THE STATE OF THE MASTER'S DEGREE IN QUEBEC

REPORT BY THE ADÉSAQ COMMITTEE ON THE NATURE AND STRUCTURE OF MASTER'S DEGREE EDUCATION IN QUEBEC (PART II)

JUNE 2009

SUMMARY

This is the qualitative component of a report by ADÉSAQ (the Quebec association of graduate deans) regarding the nature and structure of master's degree education in Quebec, including the activities associated with that education. It complements the more qualitative first component.

A statistical snapshot of the 8,093-student Fall 2000 cohort, taken in the fall of 2005, shows that course-based master's students are more likely to graduate (72.4% obtained the degree) and graduate more quickly (6.2 sessions on average) than students enrolled in a research master's program (64.4%, 7.8 sessions). Discussion groups were formed in order to ascertain why these disparities exist. Fifty-four people, primarily instructors, research directors and graduate studies directors from the two major sectors, namely (1) natural sciences, engineering and health sciences, and (2) arts, humanities and social sciences, participated in these groups, along with a few recent research master's graduates and a few employers. Huguette Bernard, a retired professor from the Université de Montréal's Faculty of Educational Sciences, and Richard Prégent, former director of the pedagogical support program at École Polytechnique, facilitated the discussion groups and produced a report (set out in Appendix 2) that should fascinate anyone with even a passing interest in the challenges facing the research master's degree. The discussion addresses the following topics, among others:

- the ideal and actual (observed) purposes of the research-oriented master's degree;
- the skills imparted, the quality of the education, and the high expectations of employers;
- the programs' structure and the scope of the thesis;
- new characteristics of students;
- better informing students about the research master's degree, and improving candidate selection;
- funding and guiding students; and
- promoting the value of the training aspect of the research master's degree to professors.

Data regarding two new Canadian cohorts (1997 and 2002) have now been added. These data allow for more informative comparisons with the data regarding Quebec's 2000 cohort: Quebec universities appear to have improved their program completion times, and although Quebec's average remains higher than the rest of Canada's, one can see, by removing the data from Ontario, that the time to complete a master's degree in Quebec is similar to the time to complete a master's degree in Canadian provinces other than Ontario and Quebec:

University location	**1997**	**2002**
Canada, except Ontario and Quebec	8.6	7.5
Quebec	8.5	7.7
Ontario	***6.2***	***5.9***

In our analysis of the structure of Ontario's master's degree programs, we found that "doctoral stream" research master's programs are offered in two disciplines. This stream is similar to Quebec's accelerated admission practice (which offers a fast track to doctoral studies) except that in Ontario, it is clearly spelled out in the institutional documents; the curriculum is different from the master's with thesis; the very short duration (8-12 months) is specified; and successful completion entitles the graduate to a master's degree. In addition, Ontario's universities offer far more one-year professional or course-based master's programs that do not include a research project. The nature and structure of those programs make them similar to Quebec's DESS program.

The fifth chapter reports on the discussions about the nature, structure and activities of the master's degree in Quebec, with an emphasis on the research master's degree, and makes recommendations along the way. To sum up, we suggest that two research master's degree streams be recognized, a stream intended to educate highly qualified professionals, and a stream that provides a transition to doctoral studies; and that each stream have its own purpose and its own skills, objectives, curriculum, and graduation requirements. In our view, this distinction could alleviate the ambiguity currently experienced in the context of research master's programs. This ambiguity is closely tied to the conditions prevalent in the university research community — conditions that developed over time, partly in response to the productivity requirements of granting agencies and universities, but also in response to the productivity requirements of governments eager to prove that publicly funded university research is relevant to society. These external factors have had such an influence on the level of research output required of master's degree students that their studies might be mistaken for doctoral studies.

Lastly, we recommend that funding by the Ministère de l'Éducation, du Loisir et des Sports be reconsidered with a view to making it more consistent with actual program completion times.

In the Committee's opinion, Quebec's university community needs to have a thorough discussion about the research master's degree. A provincial conference, bringing together university and faculty administrators, program directors, professors, and the major federal and provincial granting agencies (among others) would be the appropriate forum for such a discussion.

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1. INTRODUCTION

This report is a continuation of a first report entitled *L'État de la situation de la maîtrise au Québec*, submitted in September 2007 by ADÉSAQ's Committee on the nature and structure of the master's degree in Quebec and the activities associated with that degree. The Committee's mandate, endorsed by ADÉSAQ, is to consider the nature and structure of the master's degree in Quebec and the activities associated with that degree, having regard to the Canadian and international context. In keeping with its mandate, the Committee employed methodology that aims primarily aimed to produce a document that discusses the issues and problems surrounding master's programs in Quebec, compared to programs of an equivalent nature or level in the rest of Canada (RoC) and the United States.

The first report began with an overview of the structures and regulatory duration of master's degree programs in Quebec, the RoC and the United States. The report also summarized the main objectives of Quebec's master's degree programs and the principal skills they seek to impart, compared these objectives and skills with the CREPUQ grid, and identified some similarities with the objectives and skills pursued by institutions in the rest of Canada. The last part of the Committee's report was a statistical snapshot of the situation, in Fall 2005, of the cohort of 8,093 Quebec students who had commenced a master's program in Fall 2000 at a Quebec university.

The first report was essentially quantitative. It contained enough findings to warrant a qualitative study, which is the subject of this second report. This second report summarizes the findings of the first report; provides additional information about the structure of programs in the rest of Canada, especially those in Ontario; draws a more detailed and informative comparison with Canadian master's-level cohorts; and synthesizes the results obtained from discussion groups regarding the research-oriented master's degree. It ends with an analysis and recommendations.

Committee members

The Committee members involved in the work from 2007 to 2009 are as follows:

- Jean Dansereau (Chair), Associate Director, Education and Training, and Director, Graduate Studies, École Polytechnique de Montréal;
- Pierre Lefrançois, Director, Education and Research, Université du Québec (headquarters);
- Norbert Morin, Associate Director (Graduate Programs), Education and Programs Office, Université du Québec à Montréal;
- Sonia Morin, Assistant to the Vice-Rector, Vice-Rectorate for Graduate Studies and Continuing Education, Université de Sherbrooke;
- Marie Audette, Dean, Faculty of Graduate Studies, Université Laval.

2. REMINDER OF THE FIRST REPORT'S FINDINGS

In order to better contextualize the work leading up to this second report, it is worth summarizing the findings of the first report.

The first report analysed the nature and structure of a sample of 26 master's programs in Quebec. Its first finding was that there are at least three types of master's program in Quebec, namely, course-based master's, research master's and applied master's (i.e. with internship) and that their structure is not homogeneous, since some involve a thesis but others do not, some involve a report but others do not, and some grant credit for the internship but others do not.[1] In addition, the standardized Quebec master's program has 45 credits, and the most frequently encountered normal duration (as stated in regulations) is six full-time sessions.

The comparative analysis of 63 programs from the RoC and the United States showed that their stated normal duration is roughly one session shorter than in Quebec, and that their structures are as diverse as Quebec's programs. However, this finding is partly based on estimates, so it needs to be validated by additional information on how activities other than courses (e.g. projects, internships, essays/major papers, theses, reports and capstone project/activity) are accounted for.

We found that there is a shortage of information about the objectives that graduating master's students in Quebec and elsewhere are specifically expected to meet, and the skills that they are specifically expected to have acquired. However, based on a preliminary analysis, the Committee found that the expectations regarding skills and skill levels set out in the CRÉPUQ grid (see Appendix 1) are generally high — perhaps too high — for master's-level studies, since some of them clearly belong to the doctoral level.

The Committee did a statistical study of the 2000 cohort, made up of 8,093 students enrolled in a master's program at a Quebec university.[2] This was the cohort's situation in Fall 2005:

Table 2.1 – General data – Fall 2000 Cohort (Snapshot in Fall 2005)

	Course-based master's (n = 4027)	Research master's (n= 4066)	TOTAL (n= 8093)
Graduation rate	72.4 %	64.4 %	68.4%
Average duration of studies	6.2 sessions	7.8 sessions	6.9 sessions
Dropout rate	23.9%	30.6%	27.3%
Students still active	3.7 %	5.0 %	4.3 %

Thus, in Quebec, the research master's program is markedly different from the course-based master's program: the graduation rate is lower, the program takes longer to complete, and the dropout rate is higher. Based on these disparities, the Working Committee determined that the research master's degree education should be examined in greater depth in order to ascertain its specific problems. To this end, discussion groups, consisting of professors, recent graduates, and employers, were formed. The groups met in the fall of 2008.

1 The program types, as defined in the first report, are as follows:
- Research program: most of the credits are granted for the project and/or thesis.
- Course-based program: most of the credits are granted for courses.
- Applied program: program with mandatory internship (*maîtrise avec stage*).

2 With the exception of Bishop's University, which offers only a handful of graduate programs.

3. BUILDING ON THE DATA FROM THE FIRST REPORT

3.1 A study about two new Canadian master's-level cohorts

Data concerning two new Canadian cohorts became available after the Committee's first report was published in the fall of 2007. Thirteen Canadian universities participated in a study of the 1997 and 2002 cohorts, and most of those universities participated in a similar study concerning the 1993 cohort. Table 3.1 sets out the graduation rates for the 1993, 1997 and 2002 cohorts.

Table 3.1 – Graduation rates (%) – Canadian study

Institution	1993	1997	2002
Quebec universities			
Université Laval	62.3	70.6	64.8
McGill University	78.2	79.3	77.7
Université de Montréal	64.8	61.7	65.4
Quebec	**66.8**	**68.5**	**69.1**
Universities in the RoC			
McMaster University	73.4	79.8	78.5
Queen's University	81.3	81.8	85.1
University of Toronto	82.0	80.5	82.6
University of Waterloo	77.7	84.4	82.9
University of Western Ontario	72.1	75.0	80.7
University of Alberta	68.0	63.5	71.5
University of Calgary	N/A	77.9	70.2
University of British Columbia (UBC)	N/A	73.0	73.3
University of Ottawa	N/A	N/A	N/A
Dalhousie University	N/A	N/A	N/A
Rest of Canada (RoC)	**77.5**	**77.4**	**78.9**
Difference between Quebec and RoC	**10.7**	**8.9**	**9.8**

It can be seen that the graduation rates of the 1997 and 2002 Quebec cohorts was higher than that of the 1993 Quebec cohort; there was an increase from 66.8% to 69.1%, a figure very close to the 68.4% graduation rate of the 2000 Quebec cohort (Table 2.1). However, all the institutions in the RoC that participated in the 1997 and 2002 cohort studies (except the University of Alberta's 1997 cohort) had graduation rates higher than the Quebec average, even though the difference between the Quebec and RoC graduation rates diminished slightly, from 10.7% for the 1993 cohort, to 8.9% for the 1997 cohort, and 9.8% for the 2002 cohort.

