MAY 2, 2019

festival of teaching and learning

Explore. Discuss. Innovate.

Keynote: Jeanette J. Norden, Ph. D.,
Professor of Cell and Developmental Biology,
Emerita, Vanderbilt University School of Medicine

UNIVERSITY OF ALBERTA

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A NOTE FROM THE STEERING COMMITTEE

The University of Alberta is home to great teachers – past and present – and the Festival of Teaching and Learning serves as our annual celebration where all instructors and learners are invited to "inspire, model, and support excellence in teaching and learning," (Objective 14, *For the Public Good*). This year's programming fosters excellence in the academy by creating a venue for the exploration of both practiced and experimental classroom innovations.

The day will stimulate plenty of discussion across the institution, as this year's presenters will explore collective learning in large classes, how community-university partnerships benefit learning, using digital media co-creation to explore Indigenous-settler relations, setting the optimal motivational context for learning, and more. The Festival of Teaching and Learning presenters and participants embrace the opportunity to gather and learn from one another and it is our hope that the conversations started here today will continue throughout the year in your departments and faculties.

We are proud to be a part of the community's supportive learning environment and we welcome your contributions to strengthening teaching and learning at the University of Alberta.

Sincerely,

Janice Miller-Young and Sarah Forgie
Co-Chairs, Festival of Teaching and Learning

On behalf of the 2019 Festival of Teaching and Learning Steering Committee

Akanksha Bhatnagar, VP Academic, Students' Union
Emily Block, Associate Professor, Alberta School of Business
Jen Carstensen, Administrative Assistant, Centre for Teaching and Learning
Samira ElAtia, Associate Professor, Campus Saint-Jean
Sarah Forgie, Vice-Provost, Learning Initiatives, Provost and Vice-President (Academic)
Jana Grekul, Associate Professor, Arts
Avneet Hayer, Graduate Students' Association
Janice Miller-Young, Academic Director, Centre for Teaching and Learning
Erin Prefontaine, Communications Associate, Office of the Provost
Ellen Watson, Educational Developer, Centre for Teaching and Learning
Janet Wesselius, Associate Professor-Philosophy, Augustana Campus

ACKNOWLEDGEMENTS

The Festival of Teaching and Learning Steering Committee would like to gratefully acknowledge the following who reviewed proposal submissions:

Nancy Barnes
Fatheema Begum Subhan
Marina Blekher
Anne Boerger
Gavin Bradley
Laurie Candy
Anna Chilewska
Luis Alberto D'Elia B.
JoAnne Davies
Deanna Davis
Debbie Feisst
Kim Frail
Louisa Fricker
Seema Ganatra
Roger Graves
Jacqueline Green
Dinuka Gunaratne
Neil Haave
Guillermo Hernandez Ramirez
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Alice Khin
Tatsuya Kin
Sharla King
Janice Kung
Janice Miller-Young
Cosette Lemelin
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Roberta A. Martindale
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Graeme Pate
Renee Polziehn
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Christy Raymond
Gabby Riches
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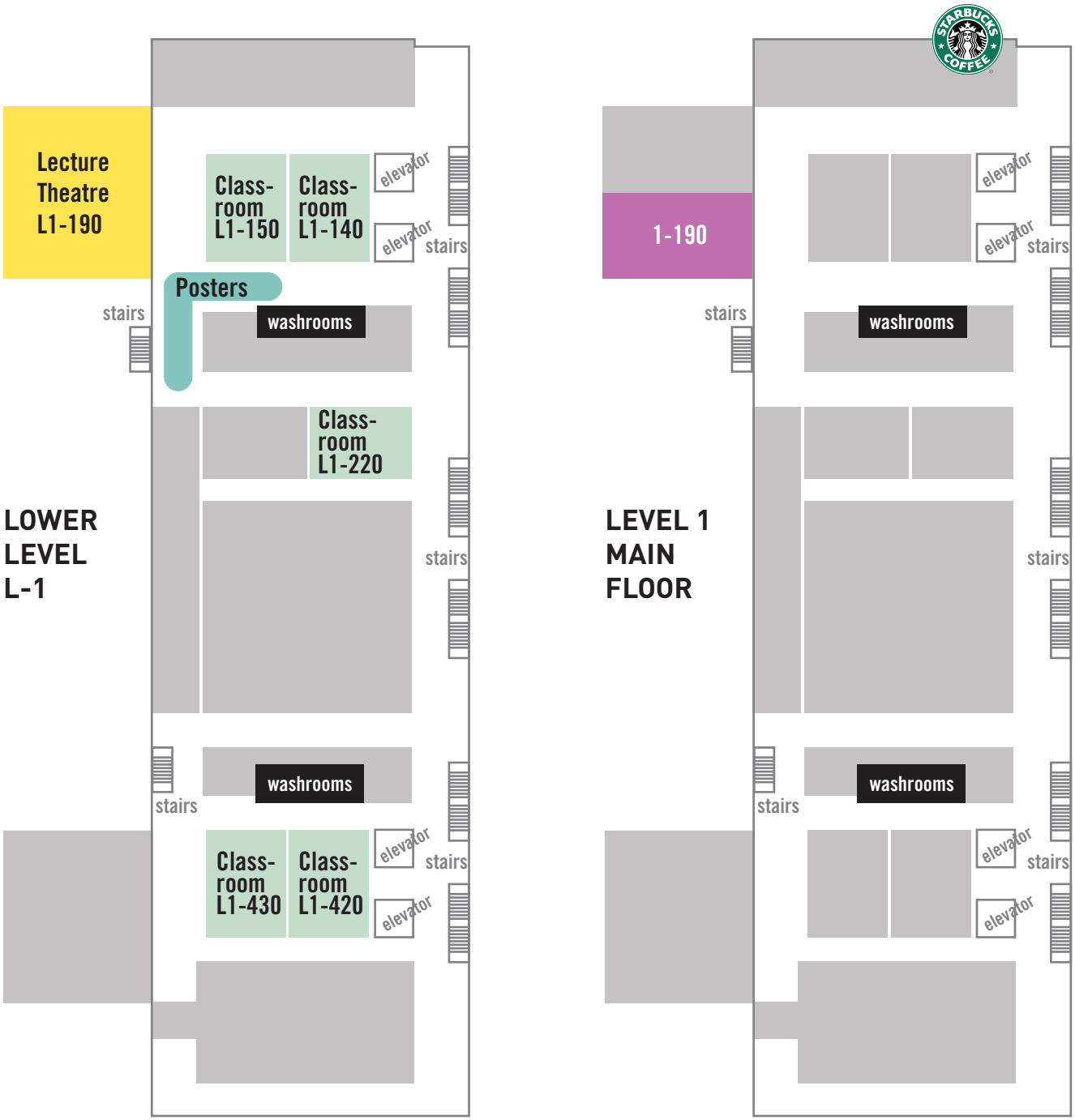
Shelley Ross
Andrea Ruelling
Robert Smith
Jamie Stewart
Kuo-Chan Sun
Ellen Watson
Jennifer Ward
Kyle Y. Whitfield
Joseph R. Wiebe

MAP OF EDMONTON CLINIC HEALTH ACADEMY (ECHA)



SCHEDULE AT A GLANCE

8:00 - 8:30 — **Coffee** *(Outside of ECHA L1-190)*

8:30 - 8:45 — **Opening Remarks:** David H. Turpin, President and Vice-Chancellor *(ECHA L1 -190)*
Introduction of Keynote: Sarah Forgie, Vice-Provost (Learning Initiatives)

8:45 - 9:45 — **Keynote: Creating a Safe Critical Learning Environment: Sharing Best Practices** *(ECHA L1 -190)*
Jeanette J. Norden, Ph. D., Professor of Cell and Developmental Biology, Emerita, Vanderbilt University School of Medicine.

