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INTRODUCTION: RISING TO THE CHALLENGE

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IDEAS 2014: Rising to the Challenge is the second annual teaching, learning and research conference co-hosted by the Galileo Educational Network and the Werklund School of Education at the University of Calgary. In addition to being a peer-reviewed conference, we have invited presenters to submit their papers to this peer-reviewed conference proceedings as a way to enhance the knowledge mobilization.

The conference mandate is to share the study of innovative teaching practices that support engaging student learning experiences in K-12 and post-secondary. The conference creates opportunities for presenters to share how research informs practice and practice informs research. It provides a forum to challenge us to be better, to build on ideas, and to thoughtfully engage in contemporary ideas of learning and teaching. It is through coming together to study learning and teaching in dynamic relationships, that we create new practice, new knowledge and new research questions (IDEAS: Rising to the Challenge Conference, 2014).

Through collaborative work, we are rising to meet five challenges in today's complex learning landscape. First, we are rising to the challenge of leading for change and innovation. "Educators need to think of innovation as those actions that significantly challenge key assumptions about schools and the way they operate. Therefore, to innovate is to question the 'box' in which we operate and to

innovate outside of it as well as within” (Washor, 2009). Innovation is a process that is comprised of three building blocks: 1) “the work of invention”; 2) “the work of adoption”; and 3) “creating the environment of next practice” (Denning & Durham, 2010). Therefore, as educators we need to be able to be innovative but we also need to be able to work within a dynamic state of change for the purpose of betterment.

Second, we are rising to the challenge of designing for intellectual engagement. “People learn best when trying to do things that are challenging and of deep interest to them – activities that reflect a close interplay of emotion and cognition in the development of capacity” (Jacobsen, Lock, & Friesen, 2013, p. 14). This interplay is what Willms, Friesen and Milton (2009) have defined as intellectual engagement. As educators, we need to design learning tasks that foster intellectual engagement. Further, we need to be able to effectively facilitate and assess intellectual engagement.

Third, we are rising to the challenge of teaching with signature pedagogies. Signature pedagogies are the “types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions” (Shulman, 2005, p. 52). In education, such pedagogies may include inquiry-based learning, problem-based learning, place-based learning, community-based learning, and cognitive apprenticeship. Using signature pedagogies encourages learners “to think, to perform, and to act with integrity” (Shulman, 2005, p. 52). Using these pedagogies fosters the development of environments of risk-taking and unpredictable and surprising settings that involve active student performance (Shulman, 2005).

Fourth, we are rising to the challenge to embrace the richness of diversity. “Diversity is not a problem to be overcome. Rather, it is to be embraced as a fundamental feature of a healthy living system within a learning context” (Lock & Friesen, 2015, p. 97). In this challenge, we need to create inclusive environments where all students are empowered to engage in meaningful and deep learning.

Fifth, we are rising to the challenge of assessing *for*, *of* and *as* learning. “Learners need ongoing, formative feedback in order to continually improve their work as it is taking place, and they also need summative feedback on the final result” (Jacobsen, et al., 2013, p. 18). Current and new assessment practices need to be embraced to support learners as they engage in knowledge-building inquiry.

As we rise to these challenges, we attend to the research regarding effective teaching practice. The Canadian Education Association's *What Did You Do In School Today? Teaching Effectiveness: A Framework and Rubric* (Friesen, 2009) addresses five core principles as a foundation for effective teaching in a knowledge era:

- Teachers are designers of learning
- Work students are asked to undertake is worth their time and attention
- Assessment practices improve student learning and guide teaching
- Teachers foster a variety of interdependent relationships, and
- Teachers improve their practice in the company of their peers.

“Educators need to embrace work as designers or architects of learning within a learning society” (Lock & Friesen, 2015, p. 99). The College of Alberta School Superintendents' Twelfth Dimension Framework also addresses the idea that teachers need to be designers of 21st Century Learning. According to the framework, this requires the 1) development of strong authentic discipline-based inquiry; 2) scaffolding of student work and assessment practices that assist each child improving, growing and thriving; 3) the use of networked digital technologies to create knowledge-building classrooms; and 4) strong relationships with students, other teachers and experts in the field so to learn together.

The goal of this conference, which is also taken up in the papers shared in the proceedings, is to provide opportunities for educators to share how elements of the Teaching Effectiveness and the

Twelfth Dimension frameworks live in the day-to-day practice of teaching and learning. Further, the conference provides an opportunity to create a new knowledge network designed to critically reflect on practice and research in order to improve teaching, learning and research.

Through the conference and in the papers shared in the proceedings, a wealth of examples are presented that reflect how educators from kindergarten through post-secondary are using research to inform practice and practice to inform research as they engage in the work of teaching, learning, and leading. Through their scholarship, they are rising to the challenge of creating and supporting robust learning in today's knowledge society.

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NURTURING EXCELLENCE IN INSTRUCTION AND LEADERSHIP

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This paper reports on the implementation of the Professional Practice Competencies for School Leaders in Alberta through the lens of Inspiring Education in Canadian Rockies Schools. Evidence of the ways in which system and school leader collaborative inquiry and professional learning are mobilizing evidence-based teaching and instructional leadership to support students to become engaged, ethical, and entrepreneurial citizens is presented. With nearly half of the school system's educators engaged in one of three overlapping leadership teams, several indicators of leadership and teaching growth are evident. Early findings indicate that this innovative leadership learning initiative is beginning to have an impact.

