



Reflections

Technology-Enabled Learning: Opportunities and Future Trends

An interview with John Doerksen,
Vice-Provost (Academic Programs and Students) & Registrar

BY KIM HOLLAND, INSTRUCTIONAL DESIGNER, TEACHING SUPPORT CENTRE

The Ontario Government has stated in their most recent annual report, achieving the goal of 70% of those in the workforce in Ontario holding a post-secondary credential is a critical strategic objective supporting social and economic development (Ministry of Training, Colleges and Universities, 2012). The provincial government has suggested that technology-enabled learning will play an ever increasing and central role in meeting this goal. To discuss what is currently developing on campus, I interviewed John Doerksen, Vice-Provost (Academic Programs and Students) & Registrar.

What is the role that technology plays in enhancing learning at Western?

I think this is a crucial time to have this discussion. The COU (Council of Ontario Universities) has recently pulled together people from all of the universities to discuss what we should be doing collaboratively in the university sector in Ontario to support technology-enabled learning. The COU has a particular focus on online learning with an interest in a collaborative entity (still in the early stages of development) that universities could use to help each other move forward in the area of E-learning.



John Doerksen

Online, blended, and web enhanced are all part of what may be described as E-learning. There is a very important context within the province for E-learning development. Here at

Western, I'm surprised at how much we are already doing it. For example, we have about 10,000 online course registrants from the 260 online courses offered last year. This is not to mention that many of our colleagues provide web enhanced learning opportunities for students in their face-to-face teaching.

There is a great deal of student interest in online courses with more student demand than space available in many online courses. This is just an indication of the opportunity to serve our students more effectively here at Western. I think students will increasingly come to expect greater use of technology enhancements to improve their learning. Our students come to us having experienced technology-enabled learning from high school. We must remain focused on students' learning—not what technology is used. But thinking about E-learning allows us to reflect on the learning process. Driving the E-learning process allows us to think about pedagogy.

...continued on page 2

Technology-Enabled Learning: Opportunities and Future Trends	1
News from Western Libraries	3
Getting Your Graduate Students off to a Good Start	4
Group Work on a Grand Scale	6
Migrating to OWL (Powered by Sakai).....	9
Academic Integrity in Canadian Higher Education: Part 2	11
Advancing Research on Teaching at Western.....	13
TSC Announcements	14
Awards and Grants	15

Contact us:

Teaching Support Centre

Room 122, The D.B. Weldon Library
Western University
London, Ontario N6A 3K7
Phone: (519) 661-2111, ext. 80346
E-mail: tsc@uwo.ca

Reflections is the newsletter of the Teaching Support Centre at Western University
Available online at www.uwo.ca/tsc

Technology-Enabled Learning: Opportunities and Future Trends...

Continued from page 1

What do you think are some of the most important teaching technologies at Western?

The learning management system (OWL) is core for us and currently we are moving from WebCT to the new OWL (powered by Sakai). Online courses, and many web enhanced face-to-face courses are offered in OWL, so this means our faculty colleagues will need support to incorporate this technology into their teaching.

What are the realities of technology-enabled learning today at Western?

Western has not fully sorted out institutionally what our strategic direction should be in the online area. Of the many online courses we currently offer, we haven't necessarily collected them together into a cluster of courses for students to be able to complete a degree. Part of our continuing challenge will be to make it possible for students to do just that—complete a degree online.

We obviously want to have our faculty colleagues interested in technology-enabled teaching and will continue to support programs and training for them to be successful. So there are issues around course development and delivery that still need to be sorted out. I think we need to sort out some policy issues surrounding online distance studies courses. There are some policies, written before the 1980's, which are quite restrictive in today's environment—so they need to be revisited. I'm hopeful we can begin a review of these policies this year, to see what make sense for us in the 21st century.

These are some of the main things that I see—but notice that these challenges do not involve technology in and of itself. We will need to continue to work to provide the appropriate kinds of support to all of our colleagues who teach online. We need to think a bit more strategically about how we want to move E-learning forward.

Where do you think the responsibility for online course development should lie—centrally or with the faculties and departments?

I think there is a role for both, and other universities have adopted various models.

I really prefer the hub and spoke model.

Are there new technologies that could have an impact here at Western?

There certainly are. One recent development is MOOC (massive open online courses), which are likely to have some impact in higher education generally. It is hard to say what this impact will be, as we are at such an early stage. The idea of having a fully automatic delivery of content is interesting. I think on the assessment side there is more work to be done, because tied into that are credentialing issues. In MOOC, the emphasis seems to be teacher focused rather than learner focused. The focus is on content—content acquisition from those who know, and content transfer to those who don't. It seems to me the best pedagogical practice is one that emphasizes student engagement. We have this in smaller online classes and in the face-to-face context. This practice, which makes students a part of a community of scholars, is where the teaching and learning nexus resides. As an aside, some people are worried MOOC could spell the end of university as we know it, but I'm not so sure that the risk is as great to the brick and mortar university as it might seem at first glance.

If MOOC are just providing content, this is not a university experience. A university education is more than just content acquisition. You can google content. In the face of MOOC, I have to ask you what it means to be an educated person. What is the experience of a university education all about?

You are right Kim, there is a richness that happens with being part of the university community with its purposeful programming and curricular activities.

How can Distance Studies contribute to meeting the demand for post secondary education in Ontario—and in the World?

It has been noted that 40,000 students from Ontario are taking courses at Athabasca University. This represents an opportunity for Ontario universities if we are clearer about the post secondary online opportunities that exist in Ontario.

In terms of international students, it will be interesting to see what online

opportunities develop. I'm reminded that support will be needed to ensure the success of international learners. At the Open Universities Australia, they had to provide additional student supports for their online international students. Without that support, the attrition rate rises dramatically.

It seems to me that creating a quality online course has multiple factors: the students must be satisfied, the faculty must be satisfied, there has to be learning effectiveness, access must be expanded, and the process must be scalable.

I like what you just said—yes, the online experience does have to be a good experience for faculty. I think a fallacy exists about the teaching and learning experience for the student in an online course: some think it is a second rate experience, which it is not. It doesn't have to be that way. With careful instructional design and clarity around best instructional practices, online instruction can be every bit as effective as face-to-face instruction. The crucial thing is to have the right kind of support for our faculty so we can have quality online programs at Western.

What are some of the other myths surrounding online teaching?