9:45 - 10:00 — **Keynote Q & A** *(ECHA L1 -190)*

10:00 - 10:15 — **Coffee** *(Outside of ECHA L1-190)*

10:15 - 12:05 — **CONCURRENT SESSIONS**

ECHA L1-140	*ECHA L1-150*	*ECHA L1-220*	*ECHA L1-420*	*ECHA L1-430*	*ECHA 1-190*
10:15 - 10:45 **The Diaries of a First Time Blender** Kerry Rusk	**Collaborative Learning in Large Classes...Yes it's Doable** Lien Luong	**Community-University Partnerships for Experiential Learning** Rebecca J. Gokiert	**We Are All Related Augmented Reality Guide: An open education teaching and learning resource using digital media co-creation to explore Indigenous-settler relations** Rob McMahon, Diana Steinhauer	**The PERFECT Approach to Serious Games** Lyn Sonnenberg, Maria Cutumisu, Thomas Jeffery, Georg M. Schmölzer	**Designing the Integration of Critical Reflection and Assessment within Community Service-Learning courses** Patti H. Clayton
10:55 - 11:25 **Ranting for an Engaging Final Assessment Practice** Jordan Long	**Enhancing Student Success through Predictive Learning Analytics** Ying Cui, Ali Shiri, Fu Chen	**Innovating in the Trenches: A non-pedagogical expert using flipping and blending in the classroom** Timothy Mills	**Setting the Optimal Motivational Context for Learning** Oksana Babenko, Lia M. Daniels	**Using Artificial Intelligence and Virtual Reality to Reduce Anxiety in Clinical Interview Students** Shaniff Esmail, Brendan Concannon	
11:35 - 12:05 **A Research-Based Innovative Approach for the Development of a First-Year Introductory Engineering Design Course** Alyona Sharunova, Jason Carey	**New Times, New Classes? - the impacts of structural reform on curriculum and pedagogy** Lars K. Hallstrom	**Increasing Engagement in Student Orientation Using Gamification** Jessica Ley	**Writing Fellows in the Faculty of Law: Creating a Collegial Learning Environment Using Upper-Year Students to Deliver Substantive Content** Christopher Samuel, Stella Varvis	**Virtual Reality in the Classroom: Enhancing Education with Immersive Experiences** Nathanial Maeda, Martin Ferguson-Pell	

12:05 - 13:00 — **Posters & Lunch** *(Outside of ECHA L1 -190)*

Capitalizing on Interprofessional Education Opportunities: Structured Interprofessional Shadowing Pilot Project, Sharla King, Melanie Garrison, Interprofessional Education Student Collaborative Group
Developing Online Interactive Tools for Enriching Science and Engineering Courses, Zaher Hashisho
Engaging with Black Holes: Experiences in Astro101, Stephen Lane, Sharon Morsink
ExamVis: An Interactive Feedback System for Students, Okan Bulut, Maria Cutumisu
Learning CanMEDs through Quality Improvement in the Health-Care System for Medical Students, Nahla Gomaa, Marghalara Rashid
MOOCing Back to the Future: Five years of Massive Open Online Courses at the Faculty of Science, Gavin Bradley
RETAIN: A new approach to teaching and evaluating neonatal resuscitation, Simran Ghoman, Georg Schmölzer, Maria Cutumisu, Thomas Jeffery, Patrick von Hauff, Matthew Brown
The impact of a second midterm on students' learning outcomes, Kelly Keus, Jamie Grunwald, Neil Haave
When the Real Teacher Arrives: Exploring Relational Connections in our Teaching Practice, Kerry Rusk

13:00 - 14:00 — **Resistance is Futile: Strategies for Building Resilience for Active Learning** *(ECHA L1 -190)*
Renette Bertholet, Sheryl Gares, Mark Hall, Hani Henein, Valentina Kozlova, Michelle Spila, Valentin Villatoro

Why do students resist active learning? Over the past academic year, a Faculty Learning Community (FLC) of 10 instructors at the University of Alberta's North and Augustana campuses regularly met at the Centre for Teaching and Learning to explore this question. In this FoTL Plenary, members of this FLC, who come from diverse fields and varying years of teaching experience, describe their process and findings in terms of: how students resist, how resistance to active learning can be overcome, why resilience for active learning should be fostered in our students, and how resistance and resilience manifest within the university beyond the classroom.

continued...
Designing the Integration of Critical Reflection and Assessment within Community Service-Learning courses

2019 KEYNOTE

Jeanette J. Norden, Ph. D.

Dr. Jeanette Norden is Professor Emerita, Department of Cell and Developmental Biology, Vanderbilt University School of Medicine. For over 20 years, she conducted research on nerve regeneration, focusing on GAP-43, a protein involved in nervous system development, regeneration, and plasticity. From 1981-2013, she also taught medical, graduate, and undergraduate students and acted as Director of Medical Education in the Department of Cell and Developmental Biology until her retirement. She was a maverick in Medical Education, stressing not only intellectual, but also personal and interpersonal development in students. Her emphasis on personal development and her innovative approach in integrating 'humanity' into a basic science course was recognized at Vanderbilt, nationally and internationally. She won every award given by medical students, including the Shovel (three times; given by the graduating class to the faculty member who has had the most positive influence on them in their four years of medicine), the Jack Davies Award (ten times; for Teaching Excellence in the Basic Sciences), and the Outstanding Teacher of the Year Award (four times). She was awarded the first Chair of Teaching Excellence at Vanderbilt University, and was the first recipient of both the Gender Equity Award of the American Medical Women's Association, and the Teaching Excellence Award given by the Vanderbilt Medical School. In 2000, she was the recipient of the Robert J. Glaser Award, a national teaching award from the Alpha Omega Alpha Honor Society of the American Medical Association to honor the best medical school teachers in the United States. In recognition of her devotion to helping medical students develop into caring, compassionate physicians, Dr. Norden was awarded the 2008 Professional Award from The Compassionate Friends, an international group for bereaved parents. She was awarded the John Chapman Award, a national award for Transformative Innovations in Medical Education in 2010, and in 2012 the Arnold P. Gold Foundation Leonard Tow Humanism in Medicine Award given to a faculty member judged to be exemplary in their compassion and sensitivity and for exhibiting the highest standard of humanism in medicine. Medical students at the Joan C. Edwards School of Medicine of Marshall University awarded her the Humanism in Medicine Award (2014), the Extraordinary Commitment to Learning Award (2017), and most recently, the Laura Richardson Award for Commitment to Learning (2018).

Dr. Norden participates in numerous outreach programs in the Nashville area by going to schools or by giving public lectures on psychoactive drugs, Alzheimer's disease, and other topics related to the Neurosciences. She has taught very popular courses as part of Osher Retirement Learning at Vanderbilt, and has been a speaker on two Scientific American Insight Cruises. She has traveled extensively to give scientific presentations, talks and workshops on teaching, or to teach Medical School (Meharry Medical School; Nepal; Marshall University School of Medicine); she has also participated in several cross cultural humanitarian and educational programs internationally. Dr. Norden served as the external reviewer for a Keck Foundation grant to revise undergraduate science education in 16 colleges in the South. She was highlighted as one of the most effective teachers in America in *What the Best College Teachers Do* (K. Bain, Harvard University Press, 2004), and was the focus of a documentary made by the Korean Public Broadcasting network on Teaching Excellence in America; she was one of 6 teachers profiled in *The Art of Teaching: Best Practices from Master Educators*; in 2016, she was one of the scientists interviewed for a documentary on Alzheimer's Disease *The Truth About Memory Loss*. Dr. Norden has been invited to give over 150 presentations on teaching at Universities and Medical Schools. In 2007, she completed a 36 lecture DVD *Understanding the Brain* as part of the Great Courses series for The Teaching Company in an effort to help inform the public about the brain and common neurological disorders. In recognition of her impact on helping to educate the public about the brain and neurological disorders, in 2011 the Vanderbilt Brain Institute and Center for Neuroscience at Vanderbilt established an annual Jeanette J. Norden Outreach Lectureship in her honor.

Creating a Safe Critical Learning Environment: Sharing Best Practices

May 2 (8:45 - 9:45 a.m.) in ECHA L1-190 followed by Q&A

One of the true joys of teaching is watching students develop intellectually and personally. As educators, we create the learning environment in which such development may be stimulated. Using multiple examples from teaching both a largely lecture-based Medical Neuroscience course to second year medical students and an entirely discussion-based capstone course to undergraduates, Dr. Norden will share her reflections on what elements of the learning environment are especially relevant for fostering knowledge acquisition, critical and analytical thinking, higher-order reasoning skills, and personal reflection in students.

CONCURRENT SESSION ABSTRACTS

SPECIAL GUEST

Patti H. Clayton, Ph. D.

Patti H. Clayton was born and raised and continues to live in North Carolina – with her husband, Kevin, and their feline family. She has worked with several campuses across Canada over the past decade and was thrilled to be able to visit Banff a few years ago and to be part of a scholarship project with faculty and staff in this region.

Patti is an independent consultant (PHC Ventures) with 20 years of experience as a practitioner-scholar and educational developer in service-learning and community engagement (SLCE) and in experiential education; 10 of those years were spent building a campus program and teaching with SLCE in a variety of courses in NC. She serves as a Senior Scholar with 2 campuses in the States and has consulted with well over 100 colleges, universities, and higher education organizations in Canada, Ireland, and the US. Patti co-developed the DEAL Model of Critical Reflection, the SOFAR-CIP partnership model, the TRES protocol for assessing partnership quality, the DPI model for institutional transformation, and emerging work on Democratically Engaged Assessment. She was co-editor with Bringle and Hatcher of the 2-volume set Research on Service Learning: Conceptual Frameworks and Assessment and co-authored the Democratic Engagement White Paper with Saltmarsh and Hartley. She has co-authored over 50 book chapters and articles and is finally learning to write blog posts (see http://www.centerforengagedlearning.org/an-introduction-to-service-learning-and-community-engagement-as-co-inquiry/). Patti's current interests include walking the talk of democratic engagement; designing critical reflection for civic learning; conceptualizing place-engaged SLCE; and integrating SLCE and relationships within the more-than-human world.