The following table compares the degree program completion times of the 1993, 1997 and 2002 cohorts, measured in sessions.

Table 3.2 - Average number of sessions[3] to obtain degree – Canadian study – Comparison between 1993, 1997 and 2002 cohorts

Institution	1993	1997	2002
Quebec universities			
Laval	9.5	8.5	7.6
McGill	9.9	7.4	7.0
Montréal	9.6	9.3	8.2
Quebec	**9.6**	**8.5**	**7.7**
Universities in the rest of Canada			
McMaster	6.4	6.4	6.1
Queen's	7.0	6.2	6.0
Toronto	6.5	5.8	5.7
Waterloo	6.7	7.1	6.4
Western	6.1	6.2	5.6
Alberta	8.3	9.1	7.7
Calgary	N/A	8.2	8.1
UBC	N/A	8.6	7.0
Ottawa	N/A	N/A	N/A
Dalhousie	N/A	N/A	N/A
Rest of Canada (RoC)	**6.8**	**7.0**	**6.4**
Difference between Quebec and RoC	**2.8**	**1.5**	**1.3**

This table shows that the 2002 Quebec cohort took an average of 7.7 sessions to obtain a research master's degree, compared to 9.6 sessions for the 1993 cohort. This 7.7-session completion time is still higher than the 2000 Quebec cohort's 6.9-session average.[4] Although the participating Quebec universities appear to have bettered their average completion time, that average remains below the average for institutions in the rest of Canada. By closely examining the data from table 3.2, one can see that Ontario institutions post a shorter completion time than institutions in other provinces, a characteristic that was not noticed in the first report. This characteristic becomes striking in table 3.3, which presents the same data from table 3.2, but organizes the data in three groups: Ontario universities; universities in provinces other than Ontario and Quebec (i.e. provinces outside Central Canada); and Quebec universities.

3 The average is weighted based on the number of students in each institution.

4 Excerpt from Report No. 1, page 20: "However, upon comparing the data from the 1993 cohort (Table 13) to the data from the 2000 cohort (Table 9), one can see that the average time to completion for the 2000 cohort (6.9 sessions) is lower than the 1993 Quebec cohort's average (9.6 sessions) and slightly higher than the average for institutions in the RoC (6.8 sessions). This difference between the average completion times of the 1993 and 2000 cohorts seems surprising. By grouping the data from the 2000 cohort by field of study in Tables 10 and 11 using the G10 study categories, one can see that the completion time in pure and applied sciences was practically identical for the 1993 and 2002 cohorts (roughly 8 sessions). However, there is a difference of roughly three sessions for the other fields (natural and health sciences, humanities, and social sciences). It is difficult to account for this difference. Was there a significant reduction of the completion time in these three fields, while the completion time remained almost identical in pure and applied sciences? Or was there a methodological factor that cannot be identified because of the limited particulars for the 1993 cohort? Given this context, it would seem prudent to limit our interpretation of the completion time comparisons between the 1993 and 2000 cohorts."
[*Translator's Note: The previous report is not available in English. All excerpts therefrom are translations*.]

Table 3.3 – Average number[5] of sessions to obtain degree – 1997 and 2002 cohorts
Comparison with Ontario and other provinces

Institution	1997	2002
Ontario universities		
McMaster	6.4	6.1
Queen's	6.2	6.0
Toronto	5.8	5.7
Western	6.2	5.6
Waterloo	7.1	6.4
Ottawa	N/A	N/A
Ontario	**6.2**	**5.9**
Canadian universities outside Ontario and Quebec		
Dalhousie	N/A	N/A
Alberta	9.1	7.7
Calgary	8.2	8.1
UBC	8.6	7.0
Canada, excluding Ontario and Quebec	**8.6**	**7.5**
Quebec universities		
Laval	8.5	7.6
McGill	7.4	7.0
Montréal	9.3	8.2
Quebec	**8.5**	**7.7**
Difference between Quebec and Ontario	**2.3**	**1.8**
Difference between Que. and Canada except Ontario	**- 0.1**	**0.2**

Thus, it is the Ontario universities' numbers that put the RoC in a better position than Quebec with regard to the average master's degree completion time: when the Ontario numbers are removed from the RoC numbers, the average is practically the same as Quebec's.[6] We will come back to Ontario's situation in section 3.3, where we propose an explanation.

3.2 Additional information on how activities other than courses are accounted for in master's programs in the rest of Canada

The Committee's first report contained the following finding about the structure and normal duration of master's degree programs in Canadian provinces other than Quebec:

> In the 63 master's degree programs outside Quebec with respect to which information is provided or estimated, the average number of credits required for a degree is 31 (30.7).

5 The average is weighted based on the number of students at each institution.

6 Factors other than structure (e.g. evaluation mechanisms, tuition fees and funding method) can influence degree completion time, but given the context of this study, it was not our primary interest to discuss such factors.

> In fact, only three entities (Harvard Epidemiology, Stanford Health Research, and Stanford Anthropology), or 4.8 %, report having 45-credit program, and 45 credits is the maximum for the 63 programs outside Quebec that were compiled. It should however be recalled that the number of coursework credits for several programs is an estimate based on the number of courses or hours referred to in the program description. The Committee intends to explore the subject in greater depth at the next conference of the Canadian Association for Graduate Studies (CAGS). (Page 8)
>
> A "credit" is a regulated and standardized concept in Quebec, and it will be interesting to obtain further information about the RoC in order to draw further comparisons, because there is no way to assess the value of a credit outside Quebec for the time being. Consequently, for now, there is no way to conclude that the number of specified or estimated credits assigned to the research project in research master's programs outside Quebec is representative of the actual workload. (Page 26)

At the 2007 annual conference of the Canadian Association for Graduate Studies, held in Moncton in October, the Committee did a survey of Canadian universities to find out how non-course activities, such as projects, internships, major papers, theses, reports and capstone activities, are accounted for in master's programs in the RoC. Eighteen representatives from other provinces participated in the survey. Their answers are summarized in table 3.4.

Table 3.4 – Weight given to non-course components in master's degree programs in the RoC

Research master's programs			**Course-based master's programs**		
1. Percentage of time for research component & thesis writing	11	51.6% 20% - 90%	3. Percentage of time for activities other than courses	10	23% 0% - 66%
	2	major component		1	more course work
	1	n/a		1	wide variations
				2	not available
2. Workload of research component & thesis writing	1	1 unit	4. Workload of activities other than courses	1	0-1 unit
	2	12 credits		3	0-6 credits
	1	33 credits		1	10-20 credits
	1	1.5 FCE		1	12 credits
	1	15 credit hours		1	1 credit
	1	6 units		1	3 units
	1	2 credits		1	0.5 - 1 credit
	1	3/10		1	2/10
	4	No/0/no answer		4	variable/No/0/no answer

Thus, in research-oriented master's programs, the average weight given to research (project and writing) is 50% of the program. However, the percentages reported by survey respondents ranged from 20 to 90%. Moreover, the quantified value of this component's weight is measured several different ways, including units, credit hours, FCE and credits. For the course-based master's, the weight given to activities other than courses ranges from 0 to 66%, for an average of 23%, and the quantified value of the weight of such activities varies to the same extent as with research master's programs. Thus, programs in the RoC might attribute what appears to be a very low value (e.g. one unit) to work that is obviously major in scope.

It is clear that the quantified value of this component does not reflect the amount of work involved, in contrast to the situation in Quebec, where the standardized credit tends to better reflect the workload related to activities other than courses. Since a credit is supposedly equal to 45 hours of student work in Quebec, the number of credits is tied to time spent on work, and therefore, to completion time. This conception does not necessarily hold true in the RoC for activities other than courses.

3.3 Additional information about the structure of master's programs in Ontario

In Quebec, the research master's program culminates in a second-cycle degree, which generally consists of 45 credits, more than half of which are devoted to research activities and thesis writing. Its published normal completion time is two years, and it is funded by the government over four sessions, on the basis of 11.25 credits per session.

Our desire to understand the structure of master's degree programs outside Quebec was strengthened by our desire to account for why Ontario master's students' *actual* completion times are different from those of master's students enrolled elsewhere in Canada.

First of all, based on a consultation with the University of Ottawa's Dean of Graduate Studies, the Committee was able to delineate two broad categories of master's degree programs in Ontario: professional programs (also called profession-oriented or non-research programs) and research-oriented programs. As an example, table 3.5 sets out the Committee's understanding of the characteristics of the two types of programs offered at the University of Ottawa.

Table 3.5 – A few characteristics of Ontario master's degree program types

	Profession-oriented	**Research-oriented**	
Type	Professional master's degree	Research master's (M.A. or M.Sc.)	
		With thesis (equiv. to Que. *mémoire*)	With major paper (equiv. to Quebec *éssai*)
Structure	10 courses x 3 credits (possibly an internship) Not a doctoral-stream program.	2-6 courses + thesis (120 pages)	4-8 courses + major paper (50 pages) Leads to Ph.D.
Examples	Occ. Therapy / Physiotherapy / Audiology Social Work / MBA / M.Eng / M.Ed.	Chemistry	Linguistics
Desired duration	1-2 years (3-6 sessions)	2 years (6 sessions)	1 year (3 sessions)
Actual duration		7 sessions	
Financial support for students (bursaries)	No	2 years (6 sessions)	1 year (3 sessions)
Government funding	27 BIU (Basic Income Units) / ($5-7 K)/session/student Maximum funding at master's level: 6 sessions (funding is reduced if duration is shorter)		

The dean in question took care to specify that his university also offers a few research-oriented course-only master's degree programs, such as the English program, which has a published duration of three sessions.

This information is consistent with that provided by the Postsecondary Education Quality Assessment Board (PEQAB)[7] in a document made available to program evaluators:

> **Profession-oriented** master's programs normally draw on students holding bachelor's degrees or first professional degrees from varied academic backgrounds and provide them with a selection of courses and exercises intended to prepare them for a particular profession or field of practice or, if they are already involved in the profession or field, to extend their knowledge base and skills as professionals/ practitioners. Examples: MSW (Social Work), MHA (Health Administration), MPA (Public Administration), MHRM (Human Resource Management), M. Eng. (Engineering).
>
> A **research master's** degree program builds on knowledge and competencies acquired during related undergraduate study and requires more specialized knowledge and intellectual autonomy than a bachelor's degree program. […]. Typically, programs are thesis-based and require the student to develop and demonstrate advanced research skills under supervision. Some programs are course-based and require students to demonstrate the necessary research, analytical, interpretive, methodological and expository skills in course exercises. Examples: M.A. programs in the humanities and social sciences; M.Sc. programs, MASc. (Engineering).
>
> Source: Quality Assessment Panel Report Guidelines and Workbook – Master's degree (February 2006) http://peqab.edu.gov.on.ca/pdf/MQAPpub2006.pdf

According to the Ontario Council on Graduate Studies (OCGS), there are three types of master's programs:

> 6.2 **Master's Degrees** – Graduate study at the master's level is offered through a diverse range of programs:
>
> 6.2.1 The **research master's** program in an academic discipline offered to the graduate with an honours undergraduate degree in that discipline is the most traditional sequence. Advanced courses and the challenge of doing intensive research, usually resulting in a thesis, major research paper or cognate essay, are provided as a means of developing the skills and intellectual curiosity required for doctoral studies and/or a leadership role in society.
>
> 6.2.2 The **course-based** master's program offers advanced training to a similar clientele. While this type of program does not require the performance of research resulting in a thesis, it must contain elements that ensure the development of analytical/interpretive skills such as research papers.

