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Good Teachers, Scholarly Teachers and Teachers Engaged in Scholarship of Teaching and Learning: A Case Study from McMaster University, Hamilton, Canada

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Good Teachers, Scholarly Teachers and Teachers Engaged in Scholarship of Teaching and Learning: A Case Study from McMaster University, Hamilton, Canada

Abstract
This paper defines and operationalizes definitions of good teaching, scholarly teaching and the scholarship of teaching and learning in order to measure characteristics of these definitions amongst undergraduate instructors at McMaster University. A total of 2496 instructors, including all part-time instructors, were surveyed in 2007. A total of 339 surveys were returned. Indices of good teaching, scholarly teaching and scholarship of teaching and learning were developed. The data illustrated a strong correlation between good teaching and scholarly teaching and between scholarly teaching and scholarship of teaching and learning. The perceived value placed upon teaching varied across the different Faculties. New instructors and those engaged in scholarly teaching and scholarship of teaching and learning perceived teaching to be more valued than their peers.

Le présent article définit et opérationnalise les définitions d'enseignement efficace[1], d'enseignement érudit[2] et de la publication sur l'enseignement supérieur[3] afin de mesurer les caractéristiques de ces définitions chez les enseignants de premier cycle de l'Université McMaster. Au total, 2 496 enseignants, y compris tous ceux qui travaillent à temps partiel, ont été sondés en 2007 et 339 questionnaires ont été retournés. Les chercheurs ont élaboré des indices d'un bon enseignement, d'un très bon enseignement et d'un excellent enseignement. Les données illustrent une forte corrélation entre un bon enseignement et un très bon enseignement, de même qu'entre un très bon enseignement et un excellent enseignement. La valeur perçue accordée à l'enseignement variait selon les différentes facultés. Les nouveaux enseignants pratiquant un très bon enseignement et un excellent enseignement trouvaient l'enseignement plus utile que leurs pairs.

[1] good teaching, [2] scholarly teaching, [3] scholarship of teaching and learning

Keywords
good teaching, scholarly teaching, scholarship of teaching and learning, teaching practices, teaching value

Cover Page Footnote
The authors are grateful for the contributions of a number of individuals to this project: Dale Roy provided insightful comments during the development of the research questions; Wayne Cai provided technical support for the implementation of the survey tool; Faria Sana provided data analysis support and help with original presentations; and, Bruce Zhang provided statistical programming assistance. Finally, we acknowledge the financial support of the Provost's Office and the Faculty of Social Sciences, McMaster University.

Teaching and learning practices are receiving increased attention in institutions of higher education (Britnell et al. 2010; Clark, Moran, Skolnik, & Trick, 2009). The terms good teaching, scholarly teaching and the scholarship of teaching and learning flood the educational literature. While these terms are used frequently, it is not clear what they actually mean within the context of higher education and what they look like in practice. To begin to answer these questions, and to better understand the relationships between good teachers, scholarly teachers and teachers engaged in the scholarship of teaching and learning, an environmental scan of all undergraduate instructors was completed at McMaster University in 2007. The survey, perhaps the first of its kind at a Canadian university, is essential to understanding the characteristics of teaching and learning in undergraduate education and the potential influence on student learning.

In this paper the concepts of good teaching, scholarly teaching and the scholarship of teaching and learning are defined and operationalized, the approach used to measure these characteristics among undergraduate instructors at McMaster University is described, a summary of key findings is provided and the relationships amongst these findings are discussed. The role that the "valuing" of teaching has on the engagement in teaching and learning practices is then considered. The paper concludes with a discussion of implications and future directions for McMaster University and for higher education in Canada.

Literature Review

The educational literature was reviewed to determine working definitions for good teaching (GT), scholarly teaching (ST) and the scholarship of teaching and learning (SoTL) and the relationship between these three concepts. While a positive relationship was assumed between ST and GT in much of the writing, the relationship between ST and SoTL was less clear. As few tools for measuring these concepts were identified, the working definitions of GT, ST and SoTL guided the development of survey questions and data collection. Each of these terms are defined and explained in the following paragraphs.

Good Teaching (GT)

Chickering and Gamson's (1987) seminal work has been used extensively to guide teaching and offers seven principles for good practice in undergraduate education. These principles include: (a) contact between faculty and students, (b) cooperation among students, (c) the use of active learning techniques, (d) prompt feedback, (e) time spent on task, (f) high expectations, and (g) respect for diverse ways of learning. The McMaster University survey operationalized each of these principles for good practice to identify behaviours associated with good teaching. The only exception was the principle of time on task, which was omitted as we were unable to effectively operationalize this principle within the format of the questionnaire.

Scholarly Teaching (ST)

Scholarly teaching involves consulting the literature, selecting and applying appropriate information to guide the teaching and learning experience, conducting systematic observations, analyzing the outcomes, and obtaining peer evaluation of classroom performance (Richlin, 2001). Scholarly teachers view teaching as a profession and the knowledge base on teaching and learning as a second discipline in which to develop expertise (McKinney, 2007). Allen and Field (2005) summarized scholarly teaching as based on "practice wisdom" which is developed by reflection on experience and published research. In the survey, instructors were identified as

scholarly teachers based on their responses to questions related to: (a) reflection on teaching and learning, (b) the use of evidence- informed approaches to teaching and learning, (c) attendance at conferences and workshops on teaching and learning, (d) discussion with colleagues about teaching and learning, and (e) their engagement with the literature on teaching and learning.

Scholarship of Teaching and Learning

Beginning with the ideas of Boyer (1990) who coined the term scholarship of teaching in his publication, *Scholarship reconsidered: Priorities of the professoriate*, the concept of scholarship of teaching and learning has been defined in multiple ways. Boyer suggested scholarship of teaching as one part in his four part classification of research that included discovery, integration, application and teaching. The scholarship of teaching and learning goes beyond teaching in an effort to understand how students learn effectively and how teaching influences this process (Allen & Field, 2005). It involves the systematic study of teaching and learning concurrent with the public sharing and critique of such work by members of one's community (Hutchings & Shulman, 1999). Many of the definitions build on the work by Boyer (1990). Cambridge (2001) defines scholarship of teaching as work that entails posing a problem about a teaching or learning issue, studying the problem using methods appropriate to the discipline, applying the results to practice, communicating the results, self-reflecting, and participating in peer review of the work. Kreber and Cranton (2000) and Kreber (2001) view SoTL as ongoing learning about teaching and the demonstration of this same knowledge. McKinney (2004) describes this work as including organized study of teaching and learning, sharing the results publicly and dissemination through presentations, publications or performances. It is unclear if McKinney is actually suggesting that you can study teaching independently of learning or learning independently of teaching. For this study we see the two as tightly interwoven. The Society for Teaching and Learning in Higher Education (STLHE) has its own definition which builds on these earlier definitions and forms the basis for this work:

> The scholarship of teaching and learning in higher education is a form of inquiry or research that focuses on improving understandings of teaching and learning effectiveness in specific courses, disciplines, or institutions. Through processes of inquiry, critical reflection, and communication faculty members answer questions about the impact of their own teaching on student learning. (Christensen Hughes, 2005, p. 1)

More recently Gale (2008) has provided a definition of SoTL that suggests that "going public" is invited which infers it is not a requirement of SoTL although there is a need for the work to have influence beyond the local context. His definition is that SoTL

> involves the gathering and interpretation of evidence of student learning. It invites peer review and 'going public' with insights about how, where, and why students learn. In its dissemination, scholarship of teaching and learning influences teaching, learning and scholarship beyond the local context. (p. XX)

For the purpose of this work going public is a key component that distinguished SoTL from ST and GT.