INTRODUCTION

This paper illustrates a number of ways in which system and school leader collaborative inquiry and professional learning through the *Nurturing Excellence in Instruction and Leadership* (NEIL) are beginning to mobilize evidence-based instructional leadership (Robinson, 2011; Wahlstrom, 2012), teaching (Friesen, 2009), and professional learning (Timperley, 2011) to more fully support students to become engaged, ethical, and entrepreneurial citizens. Our focus is on the implementation of the

Professional Practice Competencies for School Leaders in Alberta (PPCSLA) in Canadian Rockies Public Schools (CRPS) towards the realization of Alberta's *Inspiring Education* vision. We begin with a brief description of the CRPS context, followed by an overview of the mixed methods research design being used to gauge the effectiveness of NEIL. Each of four overlapping leadership teams is then introduced and the inquiry-oriented approach to collaborative professional learning is described. Early indicators of success are then presented in the final section.

CONTEXT

CRPS is comprised of six schools that serve approximately 2,000 students in the Bow Valley area, just west of Calgary, Alberta. Through implementation of NEIL and the actions toward the realization of the Inspiring Education vision, CRPS plans to undergo a profound shift in its learning culture. The new CRPS senior leadership team believes that evidence informed leadership and teaching excellence will support each student to become an *engaged thinker* and *ethical citizen* with an *entrepreneurial spirit*. The system's primary goal over the next three years is to develop a strong, identifiable and sustainable culture of outstanding leadership, exemplary teaching and excellence in learning.

RESEARCH DESIGN

Research Purposes

Our ongoing research study has four purposes. One purpose is to examine the ways in which iterative cycles of evidence-informed professional learning impact shared instructional leadership and teaching practices. Second, the study is investigating ways in which a systematic focus on teaching and learning impact student learning and engagement to support students as engaged thinkers and ethical citizens with an entrepreneurial spirit. A third purpose is to investigate the ways in which school and system leader understanding and application of the PPCSLA are impacted through ongoing, iterative cycles of evidence-informed professional learning. A fourth purpose is to gain insights into school and system

leader perspectives on the importance of, benefits from and challenges related to practicing educational leadership within the PPCSLA framework, with a particular focus on implementing Inspiring Education.

Research Questions

1. In what ways do iterative cycles of evidence-informed professional learning impact shared instructional leadership and teaching practices?
2. In what ways will a systematic focus on teaching and learning impact student learning and engagement?
3. How will school and system leader understanding and application of the Professional Practice Competencies for School Leaders (PPC) be impacted through participation in the *Nurturing Excellence in Instruction and Leadership* initiative?
4. What perspectives do CRPS school and system leaders express about the importance of, benefits from and challenges related to practicing educational leadership within the PPC framework, with particular focus on implementing Inspiring Education?

Mixed Methods Research

This study is utilizing a convergent parallel mixed methods research design. In keeping with the principles and assumptions of this research approach, qualitative and quantitative methods are being combined to provide a better understanding of the research purposes and questions than either method by itself (Creswell, 2012). The rationale for using a mixed methods approach is to gain insights from both quantitative and qualitative methods. Quantitative online surveys are providing opportunities to gather data from participants at various points in the initiative. Qualitative interviews, focus groups, field notes and session evaluations will allow for a richer, more in-depth exploration of perspectives.

Quantitative student engagement and achievement data collected by CRPS will also be analyzed as the study proceeds.

The convergent parallel mixed methods research design places equal emphasis on the two forms of data: qualitative and quantitative. Each data source is being collected independently and is being analyzed separately. The quantitative and qualitative data will be integrated during the final stages of data analysis, following processes outlined by Creswell (2012, pp. 548-560).

Data are being collected from the following sources: individual and focus group interviews, field notes, documents, artifacts and participant evaluations of the professional leadership learning sessions, online surveys, school system student engagement and achievement data, and classroom observations.

OVERLAPPING LEADERSHIP TEAMS

NEIL is moving forward through open, transparent and collaborative planning and implementation processes. Nearly half of the system's educators are engaged in one or more of the four overlapping leadership teams described below

Education Leadership Team

The Education Leadership Team (ELT) is made up of eight principals and three system educational leaders who are focused on deepening their understanding of all seven Professional Practice Competencies for School Leaders through iterative knowledge-building cycles involving case studies, learning task design and analysis, conversation, and reflection. This group meets monthly and is engaged with Galileo Educational Network (GENA) instructional leadership experts in ongoing iterative knowledge-building cycles related to the evidence informed leadership and effective teaching. Since this group is responsible for shared leadership learning within each school, its members engage in collaborative leadership learning sessions from time to time with GENA teaching and leadership consultants.

Distributed Leadership Team

The distributed leadership team (DLT) is a recently formed group of 18 teacher leaders who are focused on developing their expertise in effective teaching and developing their knowledge of PPCSLA #4 *Providing Instructional Leadership*, PPCSLA#3 *Leading a Learning Community* and PPCSLA#1 *Fostering Effective Relationships* through iterative knowledge-building cycles of reflection on and their own practices as well as mentoring and coaching colleagues. GENA teaching and leadership consultants work with this group.

Lead Learners

Lead learners (LL) make up an even more recently formed group of two to three teacher leaders per school. This group primarily works with GENA teaching mentors. To this point their work has been focused on learning task design in keeping with the learning and teaching principles of Friesen's (2009) *Teaching Effectiveness: A Framework and Rubric*. Professional learning activities provide opportunities for reflecting on the impact of their teaching on student learning and making their teaching and learning visible with colleagues.

Project Planning Team

The project planning team is comprised of the ELT and representatives of the Galileo who work with all levels to plan, implement and assess iterative knowledge-building cycles of professional learning in relation to project deliverables. Feedback and suggestions from this group and from the two recently formed teacher leadership groups are used to generate iterative cycles of inquiry that connect session learning to leading and teaching practices in school settings and then once again back to subsequent professional learning sessions. An important feature of the initiative is the steady flow of feedback and insights so that leadership is developed with participants rather than for them.

