently, the dominant viewpoint allows us to explain the success of university studies as a non-linear path, an educational path modulated by personal and academic experiences that influence whether a course of study is pursued (Government of Quebec, 2017). Successful completion includes "getting a degree or qualification; attaining a training objective; advancing in a personal or professional path; enrolling in another education or training sector" (Government of Quebec, 2017, p. 18).

> Successful completion of university education is "a direction," not just a goal (CSÉ, 2019).

Complementary to the concept of success, Monfette (2016) explains that perseverance refers to the result of a sustained, multivariable phenomenon of complex interactions between learners, the environment and the education system. Although according to the author, certain elements of definition reflect the literature – a dynamic, interactive process, "the ability to pursue one's goal," "the importance of taking into account the path to reach the goal, despite the obstacles encountered (Duckworth et al., 2007; Rothermund, 2003; Stailescu, 2011; Tinto, 1975)" (p. 116) – Monfette points out a lack of consensus on the definition of postsecondary perseverance (Bélair and Lebel, 2007; Lison et al., 2011; Mukamurera, 2014).

> Success is understood as a multifactorial process of perseverance (CSÉ, 2019) that is transitive, progressive, and influenced by many parameters.

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29. The aim of this report was to better understand the complexity of academic success and to take into account so-called non-traditional populations for whom the definition of success in terms of effectiveness cannot be applied.

Studies on perseverance and success pay particular attention to the steps in the students' trajectory at university (first contact with those responsible for recruitment, enrolment, beginning of studies, transition to graduate studies, graduation, professional integration, etc.) (CSÉ, 2000; Robert et al., 2016; Roberts, 2018). The process of success is thus marked by multiple interacting factors that, combined with each other and intervening according to the university path, shape the probability of entering university, completing training and obtaining a degree with a view to imminent and generally desired socioprofessional integration (Robert et al., 2016). It is no longer a question of treating the factors separately in order to see their impact on the student. Current research delves into the interactivity of factors and the potential impact they may have on each other and, ultimately, on the student experience (Sverdlik et al., 2018).

> Every stage of university studies is marked by a plurality of individual and contextual determinants (De Clercq, 2019) that are interrelated (Vasseur, 2015), act systemically (CSÉ, 2019) and complement each other.

Finally, according to several sources (CSÉ, 2000; Kljajic et al., 2017; Larose et al., 2011; Philion et al., 2016), success at university also depends on the student's representation or perspective of success rather than the standards of success imposed by social or academic norms. Consequently, well before university requirements or graduation, it is the meaning that the student gives to the very concept of success that counts, in terms of their perspective, sociohistorical path and academic experiences, and of meeting their own standards of success (CSÉ, 2000).

A brief history of research concerns in terms of academic success

In the 1980s, the dominant paradigm in education focussed on the quality of learning and the measurement of academic performance. Research focussed on what motivates university students to continue their studies and what influences their adaptation (Demal, 1989; Gossuin and Devoet, 1984, cited by Pirot and De Ketele, 2000). Research was also interested in the determinants of success related to the transient experience in the university environment (Gossuin and Devoet, 1985). In the 1990s and 2000s, the mainstream understanding supported the fundamental value of social determinants (the family, sociohistorical, cultural, or economic context) and individual determinants (affective, cognitive, and psychological aspects) on the success of higher education. In terms of endogenous characteristics, the research then recognized the inseparable nature of the university student's experience and the aims of their studies (Pirot and De Ketele, 2000). Perseverance was also increasingly observed in terms of individual determinants (Romainville, 2000; Sauvé, Racette et al., 2008), particularly with respect to student perception and the relationship to their studies (CSÉ, 2000). Consistently, in the 2000s, there was growing interest in what influences the psychological health of students and their needs in terms of cognitive and psychological support (Direction de la recherche institutionnelle (DRI), 2012). A great deal of research has been conducted on the mental well-being of university students, their main stressors, the interventions to be promoted according to their career paths and specific needs, etc. (Comité interordres, 2013; Daigle et al., 2019; Marcellini, 2017; Martineau et al., 2017; Philion et al., 2016).

Even today, there is a consensus that students' personal or individual characteristics have multiple impacts on their success at university (Audet, 2008; Berthaud, 2019; Fontaine and Peters, 2012; Romainville and Michaut, 2012; Tinto, 1975, 2017). An important nuance is emerging: the mutual influence of determinants helps to explain success. Thus, the research agrees on the crucial role of prior knowledge and competencies (organizational, technical, in terms of literacy, etc.), the student's relationship with their studies (CSÉ, 2000), and personal characteristics (age, gender, previous education, family economic status, mental state, aptitudes, etc.) in the pursuit of the study project (Giamos et al., 2017). On the interpersonal and social levels, family and parental support (Sauvé et al., 2006; Sauvé et al., 2012; Sauvé, Racette et al., 2008), interpersonal relationships, particularly those fostered by academic and social integration and student participation in university activities (Sauvé and Viau, 2003), are determinants of success at university, as related in the literature. On the pedagogical level, the connections between the professor-student supervisory relationship and success represent a fairly fertile research topic. On the psychological level, the connections between motivation and the continuation of the study project have been well documented. The studies agree that the needs in terms of psychological and psychopedagogical support have become more complex and diversified over the last 20 years and that the number of students identifying themselves as being in psychological distress is increasing at all study levels (Martineau et al., 2017; Robert et al., 2016). In addition, the literature supports the necessity of mental balance and a sense of psychological well-being in the learner.

> A multifaceted and nuanced approach to the factors of success at university has dominated the literature for more than 10 years.

In 2020, student success can no longer be seen as an isolated and singular process. Every individual involved in the academic environment and those close to the university student, including program directors, university administrators, faculty, the various professional bodies and even the student's family, plays a role in the success of their studies. The student's study project becomes not only the concern of the entire staff, but the diversity, plurality and growing specificity of the needs reported or observed (Bain De Los Santos et al., 2019) become the anchor point for interventions. Thus, at each stage of the academic journey (Wibrowski et al., 2017), different key resources (or people) (Vasseur, 2015), factors or determinants of success predominate (Acker and Haque, 2017; Denis et al., 2019). For example, there is abundant research on the importance of the first year or study term (Kirkby, 2018; Lussier, 2004; Roland et al., 2015; Sauvé et al., 2012); University entrance is a particularly sensitive time (De Clercq, 2019) when it is possible to have a decisive impact on students' attitudes and beliefs.

If one looks at the interest in research on the determinants of success at university, in terms of the literature specifically related to the graduate level, there appears to be much less empirical research that addresses the specific success factors at that level.

4. Graduate success factors in accordance with the concerns of the Université du Québec network

According to Martineau et al., (2017), a rigorous review of the literature cannot "be limited to empirical data without considering the specifics of a population, as well as the political, social and cultural context" (p. 179). In keeping with this view, the following section not only discusses the success factors that have a greater influence on graduate studies, but also explores them in terms of the main population characteristics of the graduate UQ network.

> Graduate students represent a population facing unique barriers and challenges (Clapham et al., 2012, cited by Daigle et al., 2019).

All 10 institutions in the network share a mission of accessibility to and democratization of higher education. The plurality of student profiles creates challenges to success, which can be seen in the lower graduation rates[30]. How can UQ promote success among its graduate students, given the diversity of paths, needs and expectations?

Based on the areas of intervention suggested by the 2018 UQ graduate supervision survey and through a review of the most recent research data, four groups of graduate success factors can be outlined:

1- Individual characteristics and their connections with the cognitive and methodological competencies expected of and targeted by graduate training.
2- The central role of the student's motivation and commitment in the pursuit of their study project.
3- The pedagogical supervisory practices and the relational aspect inherent in graduate training.
4- The significant contribution of the services and the human, financial and material resources offered by the institutions and programs.

4.1 Individual and personal factors

Several individual characteristics can influence progress and success (Robert et al., 2016). Among these characteristics explored by the research and by UQ in its data repository on academic success (Bonin, in press), nuances emerge for the graduate level with respect to age, gender, parental responsibilities, parental education level, preparation for studies (educational background, previous career path (traditional or atypical), etc.). and emotional competencies. The research also focuses on the skills and competencies expected from master's or doctoral training and how they influence the process of success for future researchers.

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30. For example, at the doctoral level in the UQ network, only half of the people registered obtain their degree (Ministère de l'Éducation et de l'Enseignement supérieur (MEES). Cheminement des étudiants qui poursuivent un projet d'études dans un établissement universitaire québécois. Direction des indicateurs et des statistiques, Government of Quebec.).

The graduate student's personal background

Addressing the individual characteristics of the student in an interrelated way provides a better understanding of how these characteristics influence success. There does not appear to be a consensus in the literature on the effect of age on success and perseverance in graduate studies. The relevance of this variable appears when approached in connection with other characteristics such as maturity, life cycle, marital status, family and financial responsibilities or registration status (Sung, 2006, cited by Audet, 2008).

