

**Taking Stock:  
A Report on the Symposium on Teaching and Learning  
Research in Higher Education**

For the Higher Education Quality Council of Ontario (HEQCO)

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## Executive Summary

This report presents a summary of the activities and outcomes of “Taking Stock: Symposium on Teaching and Learning Research in Higher Education” held April 25 and 26 in Guelph, Ontario. The Symposium was sponsored and organized by the Higher Education Quality Council of Ontario (HEQCO),<sup>1</sup> with the support of the Honourable Frank Iacobucci, C.C., Q.C., Chair; James Downey, President; and Ken Norrie, Vice President Research. It was conceptualized and facilitated by Julia Christensen Hughes and Joy Mighty, past and current Presidents of the Society for Teaching and Learning in Higher Education (STLHE)<sup>2</sup> respectively, and hosted by the University of Guelph.

There were 57 participants in total, the majority being faculty, educational developers and senior administrators from Ontario universities and colleges. Participants also came from other parts of Canada (British Columbia, Quebec, New Brunswick and Prince Edward Island) and beyond (the US, the UK, Finland, Australia and Hong Kong).

The impetus for the event was the recognition that researchers have already discovered much about teaching and learning in higher education, but that dissemination and uptake of this information have been limited. As such, its impact on faculty teaching practice and the student learning experience has been negligible.

The opening keynote presentation was given by Dr. Noel Entwistle, Professor Emeritus of Education at the University of Edinburgh, who “took stock” of the research on teaching and learning in higher education. Dr. Entwistle’s presentation was followed by three sessions, each of which paired one international and one North American speaker. These sessions focused on

1. What we know about student learning
2. What we know about how teaching impacts learning
3. Best practices in teaching and learning respectively

Each of these sessions was followed by a roundtable discussion, in which participants were presented with a series of guiding questions.

Following these sessions, Dr. Keith Trigwell, Professor of Higher Education and Director of the Institute for Teaching and Learning at the University of Sydney presented the second keynote address – focusing on his own research as well as synthesizing what had been presented and discussed to that point. A final panel reflected on why dissemination and uptake of this research have not been more pronounced and made suggestions for what changes are needed to help bring such change about. The symposium concluded with remarks by Ken Norrie.

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<sup>1</sup> “The Higher Education Quality Council of Ontario is an arm’s-length agency of the Government of Ontario dedicated to ensuring the continued improvement of the postsecondary education system in Ontario. The Council was created through the *Higher Education Quality Council of Ontario Act, 2005*. It is mandated to conduct research, evaluate the postsecondary education system, and provide policy recommendations to the Minister of Training, Colleges and Universities with a view to enhance the quality, access, and accountability of Ontario’s higher education system” ([www.heqco.ca](http://www.heqco.ca)).

<sup>2</sup> “The Society for Teaching and Learning in Higher Education (STLHE) is a national association of academics interested in the improvement of teaching and learning in higher education. Its members include faculty and teaching and learning resource professionals from institutions of post-secondary education across Canada and beyond” ([www.stlhe.ca](http://www.stlhe.ca)).

Inspired by Al Gore's documentary, *An Inconvenient Truth* and associated "climate project" through which individuals, communities and even nations have been motivated to reduce their environmental impact as a result of becoming better informed, we wondered what might happen if the same was done for teaching and learning in higher education. We even wondered about using a similar project title – "An (In)convenient Practice: The Truth About Teaching and Learning in Higher Education." Such a title we thought might help communicate that much of our current teaching practice in higher education is a practice of *convenience* for administrators, faculty and students alike, to the extent that efficiency and credentialism are primary considerations. As far as learning effectiveness is concerned, however, such practice is decidedly *inconvenient*, as traditional pedagogical approaches<sup>3</sup> fall far short of their potential for transformational<sup>4</sup> learning or learning that lasts.<sup>5</sup>

We also recognized that one of the challenges we would face in achieving such an outcome would be to make the language of this research accessible. Like all disciplines, the education literature is replete with its own terminology, acronyms and concepts. While these are arguably useful to those in the field, they can serve as barriers to those who are not. Throughout this report, definitions are therefore provided. We hope that in doing so, this report may be of interest to not only those who attended the Symposium or have conducted research on teaching and learning in higher education, but to others as well.

The objectives of the Symposium were to identify and synthesize, from multiple research traditions and perspectives, what is already known about teaching practice and student learning in higher education, what we still need to know, and the implications of what is known for improving the quality of education. In other words, we wanted to gather together the seminal research on pedagogical practice, as a first step towards presenting this research in a highly accessible format to the educational community and public at large. Having said this, given the enormity of the educational literature, we are not claiming that the forum provided an exhaustive treatment, but rather focused on those subject areas considered seminal by the invited speakers as well as those related to their own research.

Our ultimate goal is to have more faculty adopt teaching approaches that are consistent with what is known about student learning (i.e., evidence-based practice<sup>6</sup>). Therefore, it was our hope that the Symposium would be the precursor to other events and outcomes, such as a published account of the papers presented (which is now underway in collaboration with the McGill-Queen's University Press), and a larger public forum. Further dissemination is important in encouraging evidence-based pedagogical practice in postsecondary education (PSE) in Ontario.

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<sup>3</sup> Pedagogical approach – one's teaching philosophy and practice, including the learning activities and assessment approach used.

<sup>4</sup> Transformational learning – "learning that not only increases knowledge, but more importantly, leads to deep and pervasive shifts in the learner's perspective and understanding" (Portnow, K., Popp, N., Broderick, M., Drago-Severson, E., Kegan, R., NCSALL's Research Findings: Transformational Learning in Adulthood, Focus on Basics: Connecting Research and Practice, Vol. 2, Issue D, 1998, [www.ncsall.net](http://www.ncsall.net)).

<sup>5</sup> Learning that lasts – learning that involves "change in behavior and flexibility in perspective, enduring commitments, and transformative elements that carry the individual forward through unexpected experiences, roles and life events... [and] involves the whole person" (Mentkowski & Associates, 2000, p. xv 11, as cited in Entwistle, 2008, p. 5).

<sup>6</sup> Evidence-based practice – the adoption of practices that reflect general principles that have been found through empirical research to be supportive of student learning. This is contrary to the uncritical adoption of particular pedagogies simply because they are the tradition of the discipline or institution.

This report provides detailed overview of the Symposium activities and research findings as well as the comments, suggestions and questions made during the roundtable discussions.

## **Research Findings**

The research summarized and synthesized at the Symposium strongly suggested that:

### **1. There is a relationship between how faculty teach and how students learn**

- Students vary their approaches to learning based on their perceptions of the teaching-learning environment<sup>7</sup> (along with other more personal factors such as interest, intelligence, prior knowledge and personal goals).
- When faculty teach in traditional teacher-centred<sup>8</sup> ways, students tend to adopt a surface approach to learning.<sup>9</sup>
- When faculty teach in non-traditional, learning-centred<sup>10</sup> or learner/student-centred<sup>11</sup> ways, students tend to adopt a deep approach to learning.<sup>12</sup>

### **2. There is a relationship between how students learn and the learning outcomes achieved**

- A surface approach tends to result in poorer short-term retention, poorer understanding of key concepts, and more novice-like understandings or appreciation of how to learn and how knowledge is created.
- A deep approach tends to result in greater retention and understanding, and a more sophisticated awareness of learning and knowledge creation processes.
- A deep approach is enhanced by organized effort on the part of students (the combination of good time-management, well-organized study methods, effort and concentration).

