2013RP-11

Faculty Workload in a Research Intensive University: A Case Study

Manuel Crespo, Denis Bertrand

Rapport de projet
Project report

Montréal
Juin 2013

CIRANO
Allier savoir et décision

Centre interuniversitaire de recherche en analyse des organisations

CIRANO

Le CIRANO est un organisme sans but lucratif constitué en vertu de la Loi des compagnies du Québec. Le financement de son infrastructure et de ses activités de recherche provient des cotisations de ses organisations-membres, d'une subvention d'infrastructure du Ministère du Développement économique et régional et de la Recherche, de même que des subventions et mandats obtenus par ses équipes de recherche.

CIRANO is a private non-profit organization incorporated under the Québec Companies Act. Its infrastructure and research activities are funded through fees paid by member organizations, an infrastructure grant from the Ministère du Développement économique et régional et de la Recherche, and grants and research mandates obtained by its research teams.

Les partenaires du CIRANO

Partenaire majeur

Ministère de l'Enseignement supérieur, de la Recherche, de la Science et de la Technologie

Partenaires corporatifs

Autorité des marchés financiers
Banque de développement du Canada
Banque du Canada
Banque Laurentienne du Canada
Banque Nationale du Canada
Banque Scotia
Bell Canada
BMO Groupe financier
Caisse de dépôt et placement du Québec
Fédération des caisses Desjardins du Québec
Financière Sun Life, Québec
Gaz Métro
Hydro-Québec
Industrie Canada

Investissements PSP
Ministère des Finances du Québec
Power Corporation du Canada
Rio Tinto Alcan
State Street Global Advisors
Transat A.T.
Ville de Montréal

Partenaires universitaires

École de technologie supérieure (ÉTS)
École Polytechnique de Montréal
HEC Montréal
Institut national de la recherche scientifique (INRS)McGill University
Université Concordia
Université de Montréal
Université de Sherbrooke
Université du Québec
Université du Québec à Montréal
Université Laval

Le CIRANO collabore avec de nombreux centres et chaires de recherche universitaires dont on peut consulter la liste sur son site web.

ISSN 1499-8610 (Version imprimée) / ISSN 1499-8629 (Version en ligne)

Enseignement supérieur, Recherche, Science et Technologie
Québec

Faculty Workload in a Research Intensive University: A Case Study

Manuel Crespo[1]*, Denis Bertrand*[2]

Résumé/Abstract

The literature on faculty workload reports differences in worked weekly hours and in the distribution of total time allocated to teaching, research, and service. Some differences are also reported concerning faculty workload by gender, academic rank, and disciplinary sectors. This study analyzes self-reported faculty workload in a Canadian research intensive university. It introduces a new way of measuring time on task by calculating it in a "typical most loaded month" an in a "typical less loaded month". Results show an average weekly workload of 56.97 hours of which 44.1% is allocated to teaching, 35.2% to research, 5.8% to administrative tasks and 14.8% to service. There are few differences in faculty workload by gender, academic rank, and disciplinary sectors. Overall, self-reported faculty workload has increased in the last decade partly because of electronic communications and procedures and on-line pedagogical activities.

Mots-clés/keywords : Faculty workload, teaching, research, service, faculty workload increase, most loaded month, less loaded month, time on task, case study.

[1] Emeritus Professor, Université de Montréal.
[2] Professor, Université du Québec à Montréal.

Faculty commitment was as much a pivotal factor in the birth of the university a thousand years ago, as it is now in the development of the contemporaneous university. Faculty engages not only in teaching and research activities, but also in service activities as well as in activities related to the functioning of the university. These four types of activities require time and energy to be accomplished and together they constitute what has been called faculty workload. A convenient definition of faculty workload is found in Allen (1966). This author defines faculty workload as "how much a faculty has to do and it is measured by the total amount of time per week faculty members devote to teaching, research, administration and public service" (p. 25) [see also, Meyer, 1998]. The average time required to fulfill the tasks associated to the four types of activities is not uniform: it depends on university characteristics, local work agreements and disciplinary cultures among others. Furthermore, it may also vary according to faculty academic rank, gender and disciplinary sector. Besides the time on task involved, the tasks themselves are not uniform form one setting to another and may evolve to respond to changes in the university environment.

This paper reports findings of a case study on faculty workload of a large Canadian research intensive university[3]. Using a particular measuring approach, it assesses the amount of time invested by faculty to accomplish the different components of its workload, the relative importance of these components, and the workload profiles along academic rank, gender and disciplinary lines (Biglan, 1973a, b; Becher, 1989). It also analyses the transformation of academic work in the last decade.

According to Houston, Meyer & Paewai (2006: 27), the literature on faculty workload and work allocation is limited and "does not provide a comprehensive research-base for clear guidelines with known consequences". A Quebec[4] study on professorial work (Bertrand, 2003) compared the results of two large scale surveys on professorial work conducted in 1991 (Bertrand *et al.,* 1994) and 2003. The study analysed, among other things, faculty's time on task and the relative importance of the professorial functions. A comparison of the

[3] This paper is a revised and updated version of a paper presented at CHER 21st Conference Excellence and Diversity in Higher Education, Meaning, Goals and Instruments. Pavia, Italy, September 11-13, 2008.

[4] Quebec is one of Canada's ten provinces.

results of the two surveys shows that professors' work load has not significantly changed. In 1991, professors (all ranks) of Québec universities estimated their workload at an average of 46.5 hours per week, as compared to 45.5 hours per week in 2003.The workload is differently distributed among professors. The 2003 survey shows that 10% of them worked less than 30 hours per week, but 39% indicated that they worked 50 hours per week, and 12% said that they worked 60 hours and more per week.