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7 The Postsecondary Education Quality Assessment Board is an arm's-length advisory agency that makes recommendations to the Minister of Training, Colleges and Universities of Ontario on applications for ministerial consent under the terms of the *Post-secondary Education Choice and Excellence Act, 2000*. In fulfillment of its mandate, the Board determines the criteria and procedures for its reviews, strikes expert and advisory panels, and undertakes any related research. The Board's criteria and procedures are contained in its Handbooks and Guidelines for three categories of applicants: (a) private, (b) public, and (c) Ontario College of Applied Arts and Technology.

6.2.3 The **professional** master's program offers to the graduate of any one of several honours or more general undergraduate programs a coordinated selection of courses in a range of disciplines and their application or related skills, in preparation for entry into a profession or as an extension of the knowledge base required of practicing professionals. Such programs also need to develop analytical/interpretive skills relevant to the profession.

Source: OCGS By-Laws and Procedures Governing Appraisals, Ontario Council on Graduate Studies, Revised January 2008, p. 14
(http://ocgs.cou.on.ca/content/objects/By-Laws%20&%20Procedures%20January%202008.pdf)

However, since the Ontario organizations' administrative documents make no reference to the normal duration of any type of master's program, we consulted various Ontario university websites to find examples corroborating the fact that some programs are 3-4 sessions in length, or even shorter. The following table provides a few examples but is in no way exhaustive.

Table 3.6 – Published duration of a few Ontario master's programs

Ontario university	Program	Official duration
McMaster	MA Studies in English	One year
	MA Anthropology – course-based	12 months
Queen's	Master program in History, Pattern II	Within 12 months
Toronto	MA Economics regular stream	8 months
	MA Economics doctoral stream*	8 months
	M.Sc. Geology doctoral stream**	One year
	Sociology (MA)	9 months
	Aerospace Science and Engineering (M.Eng.)	12 months
	Master of Environmental Science	One year
	Master of Urban Design Studies	One year
Western	M.Sc. Geology (accelerated)	One year
	MA French	One year
	Master of Social Work	One year
Ottawa	Master's in Health Administration	4 sessions
	Master's in Conference Interpreting	3 sessions

Two facts bear repeating. Firstly, the G13 study discussed in this report was about the 1997 cohort, so that study looked at programs that existed in 1997. Secondly, the one-year master's programs listed in table 3.6 are from current websites. Based on these two facts, the Committee has reason to believe that, by 1997, Ontario institutions had already aligned their master's programs with the American model, because most of the programs are 12 months in duration. Since these short-term master's degrees were included in the G13's Canada-wide study, it makes sense that they significantly reduced the average number of sessions required in order to obtain a master's degree in Ontario.

Furthermore, data regarding subsequent cohorts will most likely show a shorter completion time for a larger number of Canadian universities outside Quebec and Ontario, since, as table 3.6(b) shows, several of those universities now offer short master's programs.

Table 3.6(b) – Published duration of a few Canadian master's programs outside Central Canada

Canadian university outside Quebec and Ontario	Program	Published duration
Dalhousie	Social Anthropology (MA)	One year
	Master of Engineering (M.Eng) in Internetworking	One year
Alberta	Civil and Environmental (M.Eng)	9 months (min)
	Civil and Environmental (M.Sc)	12-18 months
Calgary	Master of Social Work	One year
	M.A. Economics	One year
UBC	Master of Social Work	12 months
	Master of Software Systems	16 months
	MA History	12 months
	Mechanical Engineering (M.Eng.)	12-18 months

Lastly, these short-term master's programs call for a discussion by the Committee's members, because these professional or course-based programs, which last one year, do not include a research project, are not necessarily pre-doctoral, and are similar in nature and structure to a Quebec DESS.

4. FINDINGS FROM THE DISCUSSION GROUPS

4.1 Methodology

The Fall 2005 snapshot of the 2000 cohort highlighted the fact that, in several respects, students enrolled in research programs did not behave the same way as students enrolled in course-based programs:

- lower graduation rate (64.4%, compared to 72.4%)
- longer duration of studies (7.8 sessions, compared to 6.2), based on an anticipated regulatory duration of 6 sessions (2 years)
- higher dropout rate (31%, compared to 24%)

Given the vast differences between the two types of master's programs, the Committee chose to explore the situation of the research master's program in greater depth by interviewing the stakeholders, namely professors who are program directors or research directors, as well as people who graduated recently (within the last five years) and employers.

ADÉSAQ entrusted the task of leading the discussion groups to two external facilitators: Huguette Bernard, a retired professor from the Université de Montréal's Faculty of Educational Sciences; and Richard Prégent, former director of the École Polytechnique's pegagogical support office. The meetings were held in the fall of 2008.

Sample size

54 people participated in the discussion groups. Here is a succinct breakdown of the persons interviewed:

- 39 professors, research directors or graduate program directors from the two major sectors: (1) natural sciences, engineering and health sciences; and (2) arts, humanities and social sciences;
- 10 recent graduates; and
- 5 employers.

The professors and the ten recent graduates were also from the two major sectors.

The employers who agreed to participate are from the natural sciences and engineering fields.

Themes discussed

Framework questionnaires were prepared for each stakeholder constituency. The details of the questionnaires are set out in Appendix 2.

The questions directed to professors, research directors or program directors covered three themes:

- the perception of the purpose and specificity of the training acquired as part of a research master's program
- the scope of the master's thesis
- the situation and practices of other national and international universities with regard to research master's programs

At the end of the discussion, the facilitators asked the professors for suggestions for ADÉSAQ.

The topics of the questions directed to the recent graduates were similar to those directed to the professors:

- the perception of the purpose and specificity of the education received as part of a research master's program;
- employability; and
- the perception of the scope of the master's thesis.

Recent graduates were also asked to make suggestions to ADÉSAQ.

Lastly, the employers were asked to discuss a single theme: the search for competent graduates. They were also invited to make suggestions to ADÉSAQ regarding the master's degree program.

4.2 The discussion groups' significant contributions

The discussion rapporteurs were the facilitators, Huguette Bernard and Richard Prégent. Their report to the Committee was so lively that the Committee has decided to make its full text available in Appendix 2. From page 28 onward, the facilitators summarize what appear to be the major orientations. In this chapter, we reproduce that summary in italics, and add some of the Committee's comments, which are in regular font and begin with a hyphen. We believe that readers will benefit from this presentation because it make it possible to get a broader view of what the facilitators themselves called an exercise involving *interpretation, choosing from among the opinions expressed, and highlighting the opinions that appear to be priorities*.

The facilitators' summary
The task of summarizing the discussions' major orientations required us to engage in interpretation, select opinions from among those expressed, and highlight apparent priorities. We have drawn up a list of positions that we hope are objective. However, we realize that ADÉSAQ and other constituencies interested in the issues surrounding the research master's degree in Quebec might view these priorities somewhat differently, in view of specific criteria or a particular context of interest to them.

We will be brief and will essentially go over our findings in point form. For each point raised, we will not repeat arguments already referred to previously. The reader can simply return to them. The twelve points that we list are not in any order of priority. They follow the structure of the questionnaire that guided the interviews.

***Ideal ultimate purpose of a research master's degree education**. The professors, research directors, program directors and graduates agreed that the ideal ultimate purpose of a research master's degree education is to introduce students to research. The objective should not be to advance knowledge or produce publishable research findings. The scope of the project should remain limited so that the purpose can be achieved within a reasonable time. All the graduates shared this view; none intend to pursue doctoral studies. Their intention is to directly apply, in their workplace, the scientific process and knowledge that they acquired.*

***Actual purpose as observed**. In practice, professors and graduates noted significant drifts from the ideal purpose. Granting agencies' authoritarian pressures on professors to publish articles based on the findings of research master's students are responsible in large part for these drifts. The no less authoritarian demands of universities, which also count the number of articles published by professors for the purpose of promotions, accentuate these drifts. Consequently, professors and students are sometimes torn with respect to the purpose of the research master's degree and the outputs. Science, health and engineering professors experience these drifts just like arts, humanities and social science professors. However, science, health and engineering professors seem to be much more heavily engaged in publishing research findings based on the work done by research master's students. There is a need for departmental discussions (similar to the discussion groups) regarding the purposes and drifts. Funding organizations should also be involved in similar discussions if things are to change.*

***Skills**. There was great concurrence regarding the skills that students should acquire over the course of a research master's program. Professors, research directors, program directors, graduates and employers referred to the deepening of knowledge and the mastery of the scientific process, combined with the development of several organizational, communications, relational, reflection, and personal skills.*

***Quality of training**. Professors, graduates and employers are satisfied or very satisfied with the general quality graduating students' training, at least as far as the deepening of knowledge and the mastery of the scientific process are concerned. However, employers are much more demanding when they cite graduates' deficient pragmatism and the organizational, communications, relational, reflection and personal skills necessary to meet the needs of current and future work-related situations.*

***Employers' high expectations**. Of all the groups of people consulted, employers probably have the greatest expectations of the graduates they hire. Their perspective is more pragmatic and hands-on and their expectations are in line with that perspective. They deplore the fact that universities, professors and graduates are not in sufficient touch with industrial realities, whose constraints are considerably more imposing than the academic vision of university programs. They recommend better cooperation with employers and suggest that the value of local and international internships be promoted to students.*

***Programs**. Certain research master's programs in Quebec — the number is difficult to determine — continue to demand that students take too many courses (over several sessions) and rack up too many credits. A better balance should be struck because this situation has a direct impact on the weaknesses and shortcomings identified in the first ADÉSAQ report on the research master's degree in Quebec.*

***Students' new characteristics**. Professors and employers noted the new psychological and sociological profiles of master's-level students. Among other things, the students are more hedonistic and more concerned about their living conditions both during and after their studies. This frequently affects their "productivity" and imposes additional supervisory constraints on the professors and employers.*

- It is true that Generation Y has arrived and is bringing its values to graduate studies. But the research master's degree experience is influenced by other factors as well. Arts, humanities and social science professors stressed the heterogeneous nature of their students. Many are mature students who are concerned about reconciling their work or work experience with their studies. Some have family-related concerns as well. International students are a growing constituency and have acculturation-related needs.