### **3. There is much that faculty can do in support of deep learning and organized effort**

- The traditional lecture can be enhanced through the adoption of a number of general principles:
  - organization
  - explicit recognition of student variation<sup>13</sup>

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<sup>7</sup> Teaching-Learning Environment – a broadly encompassing term which includes factors particular to individual courses which are largely under the control of the faculty member (e.g., learning objectives and pedagogy; course content, structure, and organization; the socio-cultural environment), as well as institutional factors such as the general teaching and learning ethos, support for student learning, and the attributes of the learning space (e.g., room layout, class size, availability of technology).

<sup>8</sup> Teacher-centred – pedagogical approaches that present knowledge from the teacher's own perspective, concentrating on the coverage of factual content, which is communicated primarily through one-way transmission mechanisms. Student assessment largely focuses on short-term recall.

<sup>9</sup> Surface approach to learning – a concept first introduced by Marton (1976) and Marton & Säljö (1976), surface learning is largely extrinsically motivated (effort is expended in order to get a particular grade or credit) and is concerned with trying to reproduce information without seeking personal understanding. Memorizing facts with only superficial understanding and the uncritical acceptance of ideas are hallmarks of a surface approach to learning.

<sup>10</sup> Learning-centred – a focus on facilitating or developing a critical understanding through active and often collaborative engaging pedagogical approaches.

<sup>11</sup> Learner/student-centred – a learning-centred pedagogical approach that additionally takes into consideration individual student differences and focuses on developing the self-directed learning capabilities of the student.

<sup>12</sup> Deep approach to learning – also introduced by Marton (1976) and Marton & Säljö (1976), deep learning involves processes that are largely intrinsically motivated (the student has a genuine interest in engaging with the subject and extracting meaning for themselves in order to understand and become experts). Critical analysis, the integration of new knowledge with prior understanding, application, knowledge transfer and retention are the hallmarks of deep learning.

- appropriate level, pace and quantity of information (short-term memory severely restricts the amount of information and the number of relationships that can be kept in mind at any one time)
- a focus on the threshold concepts<sup>14</sup> of the discipline
- repetition/explanation of key concepts within multiple contexts and formats
- the use of concept maps, diagrams, illustrations or anecdotes
- faculty-student and student-student interaction and discussion
- instructor enthusiasm and other strategies which arouse interest and demonstrate importance and relevance (which activate neurons in support of memory and understanding)
- Assessments play a crucial role in directing student learning. Characteristics associated with effective assessment include:
  - clear goals that encourage learning for understanding, the development of problem-solving, critical thinking and information literacy<sup>15</sup> skills, and the ability to transform and extend knowledge
  - learning tasks that are closely related to, or directly involve, situations that would be encountered in the “real world.” such an approach is more likely to be perceived as relevant by students and increase the likelihood of learning transfer
  - experienced success (which produces chemicals resulting in a feeling of well-being)
  - immediate and readily understandable feedback (as incorrect or ineffective neural networks, once firmly established are difficult to change)
- Non-traditional pedagogies that have been found to be supportive of deep learning include a variety of active and often collaborative activities such as inquiry-based learning,<sup>16</sup> service or community based-learning,<sup>17</sup> problem-based learning,<sup>18</sup> case-based learning,<sup>19</sup> “clickers”<sup>20</sup> etc.

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<sup>13</sup> Student variation – students vary on a number of dimensions including: intelligence, ability, knowledge and skills; interests and goals; work habits and effort; conceptions of and approaches to learning etc. To the extent that faculty are aware of this variation and take it into consideration, the more effective the learning environment is likely to be.

<sup>14</sup> Threshold concepts – are pivotal, integrative concepts that transform the student’s prior understanding of the subject and are essential to further learning. Also described as “portals” or “transformative waypoints” which open up new ways of thinking about or understanding something, once threshold concepts are learned, student learning journeys can be significantly accelerated. See Land, Meyer & Smith (2008) and Meyer & Land (2006).

<sup>15</sup> Information literacy – the ability to identify, locate, critically assess and communicate needed information, including the ability to distinguish between various types of information, such as research or evidence-based and popular opinion.

<sup>16</sup> Inquiry-based learning – students participate in a process of inquiry (seeking answers to a compelling question) as a means of learning research skills and core knowledge within a particular discipline, as well as generating an understanding of how this knowledge integrates with other disciplinary domains.

<sup>17</sup> Service or community-based learning – students participate in a project with a community partner/organization, of mutual benefit, providing students with an opportunity to apply theory in practice and for the community organization to receive support they might not otherwise receive.

<sup>18</sup> Problem-based learning – a compelling problem directs students through a learning process involving problem definition; the assessment of what is known and what needs to be known; information gathering, sharing and assessment; the generation of alternatives or solutions to the problem; and self and peer critique of the learning process.

<sup>19</sup> Case-based learning – students are put in the role of decision maker with respect to a detailed description of an issue confronting a person (typically a manager) in an organization

<sup>20</sup> “Clickers” – hand-held units that enable students to indicate their degree of understanding by responding to questions asked by the instructor. Clickers are becoming increasingly popular as means of fostering student engagement in large class settings.

- Students who take part in one or more “high-impact” learning experiences<sup>21</sup> report greater levels of engagement<sup>22</sup> and greater gains in learning and personal development.

#### **4. The majority of faculty continue to teach in traditional teacher-centred ways, resulting in on-going, system-wide learning deficits**

- The vast majority of faculty lecture, providing little opportunity for any kind of student interaction.
- There is a positive association between teachers who engage in pedagogical practices that are most conducive to deep learning and the number of teaching methods of which the teacher is aware.
- Disciplinary research norms are an important factor in understanding the pedagogical inclinations of faculty:
  - faculty who approach their research from a holistic or conceptual perspective are more likely to use learning or student-centred pedagogies
  - faculty whose research is more focused on detail and isolated problems, are more likely to use teacher-centred pedagogies
- Emerging research has found significant differences between how faculty in the sciences tend to teach (teacher-focused) and how faculty in the humanities tend to teach (learning or student-focused)

Taken together, the research findings highlighted in the preceding four points are very troubling. Clearly, we know much about the relationship between teaching and learning in PSE and what we might do to support a deep learning approach. Yet we continue to teach in ways that are contrary to this evidence. Further research exploring why this is the case and what needs to be done in support of student learning is needed.

#### **Participant Suggestions**

Following each presentation, participants had the opportunity to pose questions or make observations and suggestions. These comments are briefly summarized below. As far as possible, the terminology used by the participants has been retained (some changes were made in the interests of brevity and clarity). In addition, where multiple ideas of a similar nature were presented, these have been summarized into key points.

#### **Future Research**

Participants were asked their opinions with respect to areas for further research. Key points included:

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<sup>21</sup> High-impact learning experiences – are structured learning opportunities and programs that adopt non-traditional pedagogical approaches and are intended to be transformational in nature. These include first-year seminars, learning communities, writing-intensive courses, field courses, internships, study abroad and research with a faculty member, a culminating senior experience.

<sup>22</sup>Engagement – “the time and effort students put into their studies and other educationally purposeful activities” (Kinzie, 2008).

- To what extent, across various disciplines, departments and institutions within Ontario PSE, are faculty members taking into account the general principles emerging from research on and about teaching and learning?
- How prepared and motivated are Ontario's PSE students for deep approaches to learning and what might we do to enhance this?
- How prepared and motivated are Ontario's PSE faculty for fostering deep approaches to learning and what might we do to enhance this?
- What is the potential impact of various administrative and pedagogical practices on student learning (e.g., assigning the best teachers to first year classes, providing students with explicit explanations for why we teach the way we do, fostering institutional values and cultures that support learning, the effective integration of co-curricular learning experiences, a focus on threshold concepts, active and collaborative learning approaches), from multiple-disciplinary perspectives?
- What are the key barriers to adopting evidence-based practice in teaching and learning and what can be done to overcome them?