Within our survey, SoTL was operationalized by asking instructors the degree to which they: (a) apply for teaching and learning grants, (b) present at workshops, seminars or

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conferences, (c) publish on teaching and learning, (d) run pre/post tests on students' knowledge and skills, and (e) assess new approaches to the teaching and learning practices that they have implemented.

Good Teaching, Scholarly Teaching and SoTL: What is the Relationship?

While the relationship between these concepts has not been studied directly, there is some evidence that GT, ST and SoTL have reciprocal relationships (McKinney, 2007). Cox, Huber, and Hutchings (2004) found that 98% of SoTL researchers agreed or strongly agreed that their involvement in SoTL has increased their excitement about teaching, 93% changed the design of a course based on their SoTL work, 80% believe colleagues at their institution have been influenced by their SoTL work, and 68% believe more of their students have achieved high standards of work since they have become involved in SoTL.

While it is seems reasonable that GT, ST and SoTL are all related and ultimately lead to enhanced student learning, the relationship among the three remains blurred. Are instructors who engage in SoTL more scholarly in their approach to teaching? Do SoTL researchers engage in more "good teaching" practices than other instructors? Does SoTL engagement distract individuals from GT practices? Does the value placed on teaching influence GT, ST or SoTL? These are some of the questions that this study set out to address.

Research Questions

In order to frame our survey a series of researchable questions were identified:

1. What are the characteristics of GT, ST and SoTL in undergraduate instructors at McMaster University?
2. What is the relationship between and among GT, ST and SoTL?
3. Does the perceived value placed on teaching influence engagement in GT, ST or SoTL?
4. How can GT, ST and SoTL be supported among undergraduate instructors?

Methods

Survey Development

A cross-sectional research design was used to answer the questions identified. As discussed above, original operationalizations of the key measures of GT, ST and SoTL concepts were based on the literature review and used to inform the questionnaire (See Appendix A). The questions were developed, mapped to the three definitions of GT, ST and SoTL, converted to an on-line survey using the tool, Lime Surveyor, which was hosted on an institutional server, and piloted with undergraduate instructors to ensure readability, question clarity and completion time. Revisions were made to the survey questions based on the feedback received via a range of techniques including further pre-testing with staff from the Centre for Leadership in Learning (CLL) as well as with faculty who teach research methodologies.

Survey Implementation

The sample frame consisted of the email addresses of all instructors employed at McMaster University in Hamilton, Ontario, Canada. In June 2007 all undergraduate instructors

on this list were sent an email from the University's Provost inviting them to complete the on-line confidential survey which had received ethics approval from the McMaster University Research Ethics Board. Two reminder invitations were sent to non-responders. A separate paper letter was sent to all sessional instructors (i.e. single course contract instructors) inviting them to participate. This additional step was taken because of the timing of sessional contracts not all sessional lecturers still had active McMaster email addresses. The survey closed in August 2007.

Sample

In total, 2496 survey invitations were emailed. The number of completed surveys returned was 339 for a response rate of 14%.[1] Although a large group of respondents come from the Faculty of Health Sciences (40% of all respondents), the sample is representative of the distribution of instructors in the campus population.[2] The survey questions focussed on self-report of behaviours and did not focus on attitudes towards teaching. No data was collected about individual teaching quality scores.

Data Analysis

Indices were created from the survey responses for Good Teaching (GT), Scholarly Teaching (ST) and the Scholarship of Teaching and Learning (SoTL) (see Appendix B). Based on a natural division, identified in a frequency distribution graph, in the score distribution for these indices we were able to identify sub-groups in each area of High-GT (n=140), High-ST (n=79), and High-SoTL (n=72) among the instructors surveyed. A large part of the analysis sought to examine comparisons and correlations among the High GT/ST/SoTL groups.

Results

Characteristics of Teaching and Learning at McMaster

The characteristics of teaching and learning are divided into "teaching and learning practices" and "demographics." Teaching and learning practices are further divided into classroom practices; student feedback; student interaction; expectations, methods and evaluation of students; and advanced teaching and learning practices (introducing new techniques, publishing, and applying for grants).[3]

[1] The timing of the survey in the summer months may have been a factor in low response rates. Future surveys of this kind we would recommend be conducted at the beginning of Fall or Winter terms. In addition a large number of sessional lecturers, no longer affiliated with McMaster were invited to participate. This group had a very low response rate. Finally, all clinical faculty were included in this survey. This group numbers several hundred and also had a very low response rate. The response rate amongst regular McMaster faculty was much higher.

[2] The relatively large number of faculty from Health Sciences at McMaster University may be a unique feature to be considered in making comparisons with these results relative to other Canadian universities. However, note that analysis of the survey results were run on the basis of Health Sciences instructors included and not included. For the most part, results were not significantly different for key findings.

[3] We rely upon standard measures of margin of error as applied to the entire sample (n=339) at +/- 5.4 percentage points. Chi-square tests set at the level of <0.05 were run and are the basis for which results are reported as statistically significant.

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Teaching and Learning Practices

Classroom practices. In Table 1 we find that among the average respondent the most common classroom practice is the lecture. This is followed by tutorials, small group discussions, seminars, and student led presentations. Note that respondents could choose as many of the practices as they wished (the columns in the table are cumulative; they do not total to 100%).

