

**PROFESSIONAL DEVELOPMENT NEEDS OF GRADUATE
STUDENTS: COMPARING AND CONTRASTING
PERSPECTIVES**

Fall 2007

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Representatives of Canada's Tri-Council recently distributed a *Tri-Council statement of principles on key professional skills for new researchers* thus raising the profile of this topic. The Faculty of Graduate Studies at Dalhousie University has been examining the question independently in the interest of contributing to an internal discussion on the topic of improving the graduate student experience. At the 2007 annual conference of the Canadian Association of Graduate Studies in Moncton, NB, we committed to sharing the findings of our research into the topic. The purpose of this document is to provide some brief background on professional development for graduate students and Postdoctoral Fellows (PDFs), to report on the results of a Dalhousie survey of stakeholders who have an interest in the topic, and to provide some further discussion about prospective principles and practices.

INTRODUCTION AND BACKGROUND

The Faculty of Graduate Studies at Dalhousie University undertook a strategic planning process in the summer and fall of 2006. One of the consequences of that process was clear direction from faculty and administration to expand their previous remit to include professional development for graduate students. The mandate of the Faculty also changed to include PDFs, so we looked to the previous research involving this constituency as well.

Government sponsored studies into the career consequences of getting a PhD have been done in a number of places. Two of the most pertinent statistical studies reviewed for this paper were the Canadian one entitled *Survey of Earned Doctorates: A Profile of Doctoral Degree Recipients* (Gluszynski *et al.*, 2005) and a United Kingdom one entitled *What Do PhDs Do: 2004 Analysis of First Destinations for PhD Graduates* (Shinton, 2004). As the titles suggest, each of these documents reported on the experience of their respective countries on what happens to the highly qualified personnel earning terminal degrees in the post-secondary education system. Clearly this information is very relevant from the perspective of designing the curriculum and learning

experiences of such students, making the assumption that the university has a responsibility for preparing such graduates for all careers that require such preparation. For PDFs, we have benefited from the *Postdoctoral researchers: roles, functions and career prospects* (Åkerlind, 2005).

There are two competing schools of thought regarding the employment prospects for graduate students and PDFs. One holds the view that the greying of the professoriate constitutes a major risk to North American universities in the medium term of the next 5-10 years; this suggests an urgent need to train replacement faculty. For example, the North Carolina State university system reported a comparison of the faculty demographics 1983 contrasted with 2003 (Fogg, 2005). In 1983, 31.9% of the faculty members were over the age of 50, while 20 years later the percentage had risen to 53.6%. The same data argues against the conclusion that there will be a general shortage of professors as a consequence of the change in mandatory retirement rules. Fogg (2005) reported “In 1984 there were only two tenured faculty members over the age of 69. By 2001 the system had 90 such professors.”

There have been a number of reports suggesting we have come to the point of producing too many PhDs such as the US National Research Council (Nerad & Cerny, 1999; Tilghman, 1998), and the Commission on the Future of Graduate Education in the Pharmaceutical Sciences (as reported in (Triggle & Miller, 2002). The National Opinion Research Center has also released a comprehensive study of doctorate recipients from US universities (Hoffer *et al.*, 2007), reporting that about 72% of recipients had employment/study/post doctoral commitments, and a further 7.8% were in the process of negotiating such an arrangement. In other words, just over 20% did not have a specific prospect or had “not made a plan yet” (p.40). Of those who had a specific commitment, the percentage of PhD recipients who reported a commitment to a given sector, 53.6% reported they intended to go to academe (p. 90). We note there is a huge disparity among disciplines on this dimension varying from 14.9% in engineering to 85.2% in the humanities.

These reports invite the question of how universities have adjusted their PhD graduate production over the last 10 years, or indeed whether they have any obligation to do so. Perhaps the most objective source of an assessment of the future demand for post-secondary teachers is the US Bureau of Labor Statistics, which ranked this group as 23rd fastest growing for the forecast period of 2004-2014 at 32.2% (Hecker, 2005). The scope of this study does not embrace the challenge of resolving this question.

It is also unclear from the data in Hecker (2005) whether there might be a distinction between “post-secondary teacher” and “post-secondary researcher”; it is clear that the Bureau of Labor statistics definitely refers to the “teacher” element of the occupational demand they are reporting. The forecast sounds distinctly encouraging to new graduates, except the report is silent on the question of how much of this growth is for tenure-track employment. Alternative reports suggest that such traditionally desirable positions are thin on the ground (Gaff, 2002), and that successful graduate students have a poor understanding of the expectations of such career paths. Rothgeb *et al.*, (2007) refer to *Facts in Brief* by the American Council on Education 2001, which reported that approximately 64% of faculty in higher education work at non-doctoral institutions.