***Selecting candidates**. Professors and graduates believe that the selection of research master's candidates is too lax. Several students are not where they belong. This creates downward pressure on the general level of training, and makes professors' supervisory work more complex.*

***Informing students better**. We were told that students who sign up for a research master's program are poorly informed about what really awaits them. Clear, explicit and uniform information from the professorate should be shared promptly with students. This will motivate and comfort the people concerned and might persuade students who are not in the right place to reorient themselves.*

***Guiding and supervising students**. While professors expect universities to promote and enhance the value attached to the guidance of master's-level students, the students themselves (graduates) also call for better guidance as they progress. Specifically, they advocate for a combined and coordinated approach featuring better financial guidance, better "social" or "group" coordination to break isolation, better individual supervision by research directors, and better guidance to help students make the leap into the workforce.*

Promote the training aspect of a research master's education to professors. *Professors devote significant time to supervising and following up on their master's-level students. In fact, these duties require more of their energy than the same kind of work with their doctoral students. Unfortunately, universities and granting agencies are not giving much thought to this aspect of teaching and training, and professors themselves tend to devalue it, which has a demotivating effect. Professors and students demand concrete changes in this regard.*

- Professors did not provide more specifics. However, when they realized that this aspect of their duties is only taken into account by universities and granting agencies when the student's performance or output is exceptional, it seems to have come as a rude awakening. The day-to-day aspect of this role, which students feel is of primary importance to their training, and which eats up a great deal of professors' time, does not seem to be on the institutional radar.

Scope of thesis. *Professors and graduates believe that traditional thesis preparation is a very instructive process for students. If the research topic is well thought-out, the thesis is likely to be roughly 100 pages long. Professors and graduates do not have anything close to the same degree of interest in writing articles.*

Financial support. *Financial support for studies is a major problem for professors and students. Insufficient funding influences dropout rates and completion times. Funding is not stable; a different university funding infrastructure is essential. The universities and bodies concerned must pressure people in authority to review the situation.*

Ideas from abroad*. We have heard very few original, innovative, transferable and proven ideas from universities abroad that can help us deal with the flaws that ADÉSAQ cites in its first report on the research master's degree.*

- Professors from all sectors noted that foreign colleagues who host Quebec master's students are pleasantly surprised by the quality of their training. They also confirmed that US master's programs are much shorter than Quebec's and that it is important that Quebec master's programs be competitive with those offered in the rest of Canada and the US.

4.3 Participants' suggestions

As we have seen, all the discussion group participants were invited to make suggestions about the master's degree. The content of the discussions is shown in graphical form in table 4.1, and the details are in Appendix 2.

Table 4.1 – Discussion group participants' suggestions

		Science (etc.) profs	Arts (etc.) profs	Graduates	Employers
Objectives and skills					
•	Clarify the objectives of the RM and identify the skills	3		3	
•	Involve GAs in defining or confirming the purpose of the RM	3			
•	A common voice: GAs; university/faculty/departmental administration, professors and	3	3	3	
•	Retain the professional aspect to the degree because it is often a final degree	3			
•	Make the development of professional skills an objective			3	3
Training programs					
•	Strike a better balance between research training and publication	3			
•	Examine demands or expectations re publication	3			
•	Strike a better balance between the number of courses and the time allocated to research		3		
•	Make the coursework related to the project		3		
•	Reduce the number of courses and concentrate them into one session	3			
•	Tighten the guidelines regarding the scope of the research project	3			
•	Impose a page limit for theses		3		
•	Propose MA preparation in last year of baccalaureate studies by offering MA-level courses	3			
•	Have a research proposal submitted as soon as possible so that it is defined		3		
•	Periodically and formally follow students and their progress		3		
•	Encourage thesis defence		3		
•	Have students evaluate RDs' guidance		3		
•	Take account of diversity (disciplines, orientations, non-doctoral sectors, clienteles) within programs		3		
•	Increase the number of student support mechanisms, including dispute resolution		3	3	
•	Establish stronger ties with employers when designing programs				3
•	Make the courses more practical/applied				3
•	Encourage work/study internships and mobility, including international mobility			3	3
•	Tune programs with workplaces			3	3
•	Offer specialized student associations and opportunities for scientific exchanges			3	
•	Be more critical about one's institution's educational offerings in order to increase				3
Professors' role and guidance					
•	Clarify the role of professors in RM programs: trainer or producer of researchers?	3			
•	Support and promote value of guidance function of RM programs	3	3		
•	Establish a common vision of educational/training objectives	3			
•	Provide structured research guidance			3	
Students					
•	Increase stringency of selection criteria	3		3	
•	Better inform students re the various types of master's programs, their characteristics &	3	3	3	
Funding					
•	Review the way in which university studies are funded	3			
•	Tie scholarships to students' successful completion of program milestones		3		
•	Increase funding for graduate studies	3	3	3	

These suggestions elicited further discussion and form the basis of the recommendations set out in the next chapter.

5. DISCUSSION AND RECOMMENDATIONS

The nature and structure of master's degree education in Quebec, including the activities associated with that education, were at the core of the Committee's reflections. They formed the basis of the discussion and recommendations in this report, which are essentially about research-oriented master's programs.

The data from the first report yielded several findings which the Committee felt warranted a qualitative analysis of the research-oriented master's degree in particular. The findings were as follows:

1. The total number of credits for a master's degree is much lower outside Quebec (the estimate is 31 credits) than in Quebec (45 credits).
2. The duration of studies for a research master's degree in Quebec is 1½ sessions longer than a course-based master's degree (2000 cohort).
3. The graduation rate for for such a master's degree in Quebec is 8% lower than for the course-based master's degree (2000 cohort).
4. The dropout rate from research-based master's programs is 7% higher than from course-based programs (2000 cohort).

It bears repeating that, in Quebec, research-oriented master's programs lead to a second-cycle degree that generally consists of 45 credits, more than half of which are devoted to research and thesis writing. Their published regulatory duration is two years, and they are funded by the government over four sessions at a rate of 11.25 credits per session.

5.1 The nature of a research master's degree education

As stated in the Committee's first report (September 2007) on page 8, the terms "skills", "objectives", "ultimate objectives" and "purposes" are still being clarified, and are sometimes used interchangeably or without a uniform definition. The Committee does not claim to be able to eliminate this ambiguity. It hopes to be forgiven for this, and invites readers to bear the ambiguity in mind and substitute one term for another when this seems advisable.

There is only one iteration of the ultimate objective of the research master's program: an introduction to research. Whether one consults the administrative or promotional documents published by the universities, or whether one asks professors, research directors/supervisors or program directors, the answer is unanimous. This ultimate objective is valid in theory but is not borne out in practice, due to

(1) the major funding agencies' indirect pressure on research directors to require that their students do work that yields publishable results. This pressure is addressed in the study entitled A Profile of Master's Degree Education in Canada, published by the Canadian Association for Graduate Studies, notably on page 13:

> Indeed, some interviewees suggested that another trend in master's-degree education involves a change in its primary function: while it was once most concerned with introducing students to research techniques and practices, the focus has increasingly been on encouraging students to produce original contributions to a scientific field. Many of the deans interviewed suggested that more than ever before, students in research-intensive programs are publishing in peer-reviewed journals and participating in scientific conferences as presenters. In some natural science and engineering fields, master's theses are published in peer-reviewed journals. In addition, interviewees indicated that students who have had their research published are more likely to be admitted to a doctoral program and are more likely to received funding for their doctoral studies. This trend has had a considerable impact on the scientific research output of faculty thus improving the research capacity and reputation of Canadian universities and increasing the associated rewards.

(2) the requirement that students who are applying to a funding agency for a doctoral-level merit scholarship demonstrate their research potential in presentations and written communications while they are still master's students; and

(3) the requirement that bachelor's-level students who are applying for a master's-level merit scholarship also demonstrate their research potential, notably by drafting a research project proposal and by acquiring concrete research experience (internships, papers/presentations, etc.) before even starting their master's program.

This inflationary demand for publications from research directors and students is such a spiralling trend that it could be difficult to reverse, especially in engineering and the health sciences and natural sciences. The fact that agencies and universities have responded by enabling students who are interested in research to develop their research potential as early as possible only confirms this trend. For example:

(a) Three of the six funding agencies (NSERC, CIHR and FRSQ) offer undergraduate introductory research scholarships, and universities are asking the three other agencies (SSHRC, FQRNT and FQRSC) to offer similar programs.

(b) Some bachelor's-level programs permit research activities for credit.

(c) In some disciplines, students can take master's-level courses at the end of their bachelor's degree programs and have their coursework count toward their master's degree.

(d) More bachelor's-level students are being given the opportunity to disseminate their work.

(e) Some bachelor's-level students are being hired as research assistants.

These responses by three of the agencies and the universities are appropriate because they enable students to acquaint themselves with research while they are still undergraduates, thereby giving them an edge when competing for merit scholarships. Naturally, the scope and characteristics of these responses vary depending on the sector and discipline. Nonetheless, a master's degree education is no longer the only way to acquaint oneself with research. However, a doctoral education is the only way to be certain of producing original (and therefore publishable) data.

That said, what *are* the objectives and skills of a research master's program? The participating professors and recent graduates almost unanimously said that they are as follows:

- to deepen the student's understanding of a discipline or subject by solving a research problem (whether chosen or imposed);
- to deepen the student's familiarity with the research process and enable the student to master a research methodology;
- to acquire autonomy, a work method, and a capacity for analysis and critical thinking; and
- to master oral and written communication skills.

The skills and objectives referred to above are consistent with the skills and objectives from the 17 research master's program descriptions set out in table 6 of the Committee's first report (page 16), notably points 1, 2, 4, 5 and 6.* In the table below, we reproduce solely the objectives and skills identified for a research master's program:

Table 5.1 – Objectives and skills identified in a Sample of Quebec research master's degree programs

Objectives and skills	***Number of instances (out of 17 programs)***
1. Acquire and deepen theoretical knowledge and concepts related to field of study	*8*
2. Acquire the skills necessary to apply methodologies to research and analysis	*11*
3. Develop and improve abilities and skills necessary to practice the profession	*1*
4. Acquire and develop a more detailed understanding of methodological concepts	*5*
5. Disseminate results	*1*
6. Develop critical thinking and reflection	*1*
7. Prepare for doctoral studies	*2*

*We will come back to objectives and skills #3 and #7 later in this section.