FINDINGS

With nearly half of the system's educators engaged in one of three overlapping leadership teams, several indicators of learning, teaching and leadership growth are already evident after just eight months of collaborative inquiry. Researcher reviews of data generated from year two individual and focus group interviews, observations by GENA leadership and teaching consultants, field notes, documents, artifacts and participant evaluations of the professional leadership learning sessions indicate that this leadership learning initiative is having an impact in relation to each of the research questions. Seven preliminary findings have been generated from the early analysis of data considered to the current date. These preliminary findings are listed and very briefly described below.

1. The more than forty participants in the NEIL initiative are appreciative of opportunities to participate in a coherent, iterative, and emergent program of ongoing, knowledge-building cycles of collaborative learning founded on evidence-based approaches to teaching, leadership and professional learning.
2. A model of educational leadership is emerging across all schools through the utilization of the Professional Practice Competencies for School Leaders and Robinson's (2011) image of leaders of professional learning.
3. School leaders, teachers, and central office report that the heightened focus on evidence of student, teacher and leader learning is generating renewed excitement, engagement and efficacy.
4. Aspects of shared leadership and teacher leadership are emerging in all schools.
5. Participants indicate that Friesen's (2009) *Teaching Effectiveness: A Framework and Rubric* provides an evidence-based way of activating the beliefs undergirding the *Shared Vision of Instructional Excellence* (SVIE).

6. The active involvement of teachers, school leaders, and central office personnel in conducting investigations, data collection and research that supports a renewed leadership model and provides encouragement to division teachers to consider future roles or careers in educational leadership.
7. The NEIL initiative is keeping student, teacher and leader learning at the forefront in an unprecedented, energizing and enabling manner.

CONCLUDING THOUGHTS

This paper focused on the implementation of the Professional Practice Competencies for School Leaders in Alberta through the lens of Inspiring Education in Canadian Rockies Public Schools. Collaborative inquiry and professional learning is mobilizing evidence-based teaching (Friesen, 2009), research informed instructional leadership (Robinson, 2011; Wahlstrom, 2012), and best practice professional learning (Timperley, 2011) to support students to become engaged, ethical, and entrepreneurial citizens with nearly half of the system's educators engaged in one of three overlapping leadership teams, seven preliminary findings indicated that growth in learning, teaching and leadership growth are evident. These findings indicate that this innovative leadership learning initiative is beginning to have an impact.

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SUPPORTING PEDAGOGICAL LEADERSHIP IN AREA III

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This case study examined district efforts to strengthen instructional leadership practices in Area III of the Calgary Board of Education during three years. Building on research informed conceptions of teaching, instructional leadership, professional learning, and district leadership our research focused on the development of pedagogical leadership that requires school leaders to be leaders of teacher learning. Data included individual and focus group interviews, provincial achievement tests, student engagement surveys, documents, field notes and participant observations. Our findings indicate that district leaders and consultants have effectively mobilized evidence-based professional learning to strengthen instructional leadership, teaching, and student learning.

INTRODUCTION

During the last three years the Area III in the Calgary Board of Education has implemented an initiative to deepen student learning and to more fully engage students in worthwhile work and discipline-based inquiry. As one component of a larger study examining ways in which school leadership practices are

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improving teaching, student engagement and student achievement in the Area III, this paper identifies more specific district leadership efforts that have guided this initiative. The purpose of this portion of the study was to identify practices that school district leaders have employed with the expectation of achieving better outcomes for students in the 42 schools in this diverse and economically disadvantaged section of this large urban school district.

DISTRICT LEADERSHIP THAT STRENGTHENS INSTRUCTIONAL LEADERSHIP

Building on research informed conceptions of teaching (Friesen, 2009), instructional leadership (Robinson, 2011; Wahlstrom, 2012), professional learning (Timperley, 2011), and district leadership (Brandon, Hanna, Morrow, Rhyason, & Schmold, 2013; Leithwood, 2008, 2011; Louis & Leithwood, 2012; Louis, Leithwood, Anderson, & Wahlstrom, 2010a; Marzano & Waters, 2009) our ongoing research is focusing on aspects of pedagogical leadership which require school leaders to be leaders of teacher learning rather than mere facilitators or collegial discussants. The literature on educational leadership is substantial, but only a small part of it focuses on the relationship between school leadership and student outcomes. An even smaller part of the literature considers the impact of school district leadership.

This case study portion of our larger inquiry is framed by the research literature on district leadership practices that strengthen the instructional leadership capabilities of school leaders. Several recent studies point district leadership practices in this direction (Brandon, et al. 2013; Honig, 2012; Leithwood, 2012; Louis, et al., 2010; Marzano & Waters, 2009; Wahlstrom, et al. 2010a). Key aspects from two reports from one of the larger studies (Louis, et al.) are highlighted here. Anderson and Louis (2012) found that “district policies and practices around instruction are sufficiently powerful that they can be felt, indirectly, by teachers as stronger and more directed leadership behaviors by principals” (p. 181). Through analysis of surveys, interviews, and class observations in 180 schools in 43 districts, the

researches identified five key aspects of district leadership practice linked to higher student learning results. First, district leaders communicate a strong belief in the capacity of teachers and principals to improve the quality of teaching and learning, and in the district's capacity to develop the organizational conditions needed for that to happen (high collective efficacy). Second, they build consensus about core expectations for professional teaching and leadership practice. Third, they differentiate support to schools in relation to evidence of compliance and skill in implementing the expectations, with flexibility for school-based innovation. Fourth, clear expectations are set and support is provided for school leadership practices consistent with district expectations. Fifth, organized opportunities are provided for teachers and principals to engage in school-to-school communication, focusing on the challenges of improving student learning (p. 181-182). Based on the same data set, Wahlstrom, Louis, Leithwood, and Anderson (2010b) derived similar conclusions to guide district leadership practice.