This brings us to a separate question, whether we are adequately preparing graduate students headed for careers in the professoriate. There has been a significant effort in the US around an initiative known as Preparing Future Faculty, or PFF as it is often known (see DeNeef & Association of American Colleges, 2002; Gaff, 2002; Seidel & Gaff, 2002). It is clear from this body of research that research-intensive universities generally excel at training PhDs to research and analyze in relatively narrow domains. For many universities (at least in Canada) the research skill subset would account for approximately 40% of the job performance expectation, with a further 40% teaching and 20% service. For the answer to the question of how well North American Universities prepare future faculty for the other 60% of their responsibilities, we look to a seminal piece of research entitled *At cross purposes: What the experiences of today's graduate students reveal about doctoral education* (Golde & Dore, 2001).

It appears that universities are not preparing the whole individual for the whole job of the university professor of the future. The professional development challenges are substantially deeper than this when we take into account the career trajectories of graduate students and PDFs. Obviously generalizations across all disciplines are inappropriate. But the UK data (Shinton, 2004) are instructive; of the 1375 survey respondents, 36% work in research occupations. This says the 64% work in occupations which presumably have significant job content outside of the skill set which the terminal degree conveys.

The situation for PDFs in the Australian experience (Åkerlind, 2005) is clear and likely comparable to the situation in North America. Åkerlind notes that the PDF system as a whole has been under stress for at least 10 years, quoting a special issue of *Science* (1999, vol. 285, no. 3, September). A majority of postdoctoral researchers (noting the widespread confusion about nomenclature related to researchers, fellows, associates, contract research staff, research scientist, etc.), hope for “an academic teaching/research position as their first choice for an employment goal” (Åkerlind, 2005), but PDFs report they did not get effective career counselling. The article presents the experience of some, describing the PDF period “as a time of *deskilling*, due to the

limited range of activities that she could engage in and the consequent dating of her previous experience” (p.37, italics in the original). One of the most important conclusions of this article for improving the situation and prospects of the PDF community is providing career counsel during the graduate student period, including “broadening skill-development opportunities” (p. 40).

To summarize this whirlwind look at a limited set of the literature, we can say that we do not really have a good idea of where many of our PhD graduates and PDFs end up in their careers. For those with some prospect of academic life, we cannot say with very much certainty what their chances for tenure track positions are in the short- to medium-term even though that is ostensibly what we are training them for. When we train PhD students for academic positions, we have focussed almost entirely on their research competencies, dealing with the teaching component only opportunistically, while ignoring the service and career intelligence components of their futures. For the PhDs and PDFs who will not see an academic career (which is to say almost half of them overall), we do not know what competencies they will need to succeed, and if we help them with these competencies, it is almost certainly accidental.

Accepting for the moment that broadening professional and personal skill-development opportunities is the proper responsibility of universities in Canada generally, and Dalhousie University specifically, what might the development needs of graduate students be? We conducted a series of surveys to collect data on the question.

SURVEYING THE DEVELOPMENT NEEDS OF GRADUATE STUDENTS

In the late spring 2007, we surveyed graduate students themselves as well as faculty members. We also thought it would be useful to also ask people who have a more independent and objective position with respect to the topic by surveying Dalhousie alumni. We will begin with a brief discussion of the mechanics of the survey and the metrics associated with it, followed by the data, analysis, conclusions and recommendations.

Survey Mechanics

As noted, we have conducted three surveys asking the same core questions around priorities for professional development of graduate students across the university, using the facilities of surveymonkey.com. The Faculty of Graduate Studies used a structured survey of the same core questions given to faculty and students. There were slight modifications of the survey in each survey to accumulate segment-specific data, such as the context in which the individual alumnus participant was responding, the last degree that they completed, the first position they took after

graduation, and their current position. We can provide the details of the survey questions in each of the three surveys to interested parties. The overall survey design was not intended for scientific or academic purposes, but to inform our own plans.

Graduate students were invited to participate by e-mail sent to all graduate students; 325 out of approximately 3,500 responded. Faculty were invited by e-mail to graduate coordinators who were asked to forward the invitation to interested faculty; 73 of them responded. Since we do not know how many graduate coordinators forwarded the invitation to how many faculty, we are unable to report the response rate for faculty. An e-mail message inviting participants to complete the survey was sent to External Relations at Dalhousie University. That office sent the invitational e-mail to just under 40,000 alumni for whom they had e-mail addresses. According to the data provided by External Relations, just fewer than 10,000 recipients viewed the e-mail and of these 2310 clicked through to the content of the email. Of these, almost 900 engaged in the survey before it was formally closed but the numbers reported below represent the state of the data approximately six weeks after survey initiation. We left the survey open after downloading the data in the hopes of attracting more in the way of text suggestions from alumni, but in the interest of producing timely internal results, we did not include the submissions after September 9th in the analysis.