Askling (2001) reported that a study by the Swedish Teachers' Union (SULF) estimated university professors' average workload at 57 hours per week. Results from the *Work Environment Survey* of 2002 and 2003 show that 39% of respondents had worked in the preceding week more than 10 hours beyond full time. It does not provide, however, an indication of how many hours per week is full-time workload (see Harman, 2002). Enders & Teichler (1997) reported differences in weekly number of hours worked by professors[5] in several countries. According to these authors, Dutch professors work on average 57 hours per week; German professors, 53 hours per week; Japanese professors, 48 hours per week; English professors between 52 and 50 hours per week; US professors between 52 and 46, and Sweedish professors, 45 hours per week. Bentley & Kyvik (2012) conducted a comparative international study on faculty workload in 13 countries. Their study considered only tenure track faculty. According to this study, the average weekly workload during the teaching semesters was 48.4 hours per week. With regards to regional distribution, English speaking countries' tenure track faculty average weekly workload was 50.1 hours; in Asia, 49.7 hours; in Western Europe, 48.3 hours and in Latin America 45.4 hours. The reported average weekly workload by Canadian faculty was 51.1 hours. According to Vardi (2009), the average faculty workload varies between 49 and 55 hours per week. Link *et al*. (2008) found, in their study of 1365 US academics, that the average weekly workload was 53.96 hours. Finally, Dennison (2012) reports that "surveys of time expended by regular members invariably range from 55 to 65 hours per week, higher for faculty of research universities, not the 40-hour usually assured" (p. 301).

[5] The authors establish a distinction between professors and middle ranking and junior staff faculty. The data reported applies only to professors.

The literature is not as well developed concerning faculty workload differentials by gender, academic rank (assistant, associate full professor) and disciplinary sector. Dobele *et al*. (2010) reported contrasting results within the Australian higher education context. In universities that are overrepresented with females in senior academic positions, their workload does not significantly differ with male faculty workload. On the contrary, in those universities where females are underrepresented in senior academic positions, their workload does not achieve equity, male faculty producing more research and coordinating more teaching. With regards to the same context, Probert (2005) reported that male and female faculty workloads were on average comparable. Female faculty devotes exactly the opposite percentage of time to teaching and research than their male counterparts but the differences are however non-significant. According to Kim (2011), there are no significant gender differentials relative to teaching and mentoring workload. Link *et al*. (2008), on the contrary, found that women, on average, allocate more hours to university service and less time to research than do men.

Park (1996) notes that women spend more time preparing for courses and advising students, and engage in significantly more and different types of service activities than their male counterparts (see also Terosky *et al*., 2008).

With respect to faculty workload by academic rank, Link *et al*. (2008) found some differences between full professors and associate professors: full professors spent increasing time on service at the expensive of teaching, whereas associated professors spent significantly more time teaching at the expense of research time. For Link *et al*. (2008), tenured faculty work less and allocate fewer hours to teaching, research, and grant writing but more hours to service. For these authors, associate professors spend more time teaching at the expense of research time. Beside these studies, there does not seem to be any other systematic study on faculty workload by academic rank.

The literature on faculty workload by disciplinary sector is scarce. According to Schuster & Filkenstein (2006), the number of hours worked by faculty is highest in natural sciences and engineering. The authors do not specify the number of hours worked by faculty of different disciplinary sectors.

If one considers now the percentage of total time invested in each of the professorial functions, the literature reveals a variety of percentage distributions. Layzell (1999) reports that whereas in teaching institutions 53 % of total time is allocated to teaching and 23.3% to research, in doctoral universities, 45.2% is allocated to teaching and 31.0% to research. Dobele *et al.* (2010, p. 227) estimate that faculty in Australia spends 40% of work time in research, 40% in teaching, and 20% in service activities. Fairweather & Beach (2002) estimate that faculty invests in teaching (all areas) 40.19% of total work time. A 2006 Faculty Work Life Survey at *Cornell University* shows that male faculty allocates 34% of total time to teaching and 36% to research. The rest of the workload is devoted to "service to discipline" (8%), administration and service (15%-16%) and outreach or extension (15%-16%). Although, the Cornell University Survey does not measure "time on task", some qualitative data reveals a heavy workload: "I find it takes too many hours (often 70 hours a week) to do a good job at the large number of different things I have to do". Link *et al*. (2008) estimated the average workload percentage allocated to the different functions as follows: 31.7% for teaching; 35.7% for research; 8.2% for grant writing and 24.4% for service. Finally, a recent paper by Bentley & Kyvik (2013) reanalyzing data from their 13 countries study, shows that individual faculty spent on average 18.5 hours per week on research or 39% of the total working hours (for other studies on professorial workload, see, among others, Boyer *et al*., 1994; Askling, 2001; Honan & Teferra, 2001; Burgess, Lewis & Mobbs, 2003).

To sum up, the literature reviewed shows a great variability in the reported average faculty weekly workload and some variability in the percentages of time allocated to the basic work categories (teaching, research and service). It is different from one country or region to the other. Besides, within the same country or State, one finds variations in the working time patterns between universities (see Milem *et al*. 2000; Schuster & Finkelstein, 2006). The literature reviewed also shows some studies on working conditions of female faculty, but, in general, most faculty workload studies do not explicitly tackle the question of gender differentials. Finally, the literature on workload differentials by faculty academic rank and by disciplinary sectors is scarce.

The paper is divided in five sections. The first section deals with methodological aspects of the research. The second section presents the model of faculty workload adopted in this research. The third section discusses faculty workload by professorial function (teaching, research, administration and service). The fourth section deals with faculty workload profiles by gender, academic rank and disciplinary sector. The fifth and last section discusses changes in faculty workload in the last decade. A brief conclusion summarizes the main findings of the research.