Designing the Integration of Critical Reflection and Assessment within Community Service-Learning courses

A special workshop co-hosted by CTL and Community Service-Learning
May 2 (10:15 a.m. - 2 p.m) in ECHA 1-190

Have you ever said, or heard, that "experience is the best teacher"? Most of us have. Problem is, when we stop to think about it, we know it's really not. Experience alone, as Dewey told us, is apt to be mis-educative. It is, rather, critical reflection on experience that may be our best teacher; without doubt, it is key to learning, inquiry, and change in community service-learning. It is also challenging to design, facilitate, undertake, and assess in part because it is often highly counternormative. In this highly interactive, hands-on workshop we will use a conceptual framework for designing community service-learning that emphasizes tight alignment between learning goals, critical reflection, and assessment. And we will work with research-grounded frameworks and tools -- specifically, the DEAL Model of Critical Reflection -- for designing critical reflection to generate, deepen, and document learning in ways that can improve practice and inquiry. Participants will receive a substantial packet of example critical reflection assignments and rubrics, worksheets, and references and will leave the session with concrete ideas for enhancing their use of critical reflection.

A Research-Based Innovative Approach for the Development of a First-Year Introductory Engineering Design Course

Alyona Sharunova and Jason Carey

Teaching & Learning Goals: As opposed to other leading Canadian and international post-secondary institutions, the University of Alberta does not yet have a first-year introductory engineering design course. Thus, to stay in line with other leading and recognized Engineering Schools, attract more students to the program, improve the students' retention rates, engage students earlier into design, and develop early profession engineering skills in students, the decision was made to develop a first-year introductory engineering design course called ENGG 160 – Introduction to Engineering Design, Communication, and Profession. The goals of this course are to introduce students to essential elements of engineering design and engineering disciplines, develop and enhance students' communication and teamwork skills, and teach students the critical knowledge and aspects of the engineering profession.

Research Strategy: ENGG 160 development is based on the results of an empirical research project supported by TLEF and conducted in 2016-2018 at the Faculty of Engineering by a transdisciplinary team of design experts from multiple disciplines. One of the major outcomes of the project included the Transdisciplinary Engineering Design Education Framework (TEDEF), which is based on industrial and education perspectives on design, best-practiced teaching methodologies, and perspectives on design as well as in-house interviews with engineering design professors, review of the course materials and benchmarking with other recognized and accredited engineering schools [1-3]. In addition, a TLEF Seed project of 2018 helped develop and pilot a new teaching methodology based on Bloom's Taxonomy for introducing students to the transdisciplinary engineering design practice. Together the framework and the new methodology served as a guide to the development of ENGG 160 teaching and learning plan and process.

Current Research: Today research shows that the first-year introductory design courses are highly beneficial as they establish the framework in which engineers contribute to society, provide a foundation for the education to follow, excite students about engineering, teach some early key skills, and create a set of experiences on which students base their subsequent learning [4].

Evidence: The effectiveness of the approach taken for the development of ENGG 160 is supported by the notion that, as opposed to other engineering schools who also developed first-year design courses, ENGG 160 was developed based on research-results as well as the collaboration of all engineering departments at the Faculty. In addition, it is based on the empirically developed an innovative approach to transdisciplinary engineering design education. The learning outcomes of the course and its teaching plan ensure no content overlap with other courses in the curriculum. The course content is structured and is delivered in a blended format allowing students to learn at their own pace, facilitating active learning, and promoting inclusion and diversity.

Sharunova, A., Butt, M., Kresta, S., Carey, J., P., Wyard-Scott, L., Adeeb, S., Blessing, L. M., & Qureshi, A. J. (2017, June). Cognition and transdisciplinary design: An educational framework for undergraduate engineering design curriculum development. In Proceedings of the Canadian Engineering Education Association Conference 2017, Toronto, Ontario.

Sharunova, A., Wang, Y., Kowalski, M., & Qureshi, A. J. (2018b). Looking at Transdisciplinary Engineering Design Education through Bloom's Taxonomy, *International Journal of Engineering Education* (accepted November 2018).

Sharunova, A., Butt, M., & Qureshi. A. J. (2018a). Transdisciplinary Design Education for Engineering Undergraduates: Mapping of Bloom's Taxonomy Cognitive Domain across Design Stages. https://doi.org/10.1016/j.procir.2018.02.042.

Crawley, E. F., Malmqvist, J., Ostlund, S., & Brodeur D. R. (2007). *Rethinking engineering education: The CDIO approach.* New York, NY: Springer.

Collaborative Learning in Large Classes...Yes it's Doable

Lien Luong

Biology is a large lecture course with an enrollment of 250-400 students per section. The course delivers a broad range of introductory topics to primarily first year students. I use active and collaborative learning in the classroom to facilitate student participation, encourage group learning, and reinforce learning objectives from lecture, while at the same time provide new learning tools. Cognitive studies show that students learn better by actively making connections and organizing information into meaningful concepts, especially when it involves different learning modalities. I will share examples of activities (beyond iClickers) that worked well in a large classroom and some that did not work, and why they failed. For example, students learn to construct concept maps to reinforce lecture material and identify gaps in their knowledge and misconceptions. Moreover, this sort of meta-cognition contributes to the process of " learning how to learn". I will present data from in-class surveys conducted between 2014-2018 on student attitudes toward the use of active learning in the classroom. In addition, USRI scores and comments indicate that students have a highly favorable attitude toward the use of active learning in the classroom. The student comments also reveal an unexpected "icing on the cake": low stakes group activities, especially among first year students, allow students to make friends in a safe cooperative learning environment, which in turn motivated them to attend class.

Community-University Partnerships for Experiential Learning

Rebecca J. Gokiert

Across Canada, evaluation is used to measure the effectiveness of practices, programs, and policies. Within the social sector, community-based organizations face an overwhelming pressure to generate evidence demonstrating accountability and impact; however, lack the capacity to produce this information (Cousins et al., 2014). Furthering this problem, universities are failing to equip students with practical and contextual evaluation knowledge and skills (Gokiert et al., 2017); thus, creating a generation of emerging professionals who are unable to respond to society's evaluative needs. In a collaborative effort to address this gap, academics across disciplines at the University of Alberta and local community stakeholders partnered, forming a Learning Advisory Committee, to develop *UEval*—an innovative evaluation capacity building and learning opportunity modeled after an existing course in Manitoba (Mignone et al., 2018). Three members of the Committee participated in the summer 2018 course, and identified elements requiring modifications based on observed and anticipated challenges. The University of Alberta's one-week 'evaluation institute' will bring undergraduate, graduate, and community learners together as co-learners—mutually shaping and benefiting one another's learning experiences. Recognizing that universities play a pivotal role in enhancing both student and community outcomes through experiential community-engaged learning opportunities (McShane et al., 2015), *UEval* will engage learners in the exploration and application of evaluation theory through participatory and experiential learning. Specifically, *UEval* will bring community into the classroom; thereby creating a unique experiential learning environment for learners to negotiate diverse experiences and perspectives. Co-learning will be fostered throughout the week, as learners explore community-informed case studies in mixed teams comprised of experienced evaluators, who will provide mentorship, and early learners seeking evaluation support. Within these teams, learners will have the opportunity to develop an evaluation framework for a community organization.

This presentation will detail the process of developing *UEval*, which will be piloted June 2019, and the underlying principles that are guiding this project. Specifically, three topics will be discussed: (1) modifying an existing evaluation institute in the context of Alberta and its identified educational gaps; (2) reflections on a multisectoral and interdisciplinary partnership approach (i.e., under/graduate students, faculties, community, and funders) responsible for the development of curriculum to meet diverse community-university needs; and (3) an innovative co-learning and experiential model for evaluation capacity building that will be used to teach and evaluate *UEval*. Evaluation findings from the *UEval* pilot will support the development of a new model for university- and community-engaged evaluative learning.

Cousins, J. B., Goh, S. C., Elliott, C., Aubry, T., & Gilbert, N. (2014). Government and voluntary sector differences in organizational capacity to do and use evaluation. *Evaluation and Program Planning,* 44, 1-13. doi: 10.1016/j.evalprogplan.2013.12.001.

Gokiert, R.J., Kingsley, B.C., Poth, C., Edwards, K., El Hassar, B., Tink, L. N., Tremblay, M., Cor, K., Springett, J., & Hopkins, S. (2017). Developing an evaluation capacity building network in the field of early childhood development. *Engaged Scholar Journal: Community-Engaged Research, Teaching, and Learning, 3*(2), 59-79. https://doi.org/10.15402/esj.v3i2.333

McShane, K., Usher, A. M., Tandon, R., & Steel, J. (2015). Charting the trajectory of a flexible community-university collaboration in an applied learning ecosystem. *Engaged Scholar Journal: Community-Engaged Research, Teaching, and Learning, 1*(2), 149-165. https://doi.org/10.15402/esj.v1i2.117

Mignone, J., Krawchuk, M., Hinds, A., Migliardi, P., Kinasevych, B., & Duncan, K.A. (2018). One Room School: The Summer Institute in Program Evaluation. *Canadian Journal of Program Evaluation, 33*(2), 268-278. https://doi.org/10.3138/cjpe.42195

Enhancing Student Success through Predictive Learning Analytics

Ying Cui, Ali Shiri and Fu Chen

This presentation will discuss results of a recent TLEF project in which we utilize student activity data recorded by University of Alberta eClass learning management system (i.e., logins, assignment submissions, resources accessed and frequency, interaction with discussion forums) for the prediction of student course performance. Early prediction of student performance provides students and instructors with an estimate of the likelihood of student success. With this information, students can reflect on their learning and the learning process, and plan their future learning in a more proactive and structured manner. Instructors can use this information to identify students at risk. By further examining and comparing resource uses and activities of different risk groups, instructors can provide real-time feedback to the potential at risk students that a) outlines their current performance in the course, b) suggests students to change their behaviors (e.g., participate in group discussions or submit assignment on time) in order to increase their chance of success in the course, and c) encourages students to have face to face meetings with instructors or visit various student support centers on campus such as student success center or student accessibility services.