With respect to issues pertaining to research methodology, it was suggested that qualitative research approaches, such as phenomenography,<sup>23</sup> may be extremely helpful in further revealing differences in student learning experiences and faculty approaches. Research is also needed that will move beyond self-reported data to include direct observation and peer feedback. Finally, more work demonstrating causality (as opposed to simply correlation) would be extremely helpful. In support of this outcome, work that builds on the work of Richardson (2006) was encouraged.

### **Suggestions for Moving Forward**

Participants were also asked to generate suggestions for what needs to happen in support of evidence-based pedagogical practice, with respect to three distinct levels - faculty, institutional and governmental.

#### **Individual Level: What can you do differently?**

- Educational Developers
  - Include "how students learn" in faculty development programs
  - Help faculty conduct research on their own teaching practice (build capacity – teach them how to do it – rather than do it for them)
  - Provide a coherent system for educating and supporting faculty at all levels, but focus on new faculty, sessionals and teaching assistants, as well as department heads and deans
  - Put particular emphasis on people who want to change
  - Recognize that making change is a long-term undertaking

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<sup>23</sup> Phenomenography – a qualitative research methodology focusing on subjective, personal accounts and in particular, the variety of ways in which an event may be experienced or a subject understood. In-depth interviews are the primary method with a focus on generating rich descriptions and understanding. Phenomenography played a crucial role in our understanding of surface and deep learning approaches.

- Seek to overcome the perception of teaching and learning support as remediation
- Faculty
  - Be deliberate about finding out what other faculty are doing - talk more to colleagues
  - Identify threshold concepts within one's own discipline and be deliberate and creative about teaching such concepts
  - Pay more attention to variation in student learning
  - Read the educational literature in one's discipline
  - Engage in the scholarship of teaching and learning (SoTL);<sup>24</sup> include student voices in research; adopt phenomenological research methods
  - Promote change in one's discipline (support and attend more teaching related sessions at disciplinary conferences)
  - Ensure Teaching Assistants are well-prepared for their teaching roles

### **Institutional Level: What do you need from your own institution?**

- Strong leadership, along with a clear and compelling vision regarding the importance of the broad-based adoption of evidence-based pedagogical practice
- The adoption and promotion of a "signature pedagogy"<sup>25</sup>
- The initiation of broad consultation/communication mechanisms
- The celebration of excellence in teaching and learning including the alignment of promotion and tenure processes
- Hiring systems that require faculty to have demonstrated a strong commitment to effective pedagogical practice and awareness of the pedagogical research
- The adoption of quality assurance and accreditation mechanisms that encourage innovation and measure learning processes and outcomes in authentic ways
- The explicit acknowledgment of the disconnect that exists between what faculty and faculty developers know; what we know and what we do; and what we know and what the system allows/encourages
- The provision of resources for faculty to conduct the SoTL within specific disciplines
- Improved funding of teaching and learning centres
- Balanced emphasis on the importance of research and teaching
- Support for curriculum assessment and development and the articulation of program level learning outcomes

### **Institutional Level: What can be done specifically within Colleges?**

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<sup>24</sup> Scholarship of Teaching and Learning – research into one's own teaching practice with the aim of both improving student learning in one's own course and disseminating the results in support of enhancing the quality of teaching and learning in general.

<sup>25</sup> A signature pedagogy – a pedagogical approach that a department or institution regularly practices and becomes particularly well known for. For example, some institutions are best known for their co-operative education programs, others for their commitment to problem-based learning, inquiry-based learning or community-based learning. A signature pedagogy can serve as an effective mechanism for helping shape student and faculty behaviours and expectations as well as a means of differentiation. In other words, a signature pedagogy can become part of the brand and culture of the program or institution.



- Leverage learning from each other; establish network/infrastructure for sharing SoTL across the College system
- Apply for money to support research on pedagogical practice
- Make changes to faculty induction/orientation programs - incorporate research on student learning
- Look carefully at quality measures and re-examine how teaching is evaluated
- Recognize disciplinary differences re: deep/surface learning
- Implement rewards for departments with good teaching records
- Study how well “best practices” align with student learning experiences
- Provide enhanced support and development opportunities for part-time faculty and TAs
- Protect teaching and learning resources
- Discuss quality in relation to the value added (e.g., profile efforts to support under-represented students)

### **System Level: What do you need from Government?**

- Effective Quality Assurance mechanisms
  - Adopt effective performance indicators (not graduation rates)
  - HEQCO to provide ongoing leadership in support of educational quality and evidence-based pedagogical practice
  - Change funding formula to emphasize teaching and learning; rank universities/colleges on their commitment to teaching and learning, and allocate money accordingly
- Support for the Scholarship of Teaching and Learning (SoTL)
  - Provide enhanced support for the scholarship of teaching and learning
  - Put in place funding mechanisms to help ensure the SoTL becomes more accessible, integrative, engaging and focused on the provision of practical, concrete guidance to practitioners
  - Encourage cross-institutional collaborations (focus on a few key themes each year)
  - Educate funding agencies about the value/impact of SoTL
  - Research what students are actually learning
  - Fund Canada Teaching Chairs (i.e., disciplinary experts who will teach and conduct research on the SoTL within their discipline)
- Faculty Training & Development
  - Require all faculty to demonstrate an understanding of the teaching and learning literature, or take a course/certificate
  - Require that every teacher in the PSE system be trained

The remainder of this report provides a more detailed overview of the research findings as well as the comments, suggestions and questions made during the round-table discussions.

## Opening Plenary

The paper by Dr. Noel Entwistle, “Taking Stock: Teaching and Learning Research in Higher Education” provided a comprehensive overview of the research along with a model illustrating the complexity of the educational system and the various elements that need to be brought into alignment in order to enhance teaching and learning quality. It also included a number of surveys that can be used to help diagnose student learning experiences and approaches.<sup>26</sup> The key arguments contained within Dr. Entwistle’s presentation and paper included:

- Teaching effectiveness is contextually grounded (by its purpose, discipline and myriad other factors).
- Research that has endeavoured to present general theories of teaching and learning, derived from data collected in non-PSE environments or on non-PSE students, through experimental design and surveys, is therefore limited in its application.
- In contrast, phenomenographic research (in-depth interviews of PSE students) has yielded some of the richest insights into student learning in PSE. These insights have been used to develop diagnostic surveys for use in the PSE environment.
- Conceptions of teaching and learning effectiveness are inextricably linked with conceptions of desired learning outcomes. Within PSE, desirable learning outcomes should be broadly defined to include “ways of thinking and practicing in the discipline or professional area” (p. 4) that involve an appreciation of complexity and ambiguity and the transformation of the whole person. Quality assurance processes that focus on a narrow range of outcomes can unwittingly undermine the achievement of such objectives.
- Students have different abilities, interests, goals and backgrounds as well as different conceptions of knowledge and understandings of their own learning processes. As a result, students approach learning in a variety of ways:
  - Intrinsically motivated students (those who have a genuine interest in the subject matter), who employ deep approaches to learning (seek to understand and become expert), and exert organized effort in its pursuit, achieve higher quality learning outcomes than those who are extrinsically motivated (those primarily seeking a credential), who use “surface” approaches to learning (over-relying on reproducing the content provided by faculty) and expend little organized effort.
  - Many students have dualistic (i.e., absolute) perspectives of knowledge. Moving students from absolute to relativistic perspectives (i.e., whereby knowledge is seen as uncertain and socially constructed) is more challenging than most faculty realize. Furthermore, the extent to which “relativism” is emphasized depends on the discipline.
  - Students with dualistic perspectives of knowledge tend to adopt surface approaches to learning focused on reproducing content, while those

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<sup>26</sup> Key works drawn on by Dr. Entwistle included: Biggs (1987a, 2007); Bowden & Marton (1998); Dahllöf (1991); Entwistle (1987, 1998, 2000, 2007); Land, Meyer & Smith (2008); Marton (1976); Marton & Säljö (1997); Marton, Hounsell & Entwistle (1997); Mentkowski & Associates (2000); Meyer & Land (2006); Perry (1970); Perry & Smart (1997); Prosser & Trigwell (1999); Prosser, Martin, Trigwell, Ramsden & Lueckenhausen (2005); Säljö (1979); and Zull (2002).