1. METHODOLOGICAL APPROACH

An on-line survey was sent to all tenured faculty of the University of the case study (N=1260) in November 2007. Three hundred tenure track faculty and researchers (assistant, associate, full), or 25% of the total number, answered at least part of the detailed on-line questionnaire on their actual academic workload. As it often happens, there was a decreasing completion rate from the beginning to the end. The on-line questionnaire had 57 questions distributed in six different sections. Thus, the response rates by sections were as follows: Section 1: 23.1% (N=292); Section 2: 17.1% (N= 216); Section 3: 15.7%; (N=199) Section 4: 15.3% (N=194); Section 5: 15.1% (190); Section 6: 15.1% (190). The average response rate was 16.9%[6].

1.1 Representativeness of the sample obtained

Since the identification of socio-demographic and academic characteristics of respondent was placed in the last section of the on-line questionnaire, and, as noted, there was a declining response rate, the comparison of the sample with the population will be based on 178 respondents. Two criteria are used to test for representativeness: academic rank (assistant professor, associate professor, full professor) and gender. A third criterion is also employed: the respondents' academic status: whether the respondent was a tenure track

[6] It should be noted that the response rate is calculated over the entire population of respondents. Survey response rates, particularly of populations or professionals, tend to be in the 20%-30% range and rarely over 40%. Kaplowitz, Hadloc & Levine (2004) reports an average response rate of 20.7% for e-mail only surveys; Hamilton's (s.d.) estimation of the median response rate of only surveys is 26.5%. DIIA (2007) estimates the average response rate at 30%.

professor or a tenured track researcher without teaching functions (Table 1 compares the distributions of the sample and the population).

Table 1
Comparison of survey sample and population

	Sample	Population
Assistant Professor	25.2% (45)	20.5% (259)
Associate Professor	33.1% (59)	31.9% (403)
Full Professor	41.5% (74)	47.4% (598)
Female	41.5% (74)	33.8% (427)
Male	58.4% (104)	66.1% (833)
Professor	92.7% (165)	92.9% (1171)
Researcher	7.3% (13)	7.0% (89)
Total	100% (178)	100% (1260)

The distribution of the sample by academic rank is somewhat different to that of the population. However, the differences do not exceed 5 percentage points and, in the case of associate professors the difference is only 1 percentage point. As for the gender distribution of the sample, there is an over representation of female respondents. There is no available explanation of this mismatch. Finally, there is a perfect match between the sample obtained and the population by academic status.

1.2 Measurement of "time on task"

A major problem in the measurement of faculty workload is the fact that faculty does not execute *all their tasks and activities every week or within one week,* as is often the case in non-professional jobs. Moreover, there are tasks and activities that are executed in some determined periods during the academic year. This is why this research adopts a new approach to measure time on task. Instead of the *week* as basic unit of measurement, this research adopts the *month* as unit of measurement. Besides, to account for periods of work "overloading", the research uses the notions of *"typical most loaded month"* and *"typical less loaded month".* Thus, when respondents are asked to estimate the time on task required to accomplish a specific task or activity, they have to indicate the *number of hours*

this task or activity demands in a "typical most loaded month" and in a "typical less loaded month". For estimations of the average weekly workload, the time on task indicated for typical most loaded and less loaded months is weighted by the number of most loaded and less loaded months reported by each respondent. The result is then divided by 48 weeks as faculty has a four week holiday per academic year[7].

Sixty-four percent of the 281 tenured track faculty and researchers who answered the question on the number of most loaded and less loaded months in the academic year 2006-2007, reported 6 months and more as most loaded months; 70% reported, as less loaded months, 3 months or less. The average number of most loaded months reported is 6.38 and of less loaded months, 2.96. September is considered by almost 50% of respondents as a typical most loaded month and October, by 16.4% of them. As for less loaded months, 40.4% reported, without surprise, that it is July and 24.7% that it is June.

2. FACULTY WEEKLY WORKLOAD

The estimation of faculty workload is based on a sample of 130 respondents. This estimation considers only the respondents who answered all sections of the on-line questionnaire corresponding to the four different main professorial functions: teaching, research, administration and service[8]. Moreover, all respondents whose reported total individual weekly workload was less than 20 hours and more than 100 hours were excluded from calculations. Table 2 presents the estimations of average weekly workload by professorial functions.

[7] The measure of "time on task" is therefore "self-reported".

[8] The researchers were also asked to report the time invested in teaching. Since tenure track researchers do not teach on a regular basis, there is a slight underestimation of the computed average time invested in teaching.

Table 2
Estimation of average weekly workload by professorial functions

	Teaching	Research	Administration	Service
N*	*130*	*130*	*130*	*130*
Average most loaded week	35.76	30.07	4.93	13.25
Average less loaded week	14.80	22.59	2.45	5.46
Average week	25.10	20.09	3.31	8.48
Percentage allocation of time by professorial function	**44.1%**	**35.2%**	**5.8%**	**14.8%**
Average weekly workload*	**56.97h/week**			

* Based on respondents who reported weekly workloads of more than 20 hours and 100 hours and less.

As the data shows, the average weekly workload is 56.97 hours.

3. WORKLOAD BY PROFESSORIAL FUNCTIONS

The analyses of this section deal with the time on task distributions for the different components of the four professorial functions: teaching, research, contribution to the functioning of the institution (administration), and service. The percentage of time on task by functions is calculated here *using all responses to the specific questions and not only those responses of participants who completed the questionnaire*. Therefore, the numbers reported may vary from one aspect to the other.

3.1 Teaching

In the research intensive university of the case study, the teaching function has four components: 1) "contact" teaching, 2) student supervision, activities linked to preparation and delivery of courses and student follow-up, 3) clerical and administrative tasks 4) and professional growth[9] Table 3 presents the allocation of time to the different tasks and activities of the teaching function in a typical "most loaded month" and in a typical "less loaded month". For each task or activity, the table provides the relative percentage of the time allocated for its accomplishment.