Survey Results

The follow sections of this report are organized into: 1) the overall results from each survey; and, 2) a section that provides an analysis and comparison among the three communities who responded. The weighting calculation for establishing the rank of priorities among the groups is by assigning 1, 2, 3, 4, 5 to “Zero Priority”, “Low Priority”, “Some Priority”, “High Priority”, and “Vital!” respectively. We eliminated responses of “done by my faculty” or “N/A” from weighting calculations. In the tables presenting subsets of the priorities, we selected groupings that were separated by apparently meaningful differences. These were determined by inspection, not statistical inferencing.

Student Perspectives of Professional Development for Graduate Students

As noted above, 325 graduate students responded to the question about their priorities. Table 1 below present the priority items from the student responses greater than or equal to 6% (i.e., 20 or more respondents) said this was done in their faculty. The ranking in the right hand column represents how important these elements are to the graduate students, out of 38 choices.

Table 1. Priority Items in **Student** Responses Where 6% Or More Respondents Said Topic Was Covered In Their Faculty.

Survey Items	% indicating this topic was done by their faculty	Relative ranking of importance to students
1. Workshop - preparing an effective curriculum vitae.	7.8%	9
2. Workshop - orientation to graduate studies	7.3%	32
3. Workshop - ethical considerations in the academic workplace	6.8%	34
4. Workshop - the application for ethics approval	6.4%	36
5. Workshop - citation management tools	6.0%	23
6. Workshop - exploiting the digital library, e.g., ScienceDirect, ABI INFORMS	6.0%	24

It is unclear from these results whether the low priority ranking of the items 2 to 6 in Table 1 is a function of the fact that these items are genuinely low priority in and of themselves, or whether they are low priority because they are most often done. The alternative explanation is that some faculties are providing instructions on issues in which students are uninterested, or that faculties have done a poor job of convincing students about the importance of the topics.

Table 2 presents the top priorities for professional development on the part of graduate students. The choice of the number of topics classified as “top priority” was by inspection of the rating value. The lowest rating value in Table 2 is 3.45, and the next one on the list was 3.38. With the possible exception of the second last item (*public speaking*) there is a clear pattern to these responses. Almost all of them speak to the natural short-term questions of getting though university and landing the first job, whether an academic one or not.

Table 2. Top Ranked Items by Weighted Rating – Student Respondents

ITEM	Zero	Low	Some	High	Vital!	Rat- ing	N / 325	Rank
1. Workshop - effective and efficient academic writing	10	26	76	117	87	3.69	323	1
2. Workshop - how to write grants that win money	11	18	55	98	117	3.68	323	2
3. Workshop - preparing for an academic interview	8	30	78	102	90	3.64	319	3

ITEM	Zero	Low	Some	High	Vital!	Rat- ing	N / 325	Rank
4. Presentation - effective job search techniques	9	35	77	108	85	3.64	321	4
5. Workshop - improving your scholarly writing	7	24	93	120	70	3.59	324	5
6. Workshop - managing your career progression	7	34	92	113	68	3.57	320	6
7. Presentation - how to defend your dissertation	11	23	53	90	112	3.52	323	7
8. Presentation - presenting your research at your interview	8	25	84	114	71	3.51	319	8
9. Workshop - preparing an effective curriculum vitae.	9	25	68	101	92	3.49	323	9
10. Workshop - effective public speaking	10	50	93	98	67	3.46	323	10
11. Workshop - preparing for a non-academic interview	13	37	83	99	75	3.45	321	11

Students were not shy about expressing their views in the text boxes of the survey. Table 3 below provides a summary of the most frequent student responses to the question of what other workshops or seminars should be offered.

Table 3. Classification of Student Responses in Survey Text Boxes for Additional Recommendations or Thoughts.