Student logs or activity data collected while interacting with eClass serves as indicators of student engagement and efforts in the course, which have been shown to be positively related to student academic performance (de Barba et al., 2016; Kizilcec et al., 2013). As a pilot, we developed predictive learning algorithms using student eClass activity data from two undergraduate courses with large class sizes. Our results suggest that selected student activity features could predict students' course performance with an acceptable accuracy. The next steps of the project will be discussed.

Increasing Engagement in Student Orientation Using Gamification

Jessica Ley

Our Faculty welcomes hundreds of new undergraduate students each year. One strategy we use to support student success is to offer them a Faculty-specific orientation. Our goals in delivering an orientation are to help our new students access key support resources, find relevant contact information, complete time-sensitive tasks and connect with other students in their program. To meet these goals we designed and delivered a gamified online course in eClass that students can participate in on a voluntary basis.

During our previous experience of offering our orientation in a face-to-face presentation format, we struggled with student attendance and engagement. Deciding to move our orientation online meant it would be more flexible for students to engage in at a time and location of their choosing, however, in a voluntary, non-credit, non-teacher directed environment we still needed to take further action to address our engagement challenges.

Detering et. al define gamification as using the motivating aspects of games outside the typical game environment in creative contexts like learning experiences. By adding game-elements such as points, badges, progress indicators, multiple attempts, and choice to the online orientation course we strived to motivate students to participate in and progress through the course. In our design aesthetic, we used simple tools and features available within the eClass environment to create a lighthearted, fun and game-like environment.

Over the past two years, we have achieved a 70% participation rate in our voluntary online orientation course. This past year 93% of students who participated in the course and responded to our survey indicated a high level of satisfaction with the quality of information available. By reviewing the student feedback alongside course analytics we have also identified areas we can improve in future offerings of this course.

By attending this session participants will gain a clear understanding of what gamification is and how it can be used to address motivation and engagement challenges in non-credit or in credit courses. Our focus will be on using gamification as a tool to help create a meaningful learning experience. We will showcase the gamified orientation course, share student feedback and share new strategies planned for the Fall 2019 orientation such as increasing engagement in online discussion forums. In addition to this, we will share an example of how a similar gamified design can be used to motivate students to participate in learning activities in a credit course and how the design choices may differ. By the end of this action-packed session, you will walk away with practical ideas that are ready to implement in your own classroom with tools you already have available in eClass.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011, September). From game design elements to gamefulness: defining gamification. Proceedings of the 15th International Academic *MindTrek Conference: Envisioning Future Media Environments, MindTrek 2011*. https://doi.org/10.1145/2181037.2181040

Ding, L., Kim, C., & Orey, M. (2017). Studies of student engagement in gamified online discussions. *Computers & Education,* 115, 126–142. https://doi.org/10.1016/j.compedu.2017.06.016

Kapp, K. M. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education.* San Francisco, CA: Pfeiffer.

Innovating in the Trenches: A non-pedagogical expert using flipping and blending in the classroom

Timothy Mills

Fall and Winter daytime sections of this course regularly exceed 100 students. It is a lecture-only course, with no lab or tutorial time. But social sciences are as much about human experience as about scientific exploration and explanation, so I work to introduce interactive elements and discussion time into this lecture-based format.

I use two main strategies: flipping and blending. I flip the class by making my lectures into YouTube videos for students to watch before class. In class, I can use the 3 contact hours each week for activities and discussion. This increases in-class participation substantially. Additionally, I have been collecting an arsenal of tools to use in class to enhance participation. This includes social tools and technological tools.

I present the result of a study examining the effectiveness of this approach in my class for student engagement and satisfaction. However, the presentation mainly focuses on my experiences in implementing the strategies.

How do I promote engagement? I address the tools I use, as well as how I deploy them in class to achieve my pedagogical goals. How do I manage classroom time? Flipping the class opens up the contact time dramatically. I look at how to flexibly deploy different techniques to maximize the use of time. How do these methods affect the instructor-student dynamic? I discuss this in the context of general attendance and engagement, as well as some specific unexpected benefits. How does the time commitment compare to a more lecture-heavy approach? Overall time commitment is similar, but the distribution of time to different tasks changes dramatically. What if someone is not comfortable, say, with making and distributing YouTube videos? I note methods of managing how public your materials are. I also give some of the less obvious but no less important benefits that students reap from videos and other blended materials.

I share both positive and negative reflections - my own and those I have received from students. I use this approach because it generally works for me and for my students. We find more engagement, and an ability to get deeper into some of the challenging or interesting topics. But it is not an unalloyed positive. I aim in this talk not to persuade everyone to adopt my approach, but to give people a more informed basis on which to decide for themselves whether to adopt any of these techniques.

Vargas-Madriz, L. F., & Nocente, N. (2018a). Experiences of blending undergraduate courses at the University of Alberta: Blended Learning Cycle 3 (ISBN 978-1-55195-406-6). *Report for the Provost Digital Learning Committee:* Centre for Teaching and Learning, University of Alberta.

Vargas-Madriz, L. F., & Nocente, N. (2018b). "It's like sharpening a knife:" instructors' time in blended learning courses. *Proceedings of EdMedia: World Conference on Educational Media and Technology* (pp. 1929-1934). Amsterdam, Netherlands.

New times, new classes? - the impacts of structural reform on curriculum and pedagogy

Lars K. Hallstrom

The Augustana Faculty has explicitly sought to better align the prioritization, integration and implementation of key high-impact pedagogical reforms at the campus. Specifically, the Faculty has identified and implemented two structural changes that are intended to yield significant pedagogical benefits to both students and faculty at the Campus: (1) the adoption of a compressed Fall (September) and Winter (January) term in order to facilitate more specialized teaching venues, international and experiential learning opportunities and cohort-based learning structures; and (2) the establishment of a common first-year experience in order to further establish social, community, and pedagogical linkages to the structures already in place at Augustana. These interventions are new to both Augustana and the University of Alberta. More importantly, they reflect a major shift in the curricular and pedagogical models at Augustana, as they seek to explicitly identify and develop how learning environments are structured and interact with curriculum, skills development, assessment and pedagogy (Carr et al. 2000).

Now approaching the end of the second year of implementation, the project team were able to collect two years (2015-17) of baseline data, and are currently in the process of completing data collection for the matching post-intervention semesters (2017-19). Drawing from a broad and diverse array of data sources and data collection methods (ranging from focus groups, interviews, surveys and enrollment/course data), as well as a series of teaching events for the faculty in order to debrief, share and learn from the common and unique experiences of teaching in this new structure, this presentation will provide an overview and assessment of the effects and early conclusions of the reforms and their evaluation to date. Specifically, it will focus on 3 different priority areas that have emerged: (1) the importance of clear and integrated pedagogical and curricular design; (2) the challenges of balancing curricular expectations/needs with temporal and functional constraints for both students and faculty (including mental health); and (3) the challenges (and potential opportunities) presented by the unanticipated consequences of such reform strategies (and particularly the First Year Seminar and 3-week term). Of particular interest are the effects and implications of the combination and structure of 3-11 + FYS + revised orientation and curricular opportunities, as a pathway to both pedagogical and curricular innovation in undergraduate education.

Ranting for an Engaging Final Assessment Practice

Jordan Long

Despite great changes in educational technology, pedagogy, and the evolution of the learner profile in higher education settings in the last quarter century, end-of-semester examinations remain relatively unchanged with traditional 'paper-and-pen' final exam procedure still the dominant practice (Williams & Wong, 2009). This presents a problem for post-secondary instructors as traditional final exam procedures may not offer the best modes of assessing students': mastery of course learning outcomes; retention of content knowledge; abilities to apply learned knowledge to professional and applied careers and; capability of higher-ordered cognition including critical thought (Biggs, 1999; Gannon, 2018; Jaffee, 2012). One effective alternative to a traditional final exam procedure is a multi-modal project-based final assessment that utilizes modern technology and student collaboration.

The proposed 30 minute Teaching and Learning Workshop will feature an award-winning sessional instructor leading participants through the use of a multi-modal project-based assessment as an alternative to traditional final exam procedure. The instructor will share the details of an effective example of this assessment with participants, called "The Rant". The Rant encourages students to defend a position through an application of learned content as a means to expand their thoughts on a topic that piques their interest from my Ethics and Law in Teaching course. Examples include talk-show parodies and skits, voice-over PowerPoint presentations, personal interviews, slam poetry, and digital and fine art projects. The facilitator will provide quality exemplars of student work (consent received).