Estimated total number of hours allocated to teaching in a most loaded month is 2.3 times higher than in a less loaded month. The total of 10.55 hours per month (independently of

[9] In the institution of the study, this component is called "contribution to the functioning of the institution".

month's load) is a mean estimation based on the time for contact teaching declared by respondents[10]. This average time corresponds to 6.2% of the total time of the teaching function in a most loaded month, and 14.4% in a less loaded month.

The highest allocation of time for a specific task in a typical most loaded month is the preparation of courses and seminars (16.8%), followed by students' supervision (11.9%). In a typical less loaded month, it is students' supervision that requires relatively more time (18.2%), the second task with the highest proportional allocation of time is students' follow-up with 8.3% of total allocation of time to the teaching function.

Reported average time for clerical and administrative tasks, electronic communications with students is 4.8% of total time in a typical most loaded month, and 4.1% in a typical less loaded month. To these percentages of time allocation, it must be added the time allocated to students' supervision of which an unspecified proportion is done through e-mails. In a most loaded month, students' follow-up demands 7.7% of total time and, in a less loaded month, 8.3%.

As a way of synthesizing the data, one may consider "blocks" of tasks and activities that is, groups of *related* tasks and activities. Four distinct blocks of tasks and activities are considered: Block A refers to contact teaching (lectures and seminars); Block B: refers to preparation of courses and evaluation of students, supervision of students, follow-up of students and delocalised teaching and training activities); Block C refers to clerical and administrative tasks and Block D refers to maintaining and increasing competency. As Table 3 shows, Block B requires 66.2% of total time in a typical most loaded month and 59.6%, in a typical less loaded month. Bloc C occupies 15.6% of total invested time in a typical most loaded month and 9.6% in a less loaded month. Finally, Block D requires 12% of total time in a typical most loaded month and 16.3% in a typical less loaded month. Note that the number of hours of teaching contact does not differ from a most loaded month to a less loaded month the percentages of total time invested in teaching do vary.

[10] Respondents were asked to provide their assignments for Autumn 2006, Winter 2007 and Summer 2007. A 3 credit course demands 12 hours of contact teaching per month. Estimation is based in two semesters or 8 months (and not on 11 months as all other tasks and activities).

The denominators of percentages are the total number of hours invested in the teaching function during a typical most loaded month and a typical less loaded month.

Table 3
Average time allocated to components ("blocks") of the teaching function

Components of the teaching function	Average number of hours per month		Percentage of total number of hours	
	Typical most loaded month	Typical less loaded month	Typical most loaded month	Typical less loaded month
Bloc A	10.55	10.55	6.2	14.4
Block B	112.69	43.59	66.2	59.6
Block C	26.59	7.02	15.6	9.6
Block D	20.40	11.93	11.9	16.3

Note: Total percentages may differ from 100% because of rounding.

3.2 Research Function

The research function in the research intensive University of the case study comprises two basic blocks of activities: the production of new fundamental or applied knowledge, and knowledge transfer.

Comparing the time allocated to different tasks and activities of production of new fundamental or applied knowledge in both most loaded and less loaded months, one finds that the number of hours invested in the production of articles and books are almost the same: 20.7 and 19.1 hours respectively (see Table 4). This similarity shows that this pivotal task is a constant of professors' workload, as far as invested time, during the whole academic year. It is almost the same for tasks related to the production of articles and books: the construction and validation of data collection instruments, and data analysis. These tasks require around 15 hours in a typical most loaded month and 14 hours in a typical less loaded month. There is also certain continuity in time invested throughout the entire academic year with regards to the production of research and expertise reports.

Table 4
Allocation of time for tasks and activities of production of new knowledge
(N=226)

Tasks	Typical most loaded month		Typical less loaded month	
	Average number of hours	%	Average number of hours	%
Construction and validation of instruments for data collecting	4.49	4.7	3.40	5.7
Data collecting, treatment and analysis	10.93	11.6	10.17	17.1
Production of articles and books (scientific, professional, vulgarization)	20.71	22.0	19.13	32.3
Production of critical reviews (scientific, literary, artistic)	5.44	5.7	3.50	5.9
Implementation of new practices projects	2.03	2.1	1.36	2.3
Conception and production of forms of original expression	0.63	0.6	0.91	1.5
Preparation of conferences and communications (scientific, professional, vulgarization)	8.78	9.3	6.66	11.2
Preparation of research or expertise reports	5.68	6.0	2.48	4.1
Elaboration of research projects for funding (public or private)	26.88	28.6	6.81	11.5
Activities aimed at creating a patentable new product or process	1.15	1.2	0.77	1.3
Meetings with researchers	6.59	7.0	3.96	6.6

Note: Total percentages may differ from 100% because of rounding.

Although the average number of hours allocated to the conception and production of forms of original expression is relatively low, as only a small number of respondents reported such tasks, one finds that these activities are exerted with the same intensity during the academic year.

The survey data reveals what is already known: the writing of research projects for public or private financing demands a considerable amount of time. This task demands, in a typical most loaded month, more than 28 hours or around 27% of total time invested in the production of new knowledge. Thus, more than a quarter of the total time reported for the production of new knowledge is "at risk" given the low success rate of funding demands. The time allocated to this task diminishes in a less loaded month to around 7 hours or 11.5% of total time. As an important period of research project submission, in the

Canadian context, takes place in autumn, one easily understands why September and October are identified as the two typical most loaded months of the academic year.

As Table 5 shows, tasks and activities of knowledge transfer are reported by respondents as demanding less time than those of production of new knowledge. The latter require around six and a half times more time than the former irrespective of the type of typical month. Three tasks demand more time in a most loaded month: reanalysis of research for future applications, meeting with prospective partners and scientific and technological vigil.