Item	Frequency of response / 60
1. Expressions of support for the idea of professional development seminars and workshops.	19
2. Job transition and employment concerns, including networking.	18
3. Expressions of doubt or concern about professional development courses.	6
4. Working with supervisors and committees, conflict management.	6
5. Working with industry.	4
6. Self-efficacy (motivation, stress, time management, negotiation skills, listening skills, MS Office skills).	4
7. Publishing related comments (i.e., how to publish).	4
8. Coordinating offerings among Dal providers (e.g. Centre for Learning and Teaching, Writing Centre, individual faculties, etc.).	3

Faculty Perspectives of Professional Development for Graduate Students

As noted above, 73 faculty members responded to the question about priorities. Table 4 below present the priority items from the faculty member responses where 6% or more respondents said this was done in their faculty. The ranking in the right hand column represents how important these items are to the participating faculty members out of 38 choices.

Table 4. Priority Items In Faculty Responses Where 6% Or More Faculty Respondents Said This Was Done In Their Faculty.

Item	%	Ranking
1. Workshop - preparing an effective curriculum vitae.	9.7%	6
2. Workshop - how to write grants that win money	8.3%	1
3. Workshop - the application for ethics approval	7.8%	32
4. Workshop - exploiting the digital library e.g., Science Direct, ABI INFORMS	7.1%	13
5. Workshop - improving your scholarly writing	7.0%	3
6. Workshop - applying for scholarships	7.0%	8
7. Workshop - effective public speaking	7.0%	9
8. Presentation - presenting your research at your interview	6.9%	4
9. Workshop - preparing for an academic interview	6.8%	5

We suspect these results may be biased to the faculties with students in research programs as opposed to the faculties who work primarily with professional students. Having said this, we note that **none** of the responding faculty members reported that their faculty delivered instruction on the topic faculty members ranked as number 7 in the priority list (i.e., *ending your thesis before it ends you*).

There is an odd discrepancy between what students report having received from the faculty and what faculty members claim is offered, as a comparison of Tables 2 and 4 will show. This may be explained by a difference between participating faculty members and students regarding their faculty.

Table 5. Top Ranked Items by Weighted Rating – **Faculty** Respondents

	ITEM	Zero	Low	Some	High	Vital!	Rating	N	Rank
1.	Workshop - how to write grants that win money	1	2	10	31	22	4.08	66	1
2.	Workshop - effective and efficient academic writing	0	3	17	26	21	3.97	67	2
3.	Workshop - improving your scholarly writing	0	6	12	26	22	3.97	66	3
4.	Presentation - presenting your research at your interview	0	4	15	33	15	3.88	67	4
5.	Workshop - preparing for an academic interview	1	3	16	33	15	3.85	68	5
6.	Workshop - preparing an effective curriculum vitae.	0	7	17	30	11	3.69	65	6
7.	Workshop - ending your thesis before it ends you	1	6	23	26	13	3.64	69	7
8.	Workshop - applying for scholarships	1	3	27	24	11	3.62	66	8
9.	Workshop - effective public speaking	1	6	21	29	9	3.59	66	9
10.	Presentation - how to defend your dissertation	0	13	17	23	15	3.59	68	10

Perhaps it is unsurprising that nine of the top ten items on the priority list are related directly to success in the academic setting, and on successfully completing the degree process. The exception to this observation is *public speaking* and that is arguably also a factor for success in graduate studies.

Faculty members had a number of suggestions and comments and there was a great deal of variation in the ideas offered. A couple of themes did emerge, such as helping students with the publishing process, and financial management. The financial management idea was primarily directed to administering grants, but we suspect this is not the limit of the need. This observation is based in part on other data such as the financial disclosure data of students who apply for bursaries.

A number of these comments deserve discussion. Respondents among faculty noted that some of the proposed topics were explicitly or implicitly covered in their faculties. Others noted that there would be very different specific requirements to the content of the material depending on the academic community involved. For example, the specific expectations around *curriculum vitae* varies by discipline. There was also recognition of the fact that some faculties have enough scale to offer most of the suggested development topics, while others would benefit from have a centralized delivery capacity, such as the Faculty of Graduate Studies.

Alumni Perspectives of Professional Development for Graduate Students

In collaboration with the External Relations at Dalhousie University, we invited alumni for whom the university had e-mail addresses to participate in the survey. The invitation was sent in August and the survey held open until mid-September to accommodate those on vacation. Approximately 900 people responded. At the outset, we recognized there would be different segments in the larger community, specifically those who might answer from the perspective of a graduate student, those who hire our graduates, people who identify in both categories and others as well. Table 6 below sets out the results.

Table 6. Respondents Answering from which Perspective?