Access to university, perseverance and the level of parents' education have also been well documented, particularly from the angle of FGUSs (Bonin et al., 2015; Chatoor et al., 2019). The primary challenge of FGUSs at the graduate level, considering their population characteristic (Section 2), would not be to complete a program, but to access it (Chatoor et al., 2019). Complementarily, the results of Groleau's survey (2017) highlight that the fact of parents' having a master's or doctoral degree does not guarantee that their child will complete an equivalent degree, even though "the family remains an important hub for intergenerational cultural transmission that promotes the continuation of schooling up to higher education" (p. 39). The pursuit of a university education does not appear to depend solely on family resources (intellectual, financial, etc.); rather, "hesitation" and "academic choices" "are most often connected to aspects of the experience lived inside and outside the institution" (Groleau, 2017, p. 1).

The nature of the programs and the competencies targeted by graduate education

At the undergraduate level, the general aim of education is the acquisition of subject-specific (Van der Maren et al., 2019) knowledge (AELIÉS, 2018). At the graduate level, the process differs, among others, in its aims related to production (AELIÉS, 2018) and knowledge transfer and in terms of the research process (Bégin, 2019). In the UQ network, despite subject-specific differences, the programs offered are generally organized by similar goals and types of training: For example, at the master's or doctoral level, the "professional" type trains practitioners in practice settings and the "research" type trains researchers or research professionals.

Irrespective of the study level, at the end of their program, students enrolled in a research curriculum must be able to conduct research according to the requirements of their discipline. Consequently, the master's and doctoral degrees aim for a certain mastery of the research process and an ability to apply it to answer questions or solve problems (CSÉ, 1998, according to Van der Maren et al., 2019). More specifically, the doctorate should serve to acquire autonomy and a capacity for innovation in research activities (Åkerlind and McAlpine, 2017), to do so autonomously, and to make an original contribution to a field of study (Bégin, 2019; CSÉ, 1998, according to Van der Maren et al., 2019). A number of English-language research studies have focused on qualifying the purpose of doctoral training (CAGS, 2018), which is either to create original content for knowledge or to prepare equipped, innovative researchers (Åkerlind and McAlpine, 2017). To summarize the trend, the traditional view of the doctorate as a means of accumulating analytical and technical abilities has given way to a more modern version. The latter is more oriented towards the individual behind the doctoral student and focuses on the creation and transfer of

knowledge (Muller, 2009, cited by Lee, 2018). Despite this gradual shift in perspective on the function of the postgraduate degree, the thesis remains the central element of the PhD, allowing for the most in-depth learning (CAGS, 2018).

It is important to quality this point, given the difference in educational goals depending on the study level, the results obtained at the undergraduate level do not necessarily indicate the possession of competencies and knowledge required for graduate activities (Bégin, 2019). Indeed, at this level of education, the expected competencies are more in the order of mobilizing competencies, skills, and knowledge in context (Van der Maren, 1994, in ADÉSAQ, 2018). The master's and doctoral programs offer students the opportunity to develop and acquire the competencies to be mobilized (Université de Montréal (UdeM), 2019, p. 52), specific to the requirements of scientific research, according to their field of study.

What is the nature of these competencies that are essential to graduate studies? The UQ network website states: "In order to successfully complete graduate education and [subsequently] achieve professional integration, the development and mobilization of competencies are essential." In this way, cross-curricular competences of an organizational, informational, technological and emotional nature are necessary for producing a successful dissertation or thesis (Université du Québec, 2020c).

Organizational competencies

At all study levels, upon entering the program, university students must manage, structure and plan their time, schedule, priorities, finances, etc. In other words, they must be able to effectively manage and organize human, material, and financial resources (UdeM, 2019). It is the responsibility of each individual to respect, for example, the deadlines for carrying out training activities. At the graduate level, given the older age of the student populations in the system, it can be assumed that there is greater mastery of these organizational responsibilities. Consequently, such organizational competencies become essential and decisive not only for the success of the educational project, but also in the sound management of family, school, and financial responsibilities. The development of a functional and efficient logic of action appears to be essential not only for the transition to the labour market and professional integration, but throughout the course of study.

Information and literacy competencies

Essential for graduate students, information competencies refer to understanding the processes by which information is produced and used, searching for information, using information to generate new knowledge, and participating effectively in learning communities (GT-PDCI, 2016a). The development of these information competencies enables students to be effective in finding, using, analyzing, and structuring information, properly using databases, providing quality sources, and learning about intellectual property, among other things (GT-PDCI, 2018). The results of a survey [31] on information

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31. "A literature review, interviews with various stakeholders (professors [5], educational consultants [4], librarians-trainers [10], etc.), as well as an online questionnaire sent to university students [74] and employers [36], made it possible to collect data and develop our knowledge of the contribution of information competencies in the Quebec university context" (GT-PDCI, 2018, in Dubuc, 2019).

competencies in higher education (GT-PDCI, 2016b) detailed by UQ (GT-PDCI, 2018) show that for the three study levels combined, 95% of respondents believe that it is extremely or very important to develop these types of competencies during their education, and that they will be necessary in their future professional context. According to Dubuc (2018), the survey also reports that "67% [of respondents] at the master's level and 46% at the doctoral level consider that the acquisition of information competencies helps improve their academic results." In fact, the development of such competencies includes the consolidation of related skills and competencies such as problem-solving, critical thinking, or writing ability (Daugherty and Russo, p. 9, cited by GT-PDCI, 2018). "[For example,] students demonstrate more perseverance in their search for information, as well as greater ability to write good research questions and select appropriate resources (Shao and Purpur, 2016)" (Dubuc, 2019, according to GT-PDCI, 2018). Ultimately, the information competencies acquired can impact writing quality, particularly students' ability to read, interpret and organize (Sverdlik et al., 2018).

Complementarily, literacy skills are also essential at the graduate level. They allow for a better appropriation of knowledge on a subject, a sustained degree of analysis, synthesis and reflection, and more precise processing of information (Bégin, 2019). It is crucial that at the master's and doctoral levels, students learn scientific style (Bégin, 2019) and that they develop "writing in a scientific/academic manner," i.e., in an iterative, non-linear, and nuanced manner (McAlpine and Amundsen, 2012).

A key element in academic success at the graduate level (Lee, 2018), the argumentative writing style needed in scientific research is acquired through practice and is generally acquired by the time students reach the doctoral level (Bégin, 2019).

Finally, the development of information and literacy competencies could alleviate some of the challenges that arise during a master's or doctoral program, such as problems of interpretation, text production, appropriation of content, or taking positions that arise due to a poor understanding of the literature review (Bégin, 2019).

Digital competency

According to MEES, digital competency refers to "the ability to find, organize, understand, evaluate, create and disseminate information using digital technology." (Government of Quebec, 2019). The Ministère specifies that digital competency includes social, collaborative and cognitive skills as well as "the ability to behave ethically and responsibly." (p. 28). Mastering digital competency is useful to support learning and the progression of studies, in addition to acting in a cross-curricular way in the service of other competencies (organizational, informational and literacy).

The Association des doyens, doyennes et directeurs, directrices pour l'étude et la recherche en éducation au Québec (ADEREQ) specified in its *Référentiel pour la formation des chercheuses et des chercheurs francophones en éducation* that education should empower the student population to master technologies (Van der Maren et al., 2019). To carry out the steps of a research project, it is essential today for university students to be familiar with and know how to mobilize the digital tools related to the field of research: document search engines, bibliographic management software, word or data processing software, software for creating presentations or mind maps, online collaborative work applications, etc.

Along the same lines, following the most recent world events related to COVID-19, digital competency is proving to be more important than ever in the success of the university academic process. Considering the plurality of training modes used, undertaking graduate studies without a minimum of knowledge, or a certain mastery of digital competency was unlikely in 2020.

That said, it is important to consider that not all students have the same opportunities or technical skills. Vincent et al., (2019) reminds us that each person has their own level of digital knowledge; the mastery of digital competency is not equivalent for all (CAPRES, 2019). As a 2004 British study – still relevant in 2020 – points out, non-traditional student populations may not always have the technological tools to engage in this new experience, which can be a barrier to success (University of London Arts, 2004, p. 17). The CSÉ (2015) also states that accessibility through technology, particularly distance education, may be hampered by a variety of variables:

> if certain regions do not have access to a sufficiently robust online network (Guri-Rosenblit, 2012); if certain people do not have sufficient financial means to acquire the necessary computer equipment (Makhanya, 2015); if certain people do not have the necessary digital competencies to take a distance education course (Loisier, 2013). (p.20)

Emotional competency

Emotional competency refers to a tool for measuring emotional intelligence (Petrides and Furnham, 2000) and the sense of emotional efficacy that includes self-control. This cross-cutting metacompetency (Porter and Phelps, 2014) enables the individual to better know their emotions, to master them, and eventually to achieve a certain balance (Goleman, 2014)[32]. According to Vasseur (2015), emotional competency is a way "to use one's ability to provoke and manage change by showing initiative and leadership" (p. 13) when problems are encountered.