While the systematic analyses of data collected from multiple sources in a variety of district contexts over an extended period of time in the above cited studies address earlier critiques based on limited research designs (Leithwood, 2008; Rorrer, Skrla, & Scheurich. 2008), there is much more to be learned about district leadership practices that impact educator and student learning. Findings from this portion of our study illuminate school district leadership practices that have contributed to improved outcomes in a diverse and economically disadvantaged section of a large urban school district.

CASE STUDY RESEARCH DESIGN

This study employed an exploratory case study research design. A case study is an in-depth exploration of a bounded system (e.g., activity, event, process, or individuals) based on extensive data collection (Creswell, 2012). "*Bounded* means that the case is separated for research in terms of time, place or some physical boundaries" (Creswell, 2012, p. 465). The issue under investigation within the bounded system of the Area III sector of the Calgary Board of Education from 2011 to 2014 is "participant

perceptions of school system level instructional leadership”. Such inquiry calls for a range of research methods to do justice to the complexity of the case and to facilitate synthesis and explanation (Yin, 2009).

Data were collected from individual and focus group interviews of district leaders and GENA consultants, provincial achievement tests, student engagement surveys, documents, artifacts from professional learning sessions, field notes and participant observations. Systematic data coding has been utilized to extract themes and critical elements that have been synthesized in relation to the following research question: *What district instructional leadership practices have contributed to improved outcomes in Area III?*

The Calgary Board of Education’s Sustained Focus on Teaching and Learning

Though this paper specifically focuses on district leadership practices that have led to improvements in leading, teaching and learning in one area of the Calgary Board of Education (CBE), it is important to note that the district as a whole is one of the highest provincial performers on the Alberta provincial accountability measures. Moreover, the CBE is making concerted efforts to build educator capacity to respond to the learning needs of all students in the rapidly changing context. Despite a myriad of distractions at the political level, the superintendent and her district leadership team continue to work methodically toward this aim through multiple approaches. Professional learning similar to the Area III focus on pedagogical leadership is evident in each of the other CBE Areas and an ongoing inquiry-oriented program for high school learning leaders from across the city was started in the fall of 2013. Significantly, Area and Learning Directors in the system learn with and from one another on an ongoing basis. They share challenges and successes within a school system professional community that is clearly focused on enhancing teaching and learning.

Three Iterative Knowledge Building Cycles in Area III

The design-based orientation of the Area III professional leadership learning initiative enables district leaders, GENA consultants and school based participants to adjust course in responsive and timely ways. School leaders are being provided with intensive professional learning that reflects the principles Friesen's (2009) *Teaching Effectiveness: A Framework and Rubric* and Robinson's (2011) conception of *Student-centred Leadership* to address the initiative's aims. On a continuing basis, researchers and participants are documenting changes in pedagogical leadership practices, ways in which the learning environments in area schools are reflecting the *Framework's* five principles, approaches to making student and teacher learning more visible, improvements in student engagement and achievement, and ways in which timely and constructive feedback is being generated to strengthen teaching and learning.

In addition to monthly iterative cycles of inquiry that connect session learning to leading and teaching practices in school settings and back to subsequent professional learning sessions, the Area III pedagogical leadership initiative has undergone three major adaptations. Through the three design phases, the inquiry focus has remained: *How can leadership practices improve teaching practices, student engagement and student achievement?* The learning outcomes for each session have been slightly adjusted over time. To *deepen understanding about the principal's role in leading teacher learning and development* and to *develop processes for providing teachers with timely, specific and constructive feedback about teaching and learning* are the most recent two leadership learning outcomes.

From the first session in the fall of 2011, a participant design team has been employed to help plan the ongoing program of professional learning within a knowledge-building learning community (Scardamalia & Bereiter, 2006; Timperley, 2011). The former Area III Director and her Area Assistant Director had taken the bold step of replacing half-day administrative meetings with learning sessions

on instructional leadership that they co-planned with teaching, leadership and professional learning experts from the University of Calgary's Galileo Educational Network (GENA). From the onset, the shift was well received. The basic format for the monthly principal sessions and the monthly assistant principal sessions has been maintained. Meetings typically begin at 8:30 am with short focusing comments from the Area Director and one of the GENA team members that lead directly into learning group conversations in which evidence connecting school practice to the learning outcomes is brought forward by each participant. Learning tasks for the remainder of the morning are based on responses from previous feedback loops and more detailed suggestions that emerge from the design team meetings, which take place immediately following the session. Routine administrative matters are dealt with from 11:30 a.m. till noon.

The role of the participant design team has been a vital contributor to the success of principal professional learning sessions from the beginning. Design team processes have implemented with positive results for the assistant principal group during the 2012-2013 school year, as the overall initiative gained momentum under the leadership of the current Area III Director. The central focus of the first year was on learning task design and the provision of worthwhile student work within Friesen's (2009) *Teaching Effectiveness: A Framework and Rubric* (TEF). As interest in this approach to teaching and learning heightened and understanding of it deepened, the Area Director strategically widened involvement. Focus on teaching and learning in the sessions and in a growing number of classrooms was widened through learning leader sessions and additional ongoing GENA support within five middle schools during the second year. At the same time Robinson's (2011) *Student-Centered Leadership* was introduced into the principal and assistant principal sessions, which helped participants to conceive of their instructional leadership work as *leaders of professional learning*.