Category	Response Percent	Response Count
1. As a person who would have liked the following priorities met while I was at grad school	56.0%	485
2. As a person who hires grad students	6.0%	52
3. Both	27.4%	237
4. Other (please specify	10.6%	92
	<i>answered question</i>	866
	<i>skipped question</i>	19

Those who self-identify themselves as “Other” in Question 1 came from a wide variety of backgrounds, as might be expected. There were some commonalities among the respondents who answered "other":

- Alumni (no further detail offered) 28
- Grad student 19
- Previous grad student 2
- Prospective graduate student 11
- Professor (whether local or not) 6

Sample other answers:

- I do not hire at the student level. I do promote senior employees in the company.
- Retired regional manager in the federal public service.
- Mechanical engineering graduate.
- A head-hunter / recruiter in the private sector.
- Employee, coach for graduate students/ educator.
- IT Professional.

- Medical faculty.
- As a person who is interested in career development across the life span.
- Retired Civil Engineer.
- Neither, I have nothing to do with grad students.
- Workplace and Adult Learning Specialist.
- I was not at grad school at Dal and I do not hire grad students.
- Work with graduate students.

With such a large and diverse group we have chosen to present the findings according to three segments: 1) **all** alumni respondents; 2) those who identify as speaking from the perspective **both** of a graduate student and someone who hires them; 3) those who identify themselves **only** as people hiring graduate students.

The following section of this report provides the highlights. We begin with the priorities of **all** alumni presented in Table 7 sorted by priority ranking.

Table 7. Alumni Respondents (**All**) in Ranked Sequence According to Priority

	Item	% Done	Zero	Low	Some	High	Vital!	Rat- ing	N	Ra nk
1.	Workshop - effective public speaking	2.4%	5	54	211	345	181	3.81	796	1
2.	Workshop - effective and efficient academic writing	2.1%	14	46	195	356	171	3.80	782	2
3.	Workshop - improving your scholarly writing	1.6%	17	61	213	351	153	3.71	795	3
4.	Presentation - effective job search techniques	2.1%	12	67	254	289	173	3.68	795	4
5.	Workshop - preparing an effective curriculum vitae / resume.	8.9%	20	77	212	248	189	3.68	746	5
6.	Workshop - preparing for a non-academic interview	3.5%	16	68	220	328	151	3.68	783	6
7.	Workshop - working in interdisciplinary teams	1.7%	11	82	243	308	146	3.63	790	7
8.	Workshop - giving and receiving criticism	1.6%	5	68	282	321	126	3.62	802	8
9.	Seminar - mentors how to find them, work with them, and become one	1.9%	18	103	239	286	152	3.57	798	9

Note that of the top nine priorities from the full set of alumni respondents, seven of them are clearly not academic. The top two priorities are about communication, that is, speaking and writing with approximately equal emphasis. We can compare these results to the subset of alumni respondents who self-identify as having **both** a graduate student perspective and the perspective of those who hire graduate students – Table 8.

Table 8. Alumni Respondents (subset of those who self-identify with the perspective of **both** students and someone who hires students) in Ranked According to Priority

	Zero	Low	Some	High	Vital!	Rating	N	Rank
1. Workshop - effective public speaking	1	9	53	104	49	3.88	216	1
2. Workshop - working in interdisciplinary teams	1	23	50	83	58	3.81	215	2
3. Workshop - effective and efficient academic writing	4	15	60	87	46	3.74	212	3
4. Workshop - giving and receiving criticism	1	10	75	97	35	3.71	218	4
5. Workshop - preparing for a non-academic interview	3	15	69	85	43	3.70	215	5
6. Seminar - mentors how to find them, work with them, and become one	4	22	65	81	47	3.66	219	6
7. Workshop - improving your scholarly writing	8	19	54	93	39	3.64	213	7
8. Presentation - how to manage a meeting	3	18	77	81	41	3.63	220	8

This produces a much more striking difference in emphasis between faculty and alumni, or between students and alumni. *Effective public speaking* is clearly the highest priority, and *working in interdisciplinary teams* has risen to a clear second place. *Public speaking* barely makes the top priority list for student respondents (at number 13), and *interdisciplinary teamwork* is ranked at number 18 for students. When we turn to alumni respondents who identify only from the perspective of hiring graduate students, the results are even more striking as is evidenced by Table 9 below.

Public speaking is even more clearly the top priority. *Working in interdisciplinary teams* is more clearly separated from the topic of *work / life balance*, which is not in the top topics list anywhere in the tables above. *Project management* as a topic also rises in priority to make the list.