In addition to the myth about the online experience being second-rate, another myth is that it is more cost effective to do online learning. I'm not so sure that it is the case. I think it takes a great deal of effort and energy to develop and deliver online courses. I think there is a level of student engagement that can be quite intensive with online teaching. I don't think that cost containment should be a big driver for expanding online programs. Another myth pertains to the level of students' online interest. Some think that increased flexibility and access will do away with demand for face-to-face instruction. I don't believe that's the case—I think the reports of the impending death of face-to-face instruction are a little exaggerated.

What are some of the challenges we face when implementing change in

...continued on page 3

Technology-Enabled Learning: Opportunities and Future Trends...

Continued from page 2

instructional form, be it online or blended instruction?

I think this comes back to the need to create a strategic direction for us at Western—to define our way forward. We need to find our way around effective course development and delivery while thinking a lot about pedagogy—although this is not a new challenge ... it's an ongoing one. A lot of great support is provided through the Teaching Support Centre with its wide range of programs for graduate students and faculty members. For example, I know that you have developed the online Instructional Skills Workshop to give instructors the chance to learn about online teaching. In the end, the core mission of teaching and learning hasn't changed that much—we

want to be able to cultivate the strengths and opportunities in teaching with technologies, and to do this, we have to discuss those core questions in new ways. This is an opportunity for reflecting upon our teaching.

What are some of the opportunities for incorporating technology-enabled learning for the Western community?

Support is offered by the ITRC (Instructional Technology Resource Centre) and the TSC (Teaching Support Centre) to assist faculty in adding technology elements to their courses. Also resources are available in the faculties to provide infrastructure assistance and discipline specific help as well. This fall we will have more conversations across campus about

E-learning, and I'm hopeful we will put together a symposium on E-learning through the Faculty of Education and the Teaching Support Centre. This will be an opportunity for everyone who has an interest to come together to share best practices. One of the great advantages of being part of a university community is sharing and learning from each other. I'm hopeful this is one of the events that will help Western crystallize its strategic direction for E-learning on campus.

Reference

Ministry of Training, Colleges and Universities. (2012, September 6) *Annual report 2011-2012*, Retrieved from <http://www.tcu.gov.on.ca/eng/about/annualreport/#1>

News from Western Libraries

BY TOM ADAM, TEACHING AND LEARNING LIBRARIAN, WESTERN LIBRARIES

Introducing our new expanded chat reference service...

In July, Western Libraries joined **Ask a Librarian**, a consortial virtual reference service offered through Scholars Portal and the Ontario Council of University Libraries. *Ask a Librarian* allows Western Libraries to address the major issue revealed in our assessment of the local chat service pilot project we initiated last year—hours of availability. The service, which officially launched at the start of term in September, extends the opportunity for members of the Western University community to connect with real time research assistance online more than 60 hours per week. Alone we could not staff extended evening and weekend hours. Collaborating with colleagues at U of T, Ryerson, York, Guelph, Windsor, Lakehead, UOIT, and OCAD, permits us to offer access to research help online from 10 a.m. - 10 p.m. Monday to Thursday, 10 a.m. - 5 p.m. Friday and Saturday, and 11 a.m. - 5 p.m. on Sunday.

We've placed the ASK button throughout the Western Libraries' **website** giving access to the chat service at point of need. Once you tell us the name you want to use, your affiliation and status, and type in your question, it is captured by librarians and library staff from the participating Ontario universities along with interns who are current students or recent graduates of Masters level programs in Information Studies. *Ask a Librarian* protocols ensure that queries from Western are answered by one of the 40 Western service providers whenever we are scheduled. So when you or your



students have a library question at 9 pm on a Wednesday night, *Ask a Librarian* is there for you.

Scholarship@Western...

Scholarship@Western, our institutional repository, is a multi-functional portal that collects, showcases, archives, and preserves a variety of materials created or sponsored by the Western University community. It provides open access to Western's intellectual output and professional achievements in order to facilitate knowledge sharing and broaden the international recognition of Western's academic

excellence. It also serves as a platform to support Western's scholarly communication needs and provides an avenue for the compliance of research funding agencies' open access policies.

Contact us if you are interested in setting up a researcher gallery page or wish to deposit material into *Scholarship@Western*.

Remember your Research and Instruction Librarian...

As always, Western Libraries' **Research and Instruction Librarians** are eager to partner with you to structure engaging opportunities to explore the important information management resources and develop information literacy skills for your students. Contact your subject liaison librarian with your instruction needs or contact me in the Teaching Support Centre (ext. 81441 or tadam@uwo.ca) for information about the teaching and learning services we offer.

Getting Your Graduate Students Off to a Good Start

BY NANDA DIMITROV, ASSOCIATE DIRECTOR, TEACHING SUPPORT CENTRE

It is easy for graduate students and their supervisors to get caught up in a myriad of details at the beginning of the year. The bureaucracy that surrounds getting started is formidable—after forms, keys, orientation sessions, safety training, Sakai access, course registration and funding questions, there is often little time to talk about anything else. But if you want to get your students off to a good start, make time for three critical conversations that contribute to student success: (1) discuss the big picture, (2) clarify expectations, and (3) connect your students with multiple mentors.

Discuss the Big Picture

In the first few months of the new year, consider addressing the issues that will provide students with a bird's eye view of scholarship in your discipline. Have a conversation about what it takes to grow from a student into a scholar, and what stewardship of the discipline means in your field (Golde et al., 2006; Walker et al., 2008).

Talk about the goals of the program, expectations for successful graduates at the master's or doctoral level, career development and how the choices students make during their program may affect their career prospects (e.g. the choice of thesis topic, publishing early on or gaining teaching experience).

New graduate students often focus on the most tangible components of the degree, such as coursework or qualifying exams, and do not really understand the need to develop original contributions to research, or what original research is. They do not realize that one of their tasks in graduate school is to understand unspoken norms of their discipline (Dimitrov, 2012), network with other scholars or get published early on (Austin, 2010). They often think they can leave such things for "some time later." Without guidance from their supervisor, many graduate students zero in on major theories in the field and get busy working on their own experiments, without taking the time to develop competencies they may need as an independent scholar once they are out of graduate school: grant writing, presentation skills, lab and project management, budgeting, teaching

and course design, or the mentorship and supervision of junior scholars in their research lab (Gilbert et al., 2004; CAGS, 2008). Get students to reflect on their own development by asking them to set goals for the next month, term or year, and work together with the research group to map the essential skills of a successful scholar in Bioengineering, Women's Studies or Astronomy.