To the time devoted to the production of new knowledge and to knowledge transfer, it must be added the time allocated to word processing of different documents as articles and research projects, to administrative tasks of research units. It is worth noting that the time invested in these latter tasks is 26.2 hours in a typical most loaded month and 13.5 hours in a typical less loaded month. The amount of invested time in word processing and administrative tasks is equal to 33% of total time invested in the production of articles and books, critical reviews and production of research and expertise reports in a most loaded month. In a typical less loaded month, word processing would demand 31.4% of the time allocated to these latter pivotal tasks of new knowledge production.

Table 5
Allocation of time for tasks and activities of knowledge transfer
(N=226)

Tasks	Typical most loaded month		Typical less loaded month	
	Average number of hours	%	Average number of hours	%
Scientific and technological vigil	0.07	14.5	1.66	18.6
Reanalysis of existing research for future application	3.16	22.1	1.74	19.5
Fine tuning of models of social intervention	0.51	3.5	0.28	3.1
Meeting with prospective partners of R&D projects	2.50	17.5	1,4	15.9
Prospection of risk capital	0.34	2.3	0.35	3.9
Contract negotiations	1.29	9.0	0.62	6.9
Patent preparation and submission	0.64	4.4	0.58	6.5
Meetings with professionals of the Office of Knowledge Transfer	0.50	3.5	0.18	2.0
Creation of spin-off companies	0.23	1.6	0.18	2.0
Management of spin-off companies	0.25	1.7	0.19	2.1
Managerial and promotional reports	1.05	7.3	0.48	5.3
Training workshops for utilisers	0.61	4.2	0.28	3.1
Other(s)	1.10	7.7	0.93	10.4

Note: Total percentages may differ from 100% because of rounding.

3.3 Contribution to the functioning of the institution

Table 6 presents the invested time in typical most loaded and less loaded months to participate in the administration of different units as well as to participate to university, faculty and departmental committees. Only 12.4% of respondents do not participate in any committee.. Six percent participate in 4 committees, and 24.2% in at least 5 committees. The average number of committees to which respondents participate is 3.38. As with respect to the number of different types of committees to which respondents participate, the average number is 2.23.

Table 6
Allocation of time for tasks and activities contributing to the functioning of the organisation
(N=209)

Tasks	Typical most loaded month		Typical less loaded month	
	Average number of hours	%	Average number of hours	%
Programme coordinator	4.38	23.0	2.52	29.6
Graduate studies coordinator	2.22	11.6	1.00	11.7
First cycle programme coordinator	0.91	4.7	0.25	2.9
Research Center Director	1.80	9.4	0.98	11.5
Coordinator of clinical training and training in application milieus	2.16	11.3	0.80	9.4
Member of university instances	1.37	7.2	0.42	4.9
Member of faculty and departmental instances	4.10	21.5	1.56	18.3
Member of preparation, negotiation and administration of the collective agreement instances	0.64	3.3	0.26	3.0
Other(s) tasks	1.42	7.4	0.72	8.4

Note: Total percentages may differ from 100% because of rounding.

When reflecting on the data of Table 6 one should take into consideration that the single respondent does not necessarily exerts all the tasks and activities aimed at contributing to the functioning of the institution. All estimations of time on task are based on the responses of all respondents regardless whether they exert or do not exert the specific task or activity. The estimations are thus *average* estimations. This remark is important concerning the tasks and activities aimed at the functioning of the institution because several of these result from choice by academic peers or from administrative appointment. This means, for example, that a programme coordinator does not invest an average of 4.4 hours in a most loaded month but 30.5 hours.

3.4 Service function

In the research intensive University of the case study, the activities of scientific and professional diffusion are considered within the service function. Three other sets of

activities are considered part of the service function: tasks solicited by external organizations, participation to external committees and organizations, and internationalization activities.

As expected, the delivery of scientific and professional papers at meetings, including the travel time, occupies more than two-thirds of the total time of this component of the service function (see Table 7).

Table 7
Allocation of time for tasks and activities of scientific and professional diffusion (N=205)

Tasks	Typical most loaded month		Typical less loaded month	
	Average number of hours	%	Average number of hours	%
Presentation of conferences and communications	19.88	69.5	8.76	81.2
Participation to the preparation of a colloquia or congress	8.36	29.2	1.93	17.9
Participation to relevant forms of artistic manifestations	0.35	1.2	0.09	0.0

Note: Total percentages may differ from 100% because of rounding.

As Table 8 shows, three tasks solicited by external organizations require on average proportionally more time in a typical most loaded month than in a typical less loaded month: critical review of articles and manuscripts, evaluation of projects for funding agencies and participation to thesis committees of other institutions. It should be noted that, in absolute terms and in a typical most loaded month, the evaluation of projects for funding agencies demands comparatively more time than the other tasks.

Table 8
Allocation of time for tasks solicited by external organizations
(N=205)

Tasks	Typical most loaded month		Typical less loaded month	
	Average number of hours	%	Average number of hours	%
Critical review of articles and manuscripts	7.82	22.4	3.35	32.9
Evaluation of research projects for funding agencies	11.28	32.3	1.78	17.5
Editor-in-Chief of a learned journal	1.83	5.2	0.81	7.9
Coordinator of a collection	0.99	2.8	0.3	3.3
Participation to thesis committees of outside organizations	5.76	16.5	1.63	16.0
Participation to accreditation and professional evaluation committees	1.20	3.4	0.43	4.2
Participation to ethics committees of hospitals	0.40	1.1	0.18	1.7
Participation to personnel selection and promotion outside the institution	2.24	6.4	0.63	6.1
Preparation and enactment of interviews with the media	1.30	3.7	0.33	3.2
Consultancy activities	2.02	5.7	0.69	6.7

Note: Total percentages may differ from 100% because of rounding.