- with relativistic perspectives tend to seek personal meaning through understanding and are ultimately changed by the learning process (transformational learning), coming to see things in new ways.
- Relativistic learners are more likely to be aware of their own cognitive processes (metacognition) and can self-monitor their approach to academic tasks and adjust their learning strategies accordingly (metalearning).
  - Students who have developed the capacity for deep learning approaches tend to view teaching approaches that are designed to promote conceptual understanding favourably. Students who have not developed such a capacity, tend to view such teaching approaches negatively.
- Students also vary their learning approaches based on their perceptions of the teaching-learning environment (and therefore there is much that can be done to foster deep learning and organized effort).
    - Student perceptions of the learning environment include the learning objectives, pedagogy, learning and assessment activities, and support for student learning.
    - The learning environment is affected by a number of internal institutional influences (such as funding, faculty perceptions, classroom space, leadership and ethos) and external influences (such as discipline-based teaching conventions).
    - When faculty teach in traditional teacher-centred ways, students tend to adopt surface approaches to learning.
    - When faculty teach in alternative, student-centred ways, students tend to adopt deep approaches to learning.
    - Learning is enhanced as attention is held. Coding into memory is facilitated by providing varied delivery and time, and structuring material clearly. General principles that are important to learning therefore include:
      - Repetition – within varied contexts
      - Appropriate quantity and pace of delivery (short term memory typically allows for 7 +/- 2 bits of information to be held simultaneously)
      - The use of mnemonics, illustrations or anecdotes which support long term memory
      - Arousing interest and creating perceptions of importance which activate neurons in support of memory and understanding
      - Experienced success which produces a feeling of well-being and self-confidence that encourages future interest and effort
      - Immediate feedback, as incorrect or ineffective neural networks, once firmly established, are difficult to change
      - Within lectures, clarity, level, pace, structure, explanation, enthusiasm and empathy are particularly important features
  - Faculty in the sciences are more likely to see their disciplines in atomistic ways and teach from teacher-focused perspectives. Faculty in the humanities and

social-sciences are more likely to think holistically and teach in more student-focused ways, although that is partly a function of differences in how knowledge is perceived.

- Effective teachers are knowledgeable about their subjects, teaching practices and how students learn. They are also aware of “threshold concepts” and deal with them explicitly. Threshold concepts are pivotal, integrative concepts that can transform the student’s prior understanding of the subject (as well as the teacher’s approach to student learning).
- Pedagogical innovations that take into account what is known about teaching and learning include a variety of active and collaborative approaches (e.g., peer instruction, the use of concept maps, problem-based learning).
- In order to provide a high quality learning experience in PSE, the purpose of higher education needs first to be clarified in a manner consistent with helping graduates experience “learning that lasts”.
- For this to happen, faculty need to think critically and thoughtfully about their subjects (including threshold concepts) and teaching practice. They also need to be committed to principles of basic organization and effective presentation, and adopt appropriate pedagogies.
- For this to happen, the entire educational system needs to be brought into alignment.

Following Dr. Entwistle’s presentation, questions and comments from the floor were encouraged. Key points, observations and questions included:

- The need to understand the impact of the institution (its systems, practices and culture) on teaching and learning. Systemic and sustainable change in teaching and learning will not occur without systemic and sustainable administrative change.
- The need to better understand influences on student choice and behaviour such as cost/benefit analyses with respect to course choice and effort. Students may be making sophisticated judgments/decisions based on their perceptions of how their time might be best used.
- Less is more. The more faculty attempt to “cover” the less students learn.
- Each discipline has its own language and ways of knowing which can make interdisciplinary learning particularly challenging.
- Faculty need to take the time to think about their subjects more critically, explain the nature of their disciplines and be explicit about why their courses are being taught in specific ways.
- We need to have at least three levels of action – individual, institutional and governmental in order to support the kinds of changes being recommended.

## **Panel 1: What We Know About Student Learning**

The first panelists, Dr. Sari Lindblom-Ylänne, Professor of Higher Education and Director of the Centre for Research and Development in Higher Education at the University of Helsinki, Finland

and Dr. Maryellen Weimer, Professor Emeritus Teaching and Learning Penn State University were asked to focus on what we know about student learning.

Dr. Lindblom-Ylänne's paper "Student Approaches to Learning and Their Perceptions of the Teaching-Learning Environment" and presentation extended some of the key concepts introduced by Entwistle. To begin she reviewed the concepts of surface and deep learning, drawing on the work of Entwistle & Entwistle (1992), Entwistle & Ramsden (1983), Marton, Hounsell & Entwistle (1997), and Marton & Saljo (1976) amongst others. She then suggested that deep learning approaches are reinforced through processes of self-regulation<sup>27</sup> (Vermunt, 1998).

Next, drawing on the work of Meyer (1991), Lindblom-Ylänne highlighted research that has found that students have different "study profiles" or "study orchestrations"<sup>28</sup> which are based upon a combination of factors including their preferred approaches to studying and learning, their conceptions of learning processes and their perceptions of the teaching-learning environment. When student study orchestrations are focused on making meaning, academic success typically follows.

Study orchestrations can be understood with respect to their degree of congruence or dissonance (Vermunt & Verloop, 1999). When students perceive a teaching-learning environment that is in keeping with their natural inclinations towards learning, congruence results. When students perceive a learning environment that is not in keeping with their study orchestrations, dissonance or friction is encountered and adaptations may be made. Constructive friction requires the student to engage in deeper learning strategies and more self-regulation in support of becoming a more expert learner, and when this occurs academic success follows. Destructive friction requires the student to engage in more surface learning strategies or to engage more superficially with the material, either regressing in their skill development or failing to develop potential skills. Some students are somewhat immune to such pressures, continuing to apply deep learning approaches, while others are not. Those that adopt increasingly surface level approaches become somewhat incapacitated with respect to the self-regulation of learning. Those that adopt deep learning approaches or "meaning orchestrations", regardless of the teaching environment, are more likely to experience academic success.

Dr. Weimer's presentation and subsequent paper "Taking Stock of What Faculty Know About Student Learning" began with conceptions faculty commonly hold of students (i.e., students are incredibly passive, don't want to participate in class, want faculty to provide lecture notes, cannot make decisions about their own learning, routinely ask what will be covered on the exam, lack basic study skills, are only motivated by grades). She then went on to cite research (Finkelstein, Seal & Schuster, 1998) that has found that the vast majority of faculty (76%) list the lecture as their primary instructional method. Further, within lecture classes little time (less

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<sup>27</sup> Self-regulation refers to the ability to monitor, adapt and improve the effectiveness of one's own learning processes on the basis of self-reflection and feedback, in the pursuit of academic goals. It requires self-awareness with respect to one's emotions and behaviours and is arguably essential to the success of student-centred learning approaches. Self-regulation is similar to metalearning (Biggs, 1985), which pertains to a student's ability to realistically assess and enhance his or her capabilities with respect to the demands of a particular learning activity.

<sup>28</sup> Study orchestrations are student learning approaches captured at a conceptual and/or philosophical (as opposed to a task) level. As such they capture a "preferred" approach to learning, which may or may not be congruent with what the learning environment encourages.

than 6%) is used for any kind of student interaction (Nunn, 1996). This is due in part to the extent to which faculty define their role as covering an increasingly large volume of content. Faculty typically also make all the most significant decisions – what will be learned, how it will be learned, the pace of the learning, the expectations for classroom behaviour, how learning will be assessed, and the quality of learning that has occurred.

