

Faculty Participation in Research at Canadian Colleges: A National Survey

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Note on Terminology

“College”

For the purpose of this report, “college” is used as an omnibus term representing the wide range and diversity of publicly funded *non-university* postsecondary institutions in Canada. In practice, these institutions are variously referred to as: community colleges, colleges of applied arts and technology, technical institutes, university colleges, institutes of technology and advanced learning, polytechnical institutes, and *collèges d’enseignement général et professionnel* (CEGEPs).

“Research” and “Applied Research”

For the purpose of this report, “research” is an omnibus term representing the wide range of research activities conducted at colleges across Canada. The term is used here in the very broadest sense to refer to scholarly work undertaken on a systematic basis to generate new knowledge and/or to use knowledge in new applications. In this report, “research” includes a range of activities that fall into three general categories: (1) research driven by personal *curiosity*, (2) research related to *teaching and learning*, and (3) *applied research*, a term often associated with other terms such as *innovation*, *research and development*, *commercialization*, and *technology transfer*.

Executive Summary

About the Survey

The traditional mandate of Canadian colleges (to provide career-related education in support of regional economic development) is undergoing a remarkable metamorphosis in the first decade of the 21st century. Driven largely by a federal initiative to strengthen the capacity of postsecondary institutions to contribute to a “new climate of innovation and discovery in our nation” (Industry Canada, 2007)¹, colleges on a national scale are engaged in developing research capacity and cultures.²

Several recent studies (ACCC, 2006; Corkery, 2002; Fisher, 2007; Madder, 2005)³ have described this rapid growth of research infrastructure at Canadian colleges in terms of administrative positions, research offices, updated mission statements, seed grant funds, etc. However, these studies were based almost exclusively on data collected from college *administrators*. By contrast, the purpose of this study is to give voice to college *faculty* on whom the success of the enterprise ultimately depends. The following questions guided this study:

1. What are the *attitudes toward research* reported by faculty?
2. What are the *areas of research interest* reported by faculty?
3. What are the *barriers and incentives* to participation reported by faculty?

This national, bilingual project represents the first exclusive survey of college faculty concerning their participation in research activity. As such, it provides a unique opportunity to gauge faculty knowledge of, experience with, and attitudes toward research at Canadian colleges. This cross-sectional, descriptive survey, funded by the Canadian Council on Learning (CCL) and a consortium of community colleges, employed a web-based questionnaire to collect data over a ten-week period during the winter of 2007. Results are based on responses from 2,410 faculty representing 90 publicly funded colleges in all ten provinces and one territory.

Summary of Findings

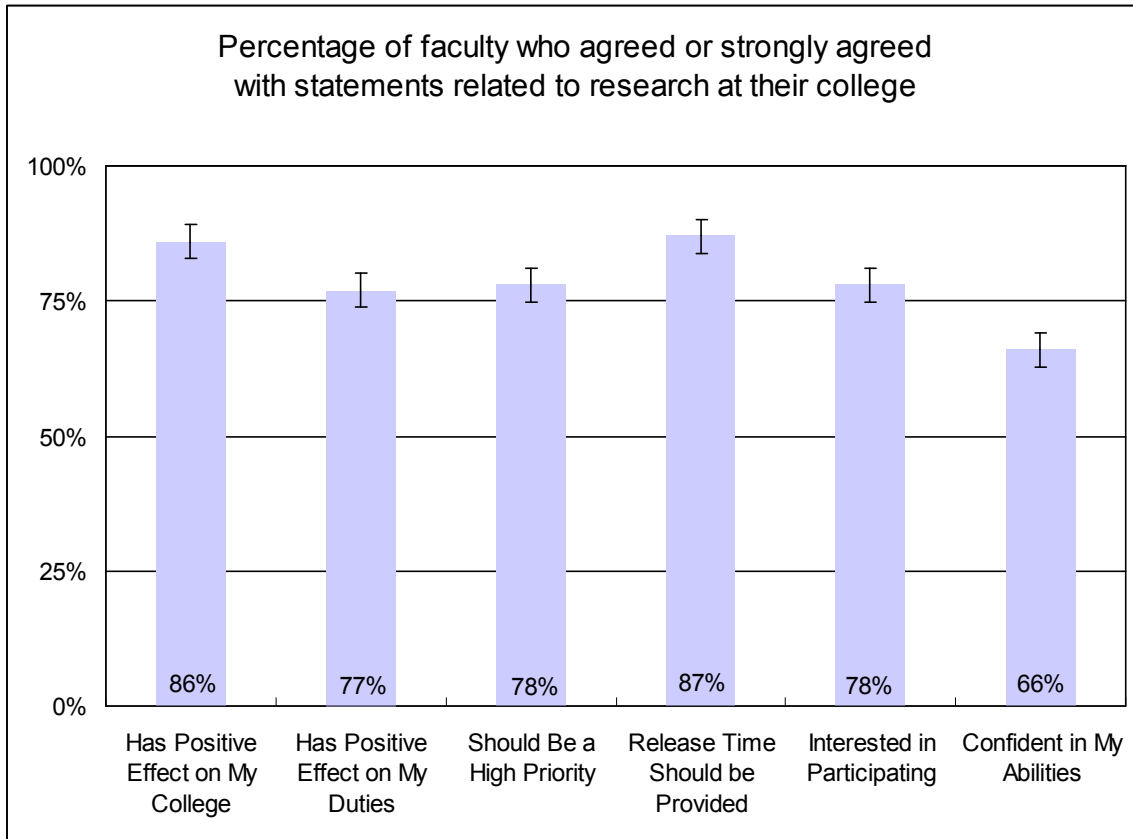
The majority of college faculty who responded to this survey expressed positive attitudes toward the development of research capacity at their institutions, and reported a strong interest in participating in research activities. In particular, faculty reported interest in three principal areas: (1) curiosity-driven research, (2) research related to teaching and learning, and (3) applied research. The relative ranking of these three areas of interest remained constant across all seven demographic variables used in this survey (gender, age, employment status, years of teaching experience, credentials, subject area, and province). Respondents also consistently identified a lack of faculty release time as the primary barrier to their participation in research activities at Canadian colleges.

Faculty reported very positive attitudes toward research at Canadian colleges

In order to gauge faculty attitudes toward research, respondents were asked to rate their level of agreement/disagreement with statements representing various aspects of college research. The majority of faculty consistently agreed or strongly agreed with most statements related to the development of research cultures at their respective colleges.

The overwhelming majority agreed or strongly agreed that research would have a positive effect on their college (86%) and on their current duties and responsibilities as faculty (77%). The majority also agreed or strongly agreed that research should be a high priority at their college (78%), and that release time should be provided for faculty to participate (87%). Most respondents also agreed or strongly agreed that they were interested in participating in research (78%) and were confident in their abilities (66%). These faculty responses represent very positive attitudes toward, interest in, and support for research activities at their colleges. Figure 1 represents the combined percentage of respondents who agreed or strongly agreed with statements reflecting their attitudes toward research at their college.

Figure 1. Faculty attitudes toward research at their college.



*SE ($N = 2,410$, $p < .05$)⁴

Faculty reported interest in three areas of research

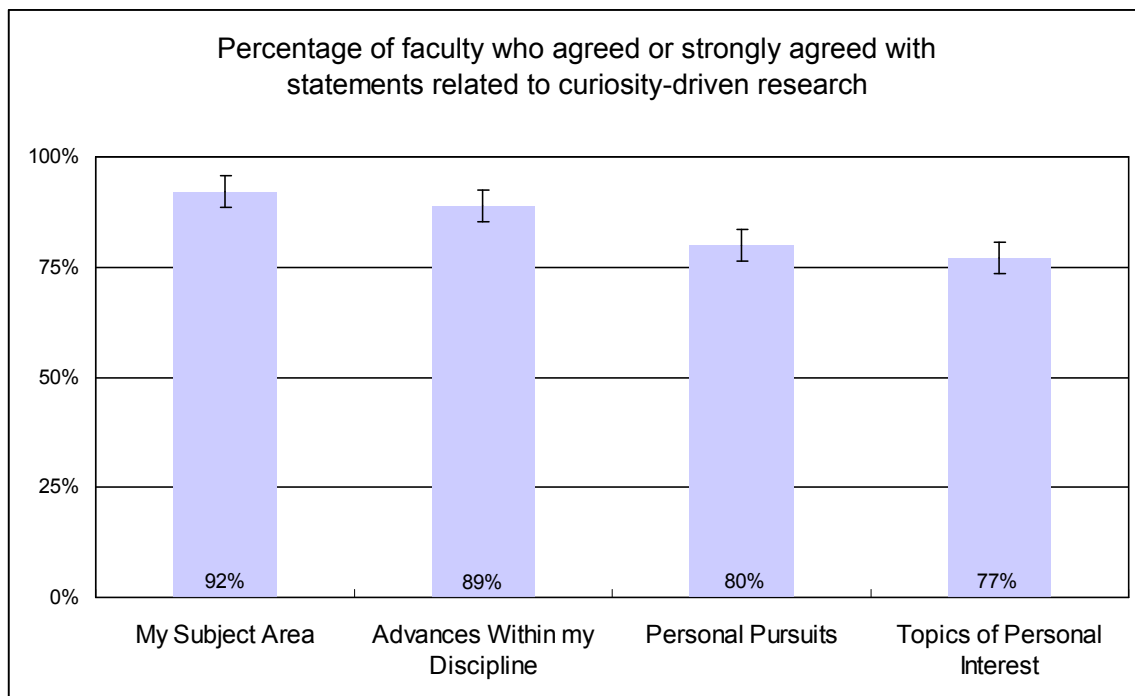
When asked about their *areas* of research interest, the majority of faculty agreed or strongly agreed that they were interested in participating in activities which could be categorized (see Composite Indices section) into three areas of research: (1) curiosity-driven research (85%), (2) research related to teaching and learning (80%), and, to a lesser degree, (3) applied research (55%) (see Figure 5). This rank order of interest areas remained constant across all seven demographic variables employed in this study.

(1) Curiosity-driven research

Curiosity-driven research is used in this report as an umbrella term representing research initiated by faculty to advance knowledge in areas of personal interest and/or

within their disciplines.⁵ In this study the majority of college faculty (85%) agreed or strongly agreed that they were interested in curiosity-driven research (see Composite Indices, Figure 5). This finding was based on responses to a number of internally consistent items reflecting this category of research; a majority of faculty agreed or strongly agreed that they were interested in research activities related to their own subject area (92%), to personal pursuits (80%), to topics of personal interest (77%), and to research that advanced their discipline (89%). Figure 2 represents a comparison of faculty attitudes toward various aspects of curiosity-driven research.

Figure 2. Faculty attitudes toward curiosity-driven research

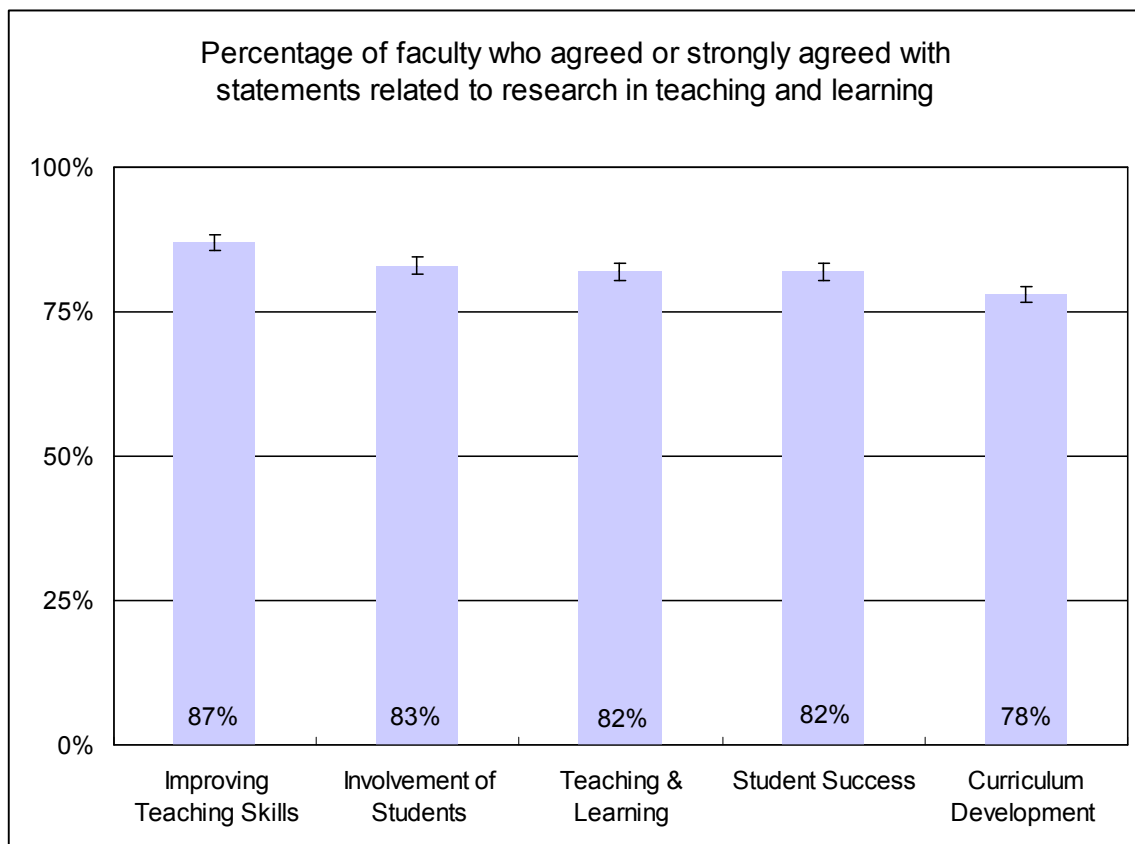


(2) Research related to teaching and learning

Since teaching represents the central mission of colleges,⁶ it is not surprising that the majority (80%) of college faculty agreed or strongly agreed that they were interested in research related to teaching and learning (see Composite Indices, Figure 5). This finding was based on responses to a number of internally consistent items reflecting this area of research; a majority of faculty agreed or strongly agreed that they

were interested in research related to improving their teaching skills (87%), research that involved students (83%), research related to student success (82%), and research related to curriculum development (78%). When asked directly, the majority of faculty agreed or strongly agreed that they were interested in research related specifically to teaching and learning (82%). Figure 3 represents a comparison of faculty attitudes toward various aspects of research related to teaching and learning.