> This competency has an impact on the duration and intensity of tasks.

Current research on intellectual autonomy and self-regulatory capacity and strategies (Bertucat, 2017) shows that these determinants may be associated with higher academic success rates among doctoral students (Sverdlik et al., 2018). This phenomenon can be explained in particular by the development of self-regulatory strategies that promote a reduction in anxiety and negative emotions (Castello et al., 2009; Koltz et al., 2010, cited by Sverdlik et al., 2018).

According to the literature, the mastery of emotional competency is particularly relevant in a context such as distance education. In an online learning activity, for example, students need to take advantage of additional strategies and competencies associated with their virtual environment (asynchronous course management, oral and written communication, etc.) (Kizilcec et al., 2017). In order to do so, they must

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32. Another model: based on Goleman's model (1995), reported by Letor (2006), the dimensions of emotional competency include self-awareness (awareness of emotions), self-regulation (self-control, integrity, sense of responsibility, capacity for innovation), self-motivation (persistence, commitment, initiative), social competencies and interpersonal competencies.

feel competent. Research shows that a growth mindset can heighten university students' sense of competency[33] (Vasseur, 2015).

4.2 Graduate student motivation and commitment

Arrival at the graduate level entails entering into a new system (Loisier, 2010, cited by AELIÉS, 2018), in which the learner's resilience and adaptation are essential. As discussed earlier, graduate studies imply very different modes of operation from those observed at the undergraduate level; the competencies to be developed are implicit and high-level, institutional expectations emerge and the types of teaching and pedagogical support are transformed. Under these conditions, motivated students who are committed to their study project and who are confident in their abilities appear more inclined to persevere and to succeed.

Motivation

Motivation has long been considered in the literature as the primary factor in university success (Jutras et al., 2010). Motivation is seen as a factor in graduate students' persistence and "completion" (Sverdlik et al., 2018). Highly documented, motivation embodies a complex, dynamic and systemic process that adjusts as learning experiences unfold (Bandura, 1986, in Tremblay-Wragg et al., 2018). This concept therefore refers to "the energy underlying the actions necessary for success" (Cabot and Dagenais, 2016, p. 2). Permeable to internal influences (psychological health, physical health, etc.) and external factors (interpersonal relationships, family responsibilities, family support, etc.), motivation depends, among other things, on the phase of each person's academic path.

Over the past 15 years, the literature has increasingly focussed on the links between the student experience and motivation, or on academic satisfaction and its impact on motivation, psychological well-being, perseverance, etc. The following is a summary of the literature on this topic (Dericks et al., 2019). According to Dericks et al., (2019), greater satisfaction with the doctoral process enhances the sense of well-being and, ultimately, promotes performance, progress in one's project and thus, greater academic success. According to them, a sense of satisfaction can motivate a student to pursue a scientific career and to help "improve their university's research networks and the higher education profession as a whole" (p. 1054).

Motivation can be encouraged in the student at every stage of the study project by the research supervisor, for example (Sverdlik et al., 2018). It is the various motivational dynamics at play in learning that influence cognitive engagement, perseverance and performance (Viau, 2004, in Tremblay-Wragg et al., 2018).

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33. Vasseur (2015) also emphasizes the importance of the quality of the supervisory relationship, opportunities for scientific socialization (presentations of research results), and interactions between peers and with members of the department to developing a sense of competency.

Commitment

Associated with success since the 1980s (Pirot and De Ketele, 2000), the concept of commitment refers to "the student's responsibility for the success of their studies," including "personal investment and the efforts devoted to their work" (CSÉ, 2008). In other words, it is the degree of effort (Solomon, 1983, according to Viau, 2004) and "the link that connects an individual to the acts that they consciously, freely and voluntarily perform" (Pirot and De Ketele, 2000, p. 368).

Motivation is "will"and commitment is "doing" (Cabot and Dagenais, 2016).

Closely tied to the concept of motivation, commitment can be observed along various dimensions (cognitive, affective, and behavioural).[34] A major challenge in the analysis of this determinant is that commitment is based on the individual's perception (Tremblay, 2004).

The direction and duration of the study project

According to Vasseur (2015), the direction of the study project (end goal, training intentions, aims, etc.). is a significant component of motivation and commitment and one of the key resources for success in higher education. The author states that people who believe in their potential and have clear aspirations or training intentions "seek out and use learning strategies and activities that are appropriate to their goals, avoid distractions, are more persistent in the face of difficulties, and enjoy their training more" (p. 10).

Training intentions can also be connected to sources of motivation in doctoral studies. Sverdlik and her colleagues (2018) report that the reasons students pursue their degrees are intellectual development, an interest in the field, gaining research experience, the need to make a life change, employability prospects and the prestige associated with a doctoral degree. At UQ, the ICOPE survey (2016) shows similar results for its doctoral students.
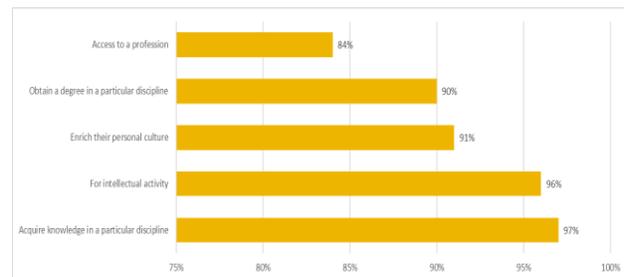
Figure 9. Reasons to enrol in the graduate program for doctoral students at the Université du Québec (ICOPE 2016)

Aside from the importance for success of defining one's intentions, a challenge seems to be emerging in terms of the realization of such aspirations: the duration of the study project (McCallin and Nayar, 2012). Bégin (2019) notes in this sense that the extension of studies can influence perseverance and interest in the project since "the student is not committed on a regular basis to maintain a sufficiently clear idea of what needs to be done and why" (p. 27). As Jutras and his collaborators stated in 2010, in Quebec, "according to indicators from the Ministère de l'Éducation, du Loisir et du Sport (MELS, 2008),

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34. The cognitive dimension refers to the use of metacognitive strategies in solving complex problems and in the construction of knowledge. The student makes an effort in time and energy, using learning strategies such as self-regulation. The socioaffective dimension refers to interests, values, emotions and feelings, attitudes and perceptions (environment, etc.). It influences the sense of belonging, the relationship with teachers, interest in the project, etc. Finally, the behavioural dimension focuses more on effort, perseverance and involvement (Adams and Paquet, 1991; Miller, 1977, according to Pirot and De Ketele, 2000). More easily observable, for example, this dimension refers to participation and respect for rules.

the actual duration of master's and doctoral studies far exceeds the duration provided by the funding granted to universities" (p. 3). It is clear that this reality can still be observed today in the UQ network; the actual duration of graduate studies exceeds the duration of funding for many.[35]

Integration as a driver of motivation and commitment

Graduate academic commitment can be supported through integration into the study and research environment. According to Berthaud (2019), student social integration is a multidimensional concept that refers to perception (Tinto, 1975), involvement (Pascarella and Tenrenzini, 1980), the quality of the network (support provided) surrounding the learner (Berthaud, 2019) and behaviours (internal and external interactions).

> In this theoretical field, social integration is seen as a factor in regulating student commitment: those who are satisfied with their interactions and social integration within the student group maintain their investment and persist more in their studies (Berthaud, 2019, p. 7).

It is important to specify that commitment differs for each individual, depending on individual factors, the direction and aims of their project, their motivation and the importance given to the role of the peer group. Adaptation to the university research culture can contribute to the positive impact of integration on student commitment and motivation (Berthaud, 2019).

The institutional and social integration of the university student is desirable in terms of perseverance (Diallo et al., 2009).

Numerous studies show that without time to integrate into their institutional, disciplinary or personal environment, to socialize or to engage outside of their studies, doctoral students are more likely to feel isolated and experience negative impacts on their motivation and psychological well-being (Pocock et al., 2011, and Sverdlik et al., 2018). Thus, it appears essential that students devote time to their integration (participation in extracurricular activities, scientific socialization at events, etc.), because this type of behaviour has been "positively associated with the development of self-regulatory strategies, which are also associated with higher levels of academic success and emotional well-being" (Guilmette et al., 2019, p. 8).

Motivation and commitment thus depend on a certain balance between the student's academic work and personal life.

Consequently, reducing isolation and promoting interaction between students helps to promote student well-being (Daigle et al., 2019). Psychological or mental well-being is an important factor that can influence the path at the graduate level (Litalien, 2014) as well as production capacity (Bégin, 2019). Depending on the stages of the research project, Bégin (2019) explains that students can be subject to varying levels of isolation, which can lead to psychological fatigue. In the drafting phase, for example,

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35. More recently, Bégin (2019) reports that timelines "are more or less respected in the sciences and applied sciences, but are longer in the humanities and social sciences, administration and education" (p. 26-27). He also points out that "full-time students finish in a shorter time than part-time students [in all areas of study combined]" (p. 27).

people who are not part of a work team are more inclined to procrastinate or vary the effort expended (Dionne et al., 2020). On the other hand, the intellectual and social integration encouraged by the work teams reduces isolation. By sharing ideas, working spaces or collaborating on projects, students are more likely to perfect their knowledge and expand their network while gaining experience in the field (Larouche, 2005, in Vasseur, 2015).