It is this approach – traditional faculty-centred deductive pedagogy – that has led to the felt loss of control (or efficacy) on the part of the student - fueling student passivity, dependency and surface learning approaches (Perry, 1997; Pintrich, 2003). This in turn has been found to result in little retention of material following the completion of a test or course.

Citing a number of meta-analyses and research studies (see for example Prince 2004; Prince & Felder, 2006; and Springer, Stanne & Donovan, 1999), Weimer concluded that in contrast to what is being practiced, there is general support for “a whole range of inductive teaching methods such as discovery learning, inquiry-based learning, problem-based learning, case-based teaching, and just-in-time teaching” (p. 3). Such approaches have generally been found to have a positive effect on academic achievement and persistence.

In addressing the disconnect between what is practiced and what is known, Weimer advocated the adoption of evidence-based pedagogical practice. Further, she suggested that such would be enhanced through more effective teaching and learning scholarship; scholarship that is accessible, integrative and engaging, and provides practical, concrete guidance to practitioners. For this to happen, she suggests that there needs to be a shift in faculty incentives, such as greater rewards for scholarship that focuses on integration, application and teaching and learning. She also advocated changes to institutional norms, suggesting that there are no norms or expectations that faculty demonstrate instructional growth or participate in professional development activity related to their teaching practice. As a result, teaching is seen as a devalued activity and the evidence concerning good practice continues to be ignored.

Following Panel 1, participants were asked to reflect on and discuss three questions at their tables. Responses were collected and are presented in brief below.

**Question 1 - *What are the key themes or concepts that we have heard so far today about student learning in PSE?***

General

- Teaching and learning are not independent concepts
- How messy and complicated this all is
- Many forms of teaching can be effective

The Scholarship of Teaching and Learning (SoTL)

- The SoTL needs to be more accessible and findings need to be translated for all disciplines in order to be generally applicable
- Many faculty are not aware of or engaged in the SoTL and therefore cannot use the research to inform their own practice
- Faculty and students can have different perceptions of what learning is

- “Controlled experiments” or similar research designs are likely not conducive to generalization, given the variation in teaching environments
- There are untested assumptions about teaching/learning
- Longitudinal studies, while beneficial, are time consuming
- Faculty learning translates into student learning
- Do faculty evaluate students based on knowledge/learning?
- How do we better mobilize what we do know?
- How can we better demonstrate that what we do in PSE results in a basic good to society through the development of life-skills?

#### Administration

- Systemic issues demand systemic answers
- Institutional/administrative conditions can either foster or hinder learning
- The need for a system/structure of rewards/consequences to motivate SoTL
- Workload issue impacts faculty

#### Faculty

- Faculty can (inadvertently) reinforce negative student behaviours and create the environments that encourage passivity
- We need to achieve congruence between the aims of our teaching and our teaching approaches – constructive alignment
- There are disconnects between what faculty and faculty developers know; what we know and what we do; what we know and what the broader educational system allows/encourages
- Enhancing faculty understanding of student learning is integral to changing teaching practice

#### Students and Learning

- Students vary in their learning motivation and approaches
- Student voices are essential in understanding teaching and learning issues; data from students can be collected in a variety of ways including focus groups, in-depth interviews, etc.
- When students experience dissonance, friction results
- There are a variety of approaches to learning (deep, surface). Students engage in a cost/benefit analysis in choosing their approach
- The student culture is changing; faculty are grappling to understand today’s reality (e.g., “Facebook”/“YouTube” influences)
- Students are not all alike (learning styles and backgrounds such as first generation, socio-economic status or new immigrant)
- Students used to prepare for a discipline or profession - now many prepare for careers that do not yet exist
- Importance of relationships/community to student learning

#### The Disciplines/Content/Objectives/Pedagogy

- Content is a barrier - let go of content and focus on the bigger picture, developing an integrated understanding, and learning processes (within every fat book there is a thin book trying to get out)

- Need to distinguish between need to know (walk around knowledge) and nice to know; how much content is enough?
- Each discipline has an internal logic that needs to be made explicit
- Discipline-based pedagogy – faculty need to translate their “disciplinary maps” for themselves, before they can communicate it to their students
- What are the Implications of university/undergrad degree level expectations?
- Access to information is easy; students need to develop the skills in order to know how to deconstruct/reconstruct such information.

**Question 2 - *What other themes or concepts are we aware of, or have we studied ourselves, that are essential to understanding student learning in PSE?***

General

- The importance of “getting them when they’re young” (students – 1<sup>st</sup> year; faculty – 1<sup>st</sup> year)
- Everyone needs to see the value of what they are doing – students, faculty and administration (are we using the right rewards?)
- Importance of well designed learning spaces (that support active learning approaches)

Faculty

- Faculty conceptions of knowledge (discipline specific)
- Building a model for faculty understanding of variables involved in teaching/learning
- How to engage faculty members in understanding/sharing what they have learned about their teaching practice with others
- How to reach the 95% of faculty who are not aware of the research?

Students and Learning

- The implications of student specialization (career/outcome focused) versus common introductory years
- The impact of student extracurricular activities
- Student learning is also about shift in ontological positions – maturation
- Social networking – changes in how students learn/communicate

The Disciplines/Content/Objectives/Pedagogy

- Identification of common teaching/learning characteristics between disciplines
- Development of student skills with respect to self (e.g., team work, conflict resolution, values, cross-cultural learning)
- Generic educational skills versus workplace specific skills
- Meta-cognitive strategies
- Autonomous learning
- Impact of feedback on student learning
- Motivation for lifelong learning – how to encourage it
- Transformative learning



- Communities of practice
- Visual thinking, concept maps, idea maps, mapping misconceptions

**Question 3 - *What are the most important research questions that we still need to answer about student learning in PSE?***

In general, there was a call for more research on all the topics discussed; in particular, from a disciplinary perspective. This is consistent with the appreciation that teaching and learning practices should be contextually grounded. There was also a call for more “generic” research. Suggested questions pertained to the following areas:

**On Students**

- What impacts have the recent curricular and policy changes in K-12 in Ontario had on entering PSE students’ ability to think critically and adopt study orchestrations that are consistent with deep learning strategies?
- How do we best encourage students to engage in deep learning processes?
- What are the key characteristics of students today that may be serving as barriers or catalysts to deep learning processes and what if anything can we do about them? (background, culture, career goals, motivation, information processing and conceptualization abilities)
- How do students’ study orchestrations affect their evaluation of faculty?

**On Administrators**

- How can we best improve teaching while dealing with shrinking budgets?
- What are the primary policies and practices administrators can implement in support of evidence-based teaching practice?

**On Faculty**

- What are the implications of teaching “less” content?
- What is the relationship between what is written on course outlines and the reality of the classroom experience?
- How can we help students develop “soft” or generic skills? How well are we doing?

**On the Evidence/Practice Gap**

- What is the size of the gap? In which direction is it moving?
- What is the relative role of each of the following in contributing to the evidence/practice gap?
  - Expectations for what should be learned
  - Expectations for how it should be learned
  - Conceptualizations of learning
  - Conceptualizations of knowledge
  - The availability of effective learning spaces
  - Workloads – students and faculty

**On Facilitating Change**

- How do we best bring change about?
- What is the best way to motivate people to care?
- How do we foster cultural change?
- What strategies (e.g., from the UK, Australia, Finland) have proven successful in bridging the gap between research and practice?

## **Panel 2: What We Know About How Teaching & Learning Impact One Another**

The second set of panelists, Dr. Michael Prosser, Professor and Director of the Centre for the Advancement of University Teaching, University of Hong Kong, and Dr. Jillian Kinzie, Associate Director of the National Survey of Student Engagement (NSSE) Institute for Effective Educational Practice and the Indiana University Center for Postsecondary Research, focused on how teaching and learning impact one another.