Personal observation of the benefits of this assessment practice to both instructor and student include: joy in creating and grading the assignment, high level of student engagement and collaboration with instructor and peers, high level of student and teacher satisfaction, and the expressed appreciation by students of the utilization of their personal strengths and skill-sets. These powerful and fulfilling benefits of this alternative final assessment practice presents valuable lessons to the practicing teacher at the higher-learning level.

Through pair and group collaboration, a significant portion of the workshop will be used for discussing and applying learned strategies to the participants' initial design of this assessment strategy in their own courses. The facilitator will include active learning techniques such as individual reflection, small and large group discussion, as well as pair and group collaboration as a means of formulating a design for future use. The facilitator will mine the ideas and experiences of the participants in order to share best practices with each other.

The intended learning outcomes for the session include the participants being able to: a) identify key benefits of a multi-modal project-based final assessment; b) articulate key features of design for a multi-modal project-based final assessment and; c) apply learned strategies to design a multi-modal project-based final assessment for their respective courses.

Setting the Optimal Motivational Context for Learning

Oksana Babenko and Lia M. Daniels

As educators, we often focus on cognitive strategies in order to support our students' learning. Less consideration is given to how our teaching and assessment practices may support or hinder our students' motivation, a critical but often overlooked component in the learning process. When we consider and set the optimal motivational context for learning (Ryan and Deci, 2000, 2017; Deci and Ryan, 2000, 2008), our students engage better in the learning process. Better engagement, in turn, results in desired outcomes – deeper learning, higher achievement, and emotional well-being. Understanding motivational processes also allows us to provide support to learners who experience difficulty and/or low motivation. The goal of this presentation is to provide strategies for educators to consider in setting the optimal motivational context for learning.

In this presentation, we will first briefly discuss results from the studies we have conducted with learners in professional education programs, highlighting how motivation is related to students' achievement, cognitions, and emotional well-being. Based on our findings and the published instructional design literature (e.g., Linnenbrink-Garcia, Patall, and Pekrun, 2016; Stewart et al., 2011), we will discuss practical strategies, including perception of control, utility value, and choice/autonomy, that educators can use to support student intrinsic motivation and bring about the most adaptive behaviours, cognitions, and emotions in their learners. We will discuss the rationale for why certain teaching and assessment practices are more or less supportive of learners' intrinsic motivation.

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The Diaries of a First Time Blender

Kerry Rusk

Blended learning is an approach to teaching and learning that thoughtfully combines and integrates computer-mediated activities with face-to-face instruction to engage students in their learning and achievement of course objectives. Setting intentional online learning activities students must complete prior to lecture allows students to come to class prepared with foundational knowledge and can create the space in face-to-face classroom time for well structure, active instructor-student and student-student interactions which have been shown to enhance learning. Additionally, blended learning exposes students to a number of different teaching strategies.

For all these reasons blended learning was identified as the approach that would best support students in their learning in Nursing 433, a concept-based community nursing course that each week combined lecture, lab and clinical. Thinking conceptually first requires students to critically examine factual information and relate it to prior knowledge to look for patterns and connections. In a blended learning approach this can be accomplished through intentionally planned online learning activities that students complete prior to class. In the face-to-face class students can then be supported in identifying significant understanding of the concept and evaluate this understanding across different situations or time through a variety of active learning strategies. Finally, in clinical students are expected to use their conceptual understanding to creatively solve a problem or create a new product, process, or idea in their practice.

This presentation will explore the experience of utilizing blended learning in Nursing 433 with the support of a CTL Blended Learning grant. From writing the course outcomes to planning blended learning activities and to the final student evaluations, this presentation will share the dos and don'ts of the process and practice of utilizing blended learning while highlighting the strengths and challenges of this approach from the literature as well as the Nursing 433 experience from an instructor and student perspective.

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Posey, L., & Pintz, C. (2017). Transitioning a bachelor of science in nursing program to blended learning: Success, challenges and outcomes. *Nurse Education in Practice, 26,* 126 - 133.

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The PERFECT Approach to Serious Games

Lyn Sonnenberg, Maria Cutumisu, Thomas Jeffery and Georg M. Schmölzer

How do we design positive learning experiences that can facilitate deep understanding and prepare students for complex problem solving and innovation in the real world? Over the last few years, serious games, with integrated simulated experiences, have garnered the attention and interest of educators (Mayer, 2019). Grounded in constructivist learning theories, such active-learning tools are the PERFECT addition to the educators' toolbox. Integrating James Paul Gee's work (2005), supported by research in the Learning Sciences, with that proposed by Kachur and Stapleton (2019), these seven key principles of Problem solving, Empowerment, Risk, Feedback, Edge, Context, and Transfer (PERFECT), encompass a succinct review of current best practices in the area of gamification. We recognize that many teaching faculty desire to deepen student learning and increase engagement and motivation in their learning settings, but may struggle with knowing where to begin. In this session, we will reflect on seven PERFECT gamification principles and how we applied strategies of gamification to a practical application. In the Faculty of Medicine and Dentistry, a breakdown in learning has dire consequences, particularly in intensive care settings. We designed the board game RETAIN (REsuscitation TrAIning for Neonatal residents) to train healthcare providers (HCPs) in neonatal resuscitation. The RETAIN board game is a table-top simulation serious game where HCPs are presented with a series of evidence-based, real-life delivery room resuscitation scenarios. Using the available equipment, supplies, action and debriefing cards, along with adjustable monitors, HCPs must work together and communicate with their resuscitation team in order to successfully prepare and perform for a variety of resuscitation events. The game is played with a facilitator and 1 to 4 players as an interdisciplinary team (e.g., physician, learner, nurse, or respiratory therapist). In RETAIN (Cutumisu et al., 2019) we found a critical 12% increase in the learner's knowledge retention from the pre-test to the post-test (49% to 61%). By the end of this session, we believe that by highlighting the principles and lessons we have learned through RETAIN, participants will be able to reflect on and successfully apply the PERFECT approach to serious games in their own learning environments.

Using Artificial Intelligence and Virtual Reality to Reduce Anxiety for Practical Examinations

Shaniff Esmail and Brendan Concannon

Goals: Our goal was to evaluate the efficacy of a new technological paradigm, head-mounted display immersive virtual reality (VR), for the reduction of psychological anxiety in students who are performing practical examinations. VR is a human-machine interface that allows users to "project" themselves into a computer generated world, where specific objectives can be achieved (Zhang, 2014). Our VR system allowed students to verbally interact with virtual patients that were representative of clients in a clinical interview setting. Our methods included established psychological surveys, such as the State Trait Anxiety Inventory, which measured anxiety levels of the students before and after the immersive VR conditioning sessions.

Strategy: When students interviewed our virtual patients by using natural language, recognized by our system's speech processing software, each patient's response allowed students to develop affective coping skills for emotion control. Immersive VR has been reported to be successful at training affective skills in students, related to controlling emotional responses during stressful or difficult situations (Jensen & Konradsen, 2018). Our system allowed students to experience virtual patients that can be responded to physiologically, tactfully and procedurally- conditioning students against stressors experienced during clinical interviews as encountered in the real world. Experiential learning occurs when students encounter situations where reflective observation, idea conceptualization and active experimentation occur in a continuous cycle (Aebersold, 2018). The core assumption is that students optimize mental coping mechanisms while in this virtual space, where interactivity coupled with imagination resembled the 'hands-on' aspect of experiential learning to take place.

Past Practice: There is a noticeable gap in the literature regarding the use of artificially intelligent patients in immersive VR systems to reduce anxiety during clinical practical exams. Systems using workplace VR, depicting stressful nursing and teacher settings, have shown that pre-recorded standardized patients had enabled respective workers to practice coping and emotional regulation skills, with greater results than cognitive behavioural therapy (Gaggioli et al., 2014). Immersive VR is expected to increase a student's perceived level of presence and imagination when interacting 'within' the virtual environment, resulting in greater perceived value in the learning material, fortifying both student engagement and interest.

Relevance: VR that is powered by immersive technologies is opening a new world of opportunities that can transform the ways in which students manage anxiety. Our system is an interdisciplinary project supported by Computer Science, Occupational Therapy and Rehabilitation Medicine. An immersive VR simulation, giving students the opportunity to train coping and affective skills for performance-based assessments, promises transferability to other disciplines that feature practical examinations or interviews. Such disciplines may include: those in the performance-arts (music, dance), media studies (reporting, broadcasting), business (pitching proposals) and those featuring general presentations to stakeholders. The results of our project enable greater understanding of coping processes and outcomes affected by VR systems. We intend to inspire and inform teachers and learners about the ways VR can support them, while also enticing VR developers to push the limits of their abilities.