Table 1
Instructors: Predominant Teaching Practices

Practice	All (%)	High-GT (%)	High-ST (%)	High-SoTL (%)
Lecture	44	40	34	37
Tutorial	34	41	44	46
Small group discussions	29	39	53	42
Seminar	17	16	20	22
Student led presentations	17	23	28	27
Active learning	32	40	52	48

High-GT respondents also identified lecture, tutorial, and small group discussions as three of their top four classroom practices, however their elevated preference for tutorial and small group discussion relative to the general respondents is significant. By contrast the High-ST respondents were using all of the techniques more often but especially small group discussions, with a small majority using them predominantly making this their preferred choice. They were also statistically more likely to use tutorial practices and student led presentations and yet were significantly below the average on the more traditional lecture approach. High-SoTL respondents were similar to High-ST respondents, although tutorials were used most frequently followed closely by small group discussions and lectures. This group also had a higher use of student led presentations. In terms of more active and cooperative styles of teaching practices around content delivery, High ST and High-SoTL respondents are significantly elevated, as are High-GT but to a slightly lesser extent. It is important to note however, that active learning was not defined for respondents so some individuals may have different interpretations of the term.

Student feedback.

Table 2
Feedback Methods for All, High-GT, High-ST, and High-SoTL Instructors

Feedback Methods	All (%)	High-GT (%)	High-ST (%)	High-SoTL (%)
Marks on assignments	81	91	87	92
Written comment on assignments	80	91	91	89
Marks on final exams	62	62	54	60
Through interaction with TA's	55	57	39	49
Comments and suggestions from peers	45	64	57	56
Through on-line discussion boards	27	34	33	35
During office hours	26	21	27	19

Table 2 shows that when asked about how they provide feedback to students, overall respondents were most likely to mention quantitative marks and written comments on assignments. These two forms of feedback are also the most commonly used by the High-GT/ST/SoTL groups as well. A majority of all instructors used marks on final exams, which is representative of the High-GT/SoTL groups, although the High-ST group had a significantly lower use of this approach. A small majority of all instructors also use TAs for feedback to students. While this is similar among the High-GT group, it drops for High-SoTL and High-ST groups (but only the latter is statistically significant). Peer interaction and comments are a form of feedback used by just under half of all instructors. This rises significantly in the High-ST group and the High-SoTL group and is particularly common among High-GT instructors. About a quarter of instructors use online discussion boards and office hours for student feedback. While office hour use for feedback is low among all groups (19-27% - not statistically significant), the use of online feedback is significantly more common among the High-GT /ST/SoTL groups. In other words, High GT, ST and SoTL respondents are providing across-the-board higher levels of feedback in both traditional (marks and comments) and other less traditional ways.

Table 3
Methods of Instructors: Student Interactions Outside of Class Time

Methods of Interaction	All (%)	High-GT (%)	High-ST (%)	High-SoTL (%)
Email	93	99	97	97
During office hours	79	83	81	88
In my office (but outside of office hours)	74	84	73	83
Online discussions	40	51	48	49
At student social events	35	42	42	43
At academic conferences	29	40	42	47
Over coffee	22	26	27	31
Elevated hours of interaction: Percentage of instructors who spend 15+ hours per week interacting with students outside class.	5	6	9	10

Table 3 shows that there is a relatively high level of student interaction with all types of instructors. However High-SoTL instructors show statistically higher levels in a few key areas. Electronic interaction has become the main form of contact in terms of frequency (if not necessarily overall time) with email interaction being the predominant means of that communication, particularly for High-GT Instructors. Interestingly, in the digital age we still find that four-in five of instructors interact with students during office hours. A substantial majority of instructors interact with students in the office, but outside scheduled hours. The office activity is particularly high for the High-ST and High-SoTL groups. Online discussion is also occurring among a large minority of instructors with about half of High-GT/ ST/SoTL instructors using this form of communication (i.e. significantly more than average). Social and casual interactions such as meeting at student social events or over a coffee remain relatively low for all instructors, though they are significantly higher for High-GT/ST/SoTL, although not dramatically so.

The most striking difference among the groups is the interaction with students at academic conferences. While a number of all instructors reported engaging in this, it was significantly higher for the High-GT/ST/SoTL groups. This kind of activity intuitively seems to

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fit with high-SoTL instructors, but is also a key distinguishing feature in what separates the nature of instructor-student interactions outside the class for High-GT and High-ST as well.

Expectations, methods and evaluation of students.

Table 4
Instructor Evaluation: Expectations and Approaches

Percentage Who Strongly Agree:	All (%)	High-GT (%)	High-ST (%)	High-SoTL (%)
I have high expectations of the quality of work undergraduate students should complete.	65	78	78	76
I use a variety of methods to help students learn.	57	76	72	71
I use a variety of ways to evaluate students.	49	67	72	69

Table 4 shows that most respondents strongly agreed that they have high expectations of the undergraduate students they teach, but this level rises significantly in the High-GT/ST/SoTL sub-groups. Over half of all instructors strongly agreed that they use a wide variety of methods to promote learning. This level rises significantly for High-ST /High-SoTL, and High-GT instructors. Under half of all respondents strongly agreed they use a variety of ways to provide evaluation to students; however this rose significantly for High-GT/ST/SoTL groups. Clearly, evaluation comprises one of the most distinguishing set of practices among the High-GT/ST/SoTL groups relative to the overall instructor base.

Advanced teaching and learning activities.

Table 5
Instructor Scholarly Involvement: Techniques, Scholarly Literature and Grants

Percentage Who Reply "Usually" to: "How Often Do You Engage in the Following Teaching-Related Activities?"	All (%)	High-GT (%)	High-ST (%)	High-SoTL (%)
Techniques				
Implement new approaches to teaching and learning	15	19	37	31
Assess new approaches to teaching and learning that I have tried	17	22	43	38
Literature				
Read literature on teaching and learning	9	13	24	22
Publish literature on teaching and learning	2	3	5	7
Grants				
Apply for teaching and learning grants at McMaster University	4	6	10	15
Apply for teaching and learning grants from outside granting agencies	1	1	4	4

A small percentage of McMaster instructors surveyed indicated that they "usually" implement new approaches to teaching and learning (see Table 5). Although not statistically different in the High-GT group, it rises in the High-SoTL group and the High-ST group. A slightly higher percentage of overall respondents reported assessing new approaches to teaching and learning than implementing new approaches. This was not significantly higher for the High-GT group, but was for the High-SoTL and High-ST group. Attempting new learning approaches and conducting assessment of their value demarks the High-ST and High-SoTL from both the average and even High-GT instructor.

Overall, a small percentage of respondents usually read the literature on teaching and learning. This level rises significantly among the High-ST and High-SoTL groups. Publishing on teaching and learning is clearly not an activity for the average instructor. This figure does rise for the High-ST and High-SoTL groups.

Similarly, there is a low level of teaching and learning grant applications from the average instructor. For the McMaster University-available grants, less than 5% say they "usually" apply. This rises significantly for High-ST and High-SoTL groups.