> "The success of master's and doctoral education thus seems to depend, at least in part, on supervised or guided socialization in the context of the various aspects of the research profession" (Gemme and Gingras, 2006, p. 23).

4.3 Pedagogical and supervisory practices

The purpose of this section is to provide an overview of new and recent research on pedagogical and supervisory practices and their connection to graduate success factors.

The pedagogical relationship of supervision

Since the 1960s, the importance of a quality pedagogical relationship between the student and a research supervisor has been abundantly documented. This pedagogical relationship is a characteristic of graduate studies (Gerard, 2009), refers to all interactions between a graduate student and a research supervisor (or co-supervisor) and is defined as a complex relationship of human-intellectual aid (UdeM, 1995, cited by Jutras et al., 2010), based on cooperation (Denis et al., 2019), and that is both upward and downward (AELIÉS, 2018; Jutras et al., 2010).

> It is a multidimensional educational partnership of a personal, socioaffective, relational, administrative, financial, institutional, and intellectual nature (Denis et al., 2019; Denis and Lison, 2016; Jutras et al., 2010; McCallin and Nayar, 2012).

The pedagogical relationship evolves with and adapts to the stages of the project and the expectations of both parties as they change (Denis et al., 2019). Although there are no standardized procedures for graduate supervision in Quebec, the majority of the literature agrees that quality academic supervision positively influences the graduate student experience and promotes the success of the study project (AELIÉS, 2018; Bégin, 2019; Brassard, 2016; CSÉ, 2019; Couillard et al., 2018b; Denis et al., 2019; Denis and Lison, 2016; Fonds de recherche du Québec, 2016; Gerard, 2009; Hutchings, 2017; Jutras et al., 2010). In fact, "beliefs, understanding and the initiatives of a variety of actors play an important role in defining what, [for example], doctoral supervision should be (Bégin, 2018; Prégent 2001; Voyer 1992)" (Denis et al., 2019, p. 31).

The literature provides a wealth of information on the key role of pedagogical supervision practices and their connection to project completion and timeliness (Åkerlind and McAlpine, 2017; AELIÉS, 2018; Couillard et al., 2018b; Halse, 2011), their effects on student motivation (Litalien, 2014), stress levels, intellectual isolation (Bégin, 2019; Denis and Lison, 2016; McCallin and Nayar, 2012) or, on the student's confidence and satisfaction with their study project (Jutras et al., 2010). The relationship between a

student and their supervisor can make the difference between success, progressive loss of interest, or lack of motivation (McCallin & Nayar, 2012).

> The first – and often most influential – external factor that affects doctoral students' experiences in graduate school is their relationship with their supervisor(s). One's supervisor influences how the student comes to understand the discipline and the roles and responsibilities of academic professionals, their socialization as a teacher and a researcher, the selection of dissertation topic, the quality of the dissertation, and subsequent job placement. (Gube, Getenet, Satariyan and Muhammad, 2017; Murphy, Bain and Conrad, 2007; Solem, Hopwood and Schlemper, 2011; Zhao et al., 2007). (Sverdlik et al., 2018, p. 369)

In addition, although there is some recent Quebec literature on the topic of graduate supervision (AELIÉS, 2018; Bégin, 2019; Couillard et al., 2018b; Université Laval, 2020a, 2020b), qualitative studies on the complexity of the pedagogical supervision relationship between the student and the research supervisor by discipline are still few and far between (Denis et al., 2019; Denis and Lison, 2014; Denis and Lison, 2016; Sverdlik et al., 2018; Turner, 2015).

The personal dimension

To understand and appreciate the relevance of the supervisory relationship, it is necessary to consider how the two parties are associated, the type of relationships they develop and maintain. There is a consensus in the literature: there is no universal formula for supporting learners in their research projects (AELIÉS, 2018; Bégin, 2019; McCallin and Nayar, 2012). To promote quality supervision, the research supervisor should have every interest in taking into account the particularity of each individual (De Clercq, 2019), their needs, level of autonomy, previous experiences, research subject (Bégin, 2019), and even distinctions between disciplines (Denis and Lison, 2019; Sverdlik et al., 2018).

Experts agree that there is no one-size-fits-all model for graduate supervision (AELIÉS, 2018; McCallin and Nayar, 2012).

In order to support the development of competencies in a greater number of students, various supervisory styles[36] are described in the literature in accordance with the intensity of supervision and faculty involvement in the student's tasks (AELIÉS, 2018; Bégin, 2019; Couillard et al., 2018a, 2018b; McCallin and Nayar, 2012). Despite the few tools or guides available in the literature to assist faculty members in their graduate supervisory role (AELIÉS, 2018; Bégin, 2019; CAGS, 2008; Theall et al., 2010; Université Laval, 2020a), there do not appear to be any common or widespread practices to this effect in the network.

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36. "Approached from a variety of perspectives in the literature, supervisory styles are often characterized by the levels of structure and support provided by the teacher and are recognized as a factor influencing the quality of the relationship with the student" (Couillard et al., 2018b, p. 15).

The socioaffective dimension

Given the exclusivity of the relationship and to ensure its efficiency (Jutras et al., 2010), it is crucial for supervision that mutual expectations, resources and perceived challenges are quickly clarified (Pyhältö and Keskinen, 2012); Pyhältö et al., 2015). A good understanding of the roles and responsibilities of the members involved in supervision is essential in building a collaborative, healthy and productive supervisory relationship (Ali et al., 2016). This convergence of perceptions (Holbrook et al., 2014) increases student satisfaction and commitment to their studies, among others.

A common vision of supervision must be developed and shared by all parties involved.

To achieve this, good communication should be encouraged in order to optimize the quality of discussions and prevent problems (Denis et al., 2019; Halse, 2011). In a survey conducted in 2016 by the DRI, faculty members who supervise graduate students in the UQ network were questioned about the selection criteria, the stages of supervision and the methods of meeting and follow-up. According to the report published in 2018, at the stage of establishing the supervisory relationship, professors give central importance to their interest in the student's research project (95%), to their planned availability for supervision (94%), to the connection between the research topic and their field of research (87%), and, finally, to the quality of the supervisee's academic record (83%) (Couillard et al., 2018b).

An effective supervisory relationship depends on the quality, regularity, and fluidity of communications from the very first meeting between the supervisor and the candidate.

It appears that the operating rules and the monitoring and supervision procedures are established from the very first interactions. At the critical stage of the first meeting – a stage "often underestimated" according to Bégin (2019) – the supervising professors at UQ emphasize discussing the student's study project (97%) and the roles, responsibilities, and expectations of both parties (77%) (Couillard et al., 2018b). The research supervisor also addresses, for the most part, the supervisee's planned academic path.

Finally, a qualification seems to emerge in relation to fields of study: the selection criterion relating to material and financial aspects appears to be more present in subjects related to the pure and applied sciences; "86% of respondents discuss the issue of financial support with students, compared with 26% of respondents in the arts and literature research divisions" (Couillard et al., 2018b, p. 9).

The regularity and the course of interactions

The supervisory relationship is based on regular and frequent meetings, which can promote student satisfaction and graduation (Cornér et al., 2017). Still according to the DRI survey, the professors in the network consider that a quality supervisory relationship inevitably depends on their availability and the importance of regular follow-up. For example, faculty members report spending an average of one-third of their faculty time on supervision. A larger proportion of faculty time is reserved for supervision in pure and applied sciences, with more than 30% of respondents devoting more than 50% of their time to this

task (Couillard et al., 2018b, p. 7). While the majority (59%) find this investment of time "acceptable," just over one-third of faculty find it "high" or "too high" (33%)[37].

"Time is seen as a valuable resource" (Couillard et al., 2018b, p. 6).

Although Bégin (2019) argues that establishing meeting and follow-up procedures is central to a satisfactory dynamic among the parties involved, only 54% of the research supervisors said they discussed the frequency of supervision at the first meeting. No operating rules were ever recorded in a written agreement (57% report never doing so).

In addition, while the literature suggests that there are certain steps inherent in the relational process of research supervision,[38]

> there is not, *a priori,* a sequence of meetings or precise modalities that are recognized to ensure an optimal and efficient supervision. The reason is simple: supervision depends on the student, their needs, autonomy, previous experiences, situations encountered in the process, the research topic, the context of experimentation or data collection, and several other factors or events that may or may not require the intervention of the research supervisor. (Bégin, 2019, p. 101)

Potential challenges faced by the supervisor and the student

At UQ, the survey report on supervision points out that 27% of supervising professors have experienced a conflict with a student (Couillard et al., 2018a). To reduce the possibility of conflict, a relationship based on mutual trust is crucial: trust that is built through meeting commitments (which starts with meeting commitments on frequency of meetings and feedback). The student may benefit from a sense of confidence in their path, supervisor, program and institution (Jutras et al., 2010). This confidence has a positive influence on their training, their project and, in a complementary way, on their level of motivation and commitment.