In a typical most loaded month, respondents allocate an average of 8.03 hours to the participation in activities of external organizations. The participation in international scientific organizations demands proportionally more time. The same pattern occurs with regards to the average of 2.01 hours allocated to these tasks in as of the less loaded month (see Table 9).

Table 9
Allocation of time for participation in activities of external organizations
(N=205)

External organizations	Typical most loaded month		Typical less loaded month	
	Average number of hours	%	Average number of hours	%
National scientific organizations	4.67	58.1	0.59	29.3
International scientific organizations	1.57	19.5	0.66	32.8
Governmental organizations	0.29	3.6	0.27	13.4
Cultural organizations	0.18	2.2	0.03	1.4
Professional organizations	0.49	6.1	0.0	4.4
External employees' organizations	0.01	0.0	0.0	0.0
Social and charity organizations	0.72	8.9	0.2	13.4
Other (s)	0.10	1.2	0.1	4.9

Note: Total percentages may differ from 100% because of rounding.

If one considers the proportion of respondents that participate in external organizations, irrespective of the average time invested, only 23.9% participate in national scientific organizations and 14.9% in international scientific organizations. The percentages of respondents participating in other types of external organizations do not exceed 5%.

Only 7.8% of respondents report no internationalisation activities. Most of respondents report one or more internationalisation activities. Table 10 presents the distributions of respondents according to type of internationalization tasks or activities. Four of them are favoured by respondents: elaboration and implementation of exchange projects, prospection of available international research or training projects, implementation of research or training projects and inception and follow up of international students.

Table 10
Percentage of participation in internationalization activities
(N=205)

Participation in internationalization activities	%
Elaboration and implementation of exchange projects	16,2
Prospection of available international research or training projects	22.2
Implementation of research or training projects (independent or in consortium)	17.7
Elaboration of courses or programmes with international content	6.0
Inception and follow-up of international students	24.0
Coordination of delocalized training periods or formal programs in foreign countries	5.4
Organization of campus training periods or formal programs for international clienteles	3.0
Others	5.4

Note: Total percentages may differ from 100% because of rounding.

4. FACULTY WORKLOAD BY GENDER, ACADEMIC RANK AND DISCIPLINARY SECTORS

This section briefly discusses faculty workload according to academic rank, gender and disciplinary sectors. Its aim is to find *whether there are specific workload profiles according to these variables or if they follow the univariate patterns already discussed*. For each professorial function, there is a discussion of similarities and differences for each one of the independent variables.

4.1 Teaching function

The gender variable has no incidence on faculty's workload profiles. Both male and female faculty reports similar distributions of allocated time for the accomplishment of the various components of the teaching function.

If one considers the component or block relative to preparation of courses, students' evaluation, supervision, participation to thesis committees, there is no difference by faculty academic rank. There is also no difference vis-à-vis word processing and administrative activities as well as vis-à-vis activities geared to the maintenance of the level of academic competency (professional growth).

The distributions of allocated time for the various components of the teaching function by disciplinary sector are in general comparable. There are a few differences, but they are not significant.

4.2 Research function

With respect to gender, the distributions of allocated time for each component of the research function are remarkably similar.

The differences in the percentage distributions of allocated time for the accomplishment of the components of the research function are relatively small: they do not exceed three percentage points. It is worth noting that, irrespective of academic rank, faculty devotes, in a typical most loaded month, one fifth of the total research time to word processing and administrative procedures. Also worth of mentioning is the fact that respondents grant comparatively less time to knowledge transfer activities than to clerical and bureaucratic tasks.

Faculty workload relative to some aspects of the research function varies according to disciplinary sectors. In a typical most loaded month, the workload profile of faculty in the natural sciences differs, with regard to new knowledge production, from the other three profiles: those in the natural sciences invest proportionally less time (at least 7 percentage points) than their colleagues, and proportionally more time than their counterparts with regard to knowledge transfer activities (at least 7 percentage points).

4.3 Contribution to the functioning of the institution

There are no significant differences by gender with respect to the time invested in tasks and activities that contribute to the functioning of the institution.

There is an inverse relationship between faculty academic rank and contribution to the functioning of the institution. Full professors and associate professors report higher average number of hours dedicated to tasks and activities that contribute to the functioning of the institution and assistant professors.

In a most loaded month, respondents from the Health Sciences sector report the highest average number of hours devoted to the functioning of the institution, followed by respondents from Applied Sciences.

4.4 Service function

There are certain differences between male and female faculty with respect to proportional allocation of time to the service function. In a most loaded month, male faculty report proportionally more time than female faculty relative to the participation in scientific and professional events and artistic manifestations. On the contrary, male faculty report proportionally less time to the response to solicitations from external organizations.

In a typical most loaded month, full professors' workload profiles of the components of the service function are different from those of assistant and associate professors. The former allocate proportionally less time to active participation to scientific and professional events than the latter. On the contrary, they devote proportionally more time to participation as member of the board or committee member of external organizations than assistant and associate professors.

Contrary to the behaviour of disciplinary sectors vis-à-vis the other three professorial functions, in the case of the service function there are marked differences. The proportional allocation of time to the different components, in a typical most loaded month, is quite similar for faculty in the social sciences and humanities and in the natural sciences. The two other sectors differ with the former ones with respect to participation to scientific and professional events and artistic manifestations, and to participation as member of the board or committee member of external organizations.

5. RECENT CHANGES IN FACULTY WORKLOAD

This section deals with recent changes of faculty workload in the research intensive University of the case study in the last decade. Only respondents with at least ten years of seniority were solicited to answer questions relative to comparisons between workload in the academic year 2006-2007 and ten years before.

5.1 Teaching function

Three components of the teaching function will be discussed: preparation of courses, students' evaluation and supervision, administrative and clerical tasks, and professional growth. Also, some results about the composition of the teaching tasks and on the utilization of ITC in teaching will also be discussed.