Table 9. Alumni Respondents (subset of those who self-identify as someone who **only** hires students) in Ranked Sequence According to Priority

	Zero	Low	Some	High	Vital!	Ratng Avg	N	Rank
1. Workshop - effective public speaking	0	2	10	22	13	3.98	47	1
2. Workshop - working in interdisciplinary teams	1	3	10	19	14	3.89	47	2
3. Workshop - coming to terms with work / life balance	1	4	13	17	14	3.80	49	3
4. Workshop - giving and receiving criticism	1	4	11	22	10	3.75	48	4
5. Seminar - mentors how to find them, work with them, and become one	1	2	14	24	8	3.73	49	5
6. Workshop - effective and efficient academic writing	0	2	14	23	6	3.73	45	6
7. Workshop - preparing for a non-academic interview	0	6	11	22	8	3.68	47	7
8. Workshop - improving your scholarly writing	1	2	18	17	9	3.66	47	8
9. Seminar - project management for researchers	1	5	11	20	8	3.64	45	9

Alumni shared many other thoughts about the professional development initiative. We eliminated responses such as “nothing further to add”. By inspection, it appears as if alumni have very clear preferences, with material differences in the weighting average for the top three items in the list, *effective public speaking*, *working in interdisciplinary teams*, and *coming to terms with work / life balance*. The next three topics on the list (*giving and receiving criticism*, *mentors*, *effective and efficient academic writing*) cluster at approximately 3.74, and the last three topics cluster at approximately 3.66

ANALYSIS AND CONCLUSIONS

Making sense of such a large volume of data takes substantial time and effort, especially if we elect to apply the standards of statistical inference. These analyses are under way, but we can get an overview quickly by looking at the extremes in each segment of respondents and making direct comparisons beginning with the top priorities of alumni.

We chose a threshold of 5 positions or more in the difference in rankings to identify differences in priorities among respondents. Table 10 below tells us that there is a significant disconnect between the views of graduate students and alumni five of the top nine priorities of alumni, especially on *effective public speaking, working in interdisciplinary teams, job search techniques, and mentors*. There is reasonable agreement on the need for *effective and efficient academic / scholarly writing, and an effective C.V. / résumé*.

Table 10. Comparing Priority Ranks to Top Alumni Concerns

ITEM	Alumni Rank	Student Rank	Faculty Rank	Alumni-Faculty A/D	Alumni-Student A/D	Student-Faculty A/D
1. Workshop - effective public speaking	1	11	9	D	D	D
2. Workshop - effective and efficient academic writing	2	1	2	A	A	A
3. Workshop - improving your scholarly writing	3	5	3	A	A	A
4. Presentation - effective job search techniques	4	4	12	D	A	D
5. Workshop - preparing an effective curriculum vitae / résumé.	5	9	6	A	A	A
6. Workshop - preparing for a non-academic interview	6	11	17	D	D	D
7. Workshop - working in interdisciplinary teams	7	18	16	D	D	A
8. Workshop - giving and receiving criticism	8	12	11	A	A	A
9. Seminar - mentors how to find them, work with them, and become one	9	17	15	D	D	A

Legend:

A/D **Agreement / Disagreement** between respondent communities

Another way of looking at the data is to take the absolute difference in the ranking between respondent groups to highlight the greatest differences. Table 11 below presents the areas of

greatest absolute disagreement by subtracting the priority ranking of students and faculty and selecting the items with the largest differences.

Table 11. Biggest Priority Differences Between **Faculty** and **Students**

ITEM	Student Rank	Faculty Rank	Difference
Workshop - ethical considerations in the academic workplace	34	19	15
Workshop - managing your career progression	6	18	12
Workshop - exploiting the digital library, e.g., ScienceDirect, ABI INFORMS	24	13	11
Presentation - effective job search techniques	4	12	8
Workshop - issues of gender, race, and sexual preference in the academic career	37	29	8
Presentation - how to defend your dissertation	7	10	7
Workshop - preparing for a non-academic interview	11	17	6

Table 11 above tells us that faculty members rank *ethics in the academic workplace* at the middle of the pack, but for students it is very low priority. Students have lower priority for *understanding digital resource tools*, and *minority rights issues* than faculty's perception of what students need. Students have higher priority for *career progression*, *defending the dissertation*, and *getting a job* than faculty do on behalf of students.

Table 12 below sets out the difference in ranking between students and alumni. These differences are more marked than the differences between students and faculty. Perhaps this is predictable, especially for the first two items in the list, *preparing for the academic interview*, and *applying for scholarships*. Neither of these topics has much salience for alumni, the vast majority of which are not likely to have an active involvement with academic enterprises.