Clarify Expectations

In a survey of Western faculty, Skarakis-Doyle and McIntyre (2008) identified seven areas in which it is important to clarify expectations with graduate students. These are:

The extent and **nature of direction** from the supervisor

The **degree of independence** of the student

Frequency and manner of consultation and feedback

Written work: frequency of submissions, drafts, progress reports

The role of supervisor in **editing work**

Manner in which **ideological or opinion differences** will be handled. (p.7)

In addition it is important to discuss issues of authorship and intellectual property, including order of authors on co-authored articles.

Western has developed a **template letter of understanding** that graduate supervisors can adapt to their needs and use to discuss expectations with their graduate students. *The Western Guide to Graduate Supervision* also includes several expectations worksheets that may guide this dialogue.

To clarify what excellent work means for you, show new graduate students examples of both outstanding and average quality research by other graduate students—not only exemplary research by established scholars—so they can see the level of sophistication expected in a master's thesis or dissertation in the discipline.

In addition to the financial and administrative issues (vacation time,

Join us for informal lunchtime Supervision Conversations

12 noon - 1:00 pm in Room 122, Weldon Library unless otherwise indicated.

SEPTEMBER 17

Setting Clear Expectations: Contracts and Letters of Understanding

OCTOBER 12

Giving Feedback that Grad Students Listen To

NOVEMBER 13

Supporting ESL speakers in the Thesis Writing Process

DECEMBER 10 (2:00 -3:00 PM)

Procrastinators and Perfectionists: Helping Students who are Stuck

JANUARY 16

Mentoring Independent, Initiative Grad Students

FEBRUARY 12

Helping Grad Students Manage Stress and Anxiety

MARCH 5

Developing Grad Students as Stewards of the Discipline

APRIL 7

Mentoring Graduate Students Across Cultures

For more information and to register, go to:
www.uwo.ca/tsc

...continued on page 5

Getting Your Graduate Students Off to a Good Start

Continued from page 4

hours, funding, how to apply for grants, documenting their work, keeping track of data), also talk about **feedback**: how do you give feedback and how the student receives it. What types of feedback help them learn? How do you want students to respond to feedback on written work? Should they respond to your comments in writing as if they were getting back to a journal editor or do you just want them to incorporate the changes and give you a clean copy of the text?

Connect Students with Multiple Mentors

Doctoral attrition rates are between 30 and 50% in Canadian universities (Lovitts, 2001). The main reasons why doctoral students quit their programs include: negative relationship with their supervisor; a lack of match with departmental culture; or lack of integration into department (Golde, 2005). So create community and connect new graduate students with senior peers. Assign multiple mentors and bring the graduate students together informally to discuss their progress and share advice with each other. Research on graduate education in the U.S. and Canada found that a number of factors contribute to successful completion and faster time to completion by doctoral students. These include: beginning dissertation research early in the program, remaining with the original topic and supervisor, meeting frequently with the supervisor, collaborating with supervisor on conference papers, and having multiple mentors (Seagram, Gould, & Pyke, 1998; Golde & Dore, 2001). Mentors may not need to be other faculty members. Many graduate students find mentors in senior

peers, postdocs, the graduate assistant in the department or grad students in other disciplines with whom they can share strategies for staying on track, organizing their work, managing large amounts of reading, deciphering the research ethics process or managing their time.

References

- Austin, A. E. (2010). Reform efforts in STEM doctoral education: Strengthening preparation for scholarly careers. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 91-128). Dordrecht Netherlands: Springer. Retrieved from <http://www.springerlink.com/content/h277457160767h44/>
- CAGS (2008). Professional Skills Development for Graduate Students. Downloaded from <http://www.cags.ca/documents/publications/Prof%20Skills%20Dev%20for%20Grad%20Stud%20%20Final%2008%2011%2005.pdf>
- Dimitrov, N. (2012). The development of disciplinary communication competence among teaching assistants: A research agenda. In Gorsuch, G. (Ed.), *Working theories for TA and ITA development* (pp. 169-199). Stillwater, OK: New Forums Press.
- Gilbert, R., Balatti, J., Turner, P., & Whitehouse, H. (2004). The generic skills debate in research higher degrees. *Higher Education Research and Development*, 23(3), 375-388.

- Golde, C.M., & Dore, T.M. (2001, January). At Cross Purposes: What the experiences of doctoral students reveal about doctoral education. Retrieved from www.phd-survey.org
- Golde, C. M. (2005). The role of the department and discipline in doctoral student attrition: Lessons from four departments. *Journal of Higher Education*, 76, 669-700.
- Golde, C. M., & Walker, G. E., & Associates (2006). *Envisioning the future of doctoral education: Preparing stewards of the discipline*. San Francisco, CA: Jossey-Bass.
- Lovitts, B. (2001). *Leaving the ivory tower: The causes and consequences of departure from doctoral study*. Lanham, MD: Rowman & Littlefield.
- Seagram, B., Gould J., & Pyke, S. (1998). An investigation of gender and other variables on time to completion of doctoral degrees. *Research in Higher Education*, 39 (3), 319-335.
- Skarakis-Doyle, E., & McIntyre, G. (2007). *Western guide to graduate supervision*. London, ON: Western University Teaching Support Centre.
- Walker, G., Golde, C., Jones, L., Conklin Bueschel, A., & Hutchings, P. (2008) *The formation of scholars: Rethinking doctoral education for the twenty-first century*. San Francisco, CA: Jossey-Bass.

For more supervision ideas, visit the supervision pages on the TSC and the SGPS websites:

TSC Supervision Resources

www.uwo.ca/tsc/faculty_programs/graduate_supervision.html

SGPS Supervision Handbook

grad.uwo.ca/current_students/graduate_supervision/index.htm

Western Guide to Graduate Supervision

www.uwo.ca/tsc/faculty_programs/pdf/PG_1_Supervision.pdf

Western Guide to Mentoring Graduate Students Across Cultures

www.uwo.ca/tsc/faculty_programs/pdf/PG_3_MentoringAcrossCultures.pdf

Graduate Studies: A Practical Guide. Canadian Association of Graduate Studies.

www.cags.ca/documents/publications/practical_guide.pdf

Group Work on a Grand Scale:

Introducing long-term, collaborative projects into the large class context

BY NATASHA PATRITO HANNON, EDUCATIONAL DEVELOPER, TEACHING SUPPORT CENTRE

A first year class of 350. A semester-long group project worth 60% of your final grade, culminating in a public presentation for the entire University community. 65 five-person groups. Is this instructor nuts??