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Virtual Reality in the Classroom: Enhancing Education with Immersive Experiences

Nathanial Maeda and Martin Ferguson-Pell

Imagine a health care student learning to perform dental anaesthesia injections. After watching a Powerpoint and practicing on a chicken leg, the student must then perform the injection on classmates. From this preparation, the injection location, angle, and depth are difficult to visualize for a safe and successful injection. Now, imagine the same student practicing in virtual reality (VR) before performing on their classmate. By projecting the student into an immersive computer generated world, VR imparts an authentic understanding so the student may mimic the experience to safely perform the actual injection. Similarly, imagine a science student learning complex cellular structures and functions. 2D textbook representations provide little information regarding scale, thus relying on the student's visualization capabilities to piece together various images. Instead, VR enhances the understanding of cell functions by adding immersive 3D scale to the structure, without error due to the student's internal visualization of the concept.

These applications are a couple examples illustrating the educational power of VR; other examples developed in our Rehabilitation Robotics Laboratory (RRL) include craniofacial anatomy, clinical exam preparation, and more. We have extensive resources for creating high-quality VR simulations, which we develop by applying video game development strategies including programming and digital art expertise. Yet, the key to integrating the authentic detail necessary for realistic VR learning experiences is a co-creation process involving close interdisciplinary collaboration with the University of Alberta's vast world-leading content expertise. Using these available resources, the RRL generates learning experiences with unmatched capabilities and realism. Deployment of VR experiences into pedagogy are application dependent, ranging from standalone modules to in-class presentations to online supplementary delivery. In all applications, the integration of VR enhances education through experiential and mastery learning. For example, pilot data collected using the cell VR application exhibited increased engagement and enthusiasm with the content. In another example, VR improved adherence to advice taking in dental and financial contexts (Chen, Murray, Pinkoski, & Hamaliuk, 2019). Another study showed increased learning efficiency (Liang & Xiaoming, 2013). Furthermore, the advantages of VR stretch beyond information retention and into mental health. A growing body of research provides considerable evidence regarding the effectiveness of VR exposure therapy towards reducing anxiety and other irrational fears (Carl et al., 2018). Likewise, our VR simulation of clinical exams aims to both prepare students for technical aspects but also decrease anxiety associated with the exam. Considering the high occurrence (~20%) of mental health concerns among students (Auerbach et al., 2016), further integration of VR into our institution could have significant effect in improving such conditions.

As institutions increase the use of digital and open educational resources (OERs), VR presents an opportunity to integrate with OERs and enhance learning. VR is flexible, adaptive, and can produce a replicable experience with objective performance measures including real-time feedback. In particular, VR is highly useful for training students in applications that are otherwise dangerous, unethical, or expensive. Furthermore, the integration of artificial intelligence provides another dimension of authenticity to VR considering human interaction pragmatics. As exemplified through the dental anaesthesia and cell function applications, VR has significant capability and further potential to enhance educational outcomes.

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We Are All Related Augmented Reality Guide: An open education teaching and learning resource using digital media co-creation to explore Indigenous-settler relations

Rob McMahon and Diana Steinhauer

In this presentation we discuss our efforts to utilize digital media storytelling as a means to explore Indigenous-settler relations. While appropriate content is key to building Indigenous-settler relationships and understanding, here we examine pedagogical engagement through the co-creation of digital media narratives. A growing body of research is demonstrating how digital content and technologies support the learning of Indigenous cultures and languages (see Perley, O'Donnell, Beaton & George, 2016). Along with providing educational content, digital technologies offer a means to engage instructors and learners in the hands-on development of learning resources. This 'learning by design' approach employs digital technologies as development platforms that instructors and students can use to actively engage with community partners in the collaborative production, application and evaluation of learning resources (Kalantzis & Cope, 2016).

In this context the We are All Related AR project developed and piloted a learn-by-design approach for students to create augmented reality (AR) digital narratives with Indigenous co-creators. We sought to generate opportunities for dialogue on difficult conversations such as colonization and cultural appropriation, through engaged design and practice. We built this process around considerations of relational accountability, Indigenous and western approaches to project governance, intellectual property (and its limitations), and digital data stewardship. Finally, we designed the process to be flexible and platform-agnostic, to maximize adaptability and facilitate integration into diverse instructional topics and contexts. Our process is documented and shared through freely available Open Education Resource (OER) guidebooks (Teacher Handbook and Student Guidebook) which navigate readers through considerations of respectful relationship building, project governance, story creation, story sharing, and data stewardship. In Fall 2018 we piloted the process during a graduate course offered by the Faculty of Extension, where students participated in community-based activities with Knowledge Keeper Dr. Diana Steinhauer and sculptor Stewart Steinhauer from Saddle Lake Cree Nation to create augmented reality stories about the Sweetgrass Bear Treaty 6 Marker sculpture located in Enterprise Square. During this presentation we will discuss our process and associated resources, reflect on lessons learned, and invite discussion and feedback regarding next steps.

This project was funded by the Teaching and Learning Enhancement Fund (TLEF).

Writing Fellows in the Faculty of Law: Creating a Collegial Learning Environment Using Upper-Year Students to Deliver Substantive Content

Christopher Samuel and Stella Varvis

Increasingly, legal education programs are teaching future lawyers to write by letting other law students show them how. Recently, the Faculty of Law at the University of Alberta reconfigured the delivery of its mandatory first-year Legal Research and Writing course by creating paid Writing Fellow positions, filled by academically successful third-year law students. Under faculty supervision, these Writing Fellows are assigned groups of approximately fifteen first-year law students. In their small groups, the Writing Fellows deliver substantive course content and also perform the majority of student assessment. Several other North American legal programs [Kristen Murray, "Peer Tutoring and the Law School Writing Center: Theory and Practice" (2011), 17:1 Journal of the Legal Writing Institute 161] have also adopted this approach, and new programs continue to be regularly added.

Student feedback strongly indicates that the Writing Fellow program has been successful. Both the quantitative and qualitative midterm instructor feedback results (n=51) from this academic year indicate that first-year students are almost unanimously more comfortable in a learning environment led by their upper-year peers when compared against the instructor-led large lecture format. Furthermore, first-year students are less confused and more receptive to the content in these peer-led sessions. These results align with the growing body of literature that supports the efficacy of peer-led training programs (Bergey et al, "Effects of peer-led training on academic self-efficacy, study strategies, and academic performance for first-year university students with and without reading difficulties" (2019) 56:1 Contemporary Education Psychology 25).

The criticisms of the Writing Fellow program are largely focused on the difficulties in standardizing the assessment and feedback. The presenters will share some of the best-practices that they have developed to curb this criticism. The presenters will conclude by encouraging a diversity of departments to consider incorporating this non-traditional content delivery model into their respective programs.

POSTER SESSION ABSTRACTS

Capitalizing on Interprofessional Education Opportunities: Structured Interprofessional Shadowing Pilot Project

Sharla King, Melanie Garrison, Interprofessional Education Student Collaborative Group

The Interprofessional Education Student Collaborative Group (IPESCG), formed in 2017 at the University of Alberta, is comprised of student representatives from each health professional program and has identified interprofessional shadowing as a key activity to support knowledge and develop skills for interprofessional collaboration (IPC). A proposed pilot for intentional and structured interprofessional shadowing within existing practicums will complement broader projects across health sciences at the University of Alberta to integrate interprofessional education (IPE) into existing practicums.

The interprofessional curricular model at the University of Alberta is the Interprofessional Learning Pathway. The pathway provides health science students with IPE throughout their 2-4 year programs. The intentional development and application of interprofessional collaborative practice skills should occur in authentic environments, such as practicum placements. Although IPE has been integrated into accreditation requirements for many health science programs, the intentional integration into contextually authentic settings is largely inconsistent. Feedback from the IPESCG has supported this inconsistency from the student perspective. For some programs interprofessional shadowing is limited or not consistently integrated. Interprofessional shadowing interactions may or may not be supported with a structured approach and/or tool across programs.

This project will support the shift away from traditional IPE where students are prepared to join existing effective, idealized collaborative health teams in practice to the alternative approach which is to teach students how to develop, nurture and maintain effective collaborative networks in any context, regardless if there is an effective collaborative team present (Bainbridge & Regehr, 2015). This shift requires individual skill development in building social capital, perspective taking, negotiating priorities, and conflict management (pp 51) in order to be IPC ready.

We will share our ongoing learning for this project:

- The IPESCG has identified interprofessional shadowing as a key activity to support knowledge and develop skills for collaborative practice (Wright et al., 2012; Fougner & Horntvedt, 2011) including understanding different perspectives and priorities, communication, building relationships and workplace readiness.
- Arranging interprofessional shadowing experiences for all health sciences students presents an unrealistic demand on resources. Opportunities exist within existing practicums in both community and clinical settings (Kent et al., 2017) to intentionally include IPE experiences including structured interprofessional shadowing.
- Although tools exist to support interprofessional shadowing, these tools have not been formally evaluated. Evaluation provides better understanding of the barriers and needs of students, preceptors and interprofessional practitioners (those being shadowed).
- Feedback will inform quality improvements for the tools and process for structured interprofessional shadowing as well as support better understanding of outcomes.
- Structured interprofessional interactions will build individual behaviours to develop collaborative networks within their practicums and beyond. This pilot will complement a broader discussion with clinical coordinators focused on intentional IPE within practicums.