Figure 3. Faculty attitudes toward research related to teaching and learning



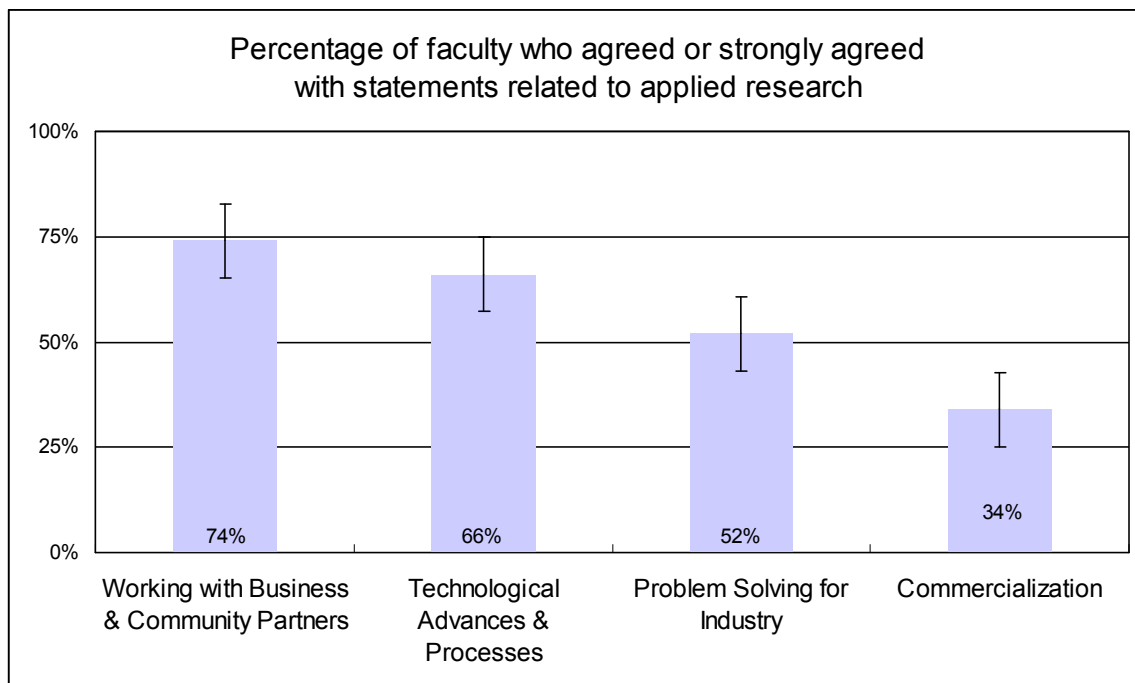
(3) Applied Research

“Applied research” is an umbrella term referring to a variety of research activities related to the *application* of knowledge, and is often associated with terms like *innovation, research and development, commercialization, and technology transfer*.⁷ In this study, more than half (57%) of faculty agreed or strongly agreed that they were

interested in *applied research* (see Composite Indices, Figure 5). This finding was based on responses to a number of internally consistent items reflecting this area of research; a majority of faculty agreed or strongly agreed that they were interested in research that involved working with business and community partners (74%), research related to technological advances and processes (66%), and research involving problem-solving for industry (52%).

Only a minority of respondents, however, expressed a positive interest in research related to “commercialization” (34%). The fact that almost half (44%) of respondents selected the “Neutral” option for the “commercialization” item suggests that their lack of positive responses may be related more to uncertainty surrounding the terminology than to negative attitudes. Uncertainty about terminology associated with “applied research” in general appears to be an issue requiring further study and clarification. Nevertheless, more than half of the respondents indicated interest in applied research, representing strong receptor capacity for further growth in this area. Figure 4 represents a comparison of faculty attitudes toward applied research.

Figure 4. Faculty attitudes toward applied research



Composite Indices

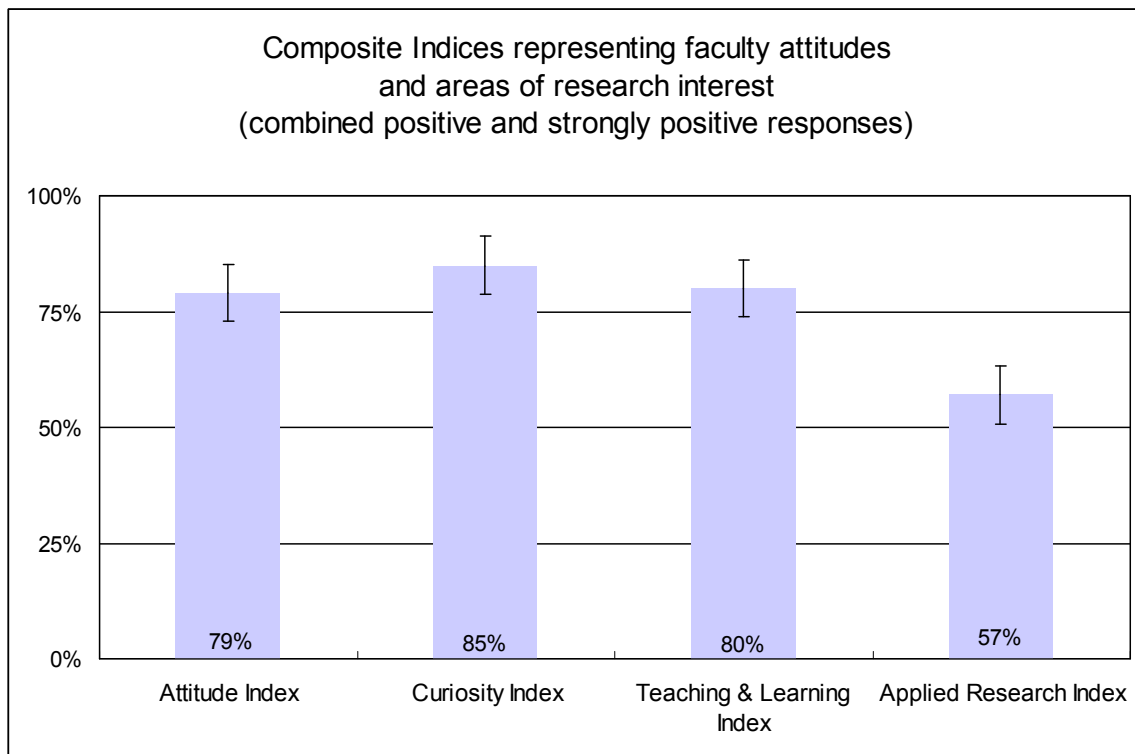
In this study, responses were obtained using 5-point Likert Scale ratings ranging from strongly disagree (1) to strongly agree (5). Mean scores were calculated for all responses. Composite indices were subsequently constructed in order to facilitate comparison of means between and among the response variables (faculty attitudes and areas of interest) and the seven demographic variables (gender, age, years of teaching experience, employment status, credentials, subject, and province). Using SPSS 14.0 analytical software, clusters of response items with high internal consistency reliability (as measured by Cronbach's coefficient *alpha*) were consolidated into four composite indices.⁸

A general **Attitude Index** consolidated six response items reflecting faculty attitudes toward research activities at their colleges. Three additional composite indices were constructed to represent the *areas* of research interest most reported by respondents: a **Curiosity Index** consolidated faculty responses to four statements related to various aspects of curiosity-driven research; a **Teaching and Learning Index** consolidated faculty responses to five statements related to various aspects of teaching and learning; an **Applied Research Index** consolidated faculty responses to four statements representing various aspects of applied research.

Figure 5 presents the combined positive and strongly positive responses associated with each composite index. A majority of faculty (79%) reported positive or strongly positive attitudes as measured by the composite Attitude Index; a majority (85%) agreed or strongly agreed that they were interested in curiosity-driven research as measured by the composite Curiosity Index; a majority (80%) also agreed or strongly agreed that they were interested in research as measured by the composite Teaching and Learning Index; over half of faculty (57%) agreed or strongly agreed that they were interested in applied research as measured by the composite Applied Research Index.

When these composite indices were subsequently used to compare means across demographic variables, the relative ranking of the three areas of interest was found to be constant across all seven variables (see Results section).

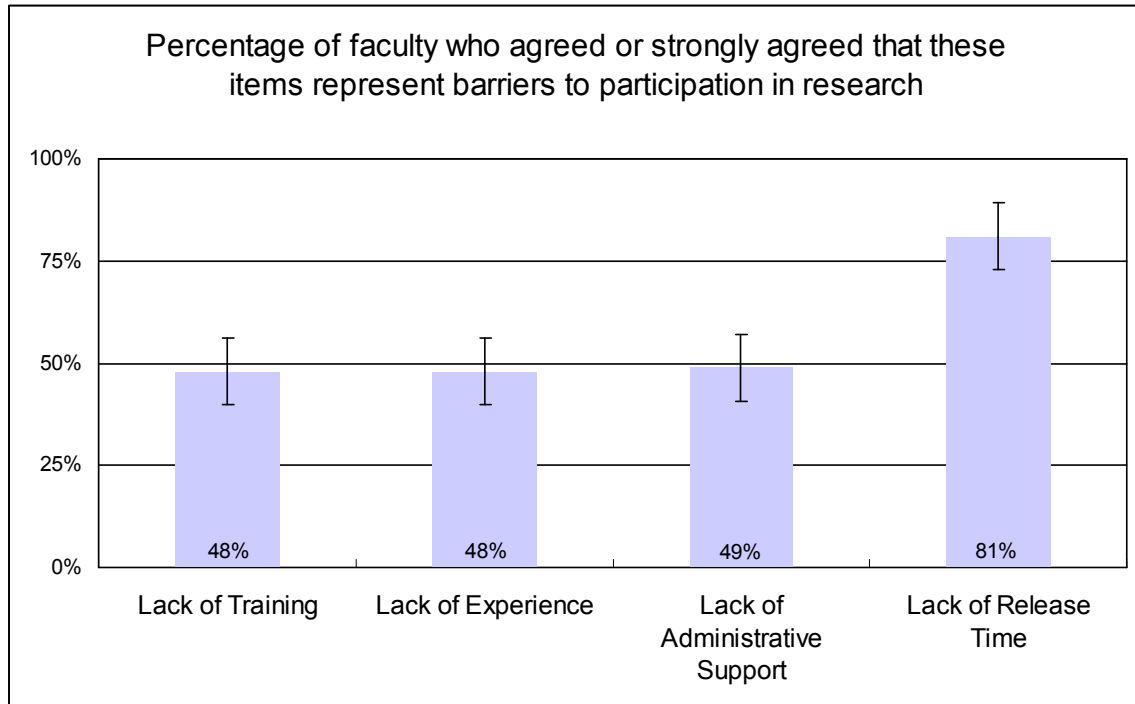
Figure 5. Comparison of composite indices representing faculty attitudes and areas of research interest