Dr. Prosser's paper and presentation "Academic Staff Experiences of Teaching, Understanding Subject Matter and Research: A Student Learning Perspective" began with a compelling summary of 30 years of teaching and learning research in higher education. Based on this research, Prosser concluded that student learning approaches are not stable characteristics of the learner. Rather, students adopt either surface or deep learning approaches depending upon their prior learning experiences and their perceptions of the current teaching and learning environment. As a result, an individual student's learning approach may vary between tasks within subjects or courses as well as between subjects or courses. Furthermore, student learning approaches are associated with the quality of learning outcomes.

In his work with Keith Trigwell (see Prosser & Trigwell, 1999), Prosser found that teachers who report having adopted information transmission and teacher-centred approaches have more students who report adopting surface approaches to learning. Teachers who report adopting more conceptual change and student-centred approaches have more students who report adopting deeper approaches to learning.

Based on his most recent research (see Prosser, Martin, Trigwell, Ramsden & Middleton, 2008), Prosser reported finding that researchers who approach their research from a holistic or conceptual perspective are more likely to use student focused teaching approaches. In contrast, faculty whose research is focused more on isolated problems, are more likely to use teacher-focused pedagogies. Prosser concluded that the research norms of a discipline may be particularly important to understanding the pedagogical inclinations of faculty. Further, workshops on teaching that fail to address disciplinary norms and the research interests of the faculty are not likely to be successful.

Dr. Kinzie's presentation "Student Engagement and Learning: Focusing on Experiences that Matter" focused on the National Survey of Student Engagement (NSSE), a survey that all Ontario universities now participate in, as well as other educational institutions across Canada and the US. The NSSE is based on the concept of student engagement, which she suggested builds on research from as far back as the 1930s. Kinzie defined student engagement as being comprised

of what students do; “the time and energy they devote to educationally purposeful activities.” Consistent with the research on deep learning, Kinzie suggested that institutions and faculty create the context which influences what students direct their energy towards. This influence consists of five key elements – a supportive campus environment, student faculty interaction, level of academic challenge, enriching educational experiences, and active and collaborative learning. The NSSE research has found that students who take part in one or more “high-impact” learning experiences (first year seminars, a learning community, writing intensive courses, research with a faculty member, a culminating senior experience) report greater levels of deep learning approaches and greater gains in learning and personal development. Kinzie recommends making it possible for every student to participate in at least two high impact activities – one in first year, and one later in their major. She also advocates creating seamless learning environments that more effectively integrate academic and non-academic departments, such as student affairs.

Following these two presentations there were questions and comments from the audience. Challenges were made to the research methods of both speakers. One participant suggested that Dr. Prosser extend his research to include participant observation, and to study to what extent there are differences in how faculty articulate their teaching and how they actually teach. Dr. Kinzie was asked about questions on the NSSE survey that deal with student diversity. Participants suggested that questions of ethnicity will likely be interpreted differently in Canada versus the US. She was also encouraged to focus more on the open-ended answers students provide. Dr. Kinzie encouraged the participating institutions to use their results to identify and make changes and to then further study the results of those changes.

The question and answer period was once again followed by a series of roundtable discussions guided by three primary questions.

**Question 1 - *What are the key themes or concepts that we have heard so far today about the link between teaching and student learning in PSE?***

Faculty

- There is a direct link between what faculty do and what students do (surface teaching yields surface learning approaches, deep teaching yields deep learning approaches)
- Faculty beliefs about their disciplines impact the structure of learning; the ability to understand and articulate one’s own knowledge and discipline may be linked to the ability to teach (and learn)
- We perceive our teaching through discipline-specific lenses, but with these lenses in place, can we really understand and articulate our teaching?
- The professor who is asked to learn/change is in a vulnerable position
- Modeling (our discipline and thought patterns) for our students is important
- Research and teaching are not incompatible
- Institutional barriers to effective teaching practice include class size, competing demands on (new) faculty, and reward structures

Students

- Students need to be exposed to the habits of mind (or the processes of inquiry) and the gripping questions of the discipline
- Student engagement appears to have an impact on student achievement, but the relationship is complex and not yet fully understood
- All students should be provided with high-impact activities
- Assessment is a key driver of student behaviour and needs to be understood on multiple levels (student perceptions, achievement of learning objectives, transferability of knowledge to other problems and contexts)

**Question 2 - *What other themes or concepts are we aware of, or have studied ourselves, that are essential to understanding the link between teaching and student learning in PSE?***

Students/Learning

- Student motivation
- The importance of prior knowledge and prior experience to student learning
- Increasing student diversity
- Student misconceptions – and how hard they are to change

Faculty/Pedagogy

- Engagement is supported by giving students increasing autonomy in choices that customize their learning activities
- There are multiple perspectives of teaching (transmission, development, apprenticeship, nurturing, social reform)
- The teacher's responsibility is not to "cover" the material, but to help students "uncover" it
- Faculty fear impedes change – BUT how can we not change when we ask our students to take risks and face their own fears? (Palmer's work – Courage to Teach)
- Faculty understanding of their own disciplines changes over time
- Faculty tend to focus on teaching (and not so much on student learning)

Institutional

- We need to mine the NSSE data in order to get full value
- We need to create institutional environments (including a socio-cultural system) that supports teaching and learning

**Question 3 - *What are the most important research questions that we still need to answer about the link between teaching and student learning in PSE?***

Note: While many suggestions related specifically to the link between teaching and learning as requested, others reached into a variety of other domains, but have been noted here nonetheless.

**The Link Between Teaching and Learning**

- More research on the relationship between teaching and learning within specific disciplinary contexts (include more granulation of actual practices)
- The impact of course design on student expectations and experiences
- What impact does assigning the “best” teachers to first year classes have on student perceptions/attitudes/achievements?
- What are the differences between the intent of professors’ actions and students’ perceptions of those actions, and the role of explicit explanations as to WHY we teach in specific ways?
- Research into the impact of professor mobility and the increasing numbers of part-time professors on teaching practice and student learning

### **Faculty/Teaching**

- How do we get faculty to free themselves from the “tyranny of content” in order that they might better concentrate on appropriate pedagogical approaches?
- In what ways do faculty evolve?
- How aware are most faculty of the pedagogical research (and its findings)?
- Research into the first-year experience of immigrant professors
- Who makes the best teachers?
- In what ways do faculty adjust their teaching when there is evidence that something is not working?

### **Administrators/Institutions**

- How aware are most administrators of pedagogical research (and its findings)?
- What are the most effective models for the development of pedagogical expertise?
- How do/should we measure the impact of educational development on faculty work?
- More work on validating NSSE concepts is needed, especially over time
- How do we best facilitate communication of these ideas?
- How do we support the effective teaching practice of part-time/sessional professors and TAs?
- How do institutions encourage/prioritize learning within institutional culture?
- What key administrative factors have the most influence/leverage on faculty teaching and student learning?
- What are the points of intersection between curricular and co-curricular learning? How do organizational structures/systems impede or enhance these intersections? How do we more effectively bring together academics with student affairs in support of student learning?
- What kinds of factors drive decisions and values in institutions, and what linkages and dynamics exist with respect to the changes we are trying to bring about?