Principles of effective instruction suggest that thoughtful collaboration among students is a key contributor to engagement in higher education (Chickering & Gamson, 1987; Kuh, 2003). It is well established, however, that average class sizes are increasing across most institutions in Canada and increased class size is often cited as a barrier to the implementation of group projects, particularly in first year survey courses. Group projects among groups larger than 50 students are often perceived to be unwieldy—difficult to manage logistically and virtually impossible to assess in any convenient way.

This short paper seeks to change that perception by exploring best practices that have been correlated with group project success, even in the largest of classrooms. With creativity and thoughtful planning, the boundary of class size can be overcome and the benefits of group work can be fostered in groups of 100, 200, even 500 students. Drawing on a review of existing literature and the author's experiences introducing a semester-long group project into a first-year course of 350 students, we will explore critical project planning decisions, including:

- project structure and timing of activities and assessments;
- setting of teams and establishment of productive group norms;
- role of learning management systems in the promotion of group dialogue, storage of project artifacts, and provision of logistical support; and
- mechanisms for evaluation – formative, summative and peer.

Throughout the article, we will assume that the assignments to be worked on by student teams involve considerable time and effort, and that the teams will remain together for a significant portion of the

course or for all of it (Oakley, Felder, Brent, & Elhajj, 2004).

Project structure and timing of activities and assessments

Embed mandatory group meet times into course structure – If the group project is worth a significant portion of the student grade (>25%), class time should be devoted to group meetings and group process. Research indicates that the success of team learning initiatives is directly correlated to the amount of class time associated with them (Fiechtner & Davis, 1985). In my own course where the group project constituted 55% of an individual student grade, two class meeting hours per week were assigned to lecture content, while the third hour was mandatory group meet time. In the large class context, this is an important step in mitigating the logistical challenges associated with coordinating the personal schedules of 50-plus students. Because the time has already been allocated in the student's class schedule, there are very few reasons why an individual cannot be present during weekly group meetings.

Mix individual and group elements into the project – Disparities in the amount of effort put forward by members of a student team can contribute to significant conflict among group members and considerable challenges for their instructor. The potential for these types of conflicts, of course, are magnified when an instructor is overseeing 20, 30, or 60 teams. To help distribute work equitably across team members, incorporate individual assignments at key points in the group project structure. For example, have all members of a group contribute three unique resources and corresponding descriptions towards an annotated bibliography in support of their project. These individual submissions can be graded for completion and then the group can collate them into a comprehensive bibliography at a later date. In this way, all group members have some insight into valuable resources associated with their topic of interest and have contributed in a meaningful way to a key aspect of the overall assignment.

Space project requirements throughout the semester – To ensure that students remain consistently on task, distribute the submission of collaborative project requirements throughout the semester. Whatever these elements may be (topic proposal or rationale, annotated bibliography, written report, presentation, etc.), embedding them throughout the semester will allow students to receive valuable formative feedback early on in the process which will ultimately enhance the quality of the final product(s).

Incorporate roles to draw on students strengths and enhance autonomy – Particularly important for first and second year students who may have had limited experience working in groups, the assignment of specific roles identifies key tasks which are central to team success, reduces anxiety, and helps teams to overcome the inertia associated with taking on new and unfamiliar challenges. In my course, students were charged with developing an educational campaign around a contemporary environmental issue. Among the roles outlined for that project were Copy Editor, Communications Expert, Interviewer(s), Presenters, and Graphic Designer. While each team member was expected to contribute to the overall project in significant ways, they individually (or in pairs), took on leadership for a particular aspect of the project. This allowed students to draw on strengths and interests they had developed outside of my course context, enhancing student motivation and commitment.

Allow for creativity – The greatest joys I've experienced as an instructor have emerged from the often unexpected, creative, and powerful outcomes of successful group projects. In my environmental science course, students have built to-scale models of verticulture facilities, have dressed as 'live' and 'dead' coral, have personally interviewed the federal environment minister, and have initiated petitions that have accumulated as many as 7000 signatures. By building opportunities for creative expression into group projects, instructors minimize instances of cheating

...continued on page 7

Group Work on a Grand Scale...

Continued from page 6

or plagiarism and motivate students to explore areas of passion and interest.

Setting of teams and establishment of productive group norms

Set team size larger than is absolutely necessary – The literature suggests that group sizes between three and six students are optimal for collaborative learning (Oakley et al., 2004). Because groups often need to be set prior to the drop deadline for a course, it is important to set your group sizes larger than is absolutely necessary to achieve the desired project outcomes. For example, if you believe that a minimum of four students would need to work together to successfully complete a project in one-semester, assign groups of five or six students. This will buffer any add/drop situations or unforeseen medical absences.

As an instructor, set the teams...but allow for an element of choice – The majority of research has demonstrated that instructor-generated teams function more optimally than those formed by the students themselves, particularly in first- and second-year university contexts (Fiechtner & Davis, 1985). From a logistical perspective, instructor-driven group formation is also often the most efficient option in a large classroom setting. However, some element of choice can, and should, be embedded into the process. For example, in my course, students were able to individually select among 25 very

broad educational campaign topics by writing a short (< 500 word) statement of interest. A maximum of 15 students could choose any given topic, and three five-student teams were generated at random from within that group of 15. Thus, students were able to engage with a topic of personal interest, while the instructor maintained control over group assignment.

Embed tasks that promote effective group processes into mandatory group meet times – Mandatory group meet times should be structured to encourage effective and fruitful collaboration. In my own course, students were given short tasks (e.g. As a group, develop a common set of 5-7 interview questions to ask of your interview subjects OR create a timeline for the upcoming three weeks in relationship to this project. Identify who will be responsible for completing each key task.) that could be accomplished within each of our mandatory one-hour meetings. The 'Communications Expert' for each group was responsible for posting the outcomes of their meeting task to the course website within 24 hours of the tutorial session. Thus, the instructional team could track group progress and team members had a common reference point for important group decisions and upcoming milestones.

Role of the learning management system

When overseeing group projects on this scale, the learning management system (LMS) is an invaluable and irreplaceable

logistical support tool. In my own course, the LMS served as the locus for topic selection, private intra-group dialogue, TA and group interaction, collecting artifacts of group process, asking and answering questions, grading and dissemination of feedback, and the storage of rubrics, tip sheets, and other resources related to the project.