The iterative cycles of inquiry and knowledge building around effective teaching and instructional leadership continued through the third year with each cohort group: principals, assistant principals and

learning leaders. Two main design-based adaptations were made in the transition from year two into year three. On the teaching and learning side of the initiative, attention shifted to the student assessment component of the TEF and more detailed sources on summative assessment (Cooper, 2011) to better respond to emerging district priorities. Attention to task design and the provision of worthwhile student work continued, as did the connections between leadership practice and Robinson's (2011) dimensions three (ensuring quality teaching) and four (leading teacher learning and development). Receiving greater emphasis through year two-three design based adaptations on the leadership side was the notion of *leadership team*. All members of each school's leadership team began working more deliberately on very similar, if not the same, inquiry cycles and evidence gathering in their schools and professional learning session.

Strengthening Leadership, Teaching and Student Learning

There is considerable evidence that the systematic focus on pedagogical leadership and effective teaching in Area III is impacting leading, teaching and learning. School leaders indicate they now see their work in less isolated ways as members of an open and supportive community of learners and through greater participation in shared and distributed leadership teams. More adaptive approaches to leadership have been observed. Increasing commitment to collaboratively improving leadership practice through evidence driven cycles of professional inquiry are also evident.

Improvements in teaching and student learning have also been documented. Widening use of the TEF is reported as is an increase in collaborative orientations to pedagogical improvement. A broader array of classroom evidence has been brought forward in professional learning community sessions to deepen reflection and spur further inquiry. Improvements in student learning and engagement are substantiated through three data sources: improved performance on provincial diploma and achievement examinations, indication of higher levels of engagement on annual *Tell Them from Me*

Surveys and a spectrum of school based observations and classroom derived artifacts of student learning.

DISTRICT LEADERS OF PROFESSIONAL LEARNING

As one small portion of a much more extensive study of the impact of pedagogical leadership, this paper briefly outlines four practices that, according to the evidence gathered from the research participants, have contributed to strengthened school leadership, teaching and student learning in the 42 schools in a culturally diverse and economically challenging area of a large urban school district.

The four practices are framed as lessons for school district leaders striving to become stronger instructional leaders.

Lesson One: Build leadership capacity *with* rather than *for* school leadership teams. Incorporating the insights of and feedback from participants in the design of professional leadership learning enhances effectiveness.

Lesson Two: Convey and model an ongoing and adaptive focus on improving teaching and learning through multiple approaches.

Lesson Three: Support improvements in school leadership practice through iterative cycles of professional learning that focus on evidence of changes in teaching practice that better engage students in learning toward important learning outcomes.

Lesson Four: Hold school leadership teams accountable for improvements in teaching practice in their school through iterative cycles of professional learning that focus on evidence of enhanced student engagement and learning toward important learning outcomes.

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LEARNING TECHNOLOGIES IN HIGHER EDUCATION

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This paper highlights key ideas from a review of the research literature on ways in which contemporary learning technologies are influencing teaching and learning experiences in higher education. The diverse ways in which students and professors connect, communicate, collaborate and create knowledge for learning and teaching both on campus and in blended and online learning spaces are explored. Promising and emerging practices from the research literature and the implications for faculty members, leaders and higher education institutions of learning are discussed. Challenges for higher education as teaching and learning undergoes change are described.

Contemporary educational technologies can enhance and enrich teaching and learning experiences on and beyond campus and often serve as a disruptive force in higher education. In this article, we share key themes and findings from a review of the research on high quality technology enhanced learning experiences in higher education. Ideas are organized in three sections: (a) trends impacting higher education learning environments, (b) a framework for exploring the use of technology in teaching and learning, and (c) implications of learning technologies for higher education. Each section expands on

the ways in which contemporary learning technologies and innovative pedagogies can improve learning in higher education.

TRENDS IMPACTING HIGHER EDUCATION

Higher education learning environments are undergoing changes in the context of major societal and technological shifts. Current advancements in digital and social technologies increase connective, collaborative and expressive human capability. Using networked mobile devices, individuals are accessing and contributing to a growing knowledge base and influencing global conversations. Higher education is shifting from a closed learning environment (prescribed content, teacher directed, pre-selected, distributive, individual expression) to open learning environments (student selected, self-organized, collaborative, participatory, interactive, networked) that invite and enable participation beyond traditional class enrolment (Jenkins, 2009, 2006; Johnson, et al., 2013; Siemens & Tittenberger, 2009). Instructor controlled, content delivery approaches in large lecture halls are giving way to a spectrum of new learning experiences in classrooms expanded with online components, pervasive and mobile technologies, and fully online learning experiences that engage global learners in virtual environments and progressive participatory cultures (Graham, Woodfield & Harrison, 2013). Technology-enhanced learning environments, defined “as complex learning environments that enable appropriate use of technological resources in order to continually enhance the conditions conducive to learning,” (Brown, 2013, p. 304) enable learners to connect, collaborate and create knowledge with others in online and offline spaces and across geographic boundaries using 21st century literacies that are increasingly important for today’s graduates (Jenkins, 2006, 2009).

Current research on learning and signature pedagogies (Shulman, 2005; Schank, 2011) influence faculty designs to include more meaningful, relevant and connected learning experiences. For instance, several qualities of participatory cultures, such as openness, collaboration and interactivity (Jenkins,

2009, 2006), are combined and actively designed into technology enhanced learning experiences to promote knowledge building and to make learning and teaching more visible in higher education (Bereiter & Scardamalia, 2010; Clifford & Friesen, 1993; Hattie, 2009; Jacobsen & Friesen, 2011; Sawyer, 2012, 2006; Thomas & Seely Brown, 2011). Technology plus transformative pedagogies enable teachers to expand beyond being the sole information provider and embrace their role as designers of engaging and interactive, technology enabled, participatory learning experiences. Research on the importance of community and how technology can enable and enhance the development of global learning communities continues to evolve. Students work on meaningful and authentic learning tasks in connected learning communities, and learn by working alongside diverse peers, build on previous experiences, and work collaboratively to construct knowledge (Anderson, 2003a, 2003b; Bransford, Brown & Cocking, 2000; Garrison & Anderson, 2003). Images of high-performance, multi-disciplinary research teams in which novices and experts come together to address genuine problems in the field are better suited to how people learn best in higher education than the information delivery models that have persisted in the 21st century (Bransford, Brown & Cocking, 2000; Sawyer, 2006, 2012; Swartz & Fischer, 2003, 2006). Research demonstrates that people learn best by doing, rather than learning about first then doing.