It is important to keep in mind that the various roles played by the student and their supervisor can bring additional challenges (Bégin, 2019). For example, working on other projects led by the supervisor may slow down the student's work on their own project. Thus, regardless of the type of relational challenges encountered, conflict management varies from one institution to another, in part because of the resources available.

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37. The relevance of addressing this aspect of supervision also lies in the fact that the growth in graduate student enrolment has surpassed that of the faculty since 2010 (CSÉ, 2010, in Fonds de recherche du Québec, 2016). Additional difficulties are emerging, particularly in terms of availability for supervision.

38. The step of contacting the research supervisor, usually done by the student, can be intimidating, even more so at the master's level (Bégin, 2019). Then come the stages of mutual commitment, from the core of the relationship (establishing the relationship (learning to work together), testing (solidifying or dissolving the relationship), and guiding the research and the end of the relationship (Jutras, et al., 2010)).

The scientific and professional dimensions

The pedagogical supervisory relationship plays a major role in the scientific and professional socialization of graduate students.

> Scientific and professional socialization refers to the various situations that enable a graduate student to participate in scientific life, interact with research communities, and engage in learning that is complementary to their disciplinary training. Ultimately, the objective is to enable the student to integrate the culture, norms and rules of a research career, thus contributing to his or her professional integration as a future researcher. (Couillard et al., 2018b, p. 11)

This "central component of supervision, in the sense that it influences student perseverance and success" (Couillard et al., 2018b, p. 11), contributes to the integration of the labour market and to the autonomous realization of the research process. In this way, an environment that allows students to socialize scientifically and interact with their peers is a determining factor in perseverance and success because it breaks isolation (Pyhältö and Keskinen, 2012). Cornér et al., (2017) also believe that providing equitable opportunities for research participation to individuals studying in a program or working in a research group contributes to their satisfaction and retention.

Within the network, research supervisors emphasize providing their graduate students with opportunities for scientific socialization in several forms: communication in a scientific event (in 71% of cases at the master's level and 86% at the doctoral level), signing or co-signing a scientific text (60% of cases at the master's level, 77% at the doctoral level) or joining a research team (62% at the master's level, 72% at the doctoral level) (Couillard et al., 2018b).

<p style="text-align:center; color:orange;">The collaboration is academic, professional and scientific in nature.</p>

According to ADEREQ, scientific socialization can also be promoted through program and institutional support (Van der Maren et al., 2019). Thus, while the research supervisor has great responsibility in the supervisory process, this core (Jutras et al., 2010), or central element of research training (Couillard et al., 2018b), goes beyond the dyad between a student and their research supervisor (Prégent, 2001, in Jutras et al., 2010). "The supervisory function is a responsibility shared by many – [actors] ([professors], the program, the department, student services, the institution – where the roles of each must be complementary" (Couillard et al., 2018b, p. 6).

Pedagogical design and training modalities

Based on this portrait of supervision and in relation to the use and increasing complexity of training modalities, a new reality seems to be taking shape. Teaching and supervisory practices, whether they are deployed in person, in a hybrid format, or through online or distance education[39], are now fundamental

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39. According to the website of the Comité de liaison interordres en formation à distance (CLIFAD), distance education is defined as "a training device that consists of a set of organized means for achieving the objectives of a course or program [...] [that] enables a person to learn relatively independently, with minimal time and travel constraints and with the remote support of resource persons."

to training and supporting graduate students. In educational institutions, both those providing unimodal and multimodal practices in distance education, remote activities are emerging and are generating a very wide variety of arrangements. The distance aspect is thus understood as a modality integrated with other pedagogical approaches with the aim of improving the service offering and the quality of training pathways (Parr, 2019). In recent years, many reflections have been made on design and pedagogical strategies in relation to the various modes of training. The CSÉ (2015) also notes that it is possible to link the growth of these modes of training to technological advances and the diversification of student profiles and paths.

In the context of distance education, for all study levels combined, it appears that success is based on the learning strategies used, on the feedback offered through supervision, but also on the pedagogical design of courses and training (Audet, 2008). The adoption of technology alone is not enough to change pedagogy. The comparison of modes or different technologies is not limited to their use; the added value of technologies would depend on the uses made of them by teachers and, more generally, on the richness of the device, particularly the variety, complementarity and pedagogical appropriateness of the tools and uses (Endrizzi, 2012). Beyond the technological choices in courses, it is more the manner in which these technologies are integrated into training activities that can have a positive impact on student success (Karsenti, 2003). As indicated by Bernard et al., (2004), the quality of teaching strategies has a greater influence on outcomes and persistence in studies than the mode of training. This seems to be coming out in the literature: regardless of the mode of instruction, pedagogical choices must be adapted and modulated according to the student, their personal characteristics, skills and competencies, level of studies, etc. (Audet, 2008). As Lakhal and Bazinet (2015) point out, the use of technologies (i.e., previous technological experience, variety of technologies used, use of social networks, etc.) is a significant determinant of distance learning and supervision, and of perseverance.

4.4 Resources

The institutions in the network currently offer a plurality of services and resources designed to meet the diverse needs of new student populations, taking into account their specific realities as much as possible.[40] The literature concurs and confirms that such a strategy is one of the keys to success, particularly at the graduate level.

> However, the literature does specify that the presence of these services alone is not a success factor.

In fact, while orientation and integration as well as quality services are essential, the success factor depends largely on targeted students using these services and on their utilization rate. In the network, it can be observed that despite a varied offering, the participation or utilization rates remain low. According to a study conducted by the Fonds de recherche du Québec's intersectoral student committee in 2017, only 11% of the students surveyed had already used:

> employment assistance and guidance services offered at their university to help them define their career plan and prepare to enter the labour market. By comparison, 40% turned to their professional network, 34% turned instead to their family or friends, 32% turned to their research supervisor, and 29% turned to online resources and social networks (CSÉ, 2019, p. 88).

One hypothesis to explain this phenomenon refers to the student's autonomy and decision-making skills. Authors Robert, Debeurme and Joly (2016) state that at all university levels, having a good knowledge of oneself and one's diagnostic (where applicable) is necessary for students to maximize the benefits of the resources offered. Just as is the case for students with disabilities or emerging disabilities, access to services (in this situation, adapted services) and good self-knowledge act as central success factors (Dauphinais et al., 2016).

Psychological resources

The learning environment (modes of training, expected competencies, etc.) is becoming more complex and is having an impact on student psychological health and well-being. Emotional exhaustion, psychological distress and depressive symptoms have been extensively documented as factors that negatively influence the pursuit of a study project (Union étudiante du Québec (UEQ), 2018). Although many services and resources aimed at providing psychological support to students are available and accessible throughout the UQ network, according to Martineau et al., (2017)

> the offering of psychosocial services from most postsecondary institutions is no longer able to meet the demand. Yet, and quite paradoxically, studies continue to demonstrate the under-utilization of services by the vast majority of young adults in need, either within the institution or in the community (Zivin, Eisenberg, Gollust and Golberstein, 2009). (p.167)

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40. Student association, financial aid, orientation and integration, Indigenous student centre, support centre, registrar, international student services, employment services, language services, library services, services for students with traditional or emerging disabilities, science support, etc.

One of the solutions proposed by CAPRES (2018) is based on promotion and prevention to improve mental health, mitigate symptoms and prevent their emergence, through adequate dissemination and adapted, targeted recruitment. Ultimately, the idea is "to promote the development of skills that will enable students to be better equipped to deal with the ups and downs of different spheres of their lives: school, social, family, etc." (CAPRES, 2018, p. 2).

Financial resources

The funding or self-funding of studies is a predominant success factor for the graduate population. The network's supervisory faculty recently stressed that financial security is a key determinant of success at the graduate level: "In the absence of adequate funding, students are forced to go into debt or work more to support themselves" (Couillard et al., 2018b, p. 15).

Although Quebecers in the network benefit from an advantageous loan and bursary system as well as tuition fees that are among the lowest in North America (Université du Québec, 2013), students must still finance

		Always and Often	
		Master's	**Doctorate**
Reimbursement of miscellaneous	**PAS**	72%	79%
	SSH	37%	49%
Grants and bursaries	**PAS**	75%	84%
	SSH	26%	35%
Graduate research assistantship	**PAS**	30%	34%
	SSH	58%	63%
Graduate teaching assistantship	**PAS**	34%	43%
	SSH	36%	39%

Figure 10. Frequency of financial support for students supported by research office funding (Couillard et al., 2018b)

their studies. Opportunities for self-funding include, among others, loans (government, bank, etc.), scholarships (granting agency, institution, program, research office, etc.), employment opportunities at the university (research or teaching assistantships, work on campus, etc.), or work off campus.