Central to LMS use was the creation of private group discussion boards for each student team (to which only group members and the instructors/TAs had access). This was the group's official communication hub and many teams exchanged upwards of 300 messages through this system. It was a mechanism for sharing new and interesting resources, and the board served as a repository for pieces related to the project, including the outcomes of weekly meetings and drafts of project elements. Interestingly, a number of groups also used this system to communicate for purposes that extended beyond the project—for example to set up study sessions prior to the mid-term and final exams.

In order to most effectively employ the LMS in support of collaborative learning, consider:

Using the LMS early and often – Ensure that students are consistently checking the LMS prior to the launch of the group

...continued on page 8

TEACHING SQUARES PROGRAM

Fall 2012 marks the third year of the campus-wide Teaching Squares program. During this fall semester, several faculty members from across multiple disciplines have committed to a process of reciprocal classroom observation and self-reflection. Participants are placed in groups of four, creating a "teaching square" and invite one another to observe their classes to gain new insights into the processes of teaching and learning. Upon completion of the observations, each group meets over lunch to enjoy a fine meal and share their ideas. Active participation by faculty members in these community-building and teaching-enhancing endeavours reflects Western's continued commitment to teaching excellence. For more information regarding this program or to register for the Winter session of Teaching Squares, please contact Natasha Patrito Hannon (npatrit@uwo.ca), Educational Developer, Teaching Support Centre.

Group Work on a Grand Scale...

Continued from page 7

project by making it central to your course design. House important course documents and resources there, initiate online discussions, answer common student questions, etc.

Providing LMS training to students – Do not assume LMS fluency among students, particularly during this transition to OWL powered by Sakai. If the LMS is going to be a cornerstone of student collaboration throughout your course, provide some formal introduction to the online project supports that you've created and their effective navigation. In my own course, I did this via a one-hour optional tutorial early in the semester, which approximately 200 of 350 students attended.

Mechanisms for evaluation – formative, summative and peer

Embed low-risk assessments at key points in the evolution of the project – To ensure that student teams remain on task over the duration of the project and to offer these teams formative feedback that will improve the overall quality of their final submissions, embed several low-risk assessments (e.g. topic proposal, annotated bibliography, draft writing) throughout the term.

Enlist community members to contribute to the grading of final products – Consider mounting the outcomes of student projects publicly and engage faculty

members, graduate students, or experts from outside the Western community in the evaluation of these products. In my own course, student groups presented their educational campaigns in the UCC atrium in a day-long event we titled the 'Environmental Expo'. Twenty-five faculty and graduate students from the Environmental Science Program volunteered two hours of time to circulate among the displays and evaluate the students' oral and visual presentations. The public nature of the forum and the presence of faculty members and graduate students contributed an element of prestige to the event, added to the motivation of students, and impacted the wider Western community much more dramatically than an in-class presentation could have. Another key bonus, of course, is that the instructional team with the support of volunteers was able to grade in eight hours what would have likely taken us over 40 hours to mark on our own.

Allow peers to evaluate each other – If students have worked together so closely and intensely for a significant amount of time, they must be able to voice their appreciation of or dissatisfaction with the contributions of colleagues in a constructive fashion. The best and most equitable mechanism that I have ever discovered for engaging in peer evaluation is described in significant detail in the

paper by Oakley and colleagues (Oakley et al., 2004). Their description comes replete with a sample rubric and feedback form, as well as suggestions for the most effective implementation of this peer evaluation strategy. This was the system that I employed in my class with great success and very few, very minor complaints from students.

References

- Chickering, A.W., & Gamson, Z.F. (1987). Seven principles of good practice in undergraduate education. *American Association of Higher Education Bulletin*, 38(9), 3-7.
- Fiechtner, S. B., & Davis, E. A. (1985). Why some groups fail: A survey of students' experiences with learning groups. *The Organizational Behavior Teaching Review*, 9(4), 75-88.
- Kuh, G. (2003). What we're learning about student engagement from NSSE: Benchmarks for effective educational practices. *Change*, 35(2), 24-32.
- Oakley, B., Felder, R.M., Brent, R., & Elhajj, I. (2004). Turning student groups into effective teams. *Journal of Student Centred Learning*, 2(1), 9-34.

SPRING PERSPECTIVES ON TEACHING CONFERENCE

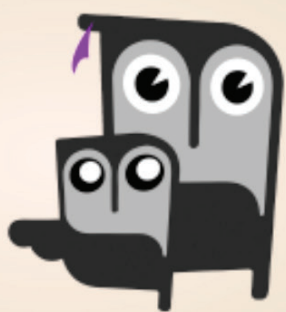
Tuesday, May 14, 2013

Dr. Tricia Seifert from the Ontario Institute for Studies in Education, University of Toronto will give the keynote address on high impact educational practices and deep learning.

Watch for more details on our website in the spring.



Tricia Seifert



Migrating to OWL (Powered by Sakai)



BY MIKE ATKINSON, FACULTY ASSOCIATE, TEACHING SUPPORT CENTRE

It's the fall and you've put off the re-development of your website in Sakai. The learning curve seems very steep and you're thinking that you'll just use the "basic" site (i.e., grades only) for this year. After all, WebCT is gone and you will have to report grades through Sakai. If you do decide to take the plunge and develop your site a bit, here are some tips that may help you along the way.

TIP # 1

Call the Instructional Technology Resource Centre (ITRC) at ext. 85513 and book an appointment with one of the ITRC students. They can show you more about Sakai in one hour than any online tutorial or workshop. Ask them how they would set the site up—they have a great feel for site design in addition to the technical knowledge to make the changes.

TIP # 2

Organize your old site before you transfer the files to Sakai. WebCT uses a different file structure than Sakai. So all those nicely embedded files you had on your WebCT site will not be embedded after the migration. It might be a good idea to copy all of your files to your desktop, create the file structure there (e.g., all files related to chapter 1 or all video files, etc.) and then migrate from your desktop.

TIP # 3



Use Cyberduck to migrate the files. This is a free download utility (cyberduck.ch) that allows you to move multiple files at once. Great

in general, but especially useful if you have 200 or 300 files to migrate or if you use a Mac.

TIP # 4

If you did not organize your files before migration, organize them before doing anything else. It will be difficult for you to create content unless those files are organized in a logical fashion.