Barriers and Incentives

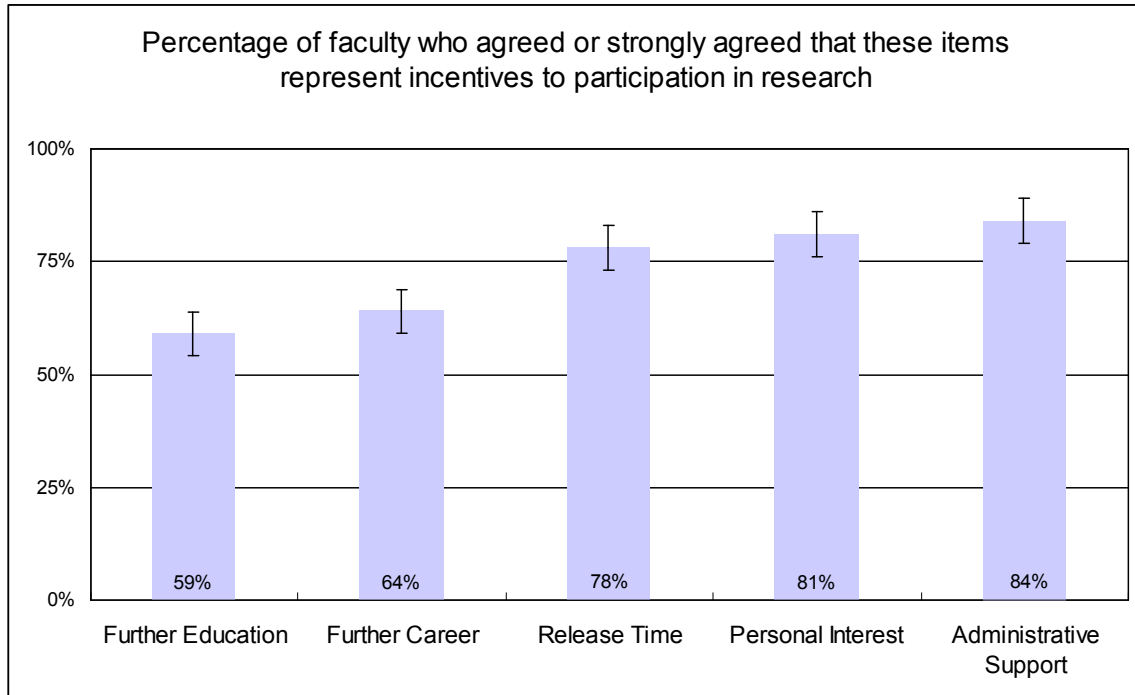
One of the purposes of this study was to identify faculty-reported barriers and incentives to participation in research activities at Canadian colleges. The majority of faculty (81%) agreed or strongly agreed that *lack of funding for release time* was the primary barrier to their participation. This finding corroborated previous research indicating lack of funding for release time as the primary barrier to faculty participation in research at Canadian colleges.⁹ In addition, almost half of faculty also reported *lack of administrative support* (49%), *lack of experience* (48%) and *lack of training* (48%) as additional barriers to participation. Figure 6 illustrates the percentage of faculty who agreed or strongly agreed to statements identifying barriers to participation.

Figure 6. Faculty-reported barriers to participation in research



Regarding *incentives* to participation, the majority of faculty agreed or strongly agreed that administrative support (84%), personal interest (81%), and release time (78%) were the primary incentives to their participation in research activities at Canadian colleges. Other incentives included furthering their careers (64%) and furthering their education (59%). Figure 7 illustrates the percentage of faculty who agreed or strongly agreed to statements identifying incentives to participation.

Figure 7. Faculty-reported incentives to participation in research.



Conclusions (What We Learned):

- The majority of faculty at Canadian colleges have positive attitudes toward research at their colleges, and are interested in participating in research activities.
- The majority of faculty are interested in three areas of research: (1) curiosity-driven research, (2) research related to teaching and learning, and (3) applied research.
- Interest in applied research may have been under-represented due to a lack of clarity regarding terminology associated with applied research.
- The rank order of faculty interest areas remained constant across all seven demographic variables (age, gender, employment status, credentials, years of teaching, subject area, province).
- Lack of release time is the primary barrier to increasing faculty participation in research at Canadian colleges.

Introduction and Background

The traditional mandate of Canadian colleges (to provide career-related education in support of regional economic development) is undergoing a remarkable metamorphosis in the first decade of the 21st century. Driven largely by a federal initiative to strengthen the capacity of postsecondary institutions to contribute to a “new climate of innovation and discovery in our nation” (Industry Canada, 2007),¹⁰ colleges on a national scale are engaged in developing research capacity and cultures.¹¹

Several recent studies (ACCC, 2006; Corkery, 2002; Madder, 2005) have described this rapid growth of research capacity and cultures at Canadian colleges:

- Corkery (2002), on behalf of Industry Canada and the Association of Canadian Community Colleges (ACCC), conducted a *Survey of College and Technical Institutes’ Applied Research and Development Activity*. Based on responses from administrators at 88 institutions, this study described the development of infrastructure and noted that “colleges perform more applied research than previously thought [and] are contributing to a more innovative economy”.¹²

- Madder (2005), on behalf of ACCC, surveyed college administrators through a series of questionnaires, interviews and focus groups in order to provide a state of the field overview of policies, programs, practices, and administrative structures supporting innovation at Canadian colleges. Madder’s (2005) *Innovation at Canadian Colleges and Institutes* described a four-fold typology of generic models or states of development, but noted significantly that Canadian colleges “are all unique [and] have adapted themselves to the resources and needs of their local and regional communities. As a result there is no single model”¹³ to support research activities.

- The ACCC National Research Advisory Committee (2006) conducted an on-line survey which received responses from administrators at 59 institutions representing 42% of ACCC member institutions at that time. This project substantiated the conclusions of the previous studies and characterized the development of research capacity in terms of faculty participation rates, internal and external policy environments, and the challenges faced in building applied research capacity.

Significantly, the scope of the ACCC NRAC study reached beyond the stated objectives (of describing the contribution of colleges in facilitating private sector development and adoption of new or improved products, services and processes) to include research activities related to the social sciences and humanities as well as to the fields of science and technology.

These studies, which described in detail the expanding and evolving development of research capacity and infrastructure (in the form of administrative positions, research offices, updated mission statements, seed grant funds, research funding challenges, etc.), also consistently reported that a *lack of funding for faculty release time* was the primary barrier to greater faculty participation (ACCC, 2006; Corkery, 2002; Madder, 2005). However, the fundamental implication - that if funding for release time was made available, faculty would participate - ultimately rested upon the *as yet unsubstantiated assumption* that college faculty in Canada were in fact interested in participating in research activities. It is noteworthy that previous studies consisted almost exclusively of surveys of college *administrators*; little consultation had yet been conducted directly with the college *faculty* on whom the success of the enterprise ultimately depends. Therefore a gap in the research was identified, namely, the need to assess the extent to which faculty are ready, willing, and able to participate meaningfully in the newly evolving research agenda at Canadian colleges.

Purpose

Since previous research was based almost exclusively on surveys of college *administrators*, the purpose of this national, bilingual project was to give voice to college *faculty* concerning their attitudes about research, their preferred areas of research interest, and their perceived barriers and incentives to participation.

Therefore, the study was guided by three central questions:

1. What are the *attitudes toward research* reported by faculty?
2. What are the *areas of research interest* reported by faculty?
3. What are the *barriers and incentives* to participation reported by faculty?

Methodology

This study consisted of a descriptive, cross-sectional survey of faculty at 90 publicly funded Canadian colleges, conducted over a ten-week period during the winter of 2007. A web-based questionnaire was distributed to 90 colleges that agreed to participate. Administrators at these colleges subsequently distributed electronically to their faculty a Letter of Invitation/Informed Consent containing a link to the secure, web-based questionnaire. A total of 2,410 faculty responses were received. Using SPSS 14.0 analytical software, *composite indices* of statistically related response items were constructed in order to facilitate the comparison of means between and among the *response variables* (representing faculty attitudes about research, and their preferred areas of interest) and seven *demographic variables* (gender, age, employment status, years of teaching, credentials, subject, and home province).¹⁴ The project unfolded in three phases over an 18-month period.

Phase 1: Instrument Development and Validation

The first phase of this project, beginning in March 2006, comprised the development and initial validation of a web-based instrument to assess faculty knowledge of, experience with, and attitudes toward research. Working with an advisory panel, an extensive review was conducted of the literature relevant to college faculty roles and participation rates in research activities (ACCC, 2006; Boyer, 1998; Colleges Ontario, 2006; Corkery, 2002; Madder, 2005; O'Banion, 1997; Skolnik, 2000). An in-depth study of questionnaire design (Bradburn, 2004; Creswell, 2005; Dillman, 2000, 2007; Gillham, 2000) provided further direction.¹⁵

Content validity, i.e., the extent to which the questionnaire provided accurate and sufficient coverage of the topic (Creswell, 2005; Huck, 2004) was addressed in several ways: the instrument was grounded in items used in other surveys of college faculty (Huber, 1997; National Research Council, 2006); personal correspondence with the authors of related college faculty surveys yielded further insights, as well as offers to

review the questionnaire for external validation.¹⁶ In all, recommendations related to the questionnaire were received from representatives of ACCC, Alberta Association of Colleges and Technical Institutes (AACTI), Brock University, Carnegie Foundation, Colleges Ontario, Industry Canada, Mohawk College, Mount Royal College, Niagara College, Nipissing University, Nova Scotia Community College, Seneca College, and the University of Virginia. In addition, a focus group session of faculty ($n = 8$) was conducted at Fanshawe College to further validate the questionnaire design, and the instrument was subsequently field tested with a convenience sample of faculty ($n = 22$). The instrument was revised accordingly in response to these various efforts (advisory committee, literature review, external validation, focus group, and field test).

Phase 2: Pilot Study (Fanshawe College 2006)

The second phase consisted of a pilot study ($n = 400$) using the web-based questionnaire at Fanshawe College in the fall of 2006. Based on a response rate of 30%, the findings of this cross-sectional, descriptive study of faculty attitudes toward research indicated that:

- 83% of respondents felt that faculty participation in research would have a positive or strongly positive effect on the college's primary mandate
- 75% agreed or strongly agreed that the college should set a high priority on research
- 65% of respondents agreed or strongly agreed that they were interested in participating in research
- 64% agreed or strongly agreed that they felt confident in their ability to conduct research.

Overall, the survey identified strong receptor capacity and suggested that faculty at Fanshawe College had positive attitudes toward and high levels of interest in research activities.¹⁷ The results also supported previous research findings that identified the lack of release time as the primary barrier to faculty participation.¹⁸

Phase 3: National Faculty Survey (2007)

Building on the successful implementation of the Fanshawe College pilot study, the scope of the project was subsequently extended to a *national* survey of college faculty. Funding was provided by the Canadian Council on Learning and a consortium of Ontario colleges (Fanshawe, Niagara, George Brown, Seneca). Further support for this ambitious project was provided through endorsement and logistical assistance from national and provincial advocacy groups including the ACCC, Atlantic Provinces Community College Consortium (APCCC), Fédération des CEGEPs, AACTI, Colleges Ontario, and ReseauTranstech. Thirty-six ethics protocols were submitted and approved by Research Ethics Boards at all colleges that required such approval.¹⁹

Participants

The proposed tangible survey population initially consisted of all full-time faculty ($N = 32,000$) employed at approximately 150 publicly funded Canadian colleges across Canada as of January 1, 2007. In order to compile a sample frame on a national scale, the initial challenge was to enlist college administrators who (a) had authorized access to faculty email addresses, and (b) were willing to “champion” this project by forwarding an electronic Letter of Invitation /Informed Consent (containing a link to the web-based questionnaire) to all full-time faculty at their respective institutions, as well as (c) providing marketing and promotion to obtain a representative response rate.

In all, 90 institutions from all provinces and regions agreed to participate, representing a 60% response rate from the 150 publicly funded colleges registered as ACCC members. This figure represents an amended tangible survey population of approximately 19,000 faculty. The survey was forwarded to administrators at the 90 participating institutions, who subsequently distributed it electronically to their respective faculties between February and April, 2007. A total of 2,410 electronic responses were received, representing a faculty response rate of 12.7% and a Confidence Interval of $\pm 1.87\%$ ($p < .05$).²⁰

Demographic Profiles

Demographic information was collected regarding gender, age, employment status, years of teaching experience, credentials, subject area, and home province. The faculty-reported data on demographic characteristics of the respondents can be summarized as follows:

Gender: Female respondents outnumbered males by a ratio of 55/45.