However, recent graduates referred to other skills and objectives which they were seeking when they enrolled in a research-oriented master's program (and which they sometimes found):

- learn to manage a major research project;
- learn to transfer theoretical knowledge to a concrete set of problems;
- become a more attractive candidate for jobs they consider interesting;
- professional skills, such as a sense of responsibility;
- relational skills, such as openness to other viewpoints and an ability to interact with partners;
- personal skills, such as rigour, perseverance and self-criticism.

It should be added that, on the whole, the participating recent graduates said that they were satisfied with the training they received in the course of their programs, and feel comfortable in their current jobs.

In the employer discussion group, the issue of the skills that should be acquired or developed during a research master's program arose during discussions about the qualities that the employers seek in the research master's graduates that they hire. From the outset, the employers admitted that they preferred candidates with a master's degree over candidates with a bachelor's degree because they expected people with a master's degree to have specialized knowledge in their field of study. However, in the same breath, they added that theoretical knowledge alone was insufficient and that they wanted that knowledge to be combined with practical knowledge. In their view, an ideal master's graduate would have the following skills and abilities:

- the ability to meet deadlines that are often quite tight, and to manage the related stress;
- mastery of at least two languages (French and English) and preferably a third in order to get access to international markets; and willingness to be internationally mobile in order to meet global challenges;
- the ability to make decisions, take risks, face one's limits and analyze one's failures, and a willingness to pursue continuing education;
- a great degree of independence;
- the ability to lead multiple and often multidisciplinary work groups, harmoniously manage interpersonal relationships, and demonstrate a positive attitude;
- a thirst for constant self-improvement, and pride in such self-improvement;
- an enterprise-oriented outlook and an adherence to the enterprise's organizational culture.

This long list of skills sought by employers contains several elements that recent graduates were seeking. Other skills clearly stem from organizational concerns, and it is questionable whether universities should bear sole responsibility for responding to those demands.

In fact, some of the skills sought by recent graduates and employers are about adapting education to the workplace. However, only terminal degree programs, intended for graduates who will be entering the workforce, are really meant for this. Table 5.1 leaves out two elements that the discussion group participants did not raise:

3. Develop and improve the abilities and skills necessary to practice the profession.
7. Prepare for doctoral studies.

These objectives and skills are more like descriptions of the objectives, or perhaps even the purposes, of a research master's degree program. The same two objectives can be found in the CREPUQ competencies grid, under *Structure globale du programme et résultats attendus* [Overall program structure and anticipated results] (Report 1, Appendix 2):

> *Research-oriented master's degree programs are generally offered to people who have completed an undergraduate or professional degree in fields related to the discipline, or to students who have taken propedeutic courses to qualify them for a master's degree program in the discipline in question. The principal objective is to develop analytical, methodological, research, interpretive and presentation skills necessary for doctoral studies or for a leadership position in society.* (Report No. 1, Appendix 2, page 32. Emphasis added.)

As the recent graduates reported during the discussion groups, this dual purpose for a single program has repercussions on the education that students receive as part of a research master's program:

> *. . . even if they did not want to pursue doctoral studies, they were aware that their professors were hoping to train researchers. (page 21).*
>
> *Several graduates got the impression that there is confusion between the objectives of a master's program and the objectives of a doctorate. Professors tend to demand more of students than necessary. One graduate asked, "Are professors plotting mini-doctorates at the master's level because few students go on to complete a doctorate?" (page 23)*

In section 3.3 of this report, we have seen that Ontario has at least three distinct types of master's programs that involve a research effort: the thesis stream and the major paper streams (both of which are terminal) and the doctoral stream, which is seen as part of the continuum of studies leading to a doctorate. Table 5.2 sets out the descriptions of the doctoral stream in two research master's degree programs at the University of Toronto:

Table 5.2 – Description of the doctoral streanm in two master's degree programs at the University of Toronto

ECONOMICS - M.A. Programs	**GEOLOGY**
. . .	
Doctoral Stream (8 months in duration)	**Master of Science (M.Sc.)**
The department has created a special stream for a limited number of students with a strong background in economics and mathematics who are seriously considering pursuit of a Ph.D. in economics. Each candidate in this program must complete eight half-year graduate courses, including the three core courses: micro, macro and econometrics. Students admitted to this stream are expected to take and pass the intensive three-week review of math and statistics for Ph.D. students given in late August (ECO 1011H). They must also complete at least one of the following Ph.D. sequences: microeconomics (ECO 2020H and ECO 2030H), macroeconomics (ECO 2021H and ECO 2031H), or econometrics (ECO 2400H and ECO 2401H) and the associated tutorials. Doctoral stream M.A. students are eligible for the guaranteed funding package offered by the University of Toronto.	The department of Geology offers two types of M.Sc. degree. The first type is the regular research master's (or doctoral-stream master's) that involves a mix of research and coursework. The research component is substantial, but requires a research report and presentation/defence rather than a formal written thesis (see M.A.Sc., below). The doctoral-stream M.Sc. program is usually completed in one year and students are guaranteed funding for at least one year.
Source: http://www.economics.utoronto.ca/index.php/index/graduate/maprograms	. . .
	Source: http://www.geology.utoronto.ca/students/graduate-students-1/degrees

This table is very telling for the following reasons: (1) In both doctoral stream examples, the student is awarded a master's degree; (2) in both, the curriculum is specifically designed to prepare students for a doctorate; (3) the curriculum is essentially course-based and there is no research project to complete; and (4) the published duration varies from 8 to 12 months.

Clearly, the University of Toronto's approach with these doctoral-stream research master's programs is to offer a fast track to a doctoral education for students who would like to become researchers. There are at least three positive consequences to this:

- the master's graduation rate has increased in record time;
- students who demonstrate an interest in becoming researchers get clear encouragement to pursue doctoral studies, and this is likely to boost the recruitment of students to this left of study, where the fullest extent of research is possible, thereby advancing knowledge through significant and therefore publishable results;
- it is taking less time (one or two years less) to train researchers.

This doctoral stream is similar to the growing Quebec practice of fast-tracking students to doctoral studies without having to write a thesis but instead undergoing a test in which a jury can evaluate their potential as successful doctoral students. Through this practice, universities are acknowledging that there are indeed two research master's paths: one path which is designed to train highly qualified professionals, and requires a thesis; and another path, a pre-doctoral path, for which specific requirements are established.

In the Committee's view, the appearance of these two paths, even if they are not specifically delineated in the panoply of research master's programs, underscores the fact that the objectives or skills called "Develop and improve the abilities and skills necessary to practicing the profession" and "Prepare for doctoral studies" have, in time, become purposes of a research master's education, and that each of them requires a distinct curriculum. The issue of curriculum will be explored in greater depth in section 5.2.

Recommendation 1

Universities should offer two distinct research master's degree streams, each of which has its purpose:

- **a stream to train highly qualified professionals, intended primarily to train professionals through research, so that they can do research work;**[8]
- **a doctoral transition stream the purpose of which is to prepare students properly for doctoral studies.**

If such a distinction were recognized and implemented, it could answer several questions, address several and problems and offer numerous benefits:

- It would enable students, who wish to pursue graduate research studies, make an informed choice based on their educational and career objectives.
- It would enable students who want a doctoral education to prepare adequately for it in a reasonable amount of time;

[8] This stream should also offer access to doctoral studies, even though the doctoral transition stream would be specifically designed for that purpose.

- It would boost doctoral student recruitment:

  Moreover, most of the persons who were present found that a doctoral education is much too long in relation to its benefits. After obtaining a research master's degree, a person can enter the workforce, earn a salary much higher than a doctoral candidate, and even do applied research. (page 20)
- It would enable professors to guide their students based on the stream that they have chosen (profession-oriented stream or doctoral transition stream);
- It would formalize the practice of fast-tracking master's students to doctoral studies and acknowledge the value of this fast track by conferring a master's degree;
- It would reduce the duration of research master's studies and the duration of doctoral studies;
- It would restore the doctorate's special pedigree associated with the production of original knowledge.

If the two research master's degree paths are formalized as streams, the skills to be developed in each stream can be identified more accurately and purposively.

Consequently, for the stream intended to train highly qualified professionals, certain skills will seek to achieve a successful transition to the workforce, i.e. ensure that graduates are highly employable as professionals trained to do research. This approach will ensure that this stream is truly responsive to the wishes of the recent graduates and employers who took part in the discussion groups.

As for the doctoral transition stream, the skills are likely to be more academic, since the purpose of this stream is to prepare students for doctoral studies, and the professionalization of training will happen at the doctoral level, whose purpose is to train researchers capable of working autonomously. In addition, since the development of skills is measured in terms of master's levels, these levels will need to be clearly identified when defining the skills to be imparted in the two research master's degree streams.

<u>Recommendation 2</u>

CREPUQ and universities should revisit and clearly define the specific skills of each of the two research master's degree streams and the extent to which each skill should be mastered. They should also ensure that the skills and skill levels are faithfully reflected in all research master's degree programs, with proper regard for the disciplines in question.

In addition, the Committee agrees that an introduction to research can be offered as early as the bachelor's level with a view to identifying candidates who have research potential and have shown an interest in master's or doctoral-level research education. Several options are already in place and others are being developed.

Recommendation 3

With proper regard for the disciplines in question, universities should recognize that introduction to research can be an objective of a bachelor's degree program, and, where such an objective is appropriate, it should be reflected in the program description.

As another measure to nurture students' interest in research master's-level studies, certain institutions have started to implement a ramp between the bachelor's degree and the research master's degree in certain disciplines where it is clearly appropriate to do so. This practice fills in a gap because Quebec has ramps between all the other levels, i.e. between the vocational DEC and the bachelor's degree, and between the master's and doctorate.

Recommendation 4

Universities should put in place the structures of a ramp between bachelor's-level and research master's-level studies in disciplines where this has been shown to be appropriate.

Recommendations 3 and 4 have several benefits for universities, professors and students:

- Students will be better informed and prepared for research master's studies.
- Merit scholarship candidates would have a far more substantiated record showing research potential, making them far more competitive.
- The time spent introducing master's-level students to research would be shorter.
- Research activities should be undertaken more quickly.
- Research supervision and guidance would be be less demanding.

5.2 The structure of the research master's degree program

According to Legendre's *Dictionnaire actuel de l'Éducation*, 2nd ed., the purpose of an education is to form a human being, and this purpose precedes and therefore orients the nature of the education and the things that are done as part of the education (page 613).

The actions tied to the purpose of an educational program are (1) the pedagogic activities which together constitute the program and are intended to achieve the program's purpose; and (2) the assessments of the extent to which the purpose has been achieved. These constitute the program's curriculum.

It is worth recalling each of the two streams proposed in Recommendation 1 and their specific purposes:

- A stream to educate highly qualified professionals, the purpose of which is to train highly qualified researchers through research.
- A doctoral transition stream, the purpose of which is to prepare students properly for doctoral studies.