## **Panel 3: What We Know About “Best” Practices in Teaching**

The third set of panelists were Dr. Carl Wieman, Nobel Laureate, Distinguished Professor of Physics and Director of the Carl Wieman Science Education Initiative and Dr. Jan (Eric) Meyer, Professor of Education and Director of the Centre for Learning, Teaching and Research in Higher Education at the University of Durham. Drs. Wieman and Meyer were asked to present on “best” practices in teaching. This was somewhat problematic as in his opening remarks Dr. Entwistle effectively challenged the supposition of this session by citing the work of Dahllöf (1991) who argued that too much attention has been focused on identifying best practices when “fifty years of education research has not been able to support such generalizations” (p. 148). Instead, Dahllöf suggested that we should ask “which method - or which combination of methods – is best...for which goals, for which students, and under which conditions” (p. 148). In keeping with this view, Entwistle suggested that we should be seeking “general principles...to guide thinking about effective practice” and that “research can offer a conceptual framework and detailed findings” to guide such thinking (p. 2). Wieman and Meyer contributed to such a framework by drawing on their own research in this area.

Dr. Wieman’s presentation drew largely from his article “Why Not Try: A Scientific Approach to Science Education” that was published in *Change* (September/October 2007). In the article Wieman reviewed research which suggests that teacher-focused pedagogy is problematic for at least three reasons: it leads to poor short-term retention of information, poor understanding of basic concepts, and more novice beliefs about science. In addressing these findings Wieman suggested that faculty need to focus on helping students create their own understanding of the material, guide them to be more expert-like and, through such an approach, better engage the learner. This, in turn, he suggested can be achieved by reducing cognitive load, explicitly testing for and addressing student misconceptions, stressing the relevance and importance of all topics taught, carefully designing collaborative learning activities, and making effective use of technology. Wieman also emphasized the importance of developing a common understanding of desired learning outcomes and authentic assessments for effectively testing what students actually learn.

Dr. Meyer’s paper and presentation “Helping Our Students: Learning, Metalearning, and Threshold Concepts” was framed by his review of four decades of research. In it he emphasized the seminal contribution of Marton and Säljö (1976) in helping us understand variation in student learning (deep/surface) with respect to differences in learning intention, processes and outcomes. Most significantly, he cited research that clearly demonstrates the “causal efficacy” between various learning processes and outcomes (Richardson, 2006).

Another key point made by Meyer is that although in some countries, such as the UK, it is expected that new faculty engage in pedagogical training and development activities, the effect of this training is limited to the extent that it is taught in a generalized as opposed to discipline-specific manner. Meyer advocated providing discipline specific findings and examples of exemplary practice, and in particular suggested involving teachers in gathering evidence concerning the ways in which their own students learn. Such an approach he suggested could be energizing. He also advocated helping students develop their capacity for, and engagement in, metalearning (reflections on their own learning processes); and referenced work that discusses how to support such an approach (Meyer & Shanahan, 2004; Meyer, Shanahan, Norton & Walters, 2006). Finally, Meyer introduced the idea of threshold concepts as “transformative waypoints” in students learning journeys (Land, Meyer & Smith, 2008; Meyer &

Land, 2006). Meyer described threshold concepts as “portals” or “objects of learning that really matter.” Specifically, he advocated keeping threshold concepts at the centre of research on teaching and learning on the basis that once threshold concepts are learned, student learning journeys can be significantly accelerated.

Following these two presentations there were questions and comments from the audience. One key suggestion concerned the development of learning objects that have proven effective at helping students learn threshold concepts, and the need to find better ways to share them. Others discussed the importance of having departments and disciplines translate generic research into appropriate and accessible forms and to develop local learning cultures in which such research is explored.

This brief discussion was followed by a final roundtable discussion, in which participants were asked to generate concrete suggestions with respect to what needs to change in order to better support evidence-based pedagogical practice in PSE at the level of the individual, institution and broader system. One table volunteered to focus on changes needed within colleges. Participant suggestions are captured below.

**Individual Level: What can you do differently? (Answered from the perspective of both faculty and educational developers)**

- Change faculty orientation programs to include teaching faculty how students learn
- Be deliberate about finding out what other faculty are doing - talk more to colleagues
- Identify threshold concepts within one’s own discipline and be deliberate and creative about teaching such concepts
- Pay more attention to variation in student learning
- Do research on one’s own teaching practice, don’t just apply others’ research findings
- Pay more attention to supporting faculty; help them conduct research on their own teaching practice (build capacity rather than doing it for them)
- Include student voices in research

**Institutional Level: What do you need from your own institution?**

- Someone to support pedagogical research in the disciplines/departments
- Redeploy existing resources; find a better focus for our centre’s efforts
- Strategic planning – focusing on ways to assist faculty must be part of the strategic plan
- Recognize that making change is a long-term undertaking
- Recognize the critical role of Department Heads and support their development
- Focus on new faculty – require participation – programs work better if many faculty participate (starts to change culture and builds expectations)
- Focus on those who want to change but don’t write off any group
- Overcome perceptions of teaching and learning support as remediation
- Provide a coherent system for training faculty (look at status of faculty development offices on campus)
- Change the reward system - align with effective teaching practice

### **Institutional Level: What can be done within colleges?**

- Leverage learning from each other; establish network/infrastructure for sharing SoTL across the College system
- Apply for money to support research on pedagogical practice
- Make changes to faculty induction/orientation programs - incorporate research on student learning
- Look carefully at quality measures and re-examine how teaching is evaluated
- Recognize disciplinary differences re: deep/surface learning
- Implement rewards for departments with good teaching records
- Study how well “best practices” align with student learning experiences
- Provide enhanced support and development opportunities for part-time faculty and TAs
- Protect teaching and learning resources
- Discuss quality in relation to the value added (e.g., profile efforts to support under-represented students)

### **System Level: What do you need from Government?**

- Effective Quality Assurance mechanisms
  - Adopt effective performance indicators (not graduation rates)
  - HEQCO to provide ongoing leadership in support of educational quality and evidence-based pedagogical practice
  - Change funding formula to emphasize teaching and learning; rank universities/colleges on their commitment to teaching and learning, and allocate money accordingly
- Support for the Scholarship of Teaching and Learning (SoTL)
  - Provide enhanced support for the scholarship of teaching and learning
  - Put in place funding mechanisms to help ensure the SoTL becomes more accessible, integrative, engaging and focused on the provision of practical, concrete guidance to practitioners
  - Encourage cross-institutional collaborations (focus on a few key themes each year)
  - Educate funding agencies about the value/impact of SoTL
  - Research what students are actually learning
  - Fund Canada Teaching Chairs (i.e., disciplinary experts who will teach and conduct research on the SoTL within their discipline)
- Support for Faculty Training & Development
  - Require all faculty to demonstrate an understanding of the teaching and learning literature, or take a course/certificate
  - Require that every teacher in the PSE system be trained
  - Fund teaching and learning centres



## Second Plenary

The second plenary by Dr. Keith Trigwell and his accompanying paper “The Relational View of Teaching-Learning Relations” emphasized the impact of the learning environment on variation in student learning, and further argued that such variation is directly associated with variation in the quality of the learning outcomes achieved. More specifically, Trigwell cited earlier work (Trigwell, Prosser & Taylor, 1994) in which he identified five qualitatively different approaches to teaching: teacher-focused information transmission; teacher-focused concept acquisition; teacher/student interaction concept acquisition; student focused concept development; and student focused concept transformation. He also reported that in subsequent research he investigated the association between variations in teaching and variations in student learning. He also made reference to the development of an “Approaches to Teaching Inventory” (ATI), which has now been used in a number of studies (Biggs, 1987a,b; Biggs, Kember & Leung, 2001; Trigwell, Prosser & Waterhouse, 1999; and Trigwell, Prosser, Ramsden & Martin, 1999).

Dr. Trigwell reported that his research on variation has found a strong and positive association between transmission/teacher-focused pedagogies and surface approaches to learning. He also found that when faculty used student-focused pedagogies, students were more likely to use deep approaches. Trigwell also reported on other studies showing that students who use surface approaches are more likely to receive lower achievement scores and that there is a positive association between teachers who engage in pedagogical practices that are most conducive to deep learning and the number of teaching methods of which the teacher is aware.