Several key challenges that face higher education emerged from the review of literature:

- Learning environments are changing and it can be challenging to develop/use/sustain effective instructional strategies across the spectrum of different course-delivery modalities.
- Programs need continuous research-informed review and renewal to keep pace with technological advances and the changes in how people socialize and learn.

- Theoretical influences on pedagogy challenge educators with a new role as developers of continuous research-informed designs for learning.
- Technological influences on pedagogy require ongoing, continuous support for faculty in advancing knowledge building and social constructivist approaches in technology enhanced and enabled learning environments.
- Advances in learning research challenge faculty to ensure that practices and designs for learning are research-informed and foster both individual growth and collective growth in communities of learners.
- Networking infrastructure and classroom technologies need to support faculty and students to be open, flexible, responsive and connected leaders of learning.
- Changed approaches to teaching, and recent research on learning, challenge higher education to develop authentic approaches to formative and summative assessment.

A current challenge for higher education is the use of contemporary technologies to support conventional information delivery and assessment of learning using tests and grades. A challenge for institutions is to provide networking infrastructures coupled with high quality, continuous professional learning that cultivates and supports contemporary pedagogies and the design of participatory learning environments. Current faculty members need support in designing learning experiences with technology and developing appropriate approaches for assessment and self-regulation (Earle, 2013). Brown, Eaton, Jacobsen, Roy and Friesen (2013) describe an approach to collaborative course design that employs integrated assessments for learning and instructional designs that integrate technology for meaningful learning. Time and resources are needed to support faculty in developing collaborative design teams to incorporate formative and assessment practices in technology-enhanced learning environments.

4C FRAMEWORK

The authors developed a framework based on the review of current literature to organize technology use in higher education within four categories: connecting, communicating, collaborating and creating. Rather than offering distinct, progressive or developmental categories, the framework offers interconnected and mutually reinforcing categories that can be used to explore promising and emerging practices that transform learning experiences and learning environments in higher education. First, making *connections* as part of learning in higher education has expanded beyond classroom walls; technologies can support connections among learners, professors and with local and global experts beyond the classroom. A connected learning environment can be defined by three characteristics according to Smith (2013): (1) Seamless integration with planning and advising services to help students plan for degree completion; (2) Personalized learning with diverse learning options (online, on campus, or through a blended alternative); and (3) Engaged and authentic learning experiences (p. 1). The literature identifies how learning technologies can support connected learning in higher education, such as using tablets or mobile devices, leveraging learning analytics for data-driven decision making and offering Massive Open Online Courses (MOOCs) as a mode of education delivery with no limit to enrolment.

Second, *communicating* in higher education continues to include traditional one-time interactions between professor-learners and learner-learner in classroom spaces. However, technologies have now expanded how and when communications in higher education take place and who may participate in the conversation. Communications with learning technologies can expand knowledge sharing to include a broader audience and provide students with options to control time, space, pacing and playback of communications. Researchers report that using learning technologies for communications increases student engagement (Liu, 2012; Oztok, Zingaro, Brett & Hewitt, 2013; Rajasakeran, 2013), develops higher-order thinking skills (Cheong, Bruno & Cheong, 2012), promotes reflective

interactions (Rogers & Lea, 2005), deepens learning in scholarly communities of inquiry (Garrison & Akyol, 2009), and results in achievement gains and positive student ratings (Brecht, 2012; Kay & Kletskin, 2012; Wong, 2013). Common learning technologies for communication purposes include clicker technologies, mobile applications, videos/flipped classroom approaches, learning management systems, discussion boards, email, blogs, microblogs, and web conferencing.

Third, many of the same technologies used for connecting and communicating can foster *collaboration* and learning alongside and with others. Working in collaboration is a necessary requirement for today's students (Karpova, Correia & Baran, 2009). Examples of technologies currently used for collaboration in higher education are networked mobile devices, wikis, and online collaborative workspaces. Fourth, everyone has the capacity to contribute to collective knowledge *creation*; however, established systems of learning in higher education still emphasize knowledge transfer (Allen, Caple, Coleman & Nguyen, 2012; Martin, Morris, Rogers, Martin & Kilgallon, 2009; Schwartz & Fischer, 2003) and value individual expressions of learning. More emphasis is needed on building expressions of learning through deep learning experiences, collaborative and creative designs and shared knowledge creation. Examples of technologies used for collective creation include games, gamification and virtual worlds. Table 1 organizes the technologies reviewed. The examples are not meant to provide an exhaustive list and many of these examples can be used to illustrate multiple categories in the framework as well as contribute to new conceptualizations of the 4C Framework.

 4Cs Learning Technologies & Learning Opportunities from the Literature

Tablets are used for staying connected to learning networks, to search for resources (i.e. search engines, library websites, news websites, etc.), during fieldwork, and for organization purposes, such as taking notes or annotating lecture templates (Jones, Johnson-Yale, Millermaier & Perez, 2008; Mang & Wardley, 2012; Pegrum, Howitt & Striepe, 2013).

Learning analytics or data analysis techniques of large data sets (Siemens et al., 2011; van Barneveld, Arnold & Campbell, 2012) used to inform and intentionally design and shape higher education learning environments around the learners (Ali, Asadi, Gasevic, Jovanovic & Hatala, 2013; Herrington, Reeves & Oliver, 2010; Fournier, Kop & Sitlia, 2011; Pea, 2006) and for strategic planning and to improve course delivery in online and blended learning environments (Dzuiban, Moskal, Cavanagh & Watts, 2012).