Age: Three-quarters of respondents (74%) were over the age of 40, with 39% over 50. Faculty under the age of 30 accounted for the least number of responses (4%). Overall these figures reflect a slight trend toward younger faculty when comparing the survey's over/under-40 ratio (75/25) to the corresponding 1997 Statistics Canada over/under-40 ratio (80/20).²¹

Employment status: While the original intention was to survey only full time faculty, the feasibility of enlisting enough institutions to compile a credible sample frame necessitated the inclusion of some non-full time faculty at those institutions for whom this separation of faculty responses was not feasible. In the end, 76% of the national aggregate respondents were full time faculty, while 24% were non-full time.

Years of Teaching Experience: Faculty with less than 10 years of teaching experience responded in slightly higher percentages (54%) than faculty with more than 10 years teaching experience (46%). Faculty were almost equally represented when grouped by years of experience as follows: less than 5 years (28%), 5–10 years (26%), 11–20 years (27%); faculty with over 20 years experience (19%) represented the lowest percentage of respondents.

Credentials: Faculty respondents reported academic credentials in the following ratios: college credentials (19%), undergraduate degrees (40%), Masters degrees

(29%), doctoral degrees (12%). Ten percent of respondents reported additional trade certification credentials.

Subject Area: The vast array of programs offered by colleges across the country defies easy categorization for a number of reasons; program terminology differs across colleges and provinces, many subject areas overlap, and many faculty teach in more than one subject area. Consequently, subject areas reported by faculty were widely distributed across the range of 15 choices, with “Other” receiving the highest percent of responses (15%), followed by Technology and Trade (13%), Health Sciences (12%), and Business (10%). These four categories represented 50% of responses.

Province: Provincial distribution of respondents closely paralleled the general provincial distribution of population in Canada.²² Ontario accounted for 36.7% of respondents, followed by Alberta (21.1%) and Quebec (13.3%). The remaining 29% of respondents were similarly distributed in close approximation to national population ratios.

Table 1 summarizes the frequency distribution (as a percentage of national aggregate responses) of these demographic variables (gender, age, employment status, years of teaching experience, credentials, subject, and province).

Table 1. Distribution of demographic variables (as % of national aggregate responses).

Gender		Employment Status	
Female	55%	Full Time	76%
Male	45%	Non-Full Time	24%
Age		Years of Teaching Experience	
< 30	3%	< 5	28%
30 – 40	22%	5 – 10	26%
41 – 50	36%	11 – 20	27%
> 50	39%	> 20	19%
Province		Subject	
BC	6.9%	Adult Basic Ed.	5.6%
AB	21.1%	Agriculture	.8%
SK	2.9%	Apprenticeship	3.2%
MB	7.6%	Business	10.4%
ON	36.7%	Communication Arts	6.6%
QC	13.3%	Counseling	3.1%
NS	4.1%	ESL	3.2%
NB	1%	Health Sciences	12%
PEI	2%	IT	7.1%
NL	4.4%	Liberal Arts	6.6%
Credentials		Library	.9%
College	19%	Social Sciences	7.3%
Bachelors	40%	Technology & Trade	13%
Masters	29%	Tourism/Hospitality	2.5%
Doctorate	12%	Performing Arts	2.6%
*Additional Trade Certification	*10%	Other	15.1%

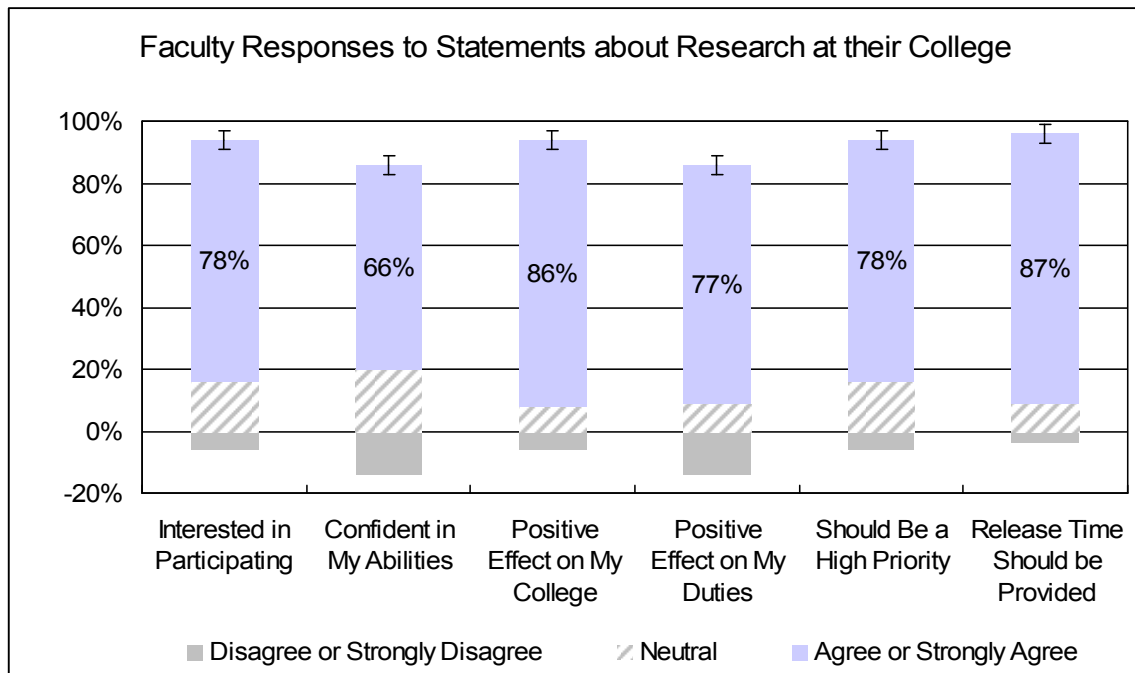
Results

Attitudes about Research

Faculty consistently reported positive attitudes toward research at Canadian colleges.

Faculty were asked to respond to a broad range of statements related to various aspects of research at Canadian colleges. These response items were selected in order to represent levels of faculty interest by gauging their attitudes toward various aspects of research in the context of their own college environments. For example, 86% reported that participation in research would have a positive or strongly positive effect on their college's primary mandate of career-oriented education; similarly, 77% reported that their participation in research activities would have a positive or strongly positive effect on their own duties and responsibilities as college faculty. Over three quarters of respondents (76%) felt that their college should set a high priority on research, while 87% believed that their college should provide release time for faculty to participate. Two thirds (66%) felt confidence in their abilities to conduct research, while 77% specifically reported that they were personally interested in participating in research activities at their college. Responses to these statements suggest positive faculty attitudes toward research and high levels of interest in participating in the expanding research initiative at Canadian colleges (see Figure 8).

Figure 8. Faculty attitudes about research.



Areas of Interest

Faculty consistently reported interest in three areas of research:

- (1) curiosity-driven research
- (2) research related to teaching and learning
- (3) applied research

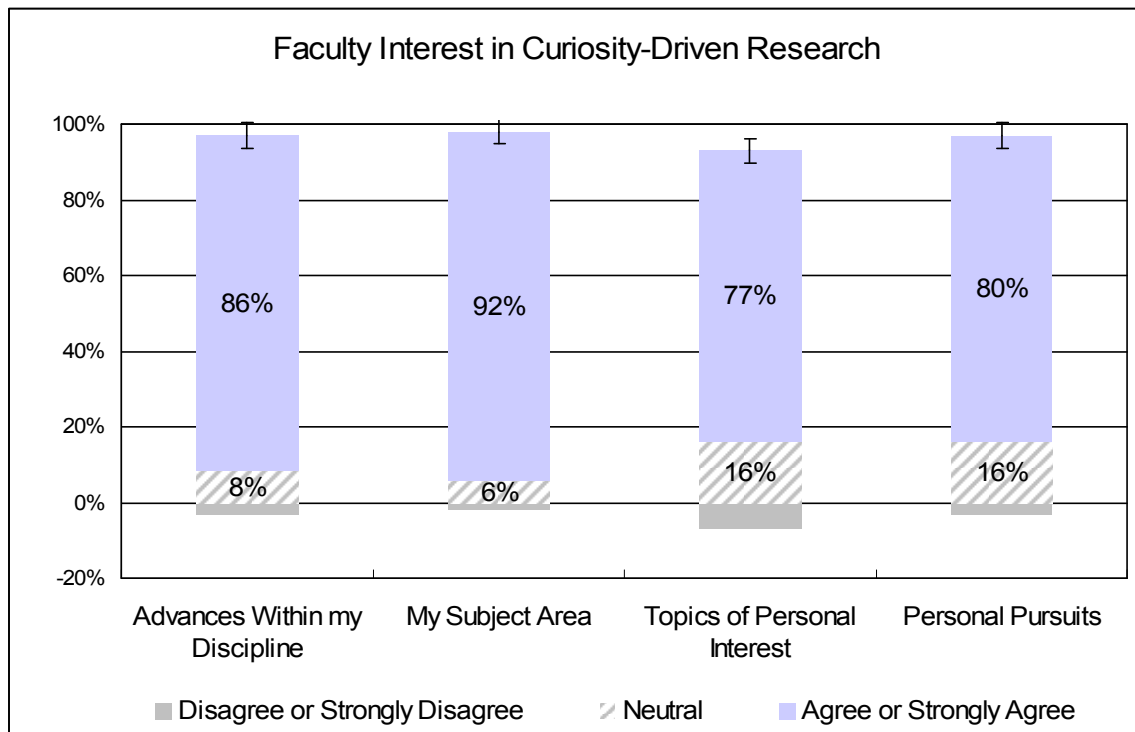
(1) Curiosity-Driven Research

“Curiosity-driven research” is used in this report as an umbrella term representing research initiated by faculty to advance knowledge in areas of personal interest and/or within their disciplines. The term is used in the spirit of Boyer’s (1990) *scholarship of discovery*, reflecting a “commitment to knowledge for its own sake, to freedom of inquiry, and to following, in a disciplined fashion, an investigation wherever it may lead.” This type of research activity, whether in one’s discipline or personal area of interest, lies:

at the very heart of academic life, and the pursuit of knowledge must be assiduously cultivated and defended. The intellectual excitement fueled by this quest enlivens faculty and invigorates higher learning institutions, and in our complicated, vulnerable world, the discovery of new knowledge is absolutely crucial.²³

In this study, faculty were asked to respond to a range of Likert Scale statements related to research driven by personal curiosity or subject/discipline interest. The overwhelming majority (92%) of respondents reported strong or very strong interest in conducting research in their own subject area; 89% reported strong or very strong interest in conducting research which would advance knowledge and understanding in their discipline. Similarly, over three quarters of respondents expressed a specific interest in pursuing topics of personal interest (77%) and personal research pursuits (81%). Responses to these statements suggest very strong faculty interest in Boyer’s (1990) *scholarship of discovery*, i.e., in research driven by their own curiosity (see Figure 9).

Figure 9. Faculty interest in curiosity-driven research.