Trigwell then addressed the question, given these relationships, what can be done to improve the quality of student learning? His suggestions included addressing faculty conceptions of teaching and learning and encouraging a number of specific behaviours. Drawing on the work of Ramsden, Margetson, Martin and Clarke (1995), Trigwell suggested that effective teachers are also good learners; display enthusiasm for their subject; recognize the importance of context and adapt their teaching accordingly; encourage learning for understanding and are concerned with developing their students’ problem-solving and critical thinking skills; demonstrate the ability to transform and extend knowledge, set clear goals, use valid and appropriate assessment methods and provide high quality feedback; and show respect for their students professionally and personally (2008, p. 8). Trigwell also called for further research focusing on the relationship between teaching and learning including work that clarifies the direction of the relationship (could it be that faculty teach in a certain way as a consequence of their students’ learning preferences?) and movement beyond self-reports (to include observation).

Finally, Trigwell summarized key messages from the Symposium. These messages included:

- The complexity of the situation
- The importance of communicating our intentions to students
- The need to understand teaching from the student perspective
- Having an awareness of student study orchestrations
- The need for systemic and systematic change
- Awareness of barriers to learning, including disciplinary ones
- The need to support the Scholarship of Teaching and Learning, particularly in the disciplines

- The need to authentically measure learning outcomes

Following the plenary, participants had the opportunity to comment and ask questions. Discussion began with a focus on learning indicators. One suggestion was to look at the impact of various learning approaches on the quality of student conversations. Another suggestion was to track student success in the labour market.

Participants also discussed strategies for helping faculty adopt more effective pedagogies. Requiring faculty to take a year-long course during which time they would engage in the SoTL was suggested, as was the opportunity to take a teaching sabbatical.

## **Panel 4: Towards Evidence-Based Practice**

The fourth and final set of panelists included Dr. Christopher Knapper, Professor Emeritus of Psychology at Queen's University; Dr. Julia Christensen Hughes, Chair of the Department of Business, University of Guelph; and Dr. Alastair Summerlee, President, University of Guelph. This panel was asked to focus specifically on what needs to happen in support of evidence-based practice.

Dr. Knapper's paper "Changing Teaching Practice: Strategies and Barriers" suggested that overwhelmingly faculty continue to adopt didactic, teacher-focused pedagogies and trivial and inauthentic assessment practices, without giving any critical consideration to how they or their students learn. In addition, curriculum development continues to rely more on disciplinary tradition and faculty preference than student and societal needs. Furthermore, the evaluation of teaching effectiveness and learning outcomes is largely superficial. This amateur practice is perpetuated by the absence of any expectation that faculty be prepared for (or expert) in their teaching, curriculum development, or assessment roles. It is also at odds with over 30 years of research that demonstrates convincingly that there is much faculty can do to promote deep and lasting student learning and effective curricula and assessment. Amongst many other works previously cited, Knapper cited the work of Astin (1993) who conducted a study involving 20,000 students across 200 institutions, and found that the characteristics and behavior of teaching staff had major implications for student development. In particular, opportunities for student-faculty interaction had "positive correlations with every self-reported area of intellectual and personal growth (p. 383)" (Knapper, 2008, 4). He also cited the work of Pascarella and Terenzini (1991) who analyzed the results of over 2,600 empirical studies and concluded that student learning "is unambiguously linked to effective teaching" (p. 619).

Knapper then went on to discuss the preliminary results of his recent study with Gibbs and Piccinin that is looking, in part, at the "drivers" of effective teaching. Preliminary conclusions consist of:

- Barriers to effective teaching include time constraints caused by a predominant research focus
- Good teaching involves changes to methods, curriculum and learning outcomes
- Change is often crisis driven
- Innovation is most often found in professional programs

- Good teaching requires leadership, a clear and compelling vision, shared goals and broad consultation/communication
- Good teaching requires celebration and reward
- Sustained change requires adequate resources (time and money)
- Good teaching is evidence/research-driven
- Sustaining good teaching requires vigilance

In order to effectively address these conclusions, Knapper advocated structural change by academic leaders which include changes in hiring practices, reward structures, quality assurance and accreditation mechanisms (that measure learning processes and outcomes in authentic ways), support of teaching and learning scholarship, and changes to how we prepare new faculty.

Dr. Christensen Hughes' presentation, "A Conceptual Overview of the Barriers to Evidence Based Practice" also focused on barriers and recommendations for enhancing evidence-based practice. At the institutional level, she cited the need for rethinking traditional accounting systems and administrative attitudes that position teaching and learning activities as costs to be minimized (despite the tuition revenue that teaching generates) and research as revenue to be maximized (despite the "matching" institutional dollars and faculty time that such research often requires). In addition, she identified the need to rethink and strengthen institutional resources such as learning spaces, learning supports, and the role of teaching assistants (graduate students who are often poorly prepared for their teaching tasks). She also suggested that much more can be done at the departmental level, where department chairs play a pivotal role in establishing the values, reward structure and culture of the department. Finally, she suggested that institutions and/or programs and departments consider adopting signature pedagogies as a means of specialization and differentiation. At the level of government, Christensen Hughes argued that much more needs to be done to reassert the critical role higher education plays in contributing to a learning-focused democratic society and knowledge economy. In keeping with this position, she called for revisiting the vision for post secondary education in Canada.

Finally, Dr. Summerlee concluded the symposium with his paper "Can Universities Survive the 21<sup>st</sup> Century?" In it, Summerlee argued that as a result of a number of pressures, universities *must* change. Information through the internet is now ubiquitous, yet most people do not know how to critically assess such information. Employers have for some time been expressing dissatisfaction with higher education's outputs. Employers want graduates with well developed process skills – while universities continue to focus on the transfer of knowledge. In addition, social debate – once the purview of universities – is now much more likely to occur in the media (where it often occurs in sensationalized ways). Finally, as a result of accessibility pressures, most universities are having to do more with less, a pressure they have responded to by increasing class sizes. At the same time students are changing. Students are increasingly female, have competing interests (such as part-time jobs, families or volunteer commitments), are technologically savvy, and are interested in participating in co-curricular activities.

In response to these pressures Summerlee advocated recommitting to education and learning, to debate and discussion, and to radically transforming our institutions to deliver on this promise. In particular, he suggested motivating students through the provision of relevant, intriguing, complex, and integrated problems. In solving such problems, students are provided with the opportunity to develop critical skills and knowledge. Finally, Summerlee suggested

adopting quality assurance measures that focus on the willingness of institutions to “experiment, change and respond to societal pressures.”

Comments emerging from the final question and answer session included the benefit of having students teach one another and involving students in the research process; the fact that many students do not appear to come to PSE to learn (but to get a credential); how important grades are to the system (and how this needs to be challenged); and how change needs to start in the first year.

The symposium ended with Ken Norrie thanking the participants on behalf of HEQCO and encouraging them to think further about what can be done to encourage evidence-based practice in PSE.

In conclusion, this report has attempted to capture the evidence, questions, comments and suggestions generated during **“Taking Stock: Symposium on Teaching and Learning Research in Higher Education.”** The evidence presented strongly suggests that there is an association between how faculty approach their research and how they teach, how faculty teach and how students learn, and how students learn and the learning outcomes achieved. And further, that the majority of faculty teach in ways that are not particularly helpful to student learning.

Much needs to be done to address this situation. An important first step has been “taking stock” of the evidence. We now need to disseminate this information and encourage its uptake. As part of this process it will be important to take into consideration the considerable barriers that have been identified and conduct further research on the changes that are needed at the individual, institutional and governmental levels in support of evidence-based practice and student learning.

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