As mentioned in the preceding section, each proposed stream needs to have its own curriculum. The stream in which highly qualified professionals are educated is quite close to the research master's degree in its current form, whereas the doctoral transition stream corresponds to the accelerated admission available at several universities. At the end of their curriculum, students will have to prove that they have achieved the purpose of the stream that they have selected. The form of this proof (test) will differ depending on the stream, as with the research master's with thesis and the accelerated admission (fast-track) process.

Recommendation 5

If it is agreed to implement two distinct research master's degree streams, universities should require a demonstration that the purpose of each stream has been achieved:

- **for the stream in which highly qualified professionals are educated (mainly for the purpose of training research-ready professionals through research) students should demonstrate, in a thesis, that they can apply the scientific method to a research project appropriate for the degree in question;**
- **for the doctoral transition stream (the main purpose of which is to prepare students properly for doctoral studies) students should have to show, both orally and in writing, their aptitudes and potential to complete a research project that is sufficiently extensive and original to constitute a doctoral thesis.**

The Committee is aware that the discussion groups did not consider the doctoral transition stream, though the accelerated admission (fast-track) process was addressed a few times. Consequently, the Committee will critically examine participants' comments and suggestions regarding the master's degree curriculum, and will comment on them, bearing in mind the need to distinguish between two research master's streams.

The courses

With respect to courses, the professors who took part in the discussion groups suggested that students be able to begin devoting their time to their research and thesis writing as quickly as possible. Consequently, they feel it is essential that the course component of master's programs be condensed into the beginning of the curriculum so that it can be completed in the shortest number of sessions possible. This suggestion might be difficult to implement in practice, because some programs cannot always offer certain courses annually and because, at several universities, students can commence their master's program in any session, thereby making the course offering even more complex to manage.

Arts, humanities and social sciences professors said that it would sometimes be good to tie certain mandatory coursework to the student's research project in order to prevent intellectual dispersion, which has an adverse effect on research productivity and makes it harder for students to focus on their thesis writing. Naturally, the courses in question are those intended to teach and explore the details of the scientific method, not those intended to acquaint students with other disciplines. This suggestion could be implemented relatively easily if the course sequence favours a prompt choice and delineation of the research project topic.

The participants' suggestions regarding courses can apply to both proposed streams.

Research project and thesis

Professors who were asked about the scope of the research project placed considerable emphasis on the quasi-authoritarian pressures that major funding agencies indirectly exert on research directors to require their students to obtain publishable findings from their research projects. As a student participant mentioned, students can feel this pressure to publish at the master's level:

> *. . . his director clearly explained to him that objective of research master's-level work is to publish. (page 23).*

The study entitled A Profile of Master's Degree Education in Canada, published by the Canadian Association for Graduate Studies in 2006, also refers to this preoccupation, on page 13:

> It was noted that some master's students take three to four years to complete their degree programs. . . . Other students may stay longer (up to an extra year) in order to produce original research for publication. [Emphasis added.]

In particular, natural science, engineering and health sciences professors acknowledge that the selected research paper topic must be extensive enough to advance knowledge and produce valid, publishable results, often on a co-authorship basis. They feel that the research director's ambition quite tangibly shapes the work students are required to carry out. And since "publish or perish" clearly plays a large role in the magnitude of the master's thesis (especially in this sector) the need to publish many scientific articles, which tend to have a positive effect on grant applications from professors who are competing for funding from the major councils, means that research directors tend to supervise theses in such a way that the work ends up being extensive enough to be considered a mini doctoral thesis. Students, of course, pick up on this, and put their heart and soul into their projects. This pressure to publish is so significant that some professors have even admitted that they are prepared to support their students financially over a longer time frame to improve the quality of findings, and that they felt justified in imposing a requirement for publishable results because provide remuneration to their students. In the same breath, the professors deplore this *spiralling inflationary obligation to publish articles containing research master's students' results. This obligation is forcefully promoted by funding agencies in making or renewing grants. Moreover, it is reinforced by the universities themselves in the context of probation and promotions in academic careers* (page 6). At least in the natural sciences, engineering and health sciences field, the logic of this inflationary spiral accounts for some of the magnitude of the thesis and the time that it takes to complete the research master's degree.

> *One professor brought up a feeling that seems to be shared: a sense of duty to publish in order to maximize the return on each funding dollar. This considerably increases the scope of the research problems addressed, not to mention the passion and intellectual ambition that the students invest in the research. (Comments of natural sciences, engineering and health sciences professors, page 6.)*

Arts, humanities and social sciences professors also acknowledge that funding agencies pressure them to publish thesis-based scholarly articles. However, the reality of student research projects in this sector is different, because it is not unusual for students to have a research project with no direct connection to their director's research. And in this sector, articles are usually published after the thesis has been written. Moreover, several professors in this sector question the scientific or scholarly value of writing articles based on master's theses, because such articles, which are sometimes minor, could simply encumber journals. In fact, the professors assert that "*the entire question of producing articles in the course of a research master's program needs to be reconsidered, and research should only be done at the doctoral level.*" (page 11).

Lastly, it should be added that where there is no doctorate coming after a master's degree, research directors have more stringent requirements.

The discussion group participants also addressed the form of the thesis (i.e. dissertation, or thesis by articles) and its length. Several participants decried the notion of a thesis by articles, which stems from pressure to obtain publishable results. Instructors and recent graduates believe that traditional thesis writing is one of the most educational exercises for students, notably because a thesis is the instrument by which to prove to a jury that the objectives and requisite skill levels of the research master's degree have been met. As for the number of pages, most of the professors consulted feel that it should be somewhere near the magic number of 100. Recent graduates' experiences varied considerably, depending on the discipline and individual. Some graduates were required to shorten their thesis so that it would be closer to the magic number, even though they would have preferred to write a longer thesis. Others had to learn how to better argue, demonstrate and structure poorly constructed aspects and therefore lengthen documents that lacked clarity or substance. For employers, the question of whether the thesis is in the form of a dissertation or articles was not a concern; rather, their focus was on the practical and applied aspect of the student's training, which suggests that action research or "case-based" theses might be preferred.

In the committee's opinion, the research project and thesis, as discussed by the groups, are part of the professional-stream research master's program [as opposed to the doctoral transition stream] and should be regarded as the academic means by which to achieve the purpose of a research master's education: to train highly qualified professionals through research. In order for students to demonstrate that the purpose of this stream has been met, they must prove to a jury that they have been able to apply the scientific method to a research project. A research project that is narrow in scope is amply sufficient for this, and there is no reason to require the student to obtain original results (a requirement of a doctoral degree) or to publish. And that is what several participating professors opined, and what at least one recent graduate experienced:

> *A few professors say that if a student clearly wants a career in research, and to publish at the master's level, the student should be oriented to a doctoral ramp. (page 8)*
>
> *. . .*
>
> *One graduate, who seems to have had a good director, said the director quickly specified that the student "was doing a master's degree, not a doctorate", that it was not his role to advance knowledge, but rather, his opportunity to learn and apply a scientific process. The student finished his studies within the anticipated time. (page 23)*

It will probably be difficult to reduce the scope of research projects entrusted to students enrolled in a regular research master's program. In the Committee's view, one way to facilitate this would be to address the question by holding discussions in such a way that professors are included as stakeholders. As for recent graduates, they deplored the fact that the requirements governing the scope of issues addressed in a thesis were not necessarily consistent within a given department, and that they sometimes even differed from one co-director to another. Arts, humanities and social science professors echoed this view; they feel that the scope of the research project and the length of the thesis should be discussed within each department so that all the professors can unite behind a consensus. For multidisciplinary programs where consensus tends to be harder to achieve, the professors feel that senior academics should take on an appropriate role so that students are not overwhelmed and delayed.

[Translator's Note: The two proposed research-oriented master's degree streams will be called "professional stream" and "doctoral transition stream" below for the sake of brevity because they have already been defined.]

Recommendation 6

Universities should initiate discussions about the need to lighten requirements governing the magnitude of the master's research project, and, accordingly the magnitude of the master's thesis, which should not be a mini [doctoral] thesis. The players that the universities consider most appropriate should be made part of these discussions.

Recommendation 7

The research project in the professional-stream research master's program should be defined as quickly as possible (within a session or two) and its scope should be validated by a committee or jury in keeping with the purpose of the stream and the requirement that this purpose be demonstrated. All of this should be done in such a way that the program is completed within its published duration.

Recommendation 8

Universities should recognize that one does not need to obtain original results or publish in order to demonstrate that one can apply the scientific method to a research project as part of a professional-stream research master's degree program.

There are many benefits to Recommendations 6, 7 and 8. These recommendations

- clearly emphasize education in the research master's program and distinguish it from a doctorate, one of the fundamental objectives of which is to add to existing knowledge;
- end the feeling of being torn between investing time in students' education and investing time in producing results for scientific publication — a feeling brought up by certain professors during the discussion groups;
- shorten the duration of research master's-level studies; and
- avoid using up a student's research topic by getting the student to write a mini doctoral thesis.

Activities other than courses in the pre-doctoral research master's stream

As we have said, the Committee's proposed pre-doctoral or "doctoral transition" stream is similar to the "accelerated admission" or "fast track" to doctoral studies. While a thesis is quite possibly THE academic method for a jury to assess whether the purposes of a professional-stream research master's program have been achieved, the method utilized for the doctoral transition stream could be a written and oral presentation to a jury. If these presentations are found satisfactory, they would entitle the student to a master's degree. In fact, the Committee believes that only one further step would be needed in order to formalize this practice, since the Quebec universities that authorize it have already set up a solid framework for it. At least one university in Quebec confers a master's degree on students who opt for the fast-track process, subject to certain conditions. Here is how that process works at that university:

- all the master's-level course requirements prior to the accelerated admission are taken into account;
- the document prepared by the student to justify his or her application for accelerated admission is considered, as is the student's oral defence of that document;
- all doctoral course requirements, including the comprehensive examination, must be completed;
- at least 45 credits must be earned from the above activities.

Although each university needs to have detailed discussions in order to formalize the doctoral-transition research master's degree and must fit that stream into its institutional culture, the Committee feels that the practice of the Quebec university in question offers several helpful avenues that should be used. The 45 credits referred to above should be understood in conjunction with section 5.4 of this chapter.

Recommendation 9

Universities should define the terms and conditions for conferring a "doctoral transition" research master's degree and an educational curriculum for the doctoral transition stream.

In all cases, and for both streams, the Committee believes that research master's students' activities should be organized coherently. In this regard, several research master's programs require students to prepare an education plan or roadmap setting out the courses and stages of the program and a timeline for their completion and evaluation. The plan is submitted to the student's research director and to a suitably empowered and qualified supervisory or program committee. The most obvious advantage of such a plan or roadmap is that it expressly states the requirements of the education in which the student is embarking, for the benefit of the students and has or her research director(s).