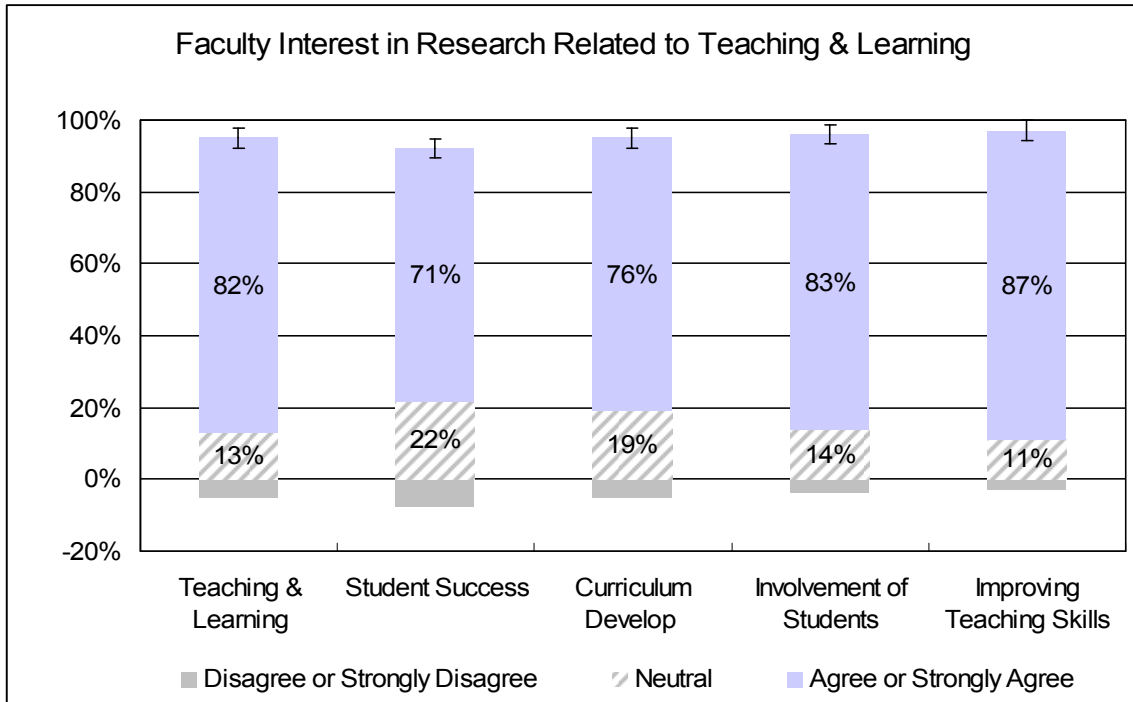


(2) Research Related to Teaching and Learning

From their inception, Canadian colleges have primarily fulfilled the function of *teaching* institutions, focusing particularly on employment-related educational programs. Boyer (1990) is unambiguous in acknowledging that colleges “have teaching as the central mission. . . . Teaching is the heartbeat of the education enterprise and, when it is successful, energy is pumped into the community, continuously renewing and revitalizing the institution. Therefore, excellence in teaching is the means by which the vitality of the college is extended.” In advocating for the recognition of the *scholarship of teaching* as a necessary and legitimate form of research activity, Boyer notes, significantly with respect to this current study, that “teaching as a form of scholarship is particularly appropriate for community colleges.”²⁴

It is therefore not surprising that the majority (80%) of college faculty surveyed in this study agreed or strongly agreed that they were interested in participating in research related to teaching and learning. Faculty were asked to respond to a range of Likert Scale statements regarding research in this area. The majority consistently reported strong or very strong interest in research related to various aspects of teaching and learning such as curriculum development (76%), improving teaching skills (87%), and student success (71%). The vast majority of respondents reported strong or very strong interest in research involving students (83%), while 82% reported strong or very strong interest in research specifically “related to teaching and learning.” These findings suggest a very high level of faculty interest in this area of research (see Figure 10.)

Figure 10. Faculty interest in research related to teaching and learning



(3) Applied Research

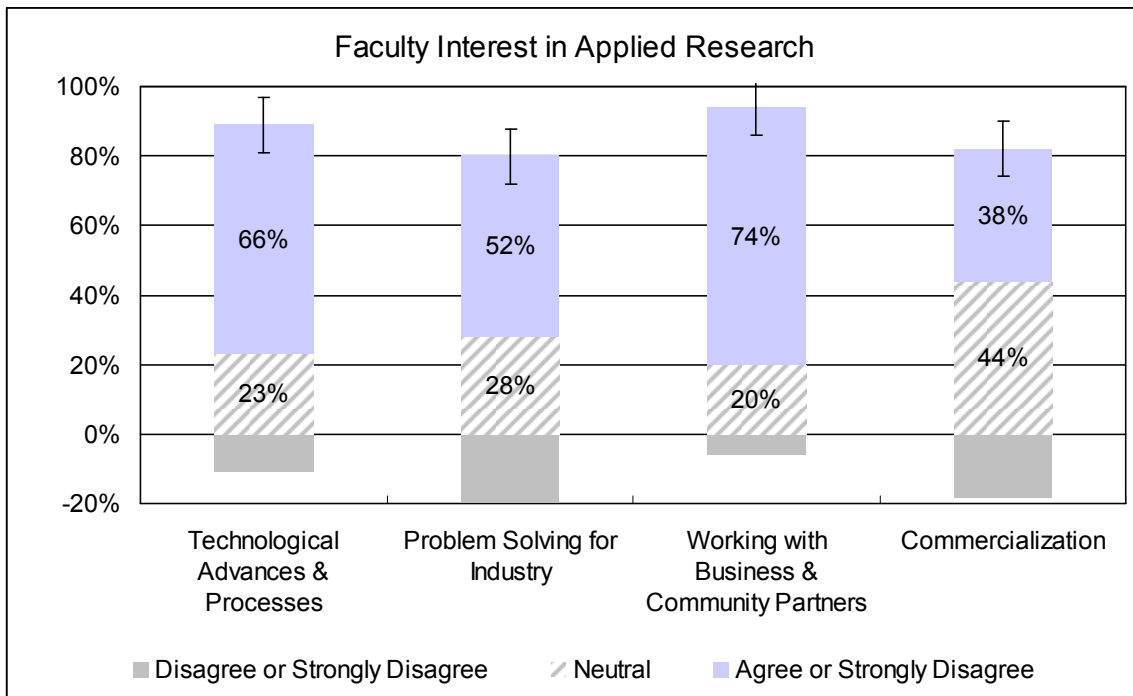
“The work of the academy must relate to the world beyond the campus,” notes Boyer (1990). In recognizing the legitimate place of a *scholarship of application*, Boyer notes that the “application of knowledge moves toward engagement as the scholar asks: How can knowledge be responsibly applied to consequential problems?” The area of applied research initiative currently evolving at Canada’s colleges clearly reflects Boyer’s precept that “higher education must serve the interests of the larger community.” Citing Handlin (1986)²⁵, Boyer notes that “scholarship has to prove its worth not on its own terms but by service to the nation and the world.”²⁶

In this study, “applied research” is used as an umbrella term referring to research activities related to the *application* of knowledge in the sense of Boyer’s (1990) *scholarship of application*. Faculty were asked to respond to a range of Likert Scale statements related applied research. Respondents reported strong or very strong levels of interest in research related to working with business/community partners

(74%), research leading to technological advances or processes (66%), problem solving for industry (52%), and commercialization (38%).

While these responses were lower than responses in other areas of interest, it is noteworthy that the percentage of “Neutral” responses was significantly higher in response to statements about applied research than to statements about curiosity-driven research or research related to teaching and learning. Respondents gave “Neutral” ratings to statements concerning working with business/community partners (20%), research leading to technological advances or processes (23%), problem solving for industry (28%), and commercialization (44%). These relatively higher percentages of “Neutral” responses may suggest uncertainty regarding the terminology used in the survey, particularly with the term “Commercialization,” rather than a lack of interest in the area of applied research. When the “Commercialization” item was removed from the Applied Research Index (see Composite Indices), the percentage of combined positive and strongly positive responses rose from 57% to 68%, representing even stronger faculty interest in applied research, and suggesting a need for clarification and consistency of terminology associated with applied research (see Figure 11).

Figure 11. Faculty interest in applied research



Nevertheless, while respondents' levels of interest in applied research were lower than interest in curiosity-driven or teaching and learning related research, and despite the challenge of uncertainty associated with terminology, more than half of faculty (57%) agreed or strongly agreed that they were interested in the area of applied research, suggesting strong receptor capacity for growth in this area (see Composite Indices, Figure 12).

Composite Indices

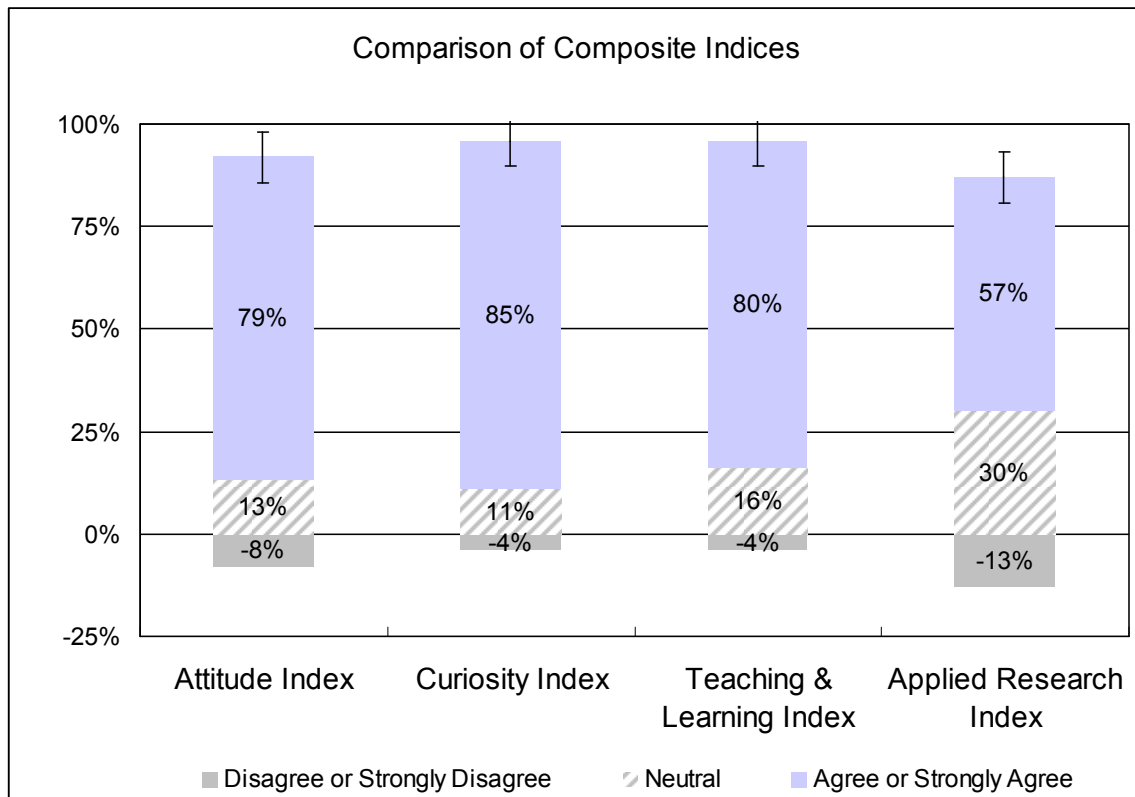
To facilitate comparison of means among and between the response variables (faculty attitudes and areas of interest) and the seven demographic variables (gender, age, employment status, years of teaching, credentials, subject areas, and home province), clusters of response items with high internal consistency reliability (as measured by Cronbach's coefficient *alpha*) were consolidated into four composite indices. All four indices achieved alpha ratings exceeding the level required ($\alpha > .700$) to support internal consistency reliability, thereby validating the use of these indices in this analysis.²⁷

- A composite **Attitude Index** was constructed representing faculty responses related to (1) participation in research activities, (2) confidence in their abilities, (3) belief that research activities have a positive effect on both their institution's mandate and (4) on their own duties, (5) belief that their institutions should provide release time for, and (6) place a high priority on, research activity. Cronbach's alpha (.795) suggests that the items comprising the Attitude Index are internally consistent.
- A composite **Curiosity Index** was constructed representing faculty responses related to (1) advancing knowledge and understanding within my discipline, (2) my discipline/subject area, (3) topics of personal interest, and (4) personal pursuits. Cronbach's alpha (.767) suggests that the items comprising the Curiosity Index are internally consistent. The majority of faculty (85%) agreed or strongly agreed that they were interested in this area of research as measured by the Curiosity Index.

- A composite **Teaching and Learning Index** was constructed representing faculty responses related to: (1) teaching and learning, (2) student success, (3) involvement of students, (4) improving teaching skills, and (5) developing curriculum. Cronbach's alpha (.810) suggests that the items comprising the Teaching Index are internally consistent. The majority of faculty (85%) agreed or strongly agreed that they were interested in this area of research as measured by the Teaching and Learning Index.
- A composite **Applied Research Index** was constructed representing faculty responses related to: (1) working with business/community partners, (2) research leading to technological advances or processes, (3) problem solving for industry, and (4) commercialization. Cronbach's alpha (.727) suggests that the items comprising the Applied Research Index are internally consistent. More than half of faculty (57%) agreed or strongly agreed that they were interested this area as measured by the Applied Research Index.

Figure 12 illustrates the level of faculty interest as measured by the Attitude Index, and the rank ordering of their preferred areas of interest as measured by the Curiosity Index, Teaching and Learning Index, and Applied Research Index..