For teaching and learning grants from external agencies the participation rate is very low overall with only 1% saying they 'usually' apply. This level again rises slightly for the High-ST and High SoTL groups.

Overall we can see that advanced learning activities involving on-going assessment of practice, reading and publishing in the area of scholarly teaching, as well as applying for teaching grants are clear markers for High-ST and High-SoTL respondents but not de-markers for High-GT respondents.

Demographics.

Table 6
Instructor Demographics and Background

GT, ST, and SoTL scores by demographics (indexed to 100)	GT	ST	SoTL
All	55	34	36
Female	66	44	46
Male	45	23	26
Lecturer	62	46	15
Assistant professor	62	37	32
Associate professor	58	34	39
Professor	42	23	27
Health Sciences	63	49	37
Humanities	65	35	33
Social Sciences	47	13	28
Science	41	14	16

Note: An index was used here to facilitate an easier comparison amongst the different demographic groups. The index is based on overall scores for all respondents.

To compare demographics by types of teaching we created a score indexed out of 100 for GT, ST, SoTL as per Table 6. Interestingly, the average scores for female instructors for GT, ST, and SoTL were significantly higher than for males

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In terms of academic rank, lecturers and assistant professors score higher than average on the GT index than full professors, with associate professors just above average. The same pattern was found for ST scores: lecturers, assistant professors, and full professors were well below the average and associate professors were at the average.

By contrast, for SoTL scores lecturers were the very lowest index followed by full professors. Assistant professors were indexed just below the average and associate professors were above the average.

Of the four faculties that had sufficient survey responses for the index to be calculated, Health Sciences indexed well above average on the GT and ST scores, but were at par on SoTL. Humanities instructors had the highest overall GT index but were average on ST and SoTL. Social Sciences instructors were below average on GT, ST, and SoTL. Science instructors were below on GT, ST, and SoTL.

Clearly therefore among all the High—GT, ST and SoTL there is a greater tendency for women to predominate, and this is also true for the most part in terms of the lower academic ranks among high-GT and ST respondents, but not necessarily the case for High-SoTL where mid-level ranks predominate. Health Sciences and Humanities have clearly higher levels of High-GT relative to the other disciplines. The same is true in terms of High-ST though Health Sciences in absolute terms outstrips Humanities. The gradation is less extreme in terms of High-SoTL where Health Sciences is predominant but not overly so relative to Humanities and Social Science faculty.

GT, ST, and SoTL: Is there a correlation?

Table 7
Instructor Correlation Levels among GT, ST & SOTL

Correlation Measures Between GT, ST and SoTL	Pearson *r*
GT and ST	0.90
GT and SoTL	0.86
ST and SoTL	0.71[4]

Table 7 shows the results of Pearson product moment correlation coefficients between the variables of GT, ST and SoTL for all respondents. The relationship between GT and ST is extremely strong and the same is true for GT and SoTL. In other words it would appear that those instructors demonstrating characteristics of high ST or SoTL are also demonstrating characteristics of GT. The relationship, although strong, is not quite as strong between ST and SoTL.

However, we found that there is a significant group of the respondents (n=30; or just over 10% of sample) who, while scoring in the upper third of ST, are actually low performers on the SoTL index. In other words, they demonstrate many of the characteristics of informed scholarly teaching but express limited interest in the scholarship of teaching and learning. As we saw in the demographic analysis, they are more likely to be female, in the Faculty of Health Sciences, and either in the early or latter part of a teaching career at the university.

[4] These r scores are statistically significant ($p < 0.05$).

There is a smaller group of respondents (*n*=20) who demonstrate relatively high SoTL characteristics but low ST characteristics. They are more engaged in the activities of studying pedagogy but are not necessarily applying the approaches to teaching in their own current work at the university. This group tends to be tenured faculty who are Associate or Full professors, in the Faculty of Social Sciences and either mid or late career stage. Perhaps this group is in fact simply not as engaged in the act of teaching currently because they are busy with intensive research in pedagogy (or in their other 'home' disciplines).

The scatterplot in Figure 1 below illustrates the extraordinary strength of association between ST and SoTL among McMaster University faculty with more detail.\

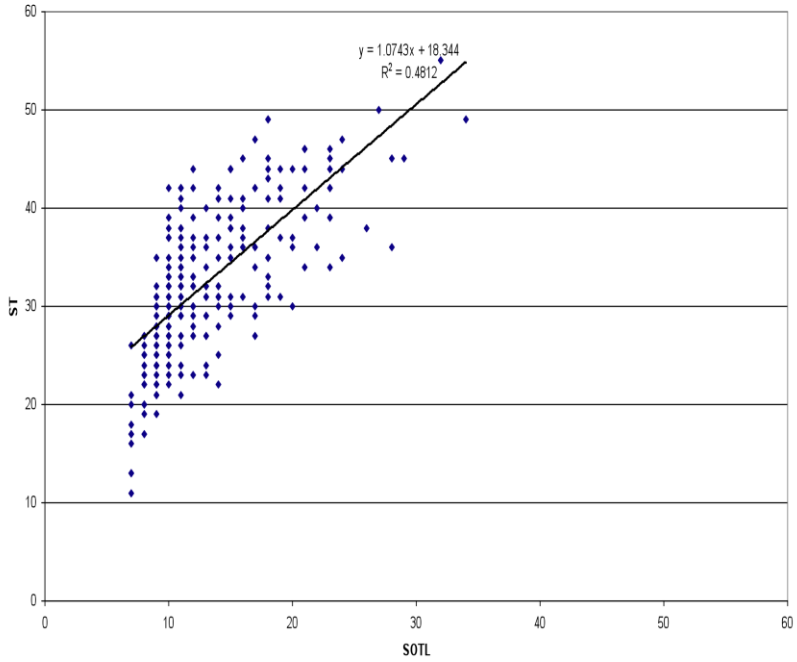

Figure 1. Correlation of ST and SoTL Scores

Value Placed on Teaching and Learning

Instructors were asked about the institutional value placed on teaching as well as how their own valuing of teaching has changed over their careers. Analysis was also done to determine if there was a difference in the perception of valuing by those who were considered scholarly teachers and those who were engaged in SoTL, and to see if personal demographics correlated with valuing teaching.

Overall, instructors agreed that teaching was most valued (in order) by: (a) students, (b) departments, (c) the general public, (d) colleagues, (e) their faculty, (f) their discipline, and (g) the institution. In general, those with heavier course loads were less likely to feel that teaching was valued by their department, faculty or discipline. Instructors in the Faculty of Health Sciences more strongly agreed that teaching was valued while those in Business, Engineering and Social Sciences were least likely to agree. In general, female instructors, lecturers and those with less than 3 years teaching experience were more likely to feel that teaching was valued. Instructors who were actively engaged in scholarly teaching and SoTL were also much more likely to report that teaching was valued.