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Developing online interactive tools for enriching science and engineering courses

Zaher Hashisho

The purpose of this presentation is to discuss options for developing online interactive tools to enhance students learning in engineering and science courses. Online interactive tools are effective tools to enhance students learning, particularly in science (e.g. math, physics) and engineering education (Pócsová et al., 2016; Branch and Butterfield, 2016). These tools are accessible to students outside face-to-face courses (Hennig et al., 2013) and can be used to quantitatively visualize equations describing processes, operations, and systems using a user-friendly interface. In the environmental engineering context, these tools can be used to effectively simulate the behaviour of pollution control devices or the fate and transports of pollutants in the environment.

While the advantages of browser-based interactive tools have been documented and reported in the peer-reviewed literature, these tools are still relatively scarce. For non-programmers, developing online interactive tools can be intimidating. Using funding from the Center for Teaching and Learning's Open Educational Resources and the American Society for Mechanical engineers, we have developed interactive JavaScript tools (https://sites.ualberta.ca/~hashisho/Plotter/plotter, https://sites.ualberta.ca/~hashisho/Plotter/distribution) to simulate the performance of several air pollution control devices, as well the behavior of air pollutants in the atmosphere. These tools are freely available for the education community as open educational resources for use and modification. They can also be used as templates, which can be readily customized and used by other instructors to develop additional tools tailored for specific courses. In this presentation, I will discuss the approach we used to develop Javascript tools, options and challenges for integrating them with courses, and resources available to help build similar tools.

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Hennig, M., Gaspers, D., Mertsching, B. (2013) Interactive WebGL-based 3D visualizations for situated mathematics teaching. *12th International Conference on Information Technology Based Higher Education and Training*, ITHET 2013; Antalya; Turkey.

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Engaging with Black Holes: Experiences in Astro101

Stephen Lane and Sharon Morsink

This presentation will explore an online for-credit course on black holes, designed for non-specialist undergraduates. The topic of black holes is typically first taught at a graduate level because it builds on concepts covered during a physics undergraduate degree. Thus, the topic is normally inaccessible to non-specialists. This course aims to provide a conceptual framework while avoiding typical mathematical rigour, enabling access to students of diverse backgrounds. One challenge faced is that of engaging and motivating students in an unfamiliar topic without the benefit of face-to-face interaction. In addition, the course aims to find a way for students to engage with material and apply their knowledge in a highly theoretical field without the benefit of a lab or seminar. The course employs both creative and investigative term projects to accomplish these goals.

A creative work is assigned in an effort to support student engagement. Students must select a medium through which to artistically present on an aspect of black holes. These have included comic strips, poetry, faux interviews, paintings, and others. This creative project gives students an opportunity to engage with the material on their home field, while requiring them to think critically about how to portray a black hole accurately. Students post their proposal or draft to their group via the course forums, where they are given a mark for providing specific supportive and constructive feedback to each other.

Furthermore, students are assigned an investigative term project where they are each given a black hole to study. Throughout the course, students are asked to apply the concepts learned in the latest course modules to their black hole by studying primary and secondary literature. For example, once students learn about the types of structures near a black hole (jet, corona, disc), they must determine whether these structures exist around their black hole and outline the arguments for and against. This provides a continuous way for them to assess and apply their knowledge while targeting higher-level learning outcomes than traditionally available through typical online assessment methods, e.g. a multiple-choice quiz. These projects are believed to improve student engagement and achieve strong learning objectives, though specific research remains to be done.

ExamVis: An Interactive Feedback System for Students

Okan Bulut and Maria Cutumisu

Feedback is an important catalyst for student learning in higher education. Despite claims about the positive effects of feedback, there are still concerns regarding its real impact in practice. Especially, not having enough staff time to accommodate the growing number of students in undergraduate programs often results in delayed feedback as well as student dissatisfaction. The purpose of this study is to design and implement an interactive score reporting system, called ExamVis, for computer-based testing that will not only provide students with high-quality, timely, and effective feedback but also engage them in the interpretation of their exam performance. In addition, the visualizations from ExamVis help the instructor identify content areas that require remedial instruction. A large sample of undergraduate students enrolled in an educational assessment course (n=508) responded to a survey on their attitudes toward feedback. Next, the students received feedback regarding their performance after each of the three computer-based exams (i.e., two midterms and one final exam). Once the students completed the exams, they received an immediate report on their overall performance and performance by sub-content areas (i.e., lectures in the course). The feedback was presented using interactive visualizations, tables, and text. The students also received a more detailed report after all students completed the exams. The detailed score report included normative data (e.g., class averages) and a list of key concepts that the students might need to study further before the final exam. The results from the survey indicated that students perceived the impact of feedback on their learning positively and that most students preferred immediate and detailed feedback in multiple forms (visuals, tables, and written feedback). The analysis of the exam scores indicated that the students who reviewed their score reports after the midterm exams performed better on the final exam, whereas the students did not attempt to review their reports continued their performance in the final exam. In addition, the instructors benefited from participating in this study by developing better assessment strategies and observing the overall standing of their classrooms more clearly.

Learning CanMEDs through Quality Improvement in the Health-Care System for Medical Students

Nahla Gomaa and Marghalara Rashid

CanMEDs 2015 Physician Competency Framework was introduced by the Royal College of Surgeons, as a requirement for residency programs. Endorsed by 12 Canadian medical organizations, it includes competencies and skills that are required to be embraced by any physician in any medical or surgical practice, namely being a collaborator, communicator, health advocate, professional, scholar, and leader, all leading to a medical expert. Parallel to this, Quality Improvement [QI] of the health care system is becoming increasingly of demand to be introduced to residents. Different versions and courses are available. We have designed a student's version, aiming at introducing the idea to multi-disciplinary students in 6 weeks of electives. Given the fact that these students will practice in health care system in different capacities, a qualitative snapshot was then captured after 6-8 weeks following the course, about their learning lessons relevant to the CanMEDS, derived from the QI electives.

Objective
The goal of this project was to explore the effect of teaching quality improvement in the health care system course to summer students at the University of Alberta. We anticipate that studying quality improvement in the health care system will significantly help students appreciate the seven CanMEDS roles.

Methods
Semi-structured interviews were used to explore students' perception. This approach allowed us to interact with participants in a manner that is less rigid in tone and creates a balance in terms of the interviewer-interviewee relationship. Questions were presented in a non-leading and non-biased manner to ensure authenticity and impartiality of the information being collected. Interviews will last ~45 minutes and will take place. The QI course was designed for the students in a flipped-course format as a pilot study with the objective of making the students in different health-related disciplines able to extract the CanMEDS roles required by solving a health care problem. Using descriptive qualitative approach, we wanted to know how students identify some or all the CanMEDS core competencies and what it meant for them.

Data analysis:
In qualitative research, the data analysis and data collection occur together as the study proceeds from beginning to end. Study data was digitally recorded to facilitate data analysis. Data was transcribed by the Comma Police (www.commapolice.com) and subsequently entered as verbatim transcripts (interviews) into N-VIVO, a qualitative software program for data management and analysis. Please note that the data collection for this project is still ongoing.

Impact
If teaching QI in the health care system to students helps to find the link between improving the health care practices and CanMEDS competencies, the QI course may be expanded to a larger number of students, with the CanMEDS competencies being the actual outcome of the course. This may make teaching these competencies from the educators' side as well as attaining the skills from the students' side easier and more practical.

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MOOCing Back to the Future: Five years of Massive Open Online Courses at the Faculty of Science

Gavin Bradley

In 2013, inspired by the launch of large platforms and high-profile media pieces (Pappano, 2012), the Faculty of Science waded into the relatively unknown landscape of Massive Open Online Courses, with its flagship effort Dino 101. In the 5 years since, we have created 20 MOOCs in topics varying from Black Holes to Computer Programming. With over 370,000 enrolled learners in the Faculty of Science MOOCs, consistent quality control through responsible project management across all courses has become essential (Epelboin, 2014). To this end, a six-step MOOC production has been developed for all new MOOCs:

Discovery: course outcomes, maps, module outlines, instructional design philosophies, sample scripts and MOOC 'playbook' are created.
Development: content writers work with project managers to script all videos, design interactive learning objects and source any extra materials.
Production: content team works with production vendors to create high-quality videos and interactive learning objects.
Implementation: all supplementary materials (e.g. assessments, course notes, messaging) are created, and the MOOC is uploaded and launched.
Facilitation: content expert engages with learners, documents and prioritises any issues.
Review: initial revisions are carried out within a year of launching; each course is then reviewed using quality-assessment rubric on a five-year cycle.

Although individual instructional design philosophies vary from course-to-course, this six-step MOOC production cycle is an integral part of the Faculty's strategy to maintain a consistency of product in future courses.