Figure 12. Comparison of composite indices



Comparison of Composite Indices across Demographic Variables

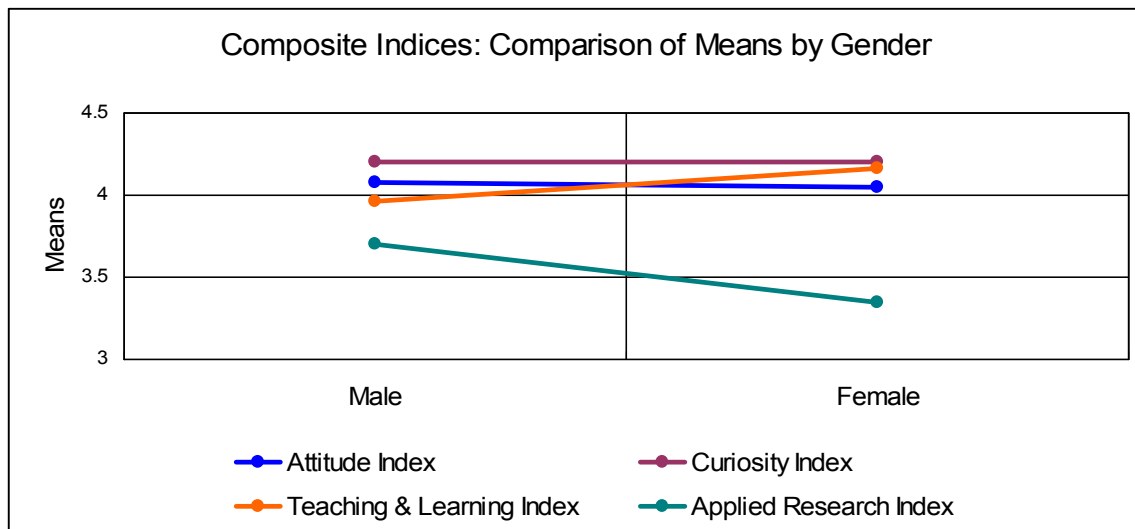
The composite indices used in this study were constructed to facilitate comparison of means between and among the *response variables* (faculty attitudes and areas of interest) and seven *demographic variables* (gender, age, employment status, years of teaching, credentials, subject, and province). Figures 13 through 19 represent the means of the four composite indices compared across the demographic variables. Using these composite indices, the rank ordering of faculty areas of research interest - (1) Curiosity Index, (2) Teaching and Learning Index, and (3) Applied Research Index - was found to be consistent across all demographic variables.

Gender

When the mean scores of the composite indices were compared by gender, the rank ordering of interest indices - (1) Curiosity Index, (2) Teaching and Learning Index,

and (3) Applied Research - was consistent with rankings across all other demographic variables. When the mean scores were compared by genders, no differences were observed regarding attitudes toward research in general, or interest in curiosity-driven research. However, gender-based variations were observed with respect to the Teaching & Learning Index, and especially with respect to the Applied Research Index. Females were more interested than males in research related to teaching and learning, and less interested than males in applied research (see Figure 13).

Figure 13. Comparison of means of composite indices by gender

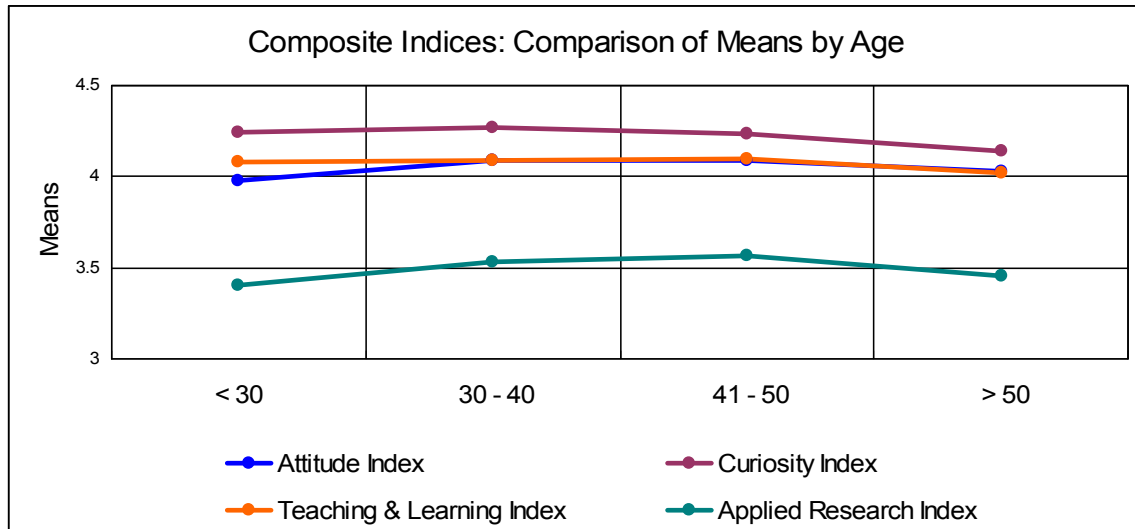


Age

When the mean scores of the composite indices were compared by age groups, the rank ordering of interest indices was consistent with rankings across the other demographic variables. A pattern was observed between four age groups (under 30, 30-40, 41-50, over 50) with mean scores consistently declining in the highest age group (over 50). This may be related to life-cycle changes as aging faculty approach the ends of their careers. Lower mean scores were also observed in the youngest age group (under 30), especially in their attitude toward participation in research in general, and specifically in relation to applied research, a finding that again possibly reflects life-cycle phases. Faculty between the ages of 30 and 50 appear to be most interested in research

at their colleges, perhaps reflecting the more stable mid-life phase that provides more opportunities for involvement in research activities (see Figure 14).²⁸

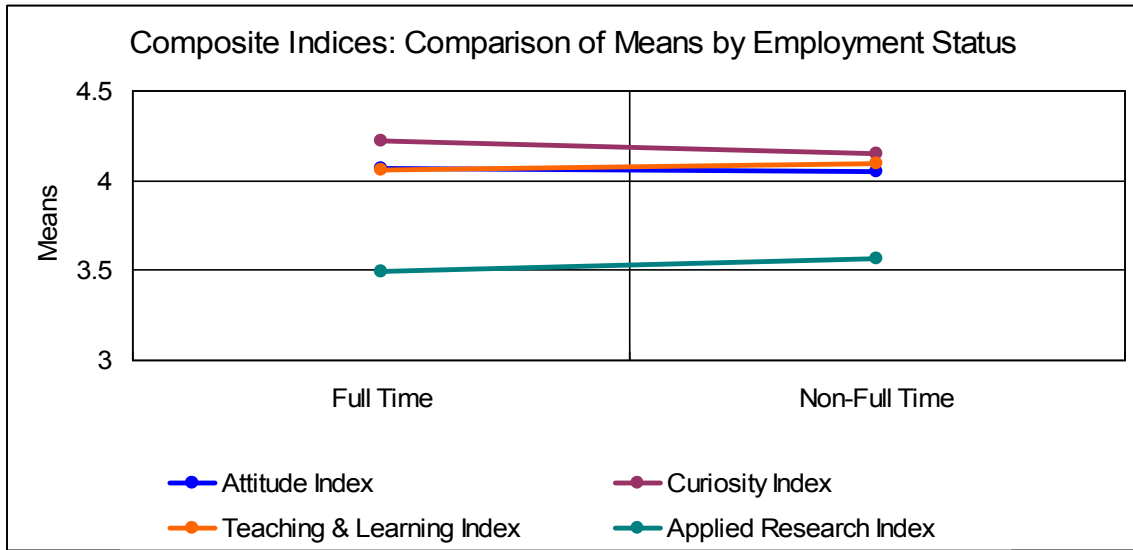
Figure 14. Comparison of means of composite indices by age



Employment status

When the mean scores of the composite indices were compared by employment status, the relative ranking of the three interest indices was consistent with rankings across the other demographic variables. However, it was observed that non-full time faculty were slightly less interested in curiosity-driven research, and slightly more interested in applied research, than their full time colleagues (see Figure 15).

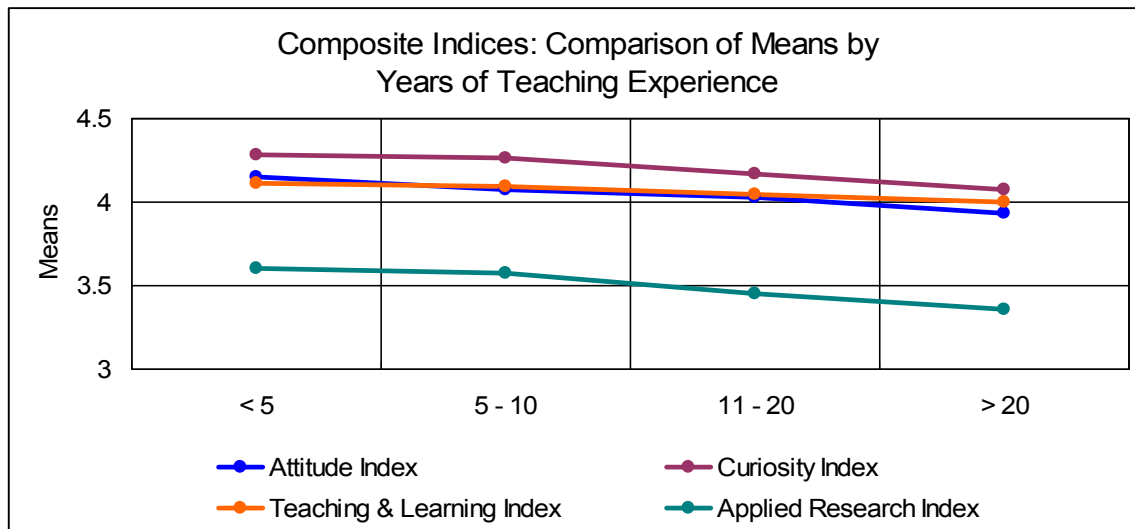
Figure 15. Comparison of means of composite indices by employment status



Years of Teaching

When the mean scores of the composite indices were compared by years of teaching, the relative ranking of the three interest indices was again consistent with rankings across the other demographic variables. When faculty were arranged in four comparative groups based on their years of teaching experience (under 5, 5-10, 11-20, and over 20), all indices remained relatively constant across the first two groups (under 5, 5-10), but then declined across the two groups of faculty with more years of teaching experience (11-20, over 20); the group with over 20 years of teaching experience had the lowest mean scores on all four indices. As in the variations previously observed across age groups, the progressive decline of interest across years of experience may reflect life-cycle patterns, with the least interest in pursuing research reported by faculty approaching the end of their careers (see Figure 16).

Figure 16. Comparison of means of composite indices by years of teaching experience



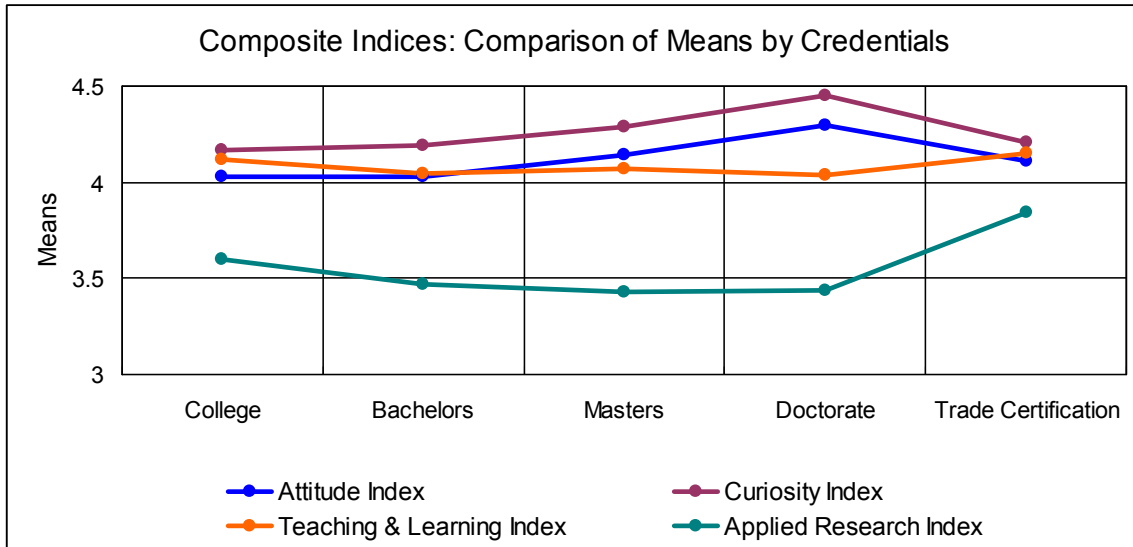
Credentials

When the mean scores of the composite indices were compared by faculty credentials, the relative ranking of the three interest indices remained consistent with rankings across the other demographic variables. Curiosity-driven interest increased with progressively higher academic degrees, peaking in the doctorate group. Interest in research related to teaching and learning remained relatively constant across all credentials; faculty with college credentials reported slightly higher levels of interest in applied research than did faculty with university credentials.

However, significant variations were observed in the group that had trade certification in addition to their other credentials. Faculty in this group were significantly more interested in applied research than any other group based on credentials. This higher level of interest in applied research by faculty holding trade certification may be a function of this group’s previous employment experiences prior to entering teaching; further study is suggested to explain this variation.