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When asked about how their own value of teaching had changed from when they began teaching to the current time, and how they felt they would value teaching in 5 to 10 years, there was a decline in how strongly teaching was valued. Individual valuing of teaching was highest in the Faculty of Business and by those engaged in scholarly teaching and SoTL. Lecturers and instructors with the heaviest teaching loads tend to value teaching the most. The data does not inform us why they value teaching more. Do they hold positions that value teaching more because of how they value teaching or is it because of their positions that they value teaching more?

Interest in Participating Teaching and Learning Events

Instructors were asked about their interest in participating in teaching and learning professional development activities if they were offered at the university. Respondents were asked to identify if they were *very interested*, *somewhat interested*, or *not at all interested* in participating in: (a) workshops (half or full day), (b) multi-day research institutes, (c) showcases of current research on teaching and learning, (d) networking luncheons, (e) seminar series on education, or (f) individual consultation with a research expert.

Overall, respondents were interested in participating in teaching and learning events and ranked half day workshops, seminar courses and showcases of current research as the top three choices. This ranking held true for all respondents. Respondents who were ranked High-ST were approximately twice as likely to be interested all of the events than their Low-ST counterparts. This was also true in comparing High-SoTL with Low-SoTL groups. Another interesting finding is that instructors who were in their first three years of teaching, were consistently more interested in participating teaching and learning development activities.

Discussion

The purposes of this study were to: (a) better understand the characteristics of good teachers, scholarly teachers and teachers engaged in the scholarship of teaching and learning at McMaster; (b) determine the relationship between GT, ST and SoTL; (c) assess if the perceived value placed on teaching influences the engagement in GT, ST and SoTL; and (d) determine instructor interest in participating in future teaching and learning events. The remainder of this paper discusses each of these questions.

Characteristics of Teaching and Learning at McMaster

Teaching and learning practices were looked at in terms of: (a) classroom practices; (b) student feedback; (c) student interaction; (d) expectations, methods and evaluation of students; and (e) advanced teaching and learning practices. In looking at the findings, there were some similarities between all respondents; however, there were some clear differences for groups identified as High-GT, High-ST and High-SoTL.

In general, all respondents used a variety of teaching methods (with lecture being the most prominent), provided feedback to students through a variety of methods (predominantly with marks on assignments and final exams), and interacted regularly with students (mainly through email and office hours). Instructors reported that they had high expectations of students and used a variety of methods to help students learn.

When looking at the teaching practices of instructors who scored highly on GT characteristics they reported increased student feedback, increased student interaction (i.e.,

online discussions, at academic conferences), higher expectations of students and a greater variety of evaluation methods. These results are not surprising as these are some of the criteria used to define good teaching within the study. What perhaps is interesting is that the criteria of cooperation among students, the use of active learning techniques and respect for diverse ways of learning (the other defining criteria for good teaching) are not as characteristic of this group.

The instructors who scored high in ST characteristics and the SoTL reported similar teaching behaviours as the GT group but tended to demonstrate these behaviours to an even greater extent. These groups also had an increased use of active learning methods (tutorials, small group discussions) considered more engaging of students (with less use of lecture). This group also spent more time interacting with students outside of class.

Another significant difference for the High-ST/High-SoTL groups was their engagement in advanced teaching and learning activities (e.g., trying new teaching and learning approaches, reading the literature, applying for grants). High-ST and High-SoTL reported much higher rates of implementing (and assessing) new approaches to teaching and learning, reading the literature on teaching and learning, and applying for teaching and learning grants. Again, while this is not surprising as these are the criteria that were used to identify this group, what is interesting is that the percentage of instructors reading and publishing about teaching and learning is surprisingly low. This is also true of applications for teaching and learning grants. If instructors are implementing and assessing new approaches to teaching and learning, perhaps additional avenues or ways of helping instructors share this work with colleagues both within McMaster and beyond is needed. This outcome aligns well with Gale's (2008) definition of SoTL whereby instructors are invited to go public and disseminate beyond the local context. Implicit in the definition is the idea of a journey to engaging in SoTL and that there is development work required to allow instructors to go public and move beyond the local context.

Early career academics reported greater interest in participating in teaching and learning professional development. The literature suggests that early in an individual's teaching career, learning is likely to be viewed as a teaching-centred activity but over time there is movement towards a student-centred approach which would map well to the characteristics identified for GT in this research (Akerlind, 2007). The socialization experiences of early career academics can be strengthened through the creation of communities of practice around teaching and learning (Gibbs, Knapper, & Piccinin, 2009; Richlin & Cox, 2004). Such communities are designed to engage groups of people, for example, multi-disciplinary faculty on a campus, in sharing sets of problems and concerns as well as passions about a topic, deepening their knowledge and expertise by interacting on an ongoing basis (Wenger, McDermott, & Snyder, 2002).

Demographic Characteristics

Demographic characteristics were compared between all respondents and for those identified as High-GT/ST/SoTL. Demographic data included sex, rank, title, years teaching and faculty. The sample was found to be representative of the university population.

In general, the distribution of sex, rank and appointment among High GT/ST/SoTL instructors were similar. Respondents identified as High-ST tended to be female, teaching professors and most likely to be in the faculty of health sciences (and least likely to be in science and social science). Teaching professor appointments typically focus on undergraduate teaching and service with a modest pedagogical component. This often includes a leadership component which may be expressed through pedagogical scholarship. Sessional instructors (i.e., hired to teach one or more courses on a term-by-term contract) and those with Contractually Limited

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Appointments (i.e., a faculty appointment between one to six years that is not associated with tenure or permanence) also scored high on scholarly teaching characteristics. Interestingly, over 62% of the faculty that were identified as low scholarly teachers, were tenured or tenure track faculty.

Respondents identified as High-SoTL also tended to be female and more likely in the Faculty of Health Sciences, and they tended to have more years teaching experience. The results are not sufficiently robust to allow us to make conclusions if this is a clearly a gender factor or if it is a discipline factor as the Faculty of Health Sciences has a greater proportion of female faculty than other areas on campus.

The categories for years of appointment were created to capture pre-tenure, immediately post-tenure and established tenure track instructors. In the 3-5 years category both High-ST and High-SoTL teachers are under-represented. This may represent an emphasis by these individuals on disciplinary research performance in the years leading up to tenure. Conversely, in the group immediately post-tenure (6-10 years) there is increased representation of High-ST and High-SoTL instructors. This may represent additional time that these individuals place on teaching, or a difference in the cohort hired at that time. At the higher ranks of faculty appointment, which are achieved typically post-tenure, there are higher numbers in the SoTL section as opposed to the high scholarly teachers. It is hypothesized that this occurs because post-tenure many faculty report having more time to engage in research about teaching and learning although they may have become quite entrenched in their approach to teaching and learning making the transition to scholarly teaching more challenging.