Two types of **MOOCs** are commonly discussed in the literature: c-MOOCs, associated with connectivism (Siemens, 2004) are open with freely provided materials designed to foster connections and collaborative knowledge building extended to global participants and x-MOOCs follow a more tutor-centric model with levelled progressions (Rodriguez, 2013).

Clickers, easy-to-use, increase performance through instantaneous feedback, increased attention, attendance and participation (Keough, 2012) and student engagement (Liu, 2012; Rajasakeran, 2013).

Mobile applications are found to engage students, promote higher-order thinking skills in lectures and interactive processes (Cheong et al., 2012); can extend reach of communications beyond the classroom.

Videos can be used for a **flipped classroom** or inverted approach in which the lecture and homework are reversed (Hamdan, McKnight, McKnight & Arfstrom, 2013) and many faculty experiment with the flipped classroom model (MacMillan et al., 2013). Studies found video lectures and access to online recordings/tutorials for repetition or adapted pacing can result in achievement gains and positive student ratings (Brecht, 2012; Kay & Klestskin, 2012; Wong, 2013).

Students find access to managed course content and communications valuable (Naveh, Tubin & Pliskin, 2010) even though **LMS** are modeled after traditional pedagogies (Jones et al. 2008; Dunlap & Lowenthal, 2009) and emphasize content delivery (Siemens & Tittenberger, 2009).

Discussion boards offer asynchronous text-based communications, reflection and interactions can promote social presence, a shared sense of belonging, shared social identity (Rogers & Lea, 2005) and deep learning in scholarly communities of inquiry (Garrison & Akyol, 2009).

Email commonly used for class communications, announcements, to seek/provide clarification, submit assignments, share resources/course materials, set up meetings (Jones et al., 2008; Karpova et al., 2009) and can positively impact student engagement and provide a sense of community (Oztok et al., 2013).

Individual **blogs** are mainly used for self-expression and dissemination of ideas with potential for commentary and discourse (Schwier, 2013) and authentic writing and reflection (Bartholomew, Jones & Glassman, 2012). Community blogs with co-ownership provide opportunities for contributions to a larger professional learning network (Bartholomew et al., 2012).

Microblogs are used for interactions, information/resource sharing, requesting/offering assistance, commentary, and networking with others, to name a few (Veletsianos, 2012).

Connecting

Communicating

Web conferencing is used for synchronous virtual learning mainly for seminar presentations (Falloon, 2011). Although technical issues are often cited as a barrier for web conferencing, Karpova et al. (2009) found web conferencing useful for brainstorming and group decision-making in comparison to other communication tools, such as discussion boards.

Personally owned **networked mobile devices** are common (Chen & Denoyelles, 2013), enable learners to consume and produce content (Anderson, 2013) and learning designs can increase participation, communications and collaboration with peers (Andreu, Delgado-Almonte & Pedraja-Rejas, 2010).

Online collaborative workspaces using cloud computing and shared applications allow for collaborative creation (feedback, tracking changes) and shared knowledge building (group contributions). Schneckenberg, Ehlers & Adelsberger (2011) reported increased student engagement and positive student ratings for online collaborative learning sessions using Google Apps.

Open access **wikis** or secured wikis integrated in the learning environment are used and Carroll, Diaz, Meiklejohn, Newcomb and Adkins (2013) found academic writing improved through a collaborative, iterative and competitive process of publicly sharing, reviewing and critiquing peers' contributions.

Collaborating

Educational **games** (e.g., computer games, video games) and **gamification**, that is a combination of game and non-game elements, are reported to support critical thinking, creative problem solving, team work (Johnson et al., 2013) and active learning (Lee & Hammer, 2011). Students are also motivated and engaged through design and creation of games for learning (Li, Tay & Louis, 2012; Tzuo, Isabelle, Ling, Yang & Chen, 2012; van Eck, 2006).

Higher education institutions are experimenting with personalized and immersive online environments to supplement classroom learning or for online learning in **virtual worlds**, such as Second Life (Tan & Waxman, 2013). Potential uses of virtual worlds include communication, collaboration, interactions through role-play activities, synchronous meetings, simulations, group projects, problem-based learning (Inman, Wright & Hartman, 2010) and collaborative creative design tasks (Keskitalo, Pyykkö & Ruokamo, 2011; Tan & Waxman, 2013).

Creating

Table 1: Promising learning technologies and practices in a 4C Framework

Despite common barriers cited in the literature that can inhibit the adoption of learning technologies and innovation, such as leadership, faculty and staff capacity, institutional characteristics and technological infrastructures (Buabeng-Andoh, 2012; Buchanan, Sainter & Saunders, 2013), learning technologies are being used effectively for connecting, communicating, collaborating and collectively creating in higher education learning environments.