When respondents compare the time invested in the tasks of preparation of courses, students' evaluation, supervision and student follow-up, 74.8% report that the time invested now in comparison to ten years before has a little or a lot increased. Only 4.6% state that the time invested has diminished and 7.6% have no opinion on the matter.

For 67.2% or respondents, tasks such as word processing, photocopying, electronic communications with students, demand a little or a lot more time than ten years before. Only 3% percent of respondents report that they did not do these tasks ten years before.

Forty-six percent of faculty report that the time needed for maintaining competency (professional growth) is the same as ten years before. Moreover, 20% indicate that the time invested has decreased.

For 55.9% of faculty, the composition of the teaching tasks has changed. Among the identified factors of the changes in the composition of teaching tasks are:

- More courses given at undergraduate level: 10.0% (N=30)
- More courses given at the graduate level: 8.2% (N=24)
- Increase in the number of student per course: 18.2% (N=53)
- Development of didactical instruments and innovative pedagogical approaches: 16.4% (N=48)
- Evaluation of students' work: 19.5% (N=57)
- Give more courses after 4 p.m.: 3.8% (N=11)
- Participation in the creation of new courses: 13.0% (N=38)
- Give more out campus courses: 3.4% (N= 10)

For 80% of those who affirm that the composition of teaching tasks has changed, *the changes have induced a work overload.*

Information technologies are at the root of the preparation and delivery of courses for a great number of respondents of the case study institution. Only 4.6% of them report that they do not employ ICT. Thirty percent of them report that they employ ICT "enormously". On a 5 points scale, the average score of ICT utilization was 3.7. For 48.1% of respondents, the utilization of ITC constitutes a work overload. On the contrary, one third estimates that the utilization induces a work relief.

5.2 Research function

Two components of the research function are discussed: production of new fundamental or applied knowledge, and knowledge transfer.

For 58.3% of faculty, the time invested at the present for the production of new knowledge has a little or a lot increased. Around one fifth of respondents affirm that the time invested now has remained the same, and 15.6% say that it has decreased.

Among respondents who answered the questions relative to the change in the amount of time invested in knowledge transfer, two fifths of them report that it has increased, and two fifths of them also indicate that the time invested has not change.

5.3 Contribution to the functioning of the institution

Close to two thirds of respondents (62.9%) think that participation to activities that contribute to the functioning of the institution demand now, as compared to ten years before, a little or more time to accomplish them.

5.4 Service function

The changes in the four components of the service function will be successively discussed: diffusion of knowledge, response to demands of external organizations, participation in outside organizations, and internationalization activities.

With respect to the tasks and activities of diffusion of knowledge, 45.5% of respondents estimate that these tasks and activities require a little or a lot more time than ten years before. Note, however, that two fifths of respondents do not see any change in the amount

of time invested compared to ten years before, and 11.9% think that it requires at the present less time.

The response to demands emanating from external organizations constitutes, according to respondents, a small work overload. The mean score of a five points scale with 1 (relief) and 5 (overload) is 3.5. Thus, 46.1% chose score 3 or less, 41.6%, score 4 and 12.4% score 5.

If one considers participation in external organizations as member of the Board or committee member, 9.8% of respondents do not participate in any organization. Among those who participate, 33.8% affirm that the time invested now is comparable to that invested before and 45.1% indicate that the time invested now has a little or a lot increased.

For 58.7% of respondents, the time required now for internationalization activities has a little or a lot increased. Around 24% of respondents estimate to be the same as before.

CONCLUDING REMARKS

Total faculty weekly workload in this case study is higher than for the whole Québec higher education institutions (Dyke & Descheneaux, 2008) [56.9 hours versus 45.5]. The weekly workload in this research intensive university is close to the upper average workload reported in the literature of 55 hours per week (McInnis 2000; Cataldi *et al*., 2005; Forgasz & Leder, 2006).

The proportional size in terms of time to task of the service component of the professorial workload is rather high. This finding points to an increasing involvement of faculty in international endeavours as well as in the participation in the social and economic environment of their institution.

Remarkably, there are few differences in the allocation of time to the various components of the professorial functions by gender, academic rank, and disciplinary sectors, with the exception of some aspects of the research function by disciplinary sector and some aspects of the service function by academic status and disciplinary sector.

There is an increasing demand of available time for preparation of research projects to be submitted to different public and private agencies for funding. Also, there is a noticeable increase in the time allocated to "peripheral" activities such as word processing for papers, conferences, reports (before this was done by the secretarial staff) and administrative and clerical tasks. Houston *et al.* (2006, p. 25) also reported a noticeably increase in such peripheral activities. Finally, electronic communications, particularly with students, take also a significant share of the daily professorial workload.

For most components of the professorial functions, more time is required now (2006-2007) to execute them than ten years before. This finding is consequent with Bertrand's study (2003) which showed that 87.9% of faculty reported that their total workload has increased.

The professorial function with the highest proportion of total workload is teaching and related tasks. Research is second in proportional percentage of total workload. This is important to note given the research intensive characteristic of the institution of this case study.

This study has introduced a new approach for estimating the average weekly faculty workload: the concept of "most loaded month" and "less loaded month". This measurement approach takes into account the fact that certain tasks are executed more intensively at particular moments in the academic year while others do not take place each week. By asking estimates of time to task required in "a most loaded month" and in a "less loaded month" and then calculating an average weekly workload, considering as well the number of most and less loaded months of the academic year reported by each respondent, the estimate obtained is hopefully more accurate than the standard procedure of asking faculty an estimate of an "average" weekly load.

Finally, national and international comparisons of faculty's workload are problematic since the procedures to measure time on tasks are varied and often encompass tasks or activities not perfectly equivalent.

REFERENCES

Allen, H.L. (1996). Faculty workload and productivity in the 1990s: preliminary findings. *The NEA 1996 Almanac of Higher Education*, 21-34.