Similarly, ST and SoTL scores were examined to determine if they were impacted by instructors who had a teaching release in the previous 24 months. It was anticipated that faculty who focused more heavily on their research, would be more likely to have a teaching release and a lower ST and SoTL score. There was no evident link to teaching release between the ST and SoTL scores.

As the Faculty of Health Sciences at McMaster University has a long history of evidence-based education, problem-based learning, and research in education, it is not surprising that a large number of instructors from this faculty had High-ST and SoTL scores. Instructors from Business, Engineering and Humanities scored similarly to all respondents for ST and SoTL, while the Faculty of Science is under-represented in both the number of scholarly and SoTL teachers. The Faculty of Social Sciences also has a very small number of teachers involved in scholarly teaching. It is reasonable in a Faculty of Social Sciences that some faculty may be engaged in research on teaching and learning as part of their disciplinary research. It would be interesting to explore these trends further as other Faculties introduce various pedagogical approaches.

Relationship between GT, ST and SoTL

While the characteristics of GT, ST and SoTL were compared throughout the paper, the question of whether or not these concepts are correlated remains. As described in the literature review, the link between ST and GT has received some support in the literature, but the link between ST and SoTL is unclear (Cox, et al. 2004; McKinney, 2007). Among McMaster University respondents, there was an extremely strong correlation was between GT and ST, supporting this literature. The test of the relationship between ST and SoTL tendencies among McMaster University undergraduate instructors shows that there is in fact a high relationship between ST and SoTL scores.

While we do know that there is a relationship between ST and SoTL, we do not know if in fact there is a causal link between ST and SoTL. In other words, we can not say with certainty based on these results that those instructors who are inclined to the behaviour and attitudes associated with ST causes instructors to take up SoTL. Nor can we say, based on these data that engaging in scholarship of teaching directly causes instructors to take on a more scholarly teaching approach. The McMaster data indicate that it is possible to exist as an individual with a high score in one domain, and a lower score in the other. But we do know that they are generally highly correlated and appear to complement each other. In fact a very basic analysis of distribution of ST and SoTL scores, coupled with a cross-tabulation of results suggests that in fact many of the high-ST and high SoTL instructors are similar and indeed the same people on campus, with a few differences.

Value Placed on Teaching

For teaching to be seen as scholarly work it must be both personally and professionally rewarding and valued. The perceived value placed on teaching by different parties is likely to influence how much effort is put into teaching or researching ways to better teach students. Valuing is often considered in terms of assessment / recognition and reward for teaching and SoTL. These are often reported as primary challenges to ST and SoTL in institutions of higher education.

Instructors perceived that students valued teaching but they reported that this same perception of value was not placed on teaching by the institution. There were also some faculties that were reported to value teaching more than others. This reinforces the potential influence of departmental leadership and the need to share strategies and successes across the university. Strategies to increase the sense of valuing include structural changes (e.g., policy, resources, ways of disseminating findings), human resources (e.g., orientation programs, faculty development, fellowships), political processes (e.g., appointment process, leadership roles, influence) and symbolic recognition (e.g., public document –mission/vision, awards, forums on education) (Huber & Hutchings, 2005; McKinney, 2007; Theall & Centra, 2001; Weimer, 2006).

On an individual level, lecturers, those teaching less than three years, and those engaged in ST and SoTL seem to perceive teaching to be the most valued. Perhaps this group needs to be involved and oriented from early on to the resources available for engagement in a variety of teaching practices. The impact that increased course loads have on the desire and ability of instructors to engage in ST and SoTL needs to be investigated further.

Conclusion and Future Directions

The characteristics of GT, ST and SoTL among undergraduate instructors at McMaster University have been described and compared. Based on the findings of this survey we see that a variety of GT, ST and SoTL practices are being implemented by all instructors surveyed, and that there does appear to be a correlation between those engaged in ST and SoTL as well as a fundamental connection between ST and SoTL with good teaching practices. A number of the variables that were used to define ST and SoTL have been identified. By focussing initiatives on increasing scores on variables that were low will help to guide future initiatives at the university. These initial results, and the potential to ultimately influence student learning by influencing teaching, reinforce the need to continue to explore this field.

While a number of interesting findings emerged from the original survey, the teaching and learning climate at McMaster University is rapidly evolving. The emphasis on scholarship in

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teaching and learning is growing throughout North America and the emergence of Web 2.0 technologies to enhance undergraduate student learning and encourage instructor-student interaction will impact the teaching and learning environment. A new classification of faculty appointment (the teaching professor) was introduced at McMaster in 2006. Teaching Professors are generally hired as assistant professors and move through the ranks of associate professor to full professor, earning permanence (a tenure-like status) during the process. Individuals within this classification have a heavier emphasis placed upon teaching and lower emphasis placed upon research than the standard faculty appointment although pedagogical research is a requirement for promotion to full professor for teaching professors. It will be interesting to observe if SoTL work becomes the domain solely of teaching professors at McMaster Univeristy or if the involvement of teaching professors in pedagogical research will translate in greater campus wide involvement by faculty holding more traditional appointments.

At McMaster University a number of additional changes have occurred since the questionnare was completed that may be changing the context within which ST/SoTL occurs. These include: the introduction of teaching professor positions; workshops and conferences that focus on enabling and celebrating the scholarship of teaching and learning; a change in Provost, President, and Deans; the introduction of a Task Force on Teaching and Learning (TOTAL) that identified ST and SoTL as areas of focus; the inclusion of SoTL in the recently released strategic plan for the institution and the creation of an Education Consultant position within the teaching and learning centre (i.e., Centre for Leadership in Learning) that focuses on enabling, facilitating and participating in the scholarship of teaching and learning. Administrating the survey again in 2011 would provide a mechanism to measure the effect of these changes. Although isolating the impact of the local changes from the wider adoption of SoTL would be very challenging.

Prior to administering the survey several changes to the survey instrument should occur. Good teaching was measured through the creation of Likert type questions that corresponded to Chickering and Gamson's (1987) seven principles for good practice in undergraduate education. One practice, time on task, was not effectively measured in the original survey and should be added to any future survey. The addition of qualitative methods (including focus groups) should also be considered. We believe that such qualitative work may also help determine beyond the exiting literature the measurement validity of the questions within the survey as an indicator of teaching attitudes in particular. For example, questions about the respondent's definition of good teaching, scholarly teaching, the scholarship of teaching and learning, and "active learning" would be informative.[5]

There were also a series of questions in the original survey that asked respondents to comment on their likelihood for future behaviours. This information was not informative and questions about the validity of results from this section indicate that it should be dropped from future surveys. Due to the questionable validity of the responses to this question, they have not been reported on in this paper.