This faculty group with trade certification also had the highest mean scores with respect to the Teaching & Learning Index, possibly suggesting a desire on the part of trade professionals to increase their effectiveness in their adoptive roles as professional educators (see Figure 17).²⁹

Figure 17. Comparison of means of composite indices by credentials

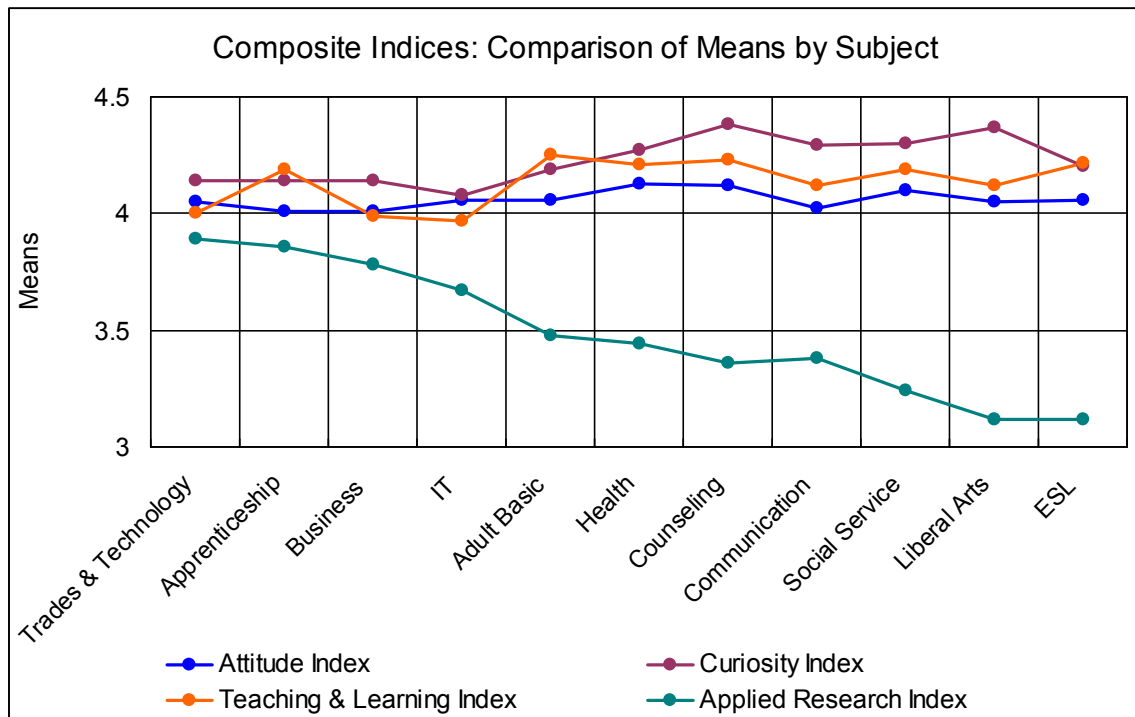


Subject

When the mean scores of the composite indices were compared by subject areas, the relative ranking of the three interest indices was generally consistent with rankings across the other demographic variables. However, some variations were observed between faculty responses based on their subject areas, especially with regards to the Applied Research Index. Higher mean scores on the Applied Research Index were obtained from faculty in Trade and Technology, Apprenticeships, Business, and to a lesser extent IT (Information Technology) than from faculty in any other subject areas. These variations may reflect the associated role of applied research and/or the professional background experiences of faculty working in these areas. As noted in the previous discussion on credentials, faculty working in the areas of trade and technology reported the highest mean scores on the Applied Research Index.

Not surprisingly, faculty reported progressively lower mean scores on the Applied Research Index when working in humanities and social science areas such as counseling, communication, social services, liberal arts, and English as a Second Language (ESL) (see Figure 18).

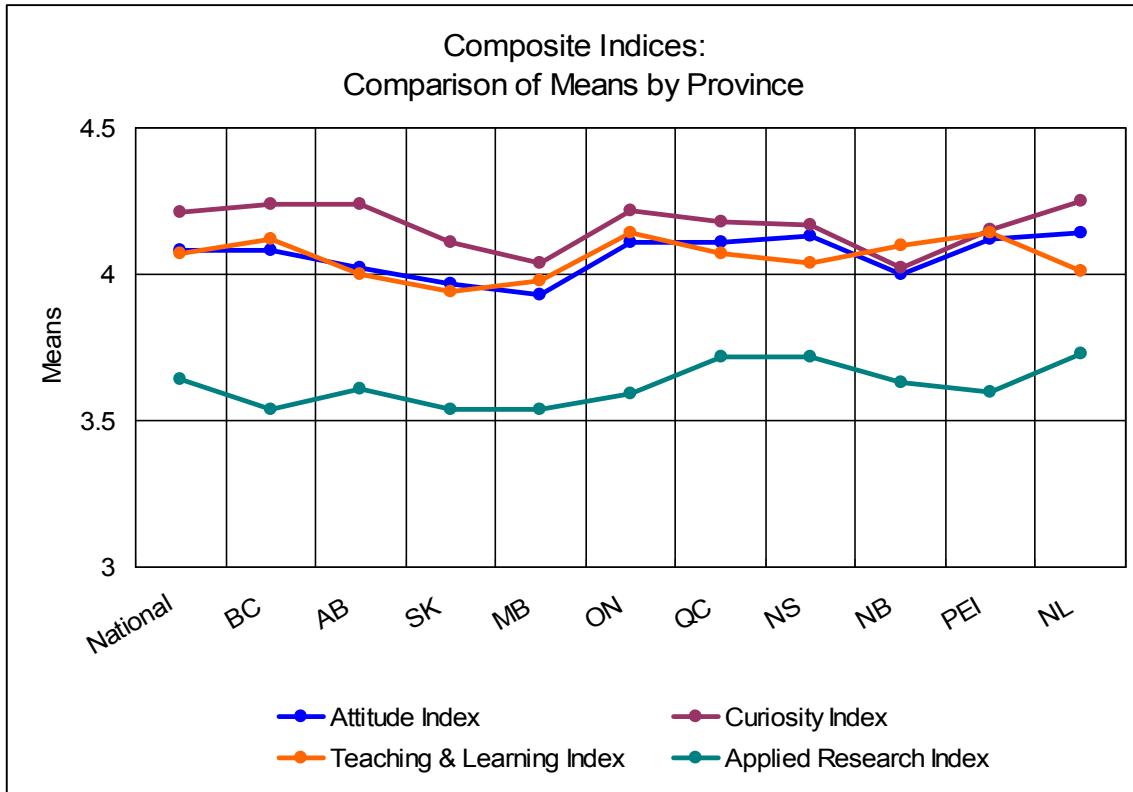
Figure 18. Comparison of means of composite indices by subject area



Province

When the mean scores of the composite indices were compared by province, the relative ranking of interest indices was consistent with rankings across the other demographic variables (with the exception of New Brunswick, where the Teaching and Learning Index slightly outscored the Curiosity Index). With respect to the Applied Research Index, the highest mean scores were observed in the provinces of Quebec, Nova Scotia, and Newfoundland & Labrador. These variations in mean scores across the country may reflect differences in provincial legislation, mandates, collective agreements, and/or economic disparities and priorities, all factors that merit further study in terms of their impact on faculty participation in research.

Figure 19. Comparison of means of composite indices by province



Barriers and Incentives

One of the purposes of this study was to identify faculty-reported barriers and incentives to participation in research activities at Canadian colleges. The majority of faculty (81%) agreed or strongly agreed that *lack of funding for release time* was the primary barrier to their participation. This finding corroborated previous research. Corkery (2002) specifically identified “lack of faculty release time [as the] primary barrier to maximizing institutions’ potential to stimulate innovation in Canada through applied research”.³⁰ Madder (2005) similarly focused on the lack of funding for faculty release time as “the primary limiting factor for innovation activities at colleges”.³¹ The ACCC’s National Research Advisory Committee identified significant teaching loads, lack of funding for research release time, and unfavourable adjudication processes as key barriers to unleashing the full potential of colleges, and recommended “new funding mechanisms . . . for faculty release time within research funding programs for

colleges".³² In Fisher's (2007) pilot study for the national survey, 85% of respondents identified the same factor as their primary barrier to participation.³³

Besides the *lack of release time*, almost half of faculty also reported *lack of administrative support* (49%), *lack of experience* (48%) and *lack of training* (48%) as additional barriers to participation. Figure 20 illustrates the percentage of faculty who agreed or strongly agreed to statements identifying barriers to participation.

Regarding *incentives* to participation, the majority of faculty agreed or strongly agreed that administrative support (84%), personal interest (81%), and release time (78%) were the primary incentives to their participation in research activities at Canadian colleges. Other incentives included furthering their careers (64%) and furthering their education (59%). The perception of administrator support as either a barrier (49%) or an incentive (84%) suggests their perceived roles as gatekeepers, and reflects the challenges and constraints of the college system in general with respect to adequate funding for faculty release time to participate in research activities. Figure 21 illustrates the percentage of faculty who agreed or strongly agreed to statements identifying incentives to participation.

Figure 20. Faculty-reported barriers to participation

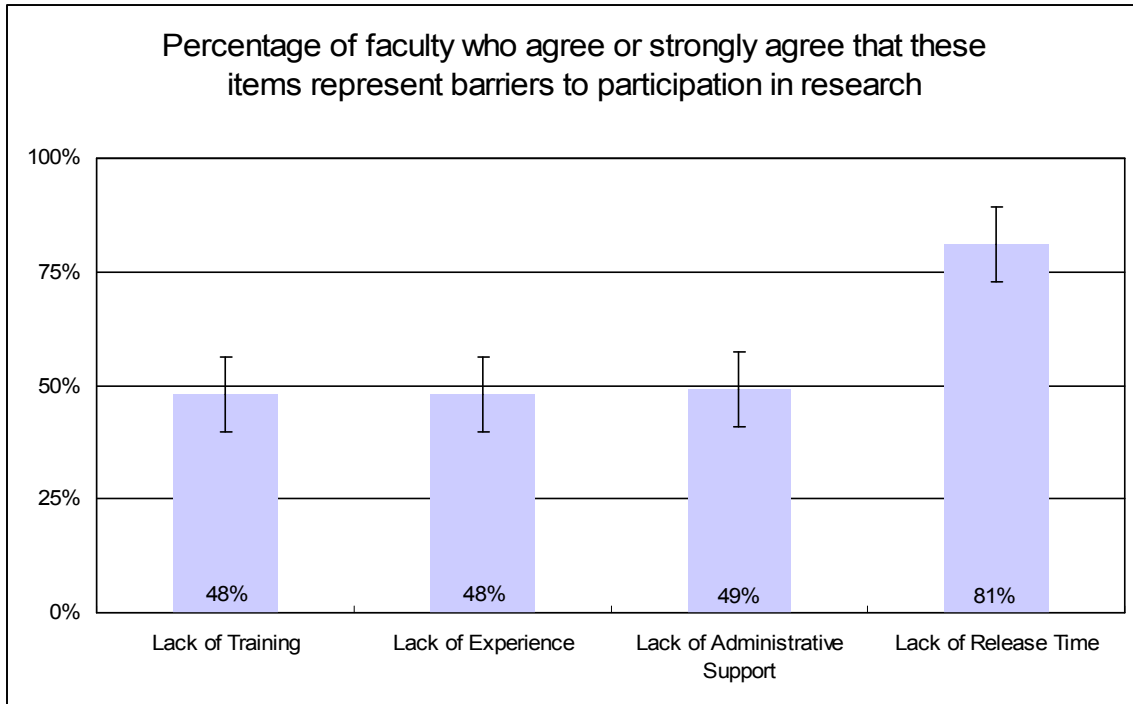
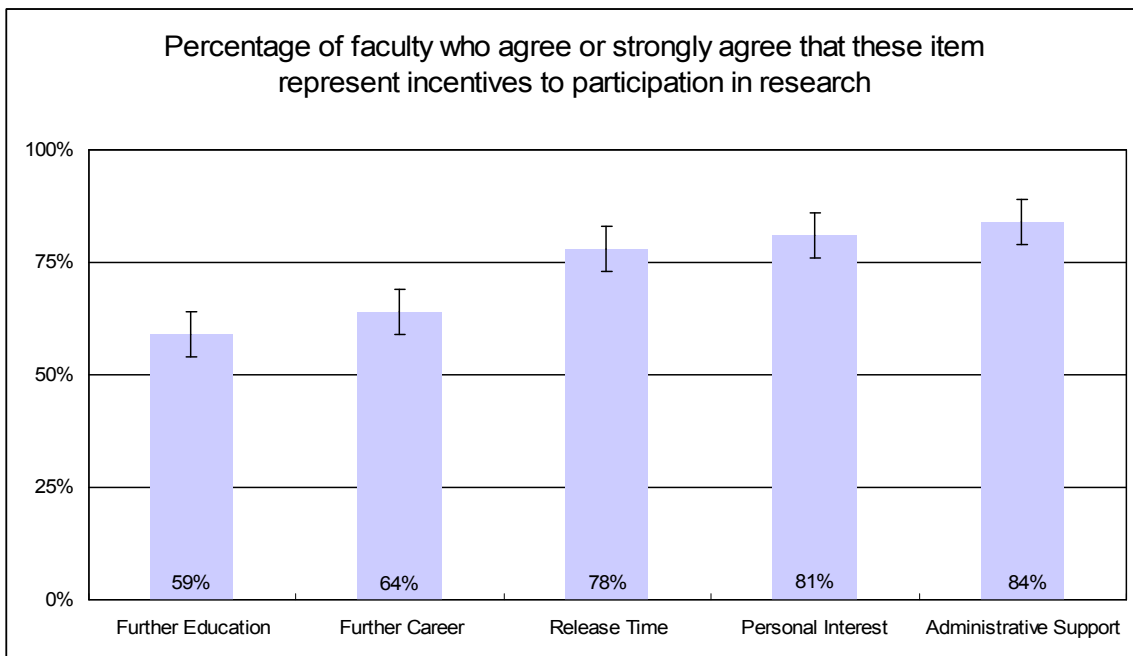