TIP # 5

Hide the Resources page. All of your

files will end up in Resources. From the Resources page, you will move files into the various lessons, chapters, etc. that students will navigate. If you do not want students to see all of the information that might be in your course, you need to hide this page link. To hide student access to the whole Resources folder: Select *Site Info* then select the *Page Order* tab near the top of the page. You will then see a list of all of the tools that you have made active in your course. To hide the tool (*Resources*) click on the 'light bulb' in the row where you see *Resources* and it will go dim then click on the save button at the bottom of this page. Your Resources folder will appear in italics and students will not see it in their OWL site of your course.

Home		
Syllabus		
Schedule		
Announcements		
Resources		
Assignments		
Tests & Quizzes		
Gradebook		
Drop Box		
News		

For more control of individual items or folders within the resources folder use this method: Go to *Resources*, click on *Permissions* (top menu bar), and un-check all the boxes for *Student* except *read resources*. When a page link is hidden it appears in italics and slightly faded on the side main menu bar.

TIP # 6

Discussions are called Forums in Sakai. On the right hand side of your home page, you will see a tool called *Message Center* (sic.) *Notifications*. Click on *New* in Forums link ... you can use the General Discussion or create your own thread. There is a nice statistics tool in the forums that allows you to track posts, replies, reads, etc. for each student.

TIP # 7

Yes you can add images to your pages. This is actually easy to do. Just go to the

page and click on *Add Resource*. You can browse your own computer for the image or file and upload right away.

TIP # 8

By default, everything you add is viewable unless you change the permissions. I often have files on a particular page that I do not want to be available to students until a specific time. With WebCT I could hide the file or use selective release. In Sakai, you need to change the permissions for a file, upload it manually at the appropriate time, OR use a simple viewing trick. Go to *Site Info* and select *Manage Groups* (top menu bar). Create a group called something like "Hidden". Leave this group empty—do not assign any students to the group. Then go to the page where you want to hide material. Click on the *Edit* button (to the left of the file you are working on), then choose "Edit the groups for which this item should be shown." Two group listings will appear: One for the entire class and one for Hidden. Uncheck the class option and choose *Hidden*. Click on *Update Item* and this file will not be available until you reverse this procedure and choose the class for viewing.

TIP # 9

View your site as a student. There is an option in the upper right hand corner on the home page to choose the role you want to view the site in. Typically choices are student, TA, or the default instructor (site reverts to this when you exit a role). This is the best way to see what your students see. Also, it is a good way to check if files are actually hidden.

TIP # 10

Don't forget to call the ITRC (x85513) when you need help. The lines are usually open from 10:00 am to 4:00 pm.

Hope that this helps. Remember that we have ITRC students working in the Teaching Support Centre every day if you want to drop by (Room 122 Weldon Library).

Western Mentoring Micro Grant

The Western Mentoring Micro Grant (up to \$2,000) is designed to maximize mentoring experiences for full-time tenure-track faculty.

Application deadline: November 30, 2012.

Click here for more information.

Contact person: **Madeline Lennon**
Coordinator, Faculty Mentor Program
Teaching Support Centre

mlennon@uwo.ca

The Western Conference on Science Education

Continuing our collaboration on post-secondary issues.

Across disciplines. Across Canada.



FACULTY MENTOR PROGRAM

Workshop Sessions

Funding Your Research— Finding Other Sources

October 26, 2012, 1:30-3:30

Finding resources outside the three major Councils can be a challenge. Colleagues who have been successful discuss their approaches.

International Research Connections

November 16, 2012, 1:30-3:30

Your research has international ramifications. What are the possibilities for linking with colleagues in other countries? Experienced colleagues suggest strategies for success, pitfalls to avoid, and the potentials of internationalization for research and teaching.

The Promotion and Tenure Process

December 6, 2012, 1:30-3:30

A panel of representatives from the UWO Faculty Association, the Office of Faculty Relations and the Office of the Provost will explain the procedures and respond to questions.

Writing—Getting It Going

January 18, 2013, 1:30-3:30

All the demands of a faculty position eat up your time. Publishing your research is the highest priority, yet writing is often left to last. Hear how others have found solutions to making it happen.

Development of a Teaching Dossier and a Teaching Philosophy

February 1, 2013, 1:30-3:30

Get a head start on this part of the P&T process with tips from the experts.

[Click here](#) for program details/registration.

Academic Integrity in Canadian Higher Education: Part Two

BY KEN N. MEADOWS, EDUCATIONAL RESEARCHER, TEACHING AND LEARNING SERVICES

In the spring 2012 issue of *Reflections*, highlights were presented from an interview I did with Dr. Julia Christensen Hughes, Dean of the College of Management and Economics at the University of Guelph, on academic integrity. Here we discuss three more questions around academic integrity in the classroom.

You mentioned that one of the findings was that collaboration on individual work is a commonly self-reported behaviour. Do you think that students' previous educational experiences of group work might influence how they perceive learning and the role of collaboration in learning?

At about the time of the first survey in 2002, we were becoming concerned by increasing numbers of students being charged with academic misconduct at the University of Guelph because of unpermitted collaboration. Some students defended their actions arguing that collaboration supported their learning and further, that what they were doing was not wrong as "collaboration" was a stated strategic priority of the university. We realized that this was one area that needed a lot more consideration.

As you know, collaboration has been found to support learning. As an example, if a student writes something, has somebody give them feedback on it, and then has the opportunity to re-write it. That is the academic tradition—we write and re-write our work based on the feedback we receive from peers. So why is it then that a student might be charged with academic misconduct for doing the same thing? In what situations might this be appropriate and where might it not? In answering these questions we need to ask ourselves what the learning outcomes of the assignment are and make sure we have constructed it in a way that supports those outcomes. It might very well be that our learning outcomes would be supported by the students collaborating in this way. So we might, for example, want to establish a formal peer review process in the class, set up a written assignment like a journal where the students submit their work, get feedback, and have to show how they have improved their work as a result.

When it is clearly the case that we want a student to do this work on their own, there are ways we can better support that too. For example, if you really want to know what a student is capable of doing entirely on her/his own, without the support of others, without the support of material, we need to provide a supervised testing situation, with well-trained proctors. With online quizzes, faculty can use a random generator of questions so that students are going to get unique questions that will make it more likely that the students will work on their own. Also, I often advise faculty



Julia Christensen Hughes
University of Guelph

that they may want to include a statement in the course syllabus that says they reserve the right to orally assess any work that a student submits so they can have a conversation about what has been written, if they suspect the work is not the student's. But, again, I would ask "what are the learning outcomes of an assignment?" and maybe it is the case that students would learn more by collaborating with others.