Table 12. Biggest Priority Differences Between *Students* and *Alumni*

ITEM	Student Rank	Alumni Rank	Difference
Workshop - preparing for an academic interview	3	19	16
Workshop - working in interdisciplinary teams	18	8	11
Workshop - applying for scholarships	16	26	10
Workshop - non-academic writing	31	21	10
Workshop - effective public speaking	10	1	9
Workshop - how to write grants that win money	2	11	9
Presentation - how to defend your dissertation	7	15	8
Presentation - presenting your research at your interview	8	16	7
Presentation - how to manage a meeting	20	13	7
Workshop - exploiting digital resources e.g. Google and Scholar.Google	33	27	6

In Table 12, students express complete disinterest in *non-academic writing*, perhaps because *academic writing* is key to their short-term success and perhaps because they do not imagine there is much of a transition to be made from academic writing and non-academic writing. Students also have a very clear concern about the short-term more generally. The list of topics that are relatively high on the student list but substantially lower on the priority list for alumni are *how to write grants that win money*, *how to defend your dissertation*, *preparing for an academic interview*, *presenting your research at your interview*, and *applying for scholarships*.

The list of topics relatively high on alumni priority while substantially lower on the priority list for students are *effective public speaking*, *giving and receiving criticism*, *mentors how to find them - work with them - and become one*, *working in interdisciplinary teams*, and *how to manage a meeting*.

Table 13. Biggest Priority Differences Between *Faculty* and *Alumni*

ITEM	Faculty Rank	Alumni Rank	Difference
Workshop - applying for scholarships	8	26	18
Workshop - preparing for an academic interview	5	19	14
Workshop - non-academic writing	35	21	14
Presentation - how to manage a meeting	26	13	13
Presentation - presenting your research at your interview	4	16	12
Workshop - conflict resolution	34	22	12
Workshop - preparing for a non-academic interview	17	6	11
Workshop - ethical considerations in the academic workplace	19	30	11
Workshop - ending your thesis before it ends you	7	18	11

We suspect that there may be some response bias that goes some way to explaining the results of Table 13. It may be the majority of the 76 faculty members that responded over-represent faculty members involved in research at the Ph.D. level that in part develops new academics as opposed to highly qualified personnel for industry or the public sector. We also speculate that faculty members in general can prepare students for academic life, but are not well positioned to prepare students for the kind of life that most alumni would be describing.

From the above data, and the many comments offered by all three groups of respondents, we conclude that there is a definite need for professional development opportunities among graduates students. These needs clearly vary by discipline, and by career intent of the student, in those cases where the student has actually identified a career intent. Faculty, students and alumni have very different perspectives on what the development needs are.

There are a variety of places on campus delivering these kinds of courses, including Student Services (e.g., the Writing Centre or the Centre for Learning and Teaching), individual faculties such as the Faculty of Medicine's new initiative on integrated training, and the Library. We believe that there are significant opportunities to partner with external organizations such as alumni and the public sector.

PROSPECTIVE PRINCIPLES AND PRACTICES

The overview of the literature and the survey data presented above does not address the fundamental question of whether universities have a responsibility for the professional development and their graduate students / PDFs, and what the nature of such a responsibility might be. We have tentatively organized our thinking along two tracks: 1) graduate students in professional faculties; and, 2) graduate students in other faculties.

It seems clear that “professional” faculties, by which we mean faculties preparing students for professional practice usually involving some form of professional credentialing, have such a responsibility. Dentistry, medicine, physiotherapy, business, library, nursing, pharmacy, law, clinical psychology, engineering are examples of faculties for which the large part of the teaching responsibility is preparing students for a credentialed profession, noting that business does not have a single credentialing approach, but involves multiple sub-disciplines such as accounting, human resource management, project management, and management consulting each with their own certification process.

While we have done no coherent primary data collection on the professional development elements of the programs in each of the domains represented above, we are confident that the core curriculum covers the specific body of knowledge implicit in each profession. We would predict that each of the disciplines also covers to some degree the norms and ethical dimensions of each practice. We doubt there is much in the way of overt practical skill development in the “soft-skills” described by the alumni respondents to the reported survey. For example, *effective public speaking, working in interdisciplinary teams, coming to terms with work / life balance, giving and receiving criticism, mentors (how to find them, work with them, and become one), effective and efficient writing, preparing for a non-academic interview, and project management* are all priority development topics identified by alumni as important. We speculate that few of the professional faculties deal overtly with these topics.

For the traditional academic faculties such as arts, sciences, social sciences, we imagine there may be some attempt to address elements of professional development but these attempts are most likely very catch-as-catch-can, voluntary for students, and generally poorly attended when offered. Where the graduate students in question are following a course of study aimed at developing them as researchers, i.e., thesis-based programs or post-doctoral fellowships, there are other concerns.