McMaster University, like many university campuses in North America, is trying to expand their graduate student numbers. This emphasis on graduate expansion has occurred with a con-committal emphasis on graduate teaching and learning. A future survey on teaching and learning should include some questions to gauge the graduate teaching and learning experience.

[5] The level of validity in these measures, and indeed the reliability in different studies, would be improved were other education institutions in Canada and around the world to replicate this survey. To that extent we have openly shared our survey design and questionnaire with other educational institutions following a preliminary presentation of methodologies and results at the 2008 STLHE Annual conference in Windsor, Ontario.

The knowledge gained about teaching and learning at McMaster University is valuable for providing a baseline and for guiding the activities of the campus teaching and learning centre (i.e., Centre for Leadership in Learning). It would be useful to have a broader understanding of the spatial context of teaching and learning across Canada and internationally by running this survey at a variety of institutions across Canada. The results from this broader research may be useful in informing practices at teaching learning centres nationally.

McMaster University has an international reputation in at least two signature pedagogies – inquiry learning and problem-based learning. A future survey may want to assess the spread of these two pedagogies across the campus. Are they being used across all Faculties? Are they being used in large and small classes? Are they being used by faculty at a variety of student level and faculty rank? Is there a correlation between the use of these methods, and involvement in GT, ST or SoTL?

Much of this work is based on the premise that scholarly teaching should be fostered as it will improve the student learning experience and that scholarship of teaching and learning may improve the student learning experience. A future study (i.e., survey) would permit the researchers to gauge if scholarly teaching and/or scholarship of teaching and learning can be "grown" on a university campus. Qualitative discussions about whether this growth impacted (positively, negatively, or neutrally) the quality of student learning would need to be explored.

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Appendix A
Questionnaire

A Study of Teaching and Learning Practices at McMaster University

I. Some questions about your interactions with students

1. Are you willing to participate in this survey?

   ○ Yes

   ○ No

2. Please **click** the box that best describes how frequently you use the following activities:

	Never	Rarely	Occasionally	Frequently	Predominantly
Lecture	○	○	○	○	○
Tutorial	○	○	○	○	○
Seminar	○	○	○	○	○
Laboratory experiments	○	○	○	○	○
Field trips/experiences	○	○	○	○	○
Student led presentations	○	○	○	○	○
Small group discussions	○	○	○	○	○
Active learning	○	○	○	○	○

If there are any other activities, please specify and describe frequency:

3. Please click the box that best answers the following statements:

Students in my class participate in ….

	Never	Rarely	Occasionally	Often	Usually	Not Anymore
Group work activities ***outside*** of the classroom	○	○	○	○	○	○
Group work activities ***during*** my class	○	○	○	○	○	○
Online discussions	○	○	○	○	○	○
Online group projects	○	○	○	○	○	○
Helping each other understand the material	○	○	○	○	○	○
Activities to introduce themselves to each other in the first lecture (e.g. an icebreaker)	○	○	○	○	○	○

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4. Outside of the scheduled class time, where do you interact with undergraduate students?
(*check all that apply*)

☐ In the corridor
☐ During office hours
☐ In my office; but outside office hours
☐ Online discussions
☐ Email
☐ Over coffee
☐ Over a meal
☐ At student social events
☐ At student athletic events
☐ At academic conferences
☐ Never
Other:

5. How many hours per week on average, during the academic term, do you spend with undergraduate students outside of class time?
(*Choose only one of the following*)

○ None

○ 1-2 hours

○ 3-5 hours

○ 6-10 hours

○ 11-15 hours

○ > 15 hours

6. Students in my class receive feedback in the following ways:
(*Check all that apply*)

☐ Marks on assignments
☐ Marks on midterms
☐ Marks on final exams
☐ Final grades
☐ Written comments on assignments
☐ Written comments on midterms
☐ Written comments on final exams
☐ During office hours
☐ Through interaction with Teaching Assistants
☐ To the entire class during lecture
☐ Through online discussion boards
☐ Through online testing tools
☐ Comments and suggestions from peers
Other:

7. On average, how frequently do students in your courses receive feedback?
(*Choose only one of the following*)

○ Weekly

○ Bi-Weekly

○ Monthly

○ Couple of times per term

Other:

8. Please click the box that best describes your agreement with the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have high expectations of the quality of work undergraduate students should complete	○	○	○	○	○
Undergraduate students are aware of my expectations for the quality of work in my courses	○	○	○	○	○
I use a variety of methods to help students learn	○	○	○	○	○
I evaluate students in many different ways	○	○	○	○	○

II. Now some questions about how you think teaching is valued….

9. Indicate your agreement with the following statements. Teaching is highly valued by:

	Strongly Agree	Somewhat Agree	Neither Agree Nor Disagree	Somewhat Disagree	Strongly Disagree
Colleagues	○	○	○	○	○
Department	○	○	○	○	○
Faculty	○	○	○	○	○
Institution	○	○	○	○	○
Discipline	○	○	○	○	○
Students	○	○	○	○	○
The general public	○	○	○	○	○

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10. To what extent has the value you put on teaching changed? Indicate how much you personally valued, value, or expect to value teaching?

	Very Low	Low	Moderately	Fairly High	Very High
Now	○	○	○	○	○
When you taught your first undergraduate class	○	○	○	○	○
In 5-10 years	○	○	○	○	○

III. Now some questions about your teaching and learning practices….

11. To what extent do the following influence your current teaching practices? Please rate the following:

	Very Low	Low	Moderately	Fairly High	Very High
Personal experience	○	○	○	○	○
Previous instructors of the course	○	○	○	○	○
Instructors who taught me	○	○	○	○	○
Literature about teaching	○	○	○	○	○
Research literature in my field	○	○	○	○	○
Colleagues	○	○	○	○	○
Observation and reflection	○	○	○	○	○
Participation in workshops/seminars	○	○	○	○	○
Feedback from student course evaluations	○	○	○	○	○
Other informal student feedback	○	○	○	○	○

If there are other influences, please specify and rate them:

12. How often do you engage in the following teaching-related activities?

	Never	Rarely	Occasionally	Often	Usually
Run pre/post tests of students' knowledge and skills	○	○	○	○	○
Collect feedback from students on specific aspects of my Undergraduate teaching (i.e. other than the University Mandated course evaluations)	○	○	○	○	○
Critically reflect on teaching and learning	○	○	○	○	○
Implement new approaches to teaching and learning	○	○	○	○	○
Assess new approaches to teaching and learning that I have tried	○	○	○	○	○
Participate in department initiatives where the focus is on teaching and learning	○	○	○	○	○
Talk to colleagues about teaching and learning	○	○	○	○	○
Apply for teaching and learning grants at McMaster University	○	○	○	○	○
Apply for teaching and learning grants from ***outside*** granting agencies	○	○	○	○	○
Attend workshops/seminars on teaching and learning at McMaster University	○	○	○	○	○
Attend workshops/seminars on teaching and learning ***outside*** of McMaster University	○	○	○	○	○
Present at workshops/seminars on teaching and learning ***outside*** of McMaster University	○	○	○	○	○
Attend conferences on teaching and learning	○	○	○	○	○
Present at conferences on teaching and learning	○	○	○	○	○
Read literature on teaching and learning	○	○	○	○	○
Publish on teaching and learning	○	○	○	○	○

13. ***In the future***, what is the ***likelihood*** you will engage in the following teaching-related activities?

	Very Unlikely	Unlikely	Neither Unlikely nor likely	Likely	Very Likely
Run pre/post tests of students' knowledge and skills	○	○	○	○	○
Collect feedback from students on specific aspects of my Undergraduate teaching (i.e. other than the University Mandated course evaluations)	○	○	○	○	○
Critically reflect on teaching and learning	○	○	○	○	○
Implement new approaches to teaching and learning	○	○	○	○	○
Assess new approaches to teaching and learning that I have tried	○	○	○	○	○
Participate in department initiatives where the focus is on teaching and learning	○	○	○	○	○
Talk to colleagues about teaching and learning	○	○	○	○	○
Apply for teaching and learning grants at McMaster University	○	○	○	○	○
Apply for teaching and learning grants from ***outside*** granting agencies	○	○	○	○	○
Attend workshops/seminars on teaching and learning at	○	○	○	○	○
McMaster University	○	○	○	○	○
Attend workshops/seminars on teaching and learning ***outside*** of McMaster University	○	○	○	○	○
Present at workshops/seminars on teaching and learning ***outside*** of McMaster University	○	○	○	○	○
Attend conferences on teaching and learning	○	○	○	○	○
Present at conferences on teaching and learning	○	○	○	○	○
Read literature on teaching and learning	○	○	○	○	○
Publish on teaching and learning	○	○	○	○	○

14. Which teaching and learning events would you be interested in participating in, if offered by the university?

	Not at all interested	Somewhat interested	Very interested
Half day workshops	○	○	○
Full day workshops	○	○	○
Multi-day research institute	○	○	○
Showcase/symposium of existing research	○	○	○
Networking luncheon	○	○	○
Seminar series	○	○	○
Individual meeting(s) with a research consultant	○	○	○

IV. Now some questions about you….

15. I am:
(*Choose only one of the following*)

○ Male

○ Female

16. What kind of appointment do you have at the University?
(*Choose only one of the following*)

○ Continuous appointment without annual review

○ Contractually limited appointment

○ Sessional

○ Teaching professor

○ Tenure track

○ Tenured

○ Other:

17. What is your academic rank?
(*Choose only one of the following*)

○ Lecturer

○ Assistant Professor

○ Associate Professor

○ Professor

○ Other:

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18. For how many years have you taught undergraduate courses?
(*Choose only one of the following*)

○ Less than 3

○ 3-5

○ 6-10

○ 11-15

○ 16-20

○ more than 20

19. How many undergraduate courses do you teach in a typical 12 month period (for the purpose of the questions a six unit course counts as 2 courses)?
(*Choose only one of the following*)

○ One

○ Two

○ Three

○ Four

○ Five

○ Six

○ Seven

○ Eight

○ Nine

○ Ten

20. What size classes do you teach in a typical 12 month period?

☐ 20 or less
☐ 21-50
☐ 51-100
☐ 101-200
☐ 201-500
☐ 501-1000
☐ 1001-2000
☐ Over 2000

21. Compared to others in your academic unit, is your undergraduate teaching load:

○ Heavier

○ About the same

○ Lighter

22. In the last twenty-four months have you had a teaching release?

○ Yes

○ No

23. In which faculty do you reside?
(*Check all that apply*)

☐ Business
☐ Engineering
☐ Health Sciences
☐ Humanities
☐ Science
☐ Social Sciences
☐ Other:

24. In which department/school/unit do you reside?

25. Any other comments?

Thank you for taking the time to complete this survey. If you are interested in finding out more about the teaching and learning practices discussed in this survey please contact:

Centre for Leadership in Learning
cll@mcmaster.ca
(905) 525-9140 ext. 24540

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Appendix B
Design of GT, ST, and SoTL Scales

GT Scale (Based on questions 2-8)

A scale out of 100 was developed based on the specific questions in the survey related to Chickering and Gamson's seven principles of good practice in undergraduate education (excluding "time on task" which we were unable to operationalize in the survey). This involved components from questions 2-8 which were then computed to give an overall score out of 100. After running a distribution analysis it was observed that a natural bifurcation division at the level of GT score was 65, which became the division point. We then created two new variable of High GT (scores of 65-100, *n*=140) and Low SoTL (scores <65, *n*=199).

SoTL/ST Scales (based on question 12)

From the questionnaire the responses to the 19 sub-questions in Question 12 provide the basis for the SoTL and ST characteristics. From the entire data set (*n*=339), we identified all respondents who answered all 17 parts for Question 12 (*n*=274). Each respondent was given a score (between 1 - 5) for each the sub-question of Question 12: score 1 for "never" and 5 for "often". This gave each respondent 17 different scores for Question 12.

Eleven of the sub-questions were used to generate an overall score per respondent for their overall ST performance – based on the 1-5 response to questions 12.1,12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.10, 12.12, 12.14, 12.6.[6] Potentially the highest score per respondent was 55. After running a distribution analysis it was observed that a natural bifurcation division was at the level of ST score was 35, which became the division point.

We then created two new variables of High ST (scores of 35-55, *n*=79) and Low SoTL (scores <35, *n*=195).

Seven of the sub-questions were used to generate an overall score per respondent for their overall SoTL performance – based on the 1-5 response to questions 12.5, 12.8, 12.9, 12.11, 12.13, 12.15, 12.17. Potentially the highest score per respondent was 35. After running a distribution analysis it was observed that a natural bifurcation division at the level of SoTL score was 15, which became the division point. We then created two new variable of High SoTL (scores of 15-35, *n*=72) and Low SoTL (scores <15, *n*=202).

[6] Note that it was decided after the survey had gone live that sub-question 12.5 was representative of both ST and SoTL so was included in both scales.