Figure 21. Faculty-reported incentives to participation



Conclusion

Overall, the results of the first pan-Canadian survey of college faculty concerning research at colleges indicated that faculty held very positive attitudes toward the development of research capacity and cultures at Canadian colleges. Most faculty felt that research had a positive impact on their college mandates as well as on their own duties and responsibilities. They also felt that research should be a high priority at their colleges, and that release time for faculty should be provided; the majority of faculty reported that they were personally interested in participating, and felt confident in their abilities.

Faculty consistently identified three preferred *areas of research interest*: curiosity-driven research, research related to teaching and learning, and applied research.

The majority of faculty were interested in curiosity-driven research related to their personal interests and/or subject areas. The majority of faculty also reported almost equal levels of interest in research related to teaching and learning, including aspects such as improved teaching skills, curriculum development, student involvement, and student success.

More than half of faculty also expressed interest in applied research, although uncertainty about terminology associated with applied research may have led to results that under-represented faculty interest in this area. Within this area of applied research, higher levels of interest were reported by males, non-full time faculty, faculty between 30 and 50 years of age, faculty with less than 10 years of teaching experience, faculty with trade certification credentials, and faculty working in specific subject areas (Trades and Technology, Business, Apprenticeships, IT). Provincial variations in applied research interest may reflect differences in legislation, mandates, collective agreements, funding opportunities, and/or regional economic disparities and priorities. Further study is suggested in this area.

The relative ranking of these three areas of research interest --- (1) curiosity, (2) teaching and learning, (3) applied research --- remained constant across all seven

demographic variables employed in this survey: gender, age, employment status, years of experience, credentials, subject area, and home province.

Finally, the majority of faculty consistently reported the *lack of release time* as their major barrier to participation. This finding corroborates all previous studies in this area, and highlights the critical need for action on this point. In order to support the development of research capacity and cultures at Canadian colleges, it is urgent that provincial and federal agencies recognize the vital role that college faculty can play in the research agenda, and implement policies that remove this central barrier to faculty participation.

In conclusion, the 2,410 faculty respondents from 90 colleges, representing a wide range of demographic characteristics and a diverse range of subjects and institutions, overwhelmingly reported positive attitudes toward and high levels of interest in the newly evolving research agenda at Canadian colleges. While curiosity-driven research and research related to teaching and learning represented the major areas of faculty interest, more than half of faculty also expressed strong or very strong interest in applied research, and uncertainty around terminology in this area may have led to an under-representation of the actual level of faculty interest in applied research. Finally, faculty consistently identified a lack of release time as the major barrier to their participation in research activity, corroborating earlier studies. A positive resolution to this critical issue of faculty release time could produce the conditions necessary to support a dramatic expansion of research capacity at Canadian colleges by unleashing the full potential of college faculty to participate in a meaningful and productive way in the “new climate of innovation and discovery in our nation.”³⁴

Appendix: Questions Asked

Faculty demographic information:

1. What is your age?
2. What is your gender?
3. How many years of teaching experience do you have?
4. Do you currently hold a full time teaching position?
5. In which subject area(s) do you work?
6. What relevant credentials have you acquired?
7. In which province or territory is your college located?

Questions concerning faculty attitudes, areas of interest, barriers and incentives:

8. To what extent do you agree or disagree that . . .
 - . . . your college should set a high priority on conducting research
 - . . . your college should provide release time for faculty to participate in research
 - . . . research has a positive effect on your college
 - . . . research has a positive effect on your duties and responsibilities
9. To what extent do you agree or disagree with the following statements concerning research . . .
 - . . . I am interested in participating
 - . . . I am confident in my abilities
 - . . . I am interested in advancing knowledge within my discipline
 - . . . I am interested in participating in research related to teaching and learning
 - . . . I am interested in participating in research leading to technological advances
 - . . . I am interested in participating in research involving students
10. To what extent do you agree or disagree that you are interested in research related to:
 - . . . Teaching and learning
 - . . . Curriculum development
 - . . . Student success
 - . . . Problem solving for industry
 - . . . Commercialization
 - . . . My subject area
 - . . . Topics of personal interest
 - . . . Improving teaching skills
11. To what extent do you agree or disagree that the following items are barriers to your participation . . .
 - . . . Lack of research experience
 - . . . Lack of training

- ... Lack of release time to participate
- ... Lack of administrative support
- ... Lack of infrastructure
- ... Lack of recognition
- ... Negative attitudes toward research at my college

12. To what extent do you agree or disagree that the following items are incentives to your participation . . .

- ... Career advancement
- ... Support from administrators
- ... Pursuit of personal interests
- ... Pursuit of further education
- ... Release time from teaching duties
- ... Opportunity to involve students
- ... Opportunity to work with business, community partners

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Data Tables for Figures 1 – 19

Figure 1. Faculty attitudes toward research at their college

Has Positive Effect on My College	86%
Has Positive Effect on My Duties	77%
Should Be a High Priority	78%
Release Time Should be Provided	87%
Interested in Participating	78%
Confident in My Abilities	66%

Figure 2. Faculty attitudes toward curiosity-driven research

My Subject Area	92%
Advances Within my Discipline	89%
Personal Pursuits	80%
Topics of Personal Interest	77%

Figure 3. Faculty attitudes toward research related to teaching and learning

Improving Teaching Skills	87%
Involvement of Students	83%
Teaching & Learning	82%
Student Success	82%
Curriculum Development	78%

Figure 4. Faculty attitudes toward applied research

Working with Business & Community Partners	74%
Technological Advances & Processes	66%
Problem Solving for Industry	52%
Commercialization	34%

Figure 5. Comparison of composite indices representing faculty attitudes and areas of research interest

	Agree or Strongly Agree
Attitude Index	79%
Curiosity Index	85%
Teaching & Learning Index	80%
Applied Research Index	57%

Figure 6. Faculty-reported barriers to participation in research

Lack of Training	48%
Lack of Experience	48%
Lack of Administrative Support	49%
Lack of Release Time	81%

Figure 7. Faculty-reported incentives to participation in research

Further Education	59%
Further Career	64%
Release Time	78%
Personal Interest	81%
Administrative Support	84%

Figure 8. Faculty attitudes about research.

	Disagree or Strongly Disagree	Neutral	Agree or Strongly Agree
Interested in Participating	-6%	16%	78%
Confident in My Abilities	-14%	20%	66%
Positive Effect on My College	-6%	8%	86%
Positive Effect on My Duties	-14%	9%	77%
Should Be a High Priority	-6%	16%	78%
Release Time Should be Provided	-4%	9%	87%

Figure 9. Faculty interest in curiosity-driven research

	Disagree or Strongly Disagree	Neutral	Agree or Strongly Agree
Advances Within my Discipline	-6%	8%	86%
My Subject Area	-2%	6%	92%
Topics of Personal Interest	-7%	16%	77%
Personal Pursuits	-4%	16%	80%

Figure 10. Faculty interest in research related to teaching and learning

	Disagree or Strongly Disagree	Neutral	Agree or Strongly Agree
Teaching & Learning	-5%	13%	82%
Student Success	-7%	22%	71%
Curriculum Develop	-5%	19%	76%
Involvement of Students	-3%	14%	83%
Improving Teaching Skills	-2%	11%	87%

Figure 11. Faculty interest in applied research

	Disagree or Strongly Disagree	Neutral	Agree or Strongly Disagree
Technological Advances & Processes	-11%	23%	66%
Problem Solving for Industry	-20%	28%	52%
Working with Business & Community Partners	-5%	20%	75%
Commercialization	-18%	44%	38%

Figure 12. Comparison of composite indices

	Disagree or Strongly Disagree	Neutral	Agree or Strongly Agree
Attitude Index	-8%	13%	79%
Curiosity Index	-4%	11%	85%
Teaching & Learning Index	-4%	16%	80%
Applied Research Index	-13%	30%	57%

Figure 13. Comparison of means of composite indices by gender

GENDER	Male	Female
Attitude Index	4.08	4.05
Curiosity Index	4.2	4.2
Teaching & Learning Index	3.96	4.16
Applied Research Index	3.7	3.35

Figure 14. Comparison of means of composite indices by age

AGE	< 30	30 - 40	41 - 50	> 50
Attitude Index	3.98	4.09	4.09	4.03
Curiosity Index	4.24	4.27	4.23	4.14
Teaching & Learning Index	4.08	4.09	4.1	4.02
Applied Research Index	3.4	3.53	3.57	3.45

Figure 15. Comparison of means of composite indices by employment status

EMPLOYMENT STATUS	Full Time	Non-Full Time
Attitude Index	4.07	4.05
Curiosity Index	4.22	4.15
Teaching & Learning Index	4.06	4.1
Applied Research Index	3.49	3.57

Figure 16. Comparison of means of composite indices by years of teaching experience

YEARS OF EXPERIENCE	< 5	5 - 10	11 - 20	> 20
Attitude Index	4.15	4.08	4.03	3.93
Curiosity Index	4.28	4.26	4.17	4.08
Teaching & Learning Index	4.11	4.09	4.05	4
Applied Research Index	3.6	3.58	3.45	3.36

Figure 17. Comparison of means of composite indices by credentials

CREDENTIALS	College	Bachelors	Masters	Doctorate	Trade Certification
Attitude Index	4.03	4.03	4.14	4.3	4.11
Curiosity Index	4.17	4.19	4.29	4.45	4.21
Teaching & Learning Index	4.12	4.05	4.07	4.04	4.15
Applied Research Index	3.6	3.47	3.43	3.44	3.84

Figure 18. Comparison of means of composite indices by subject area

PROVINCE	National	BC	AB	SK	MB	ON	QC	NS	NB	PEI	NL
Attitude Index	4.08	4.08	4.02	3.97	3.93	4.11	4.11	4.13	4	4.12	4.14
Curiosity Index	4.21	4.24	4.24	4.11	4.04	4.22	4.18	4.17	4.02	4.15	4.25
Teaching & Learning Index	4.07	4.12	4	3.94	3.98	4.14	4.07	4.04	4.1	4.14	4.01
Applied Research Index	3.64	3.54	3.61	3.54	3.54	3.59	3.72	3.72	3.63	3.6	3.73

Figure 19. Comparison of means of composite indices by province

SUBJECT	Trade & Technology	Apprenticeship	Business	IT	Adult Basic	Health	Counseling	Communication	Social Service	Liberal Arts	ESL
Attitude Index	4.05	4.01	4.01	4.06	4.06	4.13	4.12	4.02	4.1	4.05	4.06
Curiosity Index	4.14	4.14	4.14	4.08	4.19	4.27	4.38	4.29	4.3	4.37	4.2
Teaching & Learning Index	4	4.19	3.99	3.97	4.25	4.21	4.23	4.12	4.19	4.12	4.22
Applied Research Index	3.89	3.86	3.78	3.67	3.48	3.44	3.36	3.38	3.24	3.12	3.12

Figure 20. Faculty-reported barriers to participation

Lack of Training	48%
Lack of Experience	48%
Lack of Administrative Support	49%
Lack of Release Time	81%

Figure 21. Faculty-reported incentives to participation

Further Education	59%
Further Career	64%
Release Time	78%
Personal Interest	81%
Administrative Support	84%