Askling, B. (2001). Higher education and academic staff in a period of policy and system change. *Higher Education*, 41, 157-181.

Becher, T. (1989). *Academic Tribes and Territories*. Buckingham, UK: SRHE & OU Press.

Bentley, J. & Kyvik, S. (2013). Individual differenced in faculty research time allocation across 13 countries. *Research in Higher Education*, 54, 329-348.

Bentley, J. & Kyvik, S. (2012). Academic work from a comparative perspective: a survey of faculty working time across 13 countries. *Higher Education*, 63, 529-547

Bertrand, D. (2003). *Diversité, continuité et transformation du travail professoral dans les universités québécoises*. Québec: Collection Études et recherches.

Bertrand, D., Focher, R., Jacob, R., Fabi, B. & Beaulieu, P. (1994). *Le travail professoral remesuré. Unité et diversité*. Québec: Presses de l'Université du Québec.

Biglan, A. (1973a). The characteristics of subject matter in different academic areas. *Journal of Applied Psychology*, 57, 195-203.

Biglan, A. (1973b). Relationships between subject matter characteristics and the structure and output of university departments. *Journal of Applied Psychology*, 57, 204-213.

Boyer, E., Altbach, P. & Whitelaw, M. (1994). *The Academic Profession: An International Perspective*. New Jersey: The Carnegie Foundation for the Advancement of Teaching, Princeton University Press.

Burgess, T.F., Lewis, H.A. & Mobbs, T. (2003). Academic workload planning revisited. *Higher Education*, 46, 215-233.

Cataldi, E.F., Bradbum, E.M., Fahini, M. & Zimbler, L. (2005). *2004 National Study of Postsecondary Faculty*. Washington D.C., National Center for Educational Statistics.

Cornell University Institutional Research and Planning (2006). *Faculty Work Life Survey*. Ithaca, New York: Cornell University.

Dennison, G.M. (2012). Faculty workload: an analytical approach. *Innovative Higher Education*, 37, 297-305.

DIIA (2007). *Instructional Assessment Resources. Assess Teaching*. *Response Rate*. Texas: University of Texas at Austin.

Dobele, A., Rundle-Thiele, S., Kopanidis, F. & Steel, M. (2010). All things been equal: observing Australian individual academic workload. *Journal of Higher Education Policy and Management*, 32, 235-237.

Dyke, N. & Deschenaux, F. (2008). *Enquête sur le corps professoral québécois: faits saillants et questions*. Montreal: Fédération québécoise des professeures et professeurs d'université.

Enders, J. & Teichler, U. (1997). A victim of their own success? Employment and working conditions of academic staff in comparative perspective. *Higher Education*, 34, 347-372.

Fairweather, J.S. & Beach, A. (2002). Variations in faculty work at research universities: implications for State and institutional policy. *The Review of Higher Education*, *26*(1), 97-115.

Forgasz, H. & Leder, G.C. (2006). Academic life: monitoring work patterns and daily activities. *Australian Educational Researchers*, *33*(1), 1-22.

Hamilton, M.B. (s.d.). On line survey response rate and times. *Background and Guidance for Industry* [www.supersurvey.com].

Harnan, G. (2002). Academic leaders or corporate managers: deans and heads in Australian higher education, 1977-1997. *Higher Education Management and Policy*, 14, 53-70.

Honan, J.P. & Teferra (2001). The US academic profession: key policy changes. *Higher Education*, 41, 183-203.

Houston, D., Meyer, L.H. & Paewai, S. (2006). Academic staff workloads and job satisfaction: expectations and values in academic. *Journal of Higher Education Policy & Management, 28*(1), 17-30.

Kaplowitz, M.D., Hadlock, T.D. & Levine, R. (2004). A comparison of web and mail survey response rate. *Public Opinion Quarterly*, *68*(1), 94-101.

Kim, Y.L. (2011). Gender equity in higher education: faculty salaries, career development and academic services. *Procedia-Social and Behavioral Sciences*, 29, 1274-1278.

Layzell, D.T. (1999). Higher education's changing environment: faculty productivity and the reward structure, *in* W.G. Tierny (ed.), *Faculty Productivity: Facts, Fictions, and Issues*. New York: Falmer Press.

Link, A.N., Swann, C.A. & Bozeman, B. (2008). A time allocation study of university faculty. *Economics of Education Review*, 27, 363-374.

Meyer, K.A. (1998). Faculty workload studies: perspectives, needs, and future directions. *ASHE-ERIC Higher Education Reports, 26*(1), 1-101.

Milem, J.F., Berger, J.B. & Dey. E.L. (2000). Faculty time allocation. A study of changer over twenty years. *Journal of Higher Education*, 71, 454-475.

McInnis, C. (2000). Changing academic work roles: the everyday realities challenging quality in teaching. *Quality in Higher Education*, *62*(2), 143-152.

Park, S.M. (1996). Research, teaching, and service: why shouldn't women's work count? *Journal of Higher Education*, *67*(1), 46-84.

Probert, B. (2005). 'I just couldn't fit it in': gender and unequal outcomes in academic careers. *Gender, Work and Organization*, 12, 50-72.

Schuster, J.H. & Finkelstein, M.J. (2006). *The American Faculty: The Restructuring of Academic Work and Careers.* Baltimore: John Hopkins University Press.

Terosky, A., Pifer, T. & Neuman, A. (2008). Shattering Plexiglas: continuing challenges for women professors in research universities, *in* Glazer-Raymo (ed.), *Unfinished Agendas: New and Continuing Gender Challenges in Higher Education.* Baltimore: John Hopkins University Press.

Vardi, I. (2009). The impact of different types of workload allocation models on academic satisfaction and working life. *Higher Education*, 57, 499-508.