Do you think we will see changes in academic misconduct in some way due to the new technologies?

The ubiquity of information that the Internet provides is what is challenging the "sanctity" of the lecture. People can put their hands on information anywhere anytime now. I believe the Internet challenges the core activity of what the academy has always done. Now what is our purpose? I believe in large part it should be to help students learn how to pose questions or

identify problems, how to search for information, and how to judge the efficacy of that information and apply it in useful ways. How do we teach students how to find credible information, how to decipher it? Do they understand why it is worth wading through a complicated peer reviewed academic journal article to get to some core findings that they can trust, incorporate into their own work, and have that information inform their own thinking? Because of the Internet we really need to take a hard look at what is our purpose and how well are we achieving that purpose.

In your articles with Don McCabe in the *Canadian Journal of Higher Education*, you call for a recommitment to academic integrity in Canadian higher education? Have you seen that recommitment?

Yes. That was one of the results of the survey I was really pleased with. I think the study really caught the attention of senior administration in a number of different universities. There is something about having the voices, the opinions, the behaviours of your university's students, faculty, and TAs captured that can help send a pretty powerful message that there is something going on here to which we need to be attending. I saw a lot of activity on campuses with an educational focus for students and faculty—such as hosting academic integrity sessions and developing interactive websites. Some universities also revisited their proctoring procedures in exams and that is important. Other universities revisited their policies and penalties. They found that even though policies and penalties existed, faculty were not necessarily following them. So, you had huge inconsistencies across the institution in terms of how student cases were being dealt with because faculty were dealing with them under the radar. A lot of universities really started having a look at those

...continued on page 12

Academic Integrity in Canadian Higher Education...

Continued from page 11

policies and engaging faculty in their review and modification, hoping that faculty would then be more likely to follow formal policy when they came across such cases. Whether people were using Turnitin.com or just starting to Google questionable phrases, I think a lot more of that activity has happened since the survey. So, yes, I would say awareness was raised.

Thank you, Julia. You raise very important points about needing to consider what our learning outcomes are and whether collaborative assignments are valid ways to assess them as well as what our role is in teaching information literacy in this information rich age. Also, it is gratifying to hear that we have improved our policies and procedures for handling academic integrity on campus. I look forward to finding out what has changed in the last ten years as we go forward with our new survey this fall. I will be reporting on that survey in the spring.

References

- Christensen Hughes, J. M., & McCabe, D. L. (2006a). Understanding academic misconduct. *Canadian Journal of Higher Education*, 36(1), 49-63.
- Christensen Hughes, J. M., & McCabe, D. L. (2006b). Academic misconduct within higher education in Canada. *Canadian Journal of Higher Education*, 36(2), 1-21.
- Meadows, K. N. (Spring, 2012). Academic integrity in Canadian higher education: A conversation with Julia Christensen Hughes. *The Teaching Support Centre's Reflections Newsletter*, 66, 1-3. Retrieved from http://www.uwo.ca/tsc/resources/pdf/Reflections_66.pdf



The Academic Integrity Survey at Western

Students, faculty members, teaching assistants...

Please help Western understand your perspective on academic misconduct and how we can support our culture of integrity

Check your Western e-mail in October for more information!

Be part of this Canadian wide survey conducted through Rutgers University in New Jersey

Your **ANONYMOUS** responses are needed!

Questions? Contact: Dr. Ken N. Meadows, Teaching and Learning Services;
kmeadow2@uwo.ca

Help protect the integrity of Western's degrees

Advancing *Research on Teaching* at Western

BY KEN N. MEADOWS, EDUCATIONAL RESEARCHER, TEACHING AND LEARNING SERVICES

Have you ever tried a new teaching method and wondered if it was better for your students' learning than what you had been doing?

Have you ever wondered what impact a new piece of educational technology you are using in your classroom has on your students' learning?

Have you ever wanted to do research on your teaching?

At the Teaching Support Centre, we offer a variety of programs and resources to examine the impact of your teaching on your students' learning.

Research on Teaching E-mail Newsletter

Perhaps the most basic resource we offer is the RT newsletter. Each month Dr. Allen Pearson, Faculty Associate in the area of the Scholarship for Teaching and Learning, and I update subscribers on RT happenings at Western and beyond, including upcoming conferences, recent issues of RT journals, and RT funding opportunities, to name but a few. For example, did you know that the 2012 *International Society for the Scholarship of Teaching and Learning* conference is being held in Hamilton from October 24-27, 2012 (issotl12.com)? Did you know that *The Canadian Journal for the Scholarship of Teaching and Learning* published an issue in September (www.cjsotl-rcacea.ca)? If you would like to subscribe to the RT e-mail newsletter, please contact me at: kmeadow2@uwo.ca.

Research on Teaching Consultation Services

We offer RT consultation services to address any aspect of the research on teaching process you want to discuss. If you have questions about:

- ✓ generating a research question;
- ✓ developing a research design;
- ✓ selecting appropriate research methods;
- ✓ writing a proposal for the Research Ethics Board;
- ✓ developing and implementing a strategy for analyzing data;
- ✓ preparing the findings for presentation or publication;

or anything else about doing research on your teaching, please e-mail me. I would be happy to discuss your RT project, whatever stage it is at.

Research on Teaching Presentations

We host sessions on topics of interest to the RT community, at least twice a year. Past sessions have addressed issues such as Research on Teaching in the promotion and tenure process, navigating the Research on Teaching literature, and ethical considerations in Research on Teaching.

The next RT Presentation will be "**Developing Research on Teaching Surveys: A Session for Beginners**" on **October 18, 2012** from **1:30 pm – 3:30 pm** in the Teaching Support Centre. We hope to see you there!

Research on Teaching Symposium

The symposium showcases Research on Teaching projects being done here at Western. The half-day session includes presentations and posters by local RT researchers and provides the opportunity for faculty members, librarians and archivists, and graduate students who wish to learn more about Research on Teaching or who have considered doing such scholarship to meet and interact with colleagues who have completed Research on Teaching projects.

The next Research on Teaching Symposium will be held on **March 20, 2013** from **1:00 pm – 3:30 pm** in the Teaching Support Centre. Be sure to attend and learn more about the innovative work that Western's RT researchers are doing.