This project management technique has already helped produce courses of a consistent standard, with the FoS MOOCs enjoying particular success in two areas: as global community engagement tools (Ordóñez Franco et al., 2018), and for-credit on-campus courses. By keeping general science MOOCs like Dino 101 and Astro 101 free of charge for worldwide learners, these courses have become powerful global outreach tools, reaching over 1.5 million unique visitors from over 160 different countries- the majority of whom are outside of full-time education. On campus, MOOCs have been incorporated into 11 first and second year science courses, with over 5400 University of Alberta students receiving full academic credits for taking a MOOC.

Despite these successes, there are numerous challenges awaiting any institution with significant skin in the MOOC game: How much do we invest in the new wave of MOOC-based degrees (Reich, J., & Ruipérez-Valiente, 2019)? How best to integrate MOOC-based courses into existing programs on campus? What other ways can we use these high-powered online learning tools? How do we continue to make engaging content while improving accessibility? How do we keep MOOCs relevant in a field like Science, where theories and methods are continuously being revised?

As the Faculty of Science forms its own answers to these questions, we hope to reflect on the experiences of the past half-decade, and take these lessons into the next five years, with excitement, curiosity and a willingness to learn from our mistakes.

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Ordóñez Franco, P., Carroll-Miranda, J., López Delgado, M., Gerena López, E., & Rodríguez Gómez, G. (2018, February). Incorporating Computational Thinking in the Classrooms of Puerto Rico: How a MOOC Served as an Outreach and Recruitment Tool for Computer Science Education. In *Proceedings of the 49th ACM Technical Symposium on Computer Science Education* (pp. 296-301).

RETAIN: A new approach to teaching and evaluating neonatal resuscitation

Simran Ghoman, Georg Schmolzer, Maria Cutumisu, Thomas Jeffery, Patrick von Hauff and Matthew Brown

Background
Each year, 13-26 million newborns around the world require assistance to breathe at birth. Neonatal resuscitation is a highly stressful medical emergency, which can result in decision-making deficiencies in healthcare professionals (HCPs). These impairments frequently contribute to deviations from the resuscitation protocol, causing medical errors even by experienced HCPs. Guidelines recommend frequent simulation based medical education (SBME) for HCPs to maintain their knowledge and skills. However, SBME is time and resource-intensive, and therefore inaccessible or prohibitive to frequent training. Alternative methods are needed.

Objective
To observe if the training simulator RETAIN (https://playretain.com, RETAIN Labs Medical Inc. Edmonton, Canada) can be used i) as a teaching tool to improve knowledge retention of the neonatal resuscitation protocol in HCPs, and ii) as a summative assessment tool to evaluate HCPs' performance (i.e., knowledge and non-technical skills) during simulated neonatal resuscitation.

Method
The RETAIN board game consists of a board with an infant, where learners use equipment, supplies, action cards, and adjustable monitors to prepare and perform simulated neonatal resuscitations. All scenarios are evidence-based from the Royal Alexandra Hospital (Edmonton, Canada) delivery room.

I) First, 30 experienced HCPs from the Neonatal Intensive Care Unit (NICU) at the Royal Alexandra Hospital were recruited to complete a i) pre-test of a neonatal resuscitation scenario, ii) a short tutorial, iii) three rounds of the RETAIN board game, and iv) a post-test repeating the same neonatal resuscitation scenario from the pre-test.

II) Second, 20 experienced HCPs from the Royal Alexandra Hospital NICU were recruited to complete a i) pre-test of an open-answer neonatal resuscitation scenario, and ii) one round of RETAIN. Sessions were video-recorded and performance was scored using Neonatal Resuscitation Program guidelines.

Results
I) Overall, we observed a 12% increase in knowledge retention between the pre- and post-test scores (49 to 61%, respectively). Temperature management showed the most knowledge gain between the pre- and post-test (14 to 46%, respectively).

II) The mean±SD score of the pre-test was 8.35±1.81 out of 16 (52%). The mean±SD score of game performance was 18±5.27 out of 40 (45%). Participants' pre-test and game performance scores were moderately correlated ($r=0.45$, $p=0.05$).

Conclusion
I) Knowledge retention increased by 12% between the pre- and post-test. The improvement in knowledge suggests the board game might be an effective tool to present educational material to address the learning needs of experienced neonatal HCPs, and supports the use of the RETAIN simulator for clinical training.

II) Participants' performance on the pre-test and game were moderately correlated ($r=0.45$), therefore RETAIN may potentially be used as a resource-efficient alternative summative assessment tool to evaluate HCPs' knowledge and skills. Opportunities for summative assessment occur i) after completion of the biennial neonatal resuscitation provider course, and ii) to facilitate more frequent evaluations of HCPs throughout this two-year period.

Future directions include investigating the potential for RETAIN to be used as a teaching tool to facilitate neonatal resuscitation training for remote and rural learners via telemedicine.

The Impact of a Second Midterm on Students' Learning Outcomes

Kelly Keus, Jamie Grunwald, and Neil Haave

Despite anecdotal preferences for the number of midterms a course should have, there is limited research on the benefits of one versus two midterms on the outcome of students' final exam scores. The purpose of our study was to consider whether a second midterm improved student learning outcomes. Furthermore, we were interested in whether a second midterm differentially impacted low and high achieving students. According to research on the testing effect, a test can produce better long-term retention of material than additional re-exposure. Fairly robust, the testing effect occurs despite differences in test materials, format, and timing. Additionally, increasing test frequency can increase the testing effect. According to research on frequency effects, increasing test frequency can improve final exam scores but improvements in student learning diminish as test frequency increases. We hypothesized that students in courses with two midterm exams would have better learning outcomes than students in courses with one midterm exam. We also predicted that lower achieving students would disproportionately benefit from two midterms. Our study had a 2 (midterm: one or two) x 2 (achievement level: high or low) x 2 (course level: 100-level or 300-level) between-subjects design. We used difference scores (i.e., final exam score minus the first midterm exam score) as our dependent measure. Students were split into high and low achieving cohorts using the median score of the first midterm exam. We found that students enrolled in a 100-level course were positively impacted by a second midterm while those in a 300-level course were not. Students in the 100-level course who received a second midterm exam did not perform as poorly on their final exam relative to their first midterm exam compared to those who wrote only one midterm exam: a second midterm exam rescued students from a significantly poorer final exam result. However, a second midterm exam did not differentially improve the final exam scores relative to the midterm exam scores for low-achieving students.

When the Real Teacher Arrives: Exploring Relational Connections in our Teaching Practice

Kerry Rusk and Lynn Anderson

The strategic plan of the University of Alberta is "For the Public Good". This plan recognizes the importance of engaging all members of our community and integrating health into the culture of our workplace. In nursing, relationships are central to our practice and are core to our ability to provide safe, competent, compassionate and ethical care (CNA, 2010). In nursing, relational practice is "a humanely involved process of respectful, compassionate, and authentically interested inquiry into another (and one's own) experiences" (Doane, 2002, p. 401). Thus, forming relational connections in clinical practice is a key part of any nurses' ethical practice. Relational connections are also important in our teaching practice as a wealth of literature exists which demonstrates the importance of caring and relationships in student learning. Thus, relational teaching is something all instructors at the University of Alberta should be incorporating into their teaching practice to support the university's strategic plan of "For the Public Good".

Traditionally the teaching and learning relationship has been viewed as a formal relationship with clear boundaries between teaching and student. Teaching relationally still maintains these boundaries however allows the teacher to recognize the human context, experiences and stories of the themselves and their students. Dewey (1938) stated that teachers must work to developing "experiences that lead to growth" (p. 40) and Beattie (2001) argued that "good teachers are centrally concerned with the creation of authentic relationships and a classroom environment in which students can make connections between the curriculum of the classroom and the central concerns of their own lives" (p. 3). Palmer (2007) suggests that good teaching is rooted in "knowing thyself first, leading one to be more surefooted in teaching and living" (p. 6)
Further to this, (Palmer, 2007) believes good teaching, is not based on technique, it is about the identity and integrity of the teacher. Technique is what one uses until the real teacher arrives (Palmer, 2007) in the teaching and learning relationship.

Relational skill teachers can utilized, include but are not limited to: listening, patience, caring, trustworthiness, approachability, empathy, non-judgemental approach, kindness and commitment. This presentation will discuss the relational skills used by nursing faculty to support student learning and will create a space to discuss how instructors across the university can become more relational in their teaching.

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PLENARY SESSION

Resistance is Futile:
Strategies for Building Resilience for Active Learning (plenary session)

Renette Bertholet (Pharmacy & Pharmaceutical Sciences), Sheryl Gares (Augustana), Mark Hall (Physical Therapy), Hani Henein (Chemical and Materials Engineering), Valentina Kozlova (Economics), Michelle Spila (Science, Learning and Innovation), Valentin Villatoro (Laboratory Medicine & Pathology)

Why do students resist active learning? Over the past academic year, a Faculty Learning Community (FLC) of 10 instructors at the University of Alberta's North and Augustana campuses regularly met at the Centre for Teaching and Learning to explore this question. In this FoTL Plenary, members of this FLC, who come from diverse fields and varying years of teaching experience, describe their process and findings in terms of: how students resist, how resistance to active learning can be overcome, why resilience for active learning should be fostered in our students, and how resistance and resilience manifest within the university beyond the classroom.