Studies agree that graduate students who are funded, particularly through research assistantships or granting agency awards, appear to be more persevering. In the supervision survey (2016), faculty affirmed the importance of offering enough scholarships and graduate research or teaching assistantship contracts to contribute to the financial security of their students. Irrespective of the subject, certain criteria are emphasized in granting financial support from the research office: the scientific quality of the candidate's work, their performance and scientific involvement, financial position, fairness in the distribution of funds among supervisees, etc. (Couillard et al., 2018b). Constraints on the requirement to offer funding to students at the master's and doctoral levels vary from one institution or program to another: "By way of comparison, across the UQ network as a whole, 14% of professors indicated that their institution required them to provide financial support at the master's level, and 19% at the doctoral level" (Couillard et al., 2018a, p. 28).

> Beyond institution-wide rules and funding programs, [faculty] can of course provide support from their own funds. [...] It should be noted that at the network level, [professors in the] pure and applied sciences do appear to be more likely to offer scholarships, while their colleagues in the humanities and social sciences offer more research assistantship contracts as their main form of funding. (Couillard et al., 2018a, p. 29)

Finally, Larivière (2013) points out that integration into the program and the institution, as well as proximity to the research field to promote perseverance and, ultimately, employability, appear to be as

important, if not more important, than the ability to fund these studies and the related financial gain.[41] In other words, participation in research is a stronger determinant of doctoral students' success than funding.

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41. "Although funding was clearly linked to a higher graduation rate for students who did not publish, this is not true for students who managed to publish at least one paper during their doctorate, suggesting that student integration in research – as measured by participation in peer-reviewed articles – has a greater influence on graduation rates than scholarships" (Larivière, 2013, p. 38).

4.5 Summary of success factors addressed

This section provides a brief review of factors identified in recent literature and previously discussed. The summary consists of seven categories and does not claim to provide an exhaustive list of all the determinants of success; rather, it is intended to inspire reflection on possible actions to promote success.

1. Development of cognitive and methodological competencies

Graduate education involves the acquisition of knowledge, skills, and the development of high-level personal and professional competencies that are the foundation of the study project.

Keywords: analysis, abilities, knowledge, competencies (emotional, literacy, informational, organizational, digital), curriculum, writing, skills, literacy, methodology, technological tools, procedures, personal, professional, research, reflection, synthesis, cross-curricular, etc.

2. Formulation of clear intentions with regard to the study project

The student gives direction to their study project. They plan the process and the goal. These strategies support the motivation and commitment necessary for success.

Keywords: aspirations, goal, path, duration (actual, planned), commitment, stages, end goal, intentions, interest, interruption, motivation, objectives, career path, perseverance, persistence, relationship to studies, direction of the project, satisfaction, aims, etc.

3. Institutional and social integration as a support for balance

Fostered by the university environment, institutional, scientific, and social integration refers to the need for students to socialize, collaborate and learn through interactions with others.

Keywords: assistance, adaptation, autonomy, well-being (physical, psychological, etc.), scholarships, path, co-construction, discussions, dialogue, peer supervision, commitment, mutual aid, work team, experience, expertise, integration, interaction, interventions, isolation, environments (study, research, work, etc.), motivation, sharing, participation, relationship to studies, responsibilities (family, financial, perception, professional, etc.), mental health, satisfaction, financial security, sense of belonging, socialization, support (family, parental, etc.), etc.

4. Varied and flexible training modalities

A variety of training modalities are offered by institutions and programs (distance education, internships, tutoring, etc.). Professors use a variety of pedagogical modalities. All of these modalities are adapted and adaptable.

Keywords: *training activities, adaptation, asynchronous, autonomy, pedagogical choices, learning community, comodal, pedagogical design, online, teaching, flexibility, distance education, hybrid, interaction, technological mediation, mixed, modalities, modes (of teaching, training), pedagogical practices, face-to-face, feedback, flexibility, synchronous, technologies, etc.*

5. Personalized and quality pedagogical and supervisory relationship

A quality supervisory relationship refers to the smooth and regular interaction between a research supervisor and a student. The positive repercussions of the relationship are maximized if the supervision offered is adjusted according to the needs and expectations of the student.

Keywords: *adjustments, expectations, advisory committee, process, buddy system, trust, disciplinary culture, research supervisor, availability, dialogue, project stages, expertise, flexibility, flow, training, guidance, personalization, intensity, modalities, pedagogy, supervisory practices, regularity, meetings, respect, feedback, satisfaction, support (emotional, financial, intellectual, material, etc.), follow-up, etc.*

6. Adapted and continuous support service offering

Adapted and ongoing support and guidance refers to the resources and services offered to the student by the program or institution. The supervision and follow-up offered should be tailored to individual needs and to the stages of the study project.

Keywords: *orientation and integration, support and guidance, program activities, adaptability, needs, path, availability, diversity, learning environment, institution, flexibility, inclusion, mentorship, pathway, customize, process, profile, program, project (study, research), resources, services, support, transition, etc.*

7. Rate of utilization of resources and services offered

Institutions and programs are responsible for promoting, disseminating, and encouraging the use of their resources and services. Students are responsible for using what is offered.

Keywords: *accessibility, agency, assistance, learning, needs, self-knowledge, advice, decision, dissemination, availability, flexibility, attendance, inclusion, tools, openness, prevention, promotion, resources, awareness, services, use, etc.*

5. Success, a collective concern

UQ maintains that "the development and fulfilment of all talents depend" not only on the individual abilities of university students, but also "on the value placed on studies and the support offered throughout the academic process" (Université du Québec, 2013). In this regard, students, supervising faculty, learning and student services staff, administrators, etc. – all of the people working or studying at the university – share complementary responsibilities for success. To understand the effectiveness and relevance of such a collaborative network, the expected roles and responsibilities are described below for each targeted group of individuals.

5.1 The role and responsibilities of the graduate student

The primary role of graduate students is to be active in their learning, to be motivated and to demonstrate autonomy (Audet, 2008). The development, progress and realization of the training project thus depend, in part, on students' commitment to their study projects. Their success is, in fact, greatly influenced by their direct ability to act[42] and by their level of commitment to their study project: "Students must assume the responsibilities that concern their development" (Bégin, 2019, p. 144). At the graduate level, these responsibilities are embodied, for example, in knowing the path of the program of study and the prescribed steps, or managing and organizing one's work schedule according to one's academic, family and financial obligations.[43] According to the literature, this attitude of taking charge has a positive impact on several aspects of success, such as the pedagogical relationship (meeting deadlines, level of preparation for meetings, etc.) (Goldman and Goodboy, 2017; Sverdlik et al., 2018).

Students remain primarily responsible for the organizational aspects (deadlines, forms, writing, etc.). of their study and research projects. Recently, the literature displays an interest in the autonomy and responsible attitude expected in people at the graduate level. In this regard, some literature indicates that research supervisors feel that students registered in what is today qualified as a modern doctorate (Section 4 – Factors), would require more supervision, especially at the beginning of their program (Lee, 2018).

5.2 The role and responsibilities of the research supervisor

At the graduate level, the main role of the research supervisor is to guide, advise and supervise the learner and to support them in their learning throughout the research project (AELIÉS, 2018), from the first contact before (or after) admission to graduation and employability (Denis et al., 2019). The individuals who are supervising are involved – formally or informally – as critics, advisors, experts, trainers, resource persons, guides and, in a complementary manner, confidants (Bégin, 2019; Brassard, 2016; Couillard et al., 2018b).

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42. "Agency" refers to "the ability to initiate and direct actions" (Antidote, 2020); to the individual's ability to act. In Education, some French publications use the term *agentivité* for "agency."
43. Given their status at the graduate level, students are considered by the network to be financially autonomous.

> *The responsibilities of research supervisors are closer to a certain cognitive buddy system, where the experts gradually lead students they supervise to develop the same type of expertise as they have (Bégin, 2019, p. 137).*

The modern vision of a research supervisor somehow refers to the concept of intermediary. Supervisors become this intermediary who no longer aims at the simple passing on of methodological skills, but who actively seek to make explicit and conscious the reflection and selection criteria that they have been using for several years in an implicit and automatic way (Bégin, 2019, p. 168-169).

Although the responsibilities of research supervisors are well documented in the literature (AELIÉS, 2018; CAGS, 2008, 2018; Couillard et al., 2018b; Denis et al., 2019; Denis and Lison, 2016; Lee, 2018; Van der Maren et al., 2019), no standardized criteria or formal or systematic training exists across academic institutions[44]. Currently, learning about supervisory practices and pedagogical competencies (Amundsen and McAlpine, 2011) is primarily experiential: the doctoral experience itself, co-supervision, mentoring, thesis evaluation, opportunities for reflection, etc. (Denis and Lison, 2016; Lee, 2018). Hired on the basis of a certain subject-specific knowledge (Vasseur, 2015), supervisors must develop sophisticated pedagogical supervisory skills and competencies (McCallin and Nayar, 2012) that are dynamic and variable in nature[45]. These implicit requirements combined with non-mandatory pedagogical development lead to significant inequalities in the supervision offered: various motivations, pedagogical formulas, variable support depending on the professors' vagaries, their timetable, their emotional intelligence, etc. (Denis et al., 2019). The DRI's survey report on supervision reiterates the statement that a variety of elements can influence the pedagogical support offered (Couillard et al., 2018b).