Western Institute for Research on Teaching and Learning

This three-day intensive hands-on workshop is designed to support faculty members, librarians, and archivists in the development of a research project on their own teaching. In this interactive workshop, we address the basics of doing research on teaching in higher education (e.g., developing a researchable question; quantitative and qualitative research designs; research ethics) and participants work individually and in small groups to develop their own projects.

The second annual edition of the Western Institute for Research on Teaching and Learning will be held **May 1-3, 2013** in the Teaching Support Centre. Please add those dates to your calendar.

It will be a busy but exciting year for Research on Teaching at the Teaching Support Centre, and I hope you will join us!

Developing Research on Teaching Surveys:

A Session for Beginners

October 18, 2012
1:30-3:30 p.m.

Click here for information
and registration.

Welcome Bethany White

Bethany White joins the Teaching Support Centre as Faculty Associate from Science. She holds an MMATH and PhD in Statistics – Biostatistics from the University of Waterloo and a BScH in Mathematics and Statistics from Acadia University. Bethany is an Assistant Professor in the Department of Statistical & Actuarial Sciences and has recently been appointed as Faculty of Science Learning Development Coordinator. She has always had a passion for teaching and, over the years, has embraced as many teaching and professional development opportunities as she could to advance her teaching. She has taught courses of different sizes, formats and levels and has been active in the Scholarship of Teaching and Learning (SoTL). Broadly speaking, her research interests involve the impact of structured activities and course formats on students'

attitudes and learning. She has particular interest in blended course delivery, experiential education, and team teaching and has conducted research on the use of service learning, online discussions, personal response systems, and web applet activities in statistics education. She is currently conducting an evaluation study of a blended introductory statistics course.

In her new roles, Bethany hopes to promote scholarly and reflective approaches to teaching, encourage the systemic study of teaching and learning in post-secondary science and beyond, foster collaboration in teaching and SoTL across departments and among faculty and graduate students, and support the development, implementation, and evaluation of new course formats such as blended courses.



Bethany is delighted to join the Teaching Support Centre as Faculty Associate and looks forward to working with the Western community to support excellence in teaching and learning. You can contact her at: bwhite@stats.uwo.ca



Thank you to Tom Haffie!

We wish to offer many thanks to Tom as he steps down from his role as the Science Faculty Associate in the Teaching Support Centre. Tom's many contributions to our centre enriched the programs we offered. His

passion for science education was evident in all the work he did with us. We wish you well as you go back to teaching full time in the classroom. The students are lucky to have you.

Instructional Skills Workshop for Faculty

December 11 - 13, 2012 8:30 am - 5:00 pm

- Intensive three-day teaching workshop
- Open to all Western faculty
- Designed for both new and experienced instructors
- Required to attend the full three days (8:30 a.m. - 5:00 p.m.)
- Limited enrollment

The Instructional Skills Workshop (ISW) offers you the opportunity to explore, in very practical and hands-on ways, the conditions that give rise to powerful learning experiences among your students. The ISW is offered within a small group setting and is designed to enhance the teaching effectiveness of both new and experienced instructors. These sessions provide new instructors with an introduction to designing and facilitating effective learning activities. The ISW also serves as a laboratory for experienced instructors who wish to refine and expand their teaching practice, to explore new ideas, or to revisit the fundamentals.

Upcoming ISW Workshops: February 19 – 21, 2013, and May 7 – 9, 2013

For more information and registration, go to:

www.uwo.ca/tsc/faculty_programs/instructional_skills_workshop.html

AWARDS & GRANTS

WESTERN TEACHING AWARDS	Edward G. Pleva Award for Excellence in Teaching Angela Armitt Award for Excellence in Teaching by Part-Time Faculty Marilyn Robinson Award for Excellence in Teaching www.uwo.ca/univsec/senate/sutaregs.pdf	Deadline for nominations: December 15, 2012
WESTERN FUNDING INITIATIVES	Fellowship in Teaching Innovation	Deadline for applications: March 1, 2013
	Western Mentoring Micro Grant (for full-time tenure-track faculty)	Deadline for applications: November 30, 2012
	International Curriculum Fund	Dean's Deadline: January 17, 2013 ; WI Deadline: January 31, 2013
EXTERNAL AWARD	STLHE's Award Programs www.stlhe.ca/awards	
	3M National Teaching Fellowships (teaching excellence and educational leadership)	Deadline for nominations: August 16, 2013 (internal) August 31, 2013 (external)
	Alan Blizzard Award (collaboration in teaching)	Deadline for nominations: February 15, 2013
	Desire2Learn Innovation Award (innovative approaches that promote learning in new ways)	Deadline for applications: mid-January, 2013
	3M National Student Fellowship (for students who demonstrate outstanding leadership)	Deadline for applications: January 14, 2013
	Christopher Knapper Lifetime Achievement Award (contributions to teaching learning and educational development)	Deadline for nominations: December 1, 2012
	OCUFA's Award Programs ocufo.on.ca	
	Teaching Award Academic Librarianship Award	Deadline for nominations: May 2013

Information and guidelines for all these awards and grants can be found on the TSC website: www.uwo.ca/tsc/awards_and_grants/index.html

Assessment Series Fall 2012

In the Teaching Support Centre, we recognize that assessing student learning is a critical part of an instructor's role. To support effective assessment, we offer the Assessment Series – a collection of workshops that address a range of assessment issues. Join us for the first two sessions in the Assessment Series this fall.

1) What you need to know about assessing your students' learning but were afraid to ask

In the session, we will discuss the fundamentals of assessment; those topics that are necessary to address in order to create effective examinations and assignments. We will discuss why you assess, what your goals should be with a particular assessment, how your assessments should align with your objectives and teaching; all necessary questions to answer to effectively assess students learning (and submit grades that you can be confident reflect that learning). We will also collect your questions about assessment and answer them.

Wednesday, October 17, 2012

9:30 a.m. - 11:30 a.m.

Room 121, Weldon Library

Facilitated by Dr. Mike Atkinson, Faculty Associate, Teaching Support Centre and Dr. Ken N. Meadows, Educational Researcher, Teaching and Learning Services

2) Writing Multiple-Choice Questions

Writing good multiple-choice items is an art — and it takes time. In this session, we will look at the basics of test construction and spend some time actually writing items.

Wednesday, November 14, 2012

9:30 a.m. - 12:00 p.m.

Room 121, Weldon Library

Facilitated by Dr. Mike Atkinson, Faculty Associate, Teaching Support Centre

Register at www.uwo.ca/tsc