Recommendation 10

Quebec universities should adopt progress-monitoring tools (such as education plans, roadmaps and major milestones) across the board for both research master's degree streams, with due regard for each discipline.

The Committee is aware that funding agencies' marked tendency to demand publications will not be easy to reverse, but it is important that universities make joint efforts in this regard.

Recommendation 11

Universities should join forces and make representations to raise funding agencies' awareness of the negative effects of research funding requirements associated with the work done by research master's students.

5.3 An educational framework for research master's students

The guidance and structure provided by research directors and the learning environment, is crucial to a student's success. In the Committee's opinion, this guidance and structure, which will be called an educational framework, consists of a set of pedagogical, scientific, interpersonal, technical, financial, administrative and institutional conditions that favour successful studies and foster the development of the intellectual, scientific and professional independence required by research-oriented graduate studies. Responsibility for this framework is therefore shared by several actors: the institution, the faculty, the department, the program, and the research director/supervisor. This was reflected in the group discussions, from which the following points emerged:

Individual guidance and structure. The guidance and structure provided by a research director is crucial. It can inciude several aspects: ensuring that the student is passionate about her subject and that the director has the same interests; determining the subject, and its scope, in keeping with the nature of the master's degree; publishing and disseminating results; making a doctoral track available; establishing a timeline; proposing productivity requirements, etc.

Institutional guidance and structure. In order for a student's education to be successful, it is important that departments clearly explain their expectations from the outset: What is the purpose of the studies? What is the target completion time? What are the stages, requirements, thesis writing expectations, etc? It was also suggested that students be able to call on an advisor, mentor or departmental committee to settle disputes with the director and get a second opinion.

"Social" guidance and structure. It is important that students be part of a research group throughout their studies. This enables them to share thoughts, discuss matters and get feedback. In such a funded research group, the professor's financial contribution to the studies is more important as well. "*There should be workshops or seminars throughout the writing process in order to keep students motivated." Being part of such a group often gives students a physical environment in which to work, as well as more diversified human resources, greater synergy, and more motivation.*

Financial guidance and structure. [Recent graduates] do not feel that the funding they received was sufficient for living. They say that they are forced to find parallel funding sources, failing which their living conditions are too precarious. In their opinion, this shortage of money causes several dropouts (page 24). Funding for students is a major problem for professors and students. When it is too low, more students drop out and program completion times are sometimes lengthened. Existing funding is not stable; a different university funding infrastructure is essential. The universities and organizations concerned must pressure the people in charge for a review of the situation.

Closer ties and coordination with the workforce. It appears that master's students approaching the end of their studies do not have close enough ties with the workforce. As we shall see, employers stressed this. Here is what some recent graduates said:
- "It is important to have an internship and be given access to [relevant] industries."
- "What we do is sometimes abstract, and it's difficult to be interesting to an employer";
- Students should get assistance with job placements.
The graduates add that it is important to encourage them to be mobile and open to realities away from their home base.

Moreover, all the discussion group participants stressed that (1) initiatives to improve the educational framework must be supported; and (2) research directors' responsibilities should be rewarded and recognized for all the value they provide.

In the Committee's view, the guidance and structure provided by research directors/supervisors is crucial to successful master's-level studies. In fact, the research director's role can be regarded as the pedagogical component of the educational framework. That role is to make research easier to learn, help achieve the objectives and ultimate purposes of the education, and develop knowledge. Research supervision should not only be supported by the institution so that the conditions are as conducive as possible; it should also be promoted and recognized as valuable. In this regard, the Committee recommends as follows.

Recommendation 12

Universities should identify the most appropriate academic locus (program, department, etc.) to develop a framework for guidance and for achieving the purposes of each research master's stream, having due regard to the disciplines and the diverse student constituencies.

Examples: an education plan or roadmap that identifies the key stages; a student guide; an exercise to get students accustomed to the research master's program; useful information on how to handle sensitive situations; and dispute resolution mechanisms.

Recommendation 13

Universities should clearly recognize

- that the isolation of some students is a serious problem, and
- that a dynamic scholarly community, attentive to its members, is needed,

and should devote special attention to the socialization and integration of international students.

Recommendation 14

Universities should implement innovative methods to provide financial support to ensure that research master's students can succeed.

Examples: tying students' financial support to the successful completion of program milestones; providing financial support that is phased with the normal published duration of a research master's program.

Recommendation 15

Universities should recognize that while research supervision at the master's level is different from research supervision at the doctoral level, it is particularly demanding, so the work done by professors in this regard should be recognized for its true value, consistent with the purposes of the research master's degree program.

5.4 Duration of studies and government funding

The duration of a student's program should be tied to the workload that the student is expected to bear. All Quebec universities estimate that one credit is equal to 45 hours of work (courses, assignments, exams, personal study, etc.)

At the bachelor's-degree level, a student is considered enrolled full-time if he or she is earning at least 12 credits per session, and most students have a 15-credit load. Under the loan and bursary program administered by the Ministère de l'Éducation, du Loisir et du Sport (MELS), a student must have a 12-credit course load in order to qualify for financial assistance because 12 credits is considered the minimum full-time enrolment. Based on a few calculations, one can see that a full-time workload for a bachelor's-level student varies from 36 to 45 hours per week:

- 12 credits x 45 hours = 540 hours per 15-week session, which is equal to a workload of 36 hours per week as a full-time student.
- 15 credits x 45 hours = 675 hours per 15-week session, which is equal to a workload of 45 hours per week as a full-time student.

At the graduate level, the MELS loan and bursary program properly acknowledges that a student with a 9-credit enrolment is a full-time student. The MELS has therefore determined that a full-time graduate workload is heavier than a full-time undergraduate workload. One must therefore infer that the value of the credit (in terms of workload) at the graduate levels is greater than it is at the undergraduate level. A simple calculation shows that a graduate credit has the weight of 1.5 undergraduate credits:

In order to achieve a workload of 45 hours per week on a full-time basis (9 credits), a credit would have to be worth 60 hours: 45 hours per week x 15 weeks = 675 hours / 9 credits, a ratio of 1.5 to 1 in relation to a bachelor's level credit.

If this ratio of 1.5 to 1 were applied to the Quebec DESS, these programs would be competitive with Ontario's short master's degree programs on the same structural foundations (see page 10 of this report). The Committee realizes that this would be an innovative and perhaps even provocative approach, but it is worth exploring thoroughly, in collaboration with other stakeholders.

In fact, the Committee feels that this weighting of 1.5 per credit could be applied to all master's programs, including the course-based master's degree program and the two research-based master's degree programs proposed in this report.

For a 45-credit research master's programs, the 4-semester funding by the MELS is not in phase with the published duration (usually two years) or actual completion time (7.8 sessions) based on the analysis of the 2000 cohort.

The Committee also feels that the current $1,000 MELS graduation payment does not sufficiently recognize the added value to Quebec society when highly qualified professionals are trained.

Recommendation 16

A Quebec round table should be created in order to make the relationship between the actual duration of master's-level studies (whatever the type) and MELS funding coherent, notably by adjusting the number of sessions for which funding is provided, adjusting the completion bonus, and/or giving more weight to each graduate-level credit.

5.5 In brief

The distinctive characteristic of this report is that it emphasized research-oriented master's education and proposes two research master's degree streams: a stream in which highly qualified professionals are trained; and a doctoral transition stream. Each stream has its own purposes, skills, objectives and curriculum. In our view, this distinction could alleviate the ambiguity currently experienced in the context of research master's programs. This ambiguity is closely tied to the conditions prevalent in the university research community — conditions that developed over time, partly in response to the productivity requirements of funding agencies and universities, but also in response to the productivity requirements of governments that are eager to prove that publicly funded university research is relevant to society. These external factors have had such an influence on the level of research output required of master's degree students that their studies might be mistaken for doctoral studies. Consequently, doctoral research output is tending to lose its specificity (namely, the originality that contributes to the advancement of knowledge) and certain master's students are over-exploited without having access to a degree worthy of their work.

The following table summarizes all the proposals regarding the nature, structure, activities and funding of the two research master's streams proposed in this chapter.

Table 5.3 - Description of the two proposed Quebec research master's degree program streams

	Doctoral transition stream	**Stream to train highly qualified professionals**
Number of credits	30-45	30-45
Credit value	1.5 times bachelor's-level credit	1.5 times bachelor's-level credit
Published duration	8-16 months	12-24 months
Purpose of education	Appropriate preparation for doctoral studies	Train highly qualified professionals through research
Proof that purpose has been achieved	Oral and written demonstration of aptitudes and potential to carry out a research project sufficiently broad and original to constitute a doctoral thesis.	Application of scientific method to a research project without having to obtain original results or having to publish.
Skills and skill mastery level	To be defined	To be defined having regard to the fact that it is intended to professionalize and therefore has professionalization requirements
Curriculum	Courses + definition of a research project and written and oral test	Course + research project + thesis
Funding	Based on Quebec round-table discussions (see recommendation 16)	

In addition to the benefits already referred to in this chapter, the formal implementation of such a distinction would yield the following benefits for universities, professors and students:

- It would bring the research-oriented master's degree back down to a more reasonable size in the sense that the expectations from students would be more appropriate.
- It would end the ever-increasing insistence on publishable results at the master's level. This phenomenon often unduly prolongs the actual duration of the degree program, and sometimes even discourages students from pursuing doctoral studies.
- It would formalize a procedure for awarding a master's degree to students who are admitted to doctoral studies on an accelerated (fast track) basis, thereby increasing the number of master's degree recipients and getting a better picture of how master's students are doing.
- It would increase the attractiveness of Quebec master's programs, thereby making Quebec's universities more competitive with Ontario and US universities.
- It would increase doctoral recruitment by countering students' often correct perception that it takes "forever" to train a scientist (three years for a master's degree and five years for a doctorate, for a whopping total of eight years)
- It would restore the research doctorate's pedigree as the only degree formally intended for people who make an original contribution to knowledge.

One last recommendation seems necessary. Based on this report's qualitative data concerning research master's-level education — data obtained in part through discussion groups the vast majority of whose members are professors representing the main sectors of study — Quebec's academic community should be mobilized for a throrough discussion about the research master's degree.

Recommendation 17

CREPUQ and the MELS should support a provincial conference on research-oriented master's-level education. The conference should bring together university and faculty administrators, program directors, professors, the major federal and provincial funding agencies, etc., and could be held as part of the 2010 Acfas conference [*Association francophone pour le savoir*.]

6. CONCLUSION

This study's conclusion will not be written by its authors. It will be written by universities, major funding agencies and the MELS.