Supervisory style

The supervisory style[46] is a determining aspect of the recently documented graduate student experience. The style of supervision adopted may depend on variables such as the discipline, experience and personality of the research supervisor, the type of individuals supervised, the phase of the project (AELIÉS, 2018), the task to be performed, the supervisor-supervisee relationship (McCallin and Nayar, 2012), external constraints and events (Couillard et al., 2018b). Supervision can also be influenced by the type of support offered (proactive actions, encouragement, proposed resources, etc.). and its intensity (frequency, availability, etc.), by the preferred modes of teaching (distance, hybrid, face-to-face) (Denis and Lison, 2016), the methods of supervision and the rules of conduct, or by the structure of the curriculum and its various processes (Bégin, 2019).

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44. "Yet, this aspect of the professorial role [research supervision] involves many scientific, interpersonal, technical, financial, administrative and institutional conditions that are essential to the success of graduate students and to the development of various aspects of their intellectual, scientific and professional autonomy, which require specific knowledge and skills (Jutras, Ntebutse and Louis, 2010; Prégent, 2001)" (Denis and Lison, 2016, p. 375).

45. Some examples of competencies and skills to be developed: collaboration, communication, listening, supervision, evaluation, expertise leadership, professionalism (knowing how to act, ethics, etc.), critical thinking, problem solving, techniques and technologies, etc. (Brassard, 2016; Couillard et al., 2018b).

46. UQ distinguishes six typical profiles of supervising professors (scientist, psychologist, pedagogue, administrator, veteran, and humanist) (Couillard et al., 2018b).

As supervisory practices need to be flexible and inclusive, the research supervisor has no choice but to adapt and customize their actions "according to the student's study level, personality, aptitudes, etc." (Couillard et al., 2018b, p. 7), by anticipating the needs of students, by remaining on the lookout for potential challenges or by creating favourable conditions for the development of their autonomy (Bégin, 2019). The qualities graduate students expect in their research supervisors validates this finding:

> extensive research experience, ability to inspire learning, provide resources, ideas, commitment to students, openness to multidisciplinarity, sensitivity to student needs, good organizational skills, positive image, good writing skills, in-depth understanding, intelligence, clarity of expectations and support for students. (Jutras et al., 2010, p. 5).

The CGPSS (2019) results of UQ confirm this assertion. According to respondents, the primary quality of a research supervisor is the availability and regularity of follow-ups. In fact, the majority of respondents (84%) indicated that they "agreed" or "strongly agreed" that their research supervisor was available for regular meetings. These data appear reassuring considering the significant pressure observed on graduate supervision ratios (Couillard et al., 2018b).

Financial responsibilities

A recurring theme in the responsibilities of the research supervisor seems to be the financial obligations of supervisees. According to data extracted from the CGPSS (2019) to represent the institutions in the network, only 6% of graduate students reported that the main source of funding is the support suggested by their research supervisor[47]. Depending on the discipline and program, the forms of funding offered by research supervisors from their own funds vary greatly. The survey report by Couillard et al., (2018b) shows that at UQ, in the pure and applied sciences (PAS), research supervisors offer more

		Always and Often	
		Master's	**Doctorate**
Reimbursement of miscellaneous	**PAS**	72%	79%
	SSH	37%	49%
Grants and bursaries	**PAS**	75%	84%
	SSH	26%	35%
Graduate research assistantship	**PAS**	30%	34%
	SSH	58%	63%
Graduate teaching assistantship	**PAS**	34%	43%
	SSH	36%	39%

Figure 11. Frequency of financial support for students supported by research office funding (Couillard et al., 2018b)

master's and doctoral scholarships compared with their counterparts in the social sciences and humanities (SSH) (Figure 10). For the social sciences and humanities, research assistantship contracts seem to be promoted at the master's level and reimbursement of various expenses at the doctoral level (Figure 10)[48].

Student guidance

Among other responsibilities inherent in the practice of supervision, recent publications pay particular attention to the guidance provided by the research supervisor. On the one hand, it seems optimal for a research supervisor to know and suggest to supervisees resources or services available at the university

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47. This statistic excludes graduate research and teaching assistantships. 10% of students report having a research assistant position as their main source of funding and 6% report having a teaching assistant position.

48. This disparity in student funding can be explained by the types of funding (public, private, granting agency, etc.), the funds allocated to research projects and the research culture, which differ greatly from one program to another.

that are appropriate to their needs or challenges (financial assistance, libraries, orientation, remedial education, psychology, etc.). On the other hand, the research supervisor is encouraged to offer professional development opportunities – both on and off campus – in order to promote the employability of supervisees (teaching or research assistantship contracts, participation in symposiums, writing papers, etc.) (Denis et al., 2019).

Considering the aspects of supervisory practice presented above, it appears that graduate students at one of the universities in the network are generally satisfied with their research supervisors. According to students, overall, the supervisors performed the role well,[49] and if they were to start their graduate career over, three-quarters (75%) would "definitely" or "probably" select the same faculty supervisor (CGPSS Survey, 2019).

5.3 The role of the program and its responsibilities

Programs play a "pivotal" role[50] at the graduate level: the conditions for success put in place by these institutions encourage student perseverance. As stated by Jutras and colleagues (2010), "supervision is not limited to the supervisor's action with regard to developing their student's research competencies" (p. 1).

In the network institutions, the programs have indispensable responsibilities in terms of the orientation and integration of students and the supervision of their progress. Not only is the program committee responsible for the curricula, the coherency and quality of course offerings, but it also ensures that students are recruited and selected and that they are offered a variety of competency development opportunities. Through these initiatives, which are adapted to the needs and requirements of today's society and labour market (Van der Maren et al., 2019), the programs support and encourage the student's progress in achieving their academic goals.

The literature documents an essential complementary responsibility of the program: to support the scientific socialization of graduate students from the time they enter the field.

> […] doctoral departments have been explored in terms of facilitating the doctoral experience by way of cultures and structures, demonstrating a capacity to foster not only doctoral student agency but also their skill development, socialization into academic communities, and consequently satisfaction and success. (Sverdlik et al., 2018, p. 375)

This support of the path can be translated into professional development opportunities (Sverdlik et al., 2018) or through activities that include the joint participation of students and research supervisors. These activities promote and encourage a dynamic intellectual environment and thus support the development

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49. According to the CGPSS, 85% of the UQ respondents agree or strongly agree that overall, the research supervisor performed the role well.
50. "In a paper prepared for the U.S. National Commission on Post-Secondary Education, Rhoades (2012) presents faculties, departments, and their members as essential to student development and fulfilment. He states that [it is important to] recognize the significant positive impact they can have on success, both in terms of the percentage [of students] who graduate and in terms of the extent to which the broad expected outcomes of each program of study are achieved" (Vasseur, 2015, p. 68).

of research competencies (Jutras et al., 2010). Similarly, in a survey of the employment realities of doctoral students, Ross et al., (2018) note that doctoral research programs benefit from including "more opportunities for external research partnerships for doctoral students, which [helps] better support them through various career paths" (p. 82). A Quebec consultation of doctoral students also showed that the enhancement of professional careers after the doctorate could be better supported by the programs, in particular by providing additional funding opportunities: scholarships, internships, etc. (Fonds de recherche du Québec, 2016).

The organizational, administrative or financial choices (sufficient staff, experience of faculty, etc.) of the programs can have an impact on the student experience. Several authors maintain that, oriented by a certain culture,[51] implicitly or not, the impact of these discipline-influenced decisions may play an even more significant role than interest in the discipline in the satisfaction and perseverance of the graduate student (McCallin and Nayar, 2012; Sverdlik et al., 2018).

5.4 The institution's role and responsibilities

In their book on the role of the university, Tremblay and Freire Vieira (2012) explain that, historically, the main mission of this institution is training and research. This role is gradually changing. The institution now has a sustained interest in the social sphere and in group and community development. The literature also expresses this focus on a student lifecycle approach where the student pathway to higher education is placed at the centre of institutional concerns.

As Jutras and his collaborators explained in 2010, the university is perceived "as the ultimate body for planning, deciding, controlling and communicating educational matters" (p.3). This training body assumes functions that have an impact on the overall quality of supervision through academic management activities within the units that are the programs, departments, and faculties (Université de Montréal, 2003) (Jutras et al., 2010, p. 3). With the increasing complexity of student profiles and pathways, challenges are emerging for academic institutions, particularly with respect to the adaptation of services and training (CSÉ, 2019, p. 43). In terms of availability of and accessibility to resources, it would be hoped that institutions offer the high-quality, adequate learning environment that is "essential to the success of studies at the master's and doctoral levels" (Jutras et al., 2010, p. 5). Institutions now coordinate and maintain personalized support services adapted to the stages of the student's academic path. To this end, institutions are also – in a related way and to some extent – responsible for ensuring the professional development of their staff, including encouraging them to stay abreast of the latest research (Vasseur, 2015).