The basic concept of the *Tri-Council statement of principles on key professional skills for new researchers* paper is an implicit recognition that the success of any national program to develop Highly Qualified Personnel must broaden the word “qualified” well beyond its previous relatively narrow interpretation of research skills and technical knowledge. We have a collective responsibility in graduate education to produce rounded individuals who have knowledge and skills that will serve the community, their careers, and their ongoing personal development in a more complete and if possible, an integrated way. In a sense this is the fundamental principle that underpins any initiative related to professional development for graduate students.

Even a superficial reading of the Tri-Council document suggests the unspoken question of why these skills do not already exist in students who have typically enjoyed (or possibly endured) approximately 10 years of post-secondary education. The answer to this question is in the nature of the educational experience and its design, and the depth and breadth of skills we expect HQP leaders to demonstrate.

One might be tempted to take a completely different tack to the question. How do our objectives for university graduate students differ from those we might have for high school graduates? Out of high school, we want rounded individuals who have communication skills such as listening actively, persuading effectively, interpreting the communications of others accurately, participating effectively in groups, etc. We want high school graduates who can think critically and imaginatively. We want high school graduates who are numerate, and literate in reading, information, writing, new media, and old media too. We want high school graduates who have some understanding of the career options available to them, and the preparation necessary to succeed in these pursuits. What is different for university students, whatever their level? The answer to this question is the depth, sophistication, and performance standard of these skills required at the various levels.

If we accept that a skill is a behaviour that can be learned, practiced and improved in order to get better outcomes, the natural implication is that skills should be overtly developed, maintained, and if at all possible improved. This rule applies not just to graduate students and PDFs, but it applies to everyone in the university enterprise. Does the university have an obligation to help graduate students and PDFs to develop and maintain skills that are not narrowly part of the “skills for new researchers”? There is an obvious argument that suggests we need prospective new faculty members with a broader skill set than research alone. This principle is what drives the Preparing Future Faculty movement. Given that over 50% of our graduates will not end up in a university, what are we doing about the professional development needs of these people?

According to (Mangematin, 2000) PhDs who do not go on to academic jobs are not the subject of very much study. In his research on PhD engineering science students, he asserts “it is becoming more and more difficult for PhD graduates to find a job corresponding to their qualifications (p. 741).” He says this weakens the implicit contract between the student/PDF and the research team, thus affecting research productivity. One of the ways this happens is because students who work in collaboration with private sector will be exposed to a different evaluation model, one in which the “quality of research as measured by publications is not a decisive criterion” (p. 749). This runs counter to the advice we usually give students, and is in conflict with the success metrics for faculty in the university.

Mangematin’s work is not the only one that hints at how universities have a limited sense of what success on the part of their graduates might look like. (Smith *et al.*, 2002) undertook an in-depth look at the careers of PhD, physical scientists who graduated in a five year period from eight universities in the US. According to them, “there is evidence for a lack of support for nonacademic careers in our interview data (along with comments written on surveys)...” (p. 1083). This research is interesting from a number of perspectives especially the quotes provided by the authors from the survey participants. For example one of the graduates reported “... my decision to accept an industrial research position was literally scorned by advisers and faculty...”. Graduate students themselves have noted that their academic organizations are distinctly unhelpful even in publications that lay claim to providing them career advice (Hellekson, 1998).

There are many reasons why Canadian universities might choose to avoid embracing any responsibility for professional development among their graduate students and among PDFs. First, we have a demonstrably limited understanding of the career trajectories of graduate students who do not become academics, notwithstanding the fact that this is the path that most of them will take. We have a poor understanding about the skill deficits that our best trained students might suffer when it is time to contribute to communities of practice other than academics. We have scarce resources for such an investment. We do not have very much in the way of curriculum and we have even less in the way of coaching resources to make this skill development something beyond more “talking heads” in the classroom. We suspect that the vast majority of the professoriate is poorly prepared to help students identify alternative career approaches or give them much in the way of counsel of how to acquire such jobs and succeed in them, primarily because their own experience is usually limited to academic life.

Of course there are also a number of reasons why we might consider a commitment to graduate student professional development. The Canadian taxpayer which funds the universities would probably support such an initiative. Helping graduate students and PDFs clarify their career intent and their options at the end of a very long training period might contribute to reducing the

chronic underemployment among graduate students once they leave the academy. Third, investing modest resources in this direction might help to strengthen the implicit contract between graduate research student and research supervisors. Fourth, and perhaps most compelling to many university administrators, being able to deliver clearly valuable and practical professional development experiences is a significant potential differentiator when it comes time to recruiting graduate students and PDFs.

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