The quantitative component (Part I) and the qualitative component (Part II) of this study provide a portrait of the master's degree education in Quebec, with an emphasis on the research master's degree. They show that action must now be taken in order to ensure that Quebec's master's degree programs are in phase with similar programs in the United States and in the rest of Canada, especially Ontario. The ADÉSAQ committee recommends a conference on master's degree education in Quebec as part of the 2010 Acfas congress. The success of such a conference will depend on the active participation and constructive criticism of the stakeholders identified at the beginning of this chapter.

Universities must make this report their own and choose either to let it gather dust or use it as a basis for intra-institutional reflection with the aim of adapting this report's recommendations to their particular characteristics and experience. Each university now has a documented method to kindle creativity and efficiency among program directors, professors and all other institutional stakeholders involved in educating master's students, especially in research-oriented programs.

Part II of this report calls on the major funding agencies to review a certain practice that they engage in when awarding scholarships and grants involving master's-level students. Such a review appears necessary in order to avoid some significant missteps.

The MELS is the major architect of graduate education in Quebec, notably through its university funding policy. Any review or reform of the nature and structure of master's-level education in Quebec is impossible without its participation, in order to ensure that universities receive at least as much funding as they do now. This report proposes new and highly innovative options. A Quebec round table appears to be the best way to combine a review of the structure of master's-level education and a review of the funding structure of graduate studies, without budgetarily penalizing universities.

Lastly, a Quebec conference on the research master's degree, bringing together university and faculty administrators, program directors, professors and the major federal and provincial funding agencies, would appear essential in order to mobilize Quebec's university community around issues concerning the nature and structure of research master's degree education in Quebec and the activities that are part of that education.

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ANNEXE 1

GRILLE DES COMPÉTENCES (CREPUQ)

GRILLE DES COMPÉTENCES (CREPUQ)

DESCRIPTION	Grade de maîtrise Orientation professionnelle	Grade de maîtrise Orientation de recherche
Structure globale du programme et résultats attendus	Les programmes de maîtrise professionnelle prennent appui sur les connaissances et les compétences acquises lors des études pertinentes de premier cycle et ils exigent plus de connaissances spécialisées et d'autonomie intellectuelle qu'un programme de baccalauréat, en grande partie, l'apprentissage qui y est réalisé se situe à la fine pointe des développements les plus récents dans la discipline. Les étudiants doivent faire preuve d'originalité dans l'application de connaissances et ils doivent comprendre comment la recherche contribue à repousser les limites du savoir. Les étudiants doivent traiter des questions complexes de façon à la fois systématique et créatrice, et ils doivent démontrer de l'originalité dans l'analyse et la résolution de problèmes. Ces programmes recrutent généralement des étudiants qui détiennent un baccalauréat ou des personnes qui ont fait des études menant à l'exercice d'une profession et dont la formation scolaire est variée. Ces programmes fournissent aux étudiants une sélection de cours et d'exercices visant à les préparer à une profession ou à la pratique en milieu de travail ou, pour les étudiants déjà engagés dans la profession ou le marché du travail, à leur offrir un approfondissement de leur base de connaissances et de leurs compétences en tant que professionnels/praticiens. Exemples : MSW (Travail social), MHA (Administration de la santé), MPS (Administration publique), MHRM (Gestion des ressources humaines), M. Eng. (Génie).	Les programmes de maîtrise axés sur la recherche prennent appui sur les connaissances et les compétences acquises lors des études pertinentes de premier cycle et ils exigent plus de connaissances spécialisées et d'autonomie intellectuelle que les programmes de baccalauréat. En grande partie, l'apprentissage qui y est réalisé se situe à la fine pointe des développements les plus récents dans la discipline. Les étudiants doivent faire preuve d'originalité dans l'application de connaissances et ils doivent comprendre comment la recherche contribue à repousser les limites du savoir. Les étudiants doivent traiter des questions complexes de façon à la fois systématique et créatrice, et ils doivent démontrer de l'originalité dans l'analyse et la résolution de problèmes. Les programmes de maîtrise axés sur la recherche sont habituellement offerts aux diplômés de programmes (de premier cycle ou professionnels) dans des domaines reliés à la discipline ou aux étudiants ayant suivi une scolarité propédeutique les préparant pour des études de deuxième cycle dans la discipline. L'objectif principal y est le développement des compétences analytiques, méthodologiques, de recherche, d'interprétation et de présentation nécessaires aux études de doctorat ou à l'occupation d'un poste de leadership dans la société. Habituellement, ces programmes reposent sur la production d'un mémoire réalisé sous la supervision d'un professeur; l'étudiant doit y démontrer des habiletés avancées de recherche. Certains programmes sont basés sur la scolarité; ils exigent que les étudiants démontrent, dans le cadre de leurs cours, des habiletés analytiques, méthodologiques, de recherche, d'interprétation et de démonstration. Exemples : programmes de maîtrise dans les sciences humaines et sociales; programmes de M. Sc. (sciences) ou de MASc. (génie).
Préparation à la carrière et aux études avancées	Les titulaires de la maîtrise possèdent toutes les qualités requises pour œuvrer professionnellement dans des situations qui nécessitent un jugement solide, le sens des responsabilités ainsi que de l'initiative et ce, dans des environnements professionnels complexes et imprévisibles.	Les titulaires de la maîtrise possèdent toutes les qualités requises pour œuvrer professionnellement dans des situations qui nécessitent un jugement solide, le sens des responsabilités ainsi que de l'initiative et ce, dans des environnements professionnels complexes et imprévisibles.
Durée du programme	Un programme de maîtrise dure habituellement entre trois et cinq trimestres (entre 45 et 60 crédits, ou l'équivalent).	Un programme de maîtrise dure habituellement entre trois et cinq trimestres (entre 45 et 60 crédits, ou l'équivalent).
Attentes	**Ce diplôme est décerné aux étudiants ayant démontré :**	**Ce diplôme est décerné aux étudiants ayant démontré :**
Profondeur et étendue des connaissances propres au champ d'étude	une compréhension systématique de la connaissance et une conscience critique des problèmes actuels et/ou des nouvelles idées, dont une bonne partie est à la pointe de la discipline ou est basée sur des développements à la pointe de la discipline académique, du champ d'étude ou du champ d'exercice professionnel;	une compréhension systématique de la connaissance et une conscience critique des problèmes actuels et/ou des nouvelles idées, dont une bonne partie est à la pointe de la discipline ou est basée sur des développements à la pointe de la discipline académique, du champ d'étude ou du champ d'exercice professionnel;

DESCRIPTION	Grade de maîtrise Orientation professionnelle	Grade de maîtrise Orientation de recherche
Profondeur et étendue des connaissances à l'extérieur du champ d'étude	suffisamment d'ampleur et de profondeur de connaissances en dehors du champ d'étude et/ou de la discipline quand il le faut pour effectuer des projets de recherche ou pour résoudre des problèmes professionnels;	suffisamment d'ampleur et de profondeur de connaissances en dehors du champ d'étude et/ou de la discipline quand il le faut pour effectuer de projets de recherche ou pour résoudre des problèmes professionnels;
Compréhension de la méthodologie et des concepts de base	a. de l'originalité dans l'application des connaissances en même temps qu'une compréhension pratique de la manière dont les techniques reconnues de recherche et d'enquête sont employées pour créer et interpréter des connaissances dans la discipline; b. la capacité d'utiliser une variété d'outils de recherche spécialisée (ou l'équivalent) et de techniques d'enquête; c. une compréhension des concepts de base permettant à l'étudiant (i) d'évaluer la recherche actuelle et les activités avancées d'érudition dans la discipline, et (ii) d'évaluer et critiquer les méthodologies utilisées et, le cas échéant, de proposer de nouvelles hypothèses et/ou interprétations;	a. de l'originalité dans l'application des connaissances en même temps qu'une compréhension pratique de la manière dont les techniques reconnues de recherche et d'enquête sont employées pour créer et interpréter des connaissances dans la discipline; b. la capacité d'utiliser une variété d'outils de recherche spécialisée (ou l'équivalent) et de techniques d'enquête; c. une compréhension des concepts de base permettant à l'étudiant (i) d'évaluer la recherche actuelle et les activités avancées d'érudition dans la discipline, et (ii) d'évaluer et critiquer les méthodologies utilisées et, le cas échéant, de proposer de nouvelles hypothèses et/ou interprétations;
Niveau de la capacité d'analyse	a. une vaste compréhension et une application créatrice des concepts, principes et techniques dans leur propre recherche, leurs activités avancées d'érudition ou dans leur champ d'exercice professionnel; b. la capacité de traiter des problèmes complexes et de porter des jugements fondés sur des principes et techniques reconnus;	a. une vaste compréhension et une application créatrice des concepts, principes et techniques dans leur propre recherche, leurs activités avancées d'érudition ou dans leur champ d'exercice professionnel; b. la capacité de traiter des problèmes complexes et de porter des jugements fondés sur des principes et techniques reconnus;
Niveau de la capacité d'appliquer connaissances	de l'autonomie et de l'originalité dans l'approche et la résolution de problème, comme dans la planification et l'exécution de tâches à un niveau professionnel ou équivalent;	de l'autonomie et de l'originalité dans l'approche et la résolution de problème, comme dans la planification et l'exécution de tâches à un niveau professionnel ou équivalent;
Compétence et autonomie professionnelle	a. la capacité de s'autoévaluer et d'assumer la responsabilité d'augmenter leur niveau de connaissance et de compréhension et de développer de nouvelles compétences d'un niveau élevé; b. les qualités et les compétences transférables nécessaires pour travailler dans un milieu qui exige d'être autonome, responsable et capable d'initiative, prendre des décisions dans des contextes complexes et imprévisibles et assumer les exigences d'apprentissage personnel essentiel au développement professionnel continu;	a. la capacité de s'auto évaluer et d'assumer la responsabilité d'augmenter leur niveau de connaissance et de compréhension et de développer de nouvelles compétences d'un niveau élevé; b. les qualités et les compétences transférables nécessaires pour travailler dans un milieu qui exige d'être autonome, responsable et capable d'initiative, prendre des décisions dans des contextes complexes et imprévisibles et assumer les exigences d'apprentissage personnel essentiel au développement professionnel continu;
Niveau des compétences de communication	la capacité de communiquer clairement des problèmes et des conclusions à des publics spécialisés et non spécialisés;	la capacité de communiquer clairement des problèmes et des conclusions à des publics spécialisés et non spécialisés;
Conscience des limites des connaissances	une appréciation de la complexité des connaissances et de leur compréhension, et des contributions que peuvent apporter diverses interprétations, méthodes et disciplines.	une appréciation de la complexité des connaissances et de leur compréhension, et des contributions que peuvent apporter diverses interprétations, méthodes et disciplines.