Finally, institutions have political and financial responsibilities, which necessarily affect the training offered and the path taken by students. It should simply be noted that, in the network, "when asked about the financial support offered to students by their institution, professors were more likely to rate it as insufficient" (Couillard et al., 2018b, p. 12).

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51. What Litalien, in his thesis (2014), calls the departmental culture and the field of study.

6. Findings and drivers of graduate success

The main objective of this brief (Section 1 – Context) was to present an up-to-date portrait of what characterizes graduate student populations at institutions in the UQ network (Section 2 – Population). Through a review of recent theoretical considerations, university success as a process was made explicit and it was possible to review the research interests that have paved the way for today's research (Section 3 – Success). It should be noted that this exercise was not intended to review all the literature on the subject, but rather to analyze and address recent advances in terms of success and progression at graduate school. Thus, considering population characteristics and recent knowledge noted in the literature, success factors were then detailed (Section 4 – Factors). The roles and responsibilities of the actors involved in student success (the student, the supervising teaching staff, and all program and institutional staff) were then specified (Section 5 – Actors). Finally, Section (6) below provides an unprecedented interpretative look at the possible implementation of the theoretical assertions presented.

6.1 Findings

The following is a summary of the main findings presented in this scientific brief:

Diversification of the student population

The UQ network is seeing a growth in the diversity and plurality of student needs as they move through the graduate program (Section 1 – Context). This heterogeneity of the graduate student population and the growing diversity of their needs accentuate the emergence of individual and contextual challenges (Section 2 – Population).

Success as a transitional process

Success is not measured only by graduation; it is a direction, including all the stages of the study project, including its goal. The success of the study project thus includes the concept of perseverance. Success and perseverance in university studies are manifested in particular in the realization of a project, through a multi-factorial, progressive and transitory course, pathway or process (Section 3 – Success).

Synergy of graduate success factors

The review shows that the success factors influence each other. This perspective is prevalent in the literature. Since few studies focus specifically on graduate success, the correspondence between factors – regardless of their nature – is central to this analysis (Section 4 – Factors).

The factors that support success are many, and they are closely related to the student's personal background, the goals of their study project, the supervisory relationship maintained with their research supervisor (where applicable), their institutional and social integration, the personalized support offered by program and institutional staff, and their use of available services and resources (Section 4 – Factors).

In order to facilitate reflection on the theoretical findings of this brief, a summary section (Section 4.5) highlights seven categories of success factors. This table provides a review of the components of each determinant as well as a list of keywords.

Success as a collective concern

Guiding graduate students in their paths is a shared concern. The student, the supervising faculty, the program and the institution have specific and complementary responsibilities for student success. These responsibilities refer in particular to the importance of customizing the interventions and support offered, updating one's professional knowledge, and knowledge of other resources and services offered in the institution and its programs (Section 5 – Actors).

In light of these findings, can inclusive guidelines be produced to develop new measures or, to update or enhance existing measures and strategies to support student success?

6.2 Drivers of success

A review of the recent literature on the issue of graduate success has identified some **drivers of success** shared by all factors. Clearly, this interpretation is not aimed at uniformity of practice; each institution has its own distinct realities. For this reason, the proposed drivers are aimed more at harnessing the synergy of forces in the institutions for student success.

Five drivers were determined: **communication, collaboration, consolidation, coherence and recognition**. Each driver acts both independently and together with the others, to a shared end: to optimize the positive impact of the success factors on the study project. Each strategy put into action by each of these drivers is variable in nature and can be adapted to the student's path, the institutional context or the culture of the program.
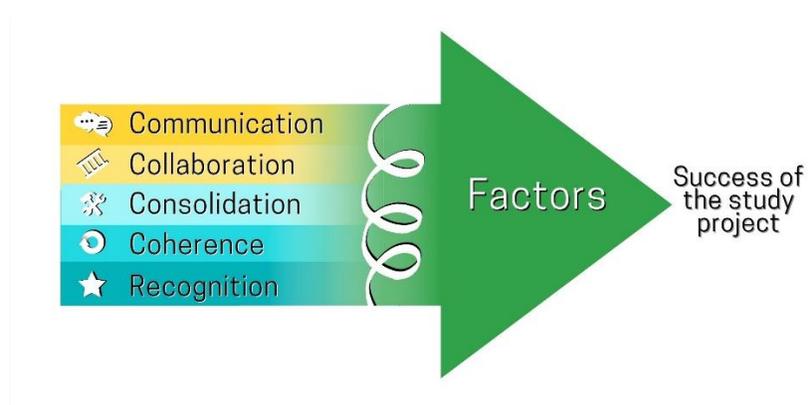

Figure 12. Representation of the interaction between the drivers of success of the graduate study project

COMMUNICATION

This driver relies on the quality of interpersonal and institutional communication as a determining factor of success. Considering that student success is a group concern, this driver supports the importance of placing at the heart of this process the interpersonal dialogue of all employees and students of the institution. The strategies and means of communication chosen and used must be adapted to the services offered, the needs of the student, and the skills of the parties involved. Fostering communication ultimately refers to fostering an institutional and programmatic culture of knowledge sharing, accessibility, transmission, dissemination and democratization of information.

Keywords: accessibility, awareness-raising, communication strategies, coordination, dialogue, dissemination, information, institutional, interpersonal, means of communication, promotion, sharing, transmission, etc.

COLLABORATION

This driver refers to the process of cooperation and contribution to exchange networks with students and with the institution's various internal partners (Brassard, 2016). At the graduate level, it appears to be crucial that knowledge sharing become a standard and implicit practice. The sharing of professional expertise or the pooling of knowledge between management and supervisors is desirable. One of UQ's strengths is that it involves its students in many of the decision-making processes, which can foster a work culture conducive to graduate success. The underlying social and interpersonal process encourages the student to achieve a higher level of reasoning and problem solving, and promotes a greater sense of self-efficacy.

Keywords: co-construction, committee, community (of learning, practice, research), complementarity, consultation, cooperation, dialogue, expertise sharing, group supervision, interdisciplinary, knowledge sharing, multidirectional, network, research team, supervisory relationship, teamwork, etc.

CONSOLIDATION

Consolidation is based on adjusting and improving practices or strategies already in place to support student success. More specifically, this integrative driver refers to the review of existing strategies and their enhancement or improvement and, in the event of a lack of existing strategies, the development of new measures. This posture implies taking into consideration the realities of the environment without aiming for uniformity of practices in all institutions. Consistent with the other drivers, the consolidation of practices is based not only on feedback from students and staff, but also on recent research findings.

Keywords: adjustment, aspiration, development, evaluation, feedback, improvement, modulation, optimization, proactivity, training (formal, informal), transformation, etc.

COHERENCE

Coherence appears to be fundamental to the operation and optimization of the effects of all the other drivers. It is clearly favourable for a common institutional culture to be put forward and conveyed by the institutions, and supported by the university community, personnel and external partner members (Wilson and Corr, 2018). Student success is at the centre of attention and acts as an anchor for coherence. Each person or department is called upon to direct their actions in accordance with the direction of the student's study project and in conformity with the values and culture of the program and the institution. In addition, the aim is to support initiatives aimed at harmonizing perceptions.

Keywords: clarity, community, culture (institutional, program, etc.), desire, flexibility, harmonization, modalities, perception, policy, process, vision, etc.

RECOGNITION

This driver contains important considerations for valuing and recognizing the individuality of the actors involved in success. The idea here is to promote the recognition of the possible and desirable contribution of each group of professionals that supports students. Each staff member has a distinct professional context, program or area of action. This recognition of disparities makes it possible to account for all the diversity and richness of possible modes of guidance and support. Valuing the expertise of each and every one of them thus appears to be conducive to success. Finally, recognition also refers to taking into account the individuality of the students and to customized support and guidance, adapted to the specificity of their needs: their path, their pace, and their discipline, to name only these.

Keywords: appreciation, context, community, customized, employee, expertise, interest, legitimization, path, reality, responsibility, validation, valuing, etc.

6.3 Possible further action

There are many structures, services and resources available to support student success at network institutions. In light of the factors, roles and drivers discussed on the preceding pages, we should ask ourselves about the impact of the findings. Considering the drivers outlined in the conclusion, it would be desirable to examine the best practices in graduate supervision and support that are already in place. How can they be optimized? How can they be adjusted to the realities and needs at the graduate level? How can we verify the benefits to graduate students?

That being said, given the global situation related to COVID-19 and the multiple repercussions envisaged, particularly in the cultural, economic, political, scientific, educational and social spheres, it goes without saying that the issue of educational success will have to be revisited in the light of updated data and studies in the coming years. What new factors for success will emerge as determinants of graduate education in a post-COVID institutional and social reality? It will certainly be interesting, for example, to see the advances and adjustments made in the area of distance education.

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