IMPLICATIONS FOR HIGHER EDUCATION

Essential conditions for effectively using learning technologies in higher education that we distilled from the literature include:

- Leadership in developing effective institutional vision and aligned processes (Dziuban et al., 2012; Jackson, 2013; Taylor & Newton, 2013)
- A culture that values learning, risk taking and ongoing faculty development (Dziuban et al., 2012; Jackson, 2013)
- Robust and reliable technological infrastructure and technologies (Dziuban et al., 2012; Inman et al., 2010; Kenny, Van Neste-Kenny, Park, Burton & Meiers, 2009; Mang & Wardly, 2012) and hardware/software requirements
- Technologies for learning are integral components purposefully incorporated in the course with clear objectives and across different course delivery modalities (Inman et al., 2010; Lin, Hoffman & Borengasser, 2013; Kerawalla, Minocha, Kirkup & Conole, 2009; Mang & Wardley, 2012; Pegrum et al., 2013)
- Instructional designs consider logistics for use and pedagogies fostering authentic, student centred learning experiences, creative development activities and collaborative knowledge building, all of which need to be surrounded by authentic approaches to formative and summative assessment (Inman et al., 2010; Jackson, 2013; Karpova et al., 2009; Kerawalla et al., 2009; Lin et al., 2013; Mang & Wardley, 2012)
- Student guidance, support with benefits/scaffolded experiences w/learning technologies (Inman et al., 2010; Lin et al., 2013; Kerawalla et al., 2009; Mang & Wardley, 2012)

Innovative use of learning technologies is occurring in higher education and research can inform faculty, leaders and institutions about participatory learning designs; however, more research and support is needed to improve learning experiences and to keep pace with new approaches to connecting, communicating, collaborating and collectively creating in a global community.

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LEADING TEACHER LEARNING & CHANGE IN THE PROFESSIONAL LEARNING COMMUNITY: ONE SCHOOL'S TRANSFORMATION TOWARDS IMPLEMENTING MEANINGFUL PLCs

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Written from the perspective of an elementary school principal, this paper supports the notion that teacher professional development occurs when teachers collaborate in professional learning communities. Grounded in the literature, this paper begins with an overview of professional learning communities. Next, an analysis of the expectations involved when teachers collaborate is explored, followed by a scrutiny of the role of school leaders in professional learning communities. Woven throughout the paper are examples from one elementary school's attempts to implement meaningful professional learning communities.

PROFESSIONAL LEARNING COMMUNITIES IN CONTEXT

Professional learning communities are focused on collaborative learning to enhance teacher effectiveness in order to improve students' learning and achievement (DuFour & Eaker, 1998; Southworth, 2011; Stoll, 2011). Such a focus represents a fundamental shift in how teaching and leading are historically perceived (Southworth, 2011). As a school-based instructional leader, my notion of professional learning communities (PLCs) is grounded in two assumptions. First, I assume

knowledge is situated in the day-to-day lived experiences of teachers and is best understood through critical reflection with others who share the same experience (Vescio, Ross & Adams, 2008). Second, I assume that actively engaging teachers in professional learning communities increases their professional knowledge and enhances student learning (Vescio, Ross & Adams, 2008).

The school where I am a principal is a kindergarten to grade six elementary school located in a large urban centre. We serve a highly diverse, multicultural and mobile community. Within the school's population of approximately 420 students, over 80% of students receive special programming or additional support. As the school's instructional leader, I have organized professional learning opportunities for the school's teachers with a focus on improving pedagogical practices and learning about learning. Specifically, as a staff, we are working together to create meaningful, genuine tasks for students; this has helped build commitment in our school to incorporate research-based knowledge as well as subject it to discussion and examination. Over the past four years, we have worked to establish a school-wide culture of professional learning. We have organized and re-organized our professional learning communities to reflect the type of collaboration we feel is inclusive, genuine, ongoing, and focused on critically examining practice with a purpose to improve student outcomes.

As professional learners, we have framed our PLCs around five key principles (Stoll, Bolam, McMahon, Wallace & Thomas, 2006). First, our PLCs are structured around a shared vision and purpose. We have created a protocol (Brown Easton, 2009) to use each time we meet. This protocol reflects three documents teachers have used extensively in the school as part of our professional learning conversations: Friesen's (2009) Teaching Effectiveness Framework and Rubric, Alberta Education's (2010) Inspiring Education document, and the Galileo Educational Network's Discipline-Based Rubric for Inquiry Studies (n.d.). Second, each teacher in the PLC takes collective responsibility for the PLC. We have created roles for ourselves to use each time we meet. One person takes a turn presenting; others act as "worriers" for each role, ensuring questions are asked from the perspective of

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each role. No one stays in a specific role; a different role is assigned for each meeting. A sample of this protocol is included as Appendix A. Third, there is deep reflective professional inquiry. An important part of the conversation occurs when teachers bring their problem of practice to the group. Through mutual conversation and case analysis, teachers apply new ideas to their own classrooms. As one teacher said, “I find it useful to hear what the other teachers are doing and to work collaboratively to develop projects. It is helpful to have the expertise of peers provide feedback and share experiences”. Fourth, group as well as individual learning is promoted. All teachers are learners with their colleagues. As one teacher articulated, “having others share what they are doing in the classroom provides me with new ideas for my class. The feedback and ideas I have received when I have presented has been an opportunity to enhance and improve my lessons”. Last, there is a strong element of collaboration. Feelings of interdependence are expressed and the PLCs have evolved with the general understanding that better teaching practice may not have happened without them. It is this element of collaboration that I specifically want to address next.

THE PROFESSIONAL LEARNING COMMUNITY AS COLLABORATIVE PRACTICE

In a number of the top systems examined by McKinsey & Company (Barber and Mourshed, 2007), teachers have moved beyond the individuality traditionally associated with teaching and are participating together in authentic professional learning opportunities. The feedback from the teachers at the school support this notion, as one teacher said, “PLCs are an effective format for sharing and discussing the work we are doing in our classrooms. It also provides a format for receiving feedback on our work from our colleagues”.

In effective professional learning communities members take collective responsibility for the learning of students (Lieberman & Miller, 2011; Robinson, 2011). Teachers work together to solve problems of practice; “knowledge is “shared, ‘big questions’ about classroom practices are discussed, and the identification of problems and solutions requires a combination of information from student

assessments and the shared professional knowledge that teachers and administrators bring to the table” (Anderson, Leithwood, & Seashore Louis, 2012, p. 231). Further, professional learning communities appear to support sustainable improvements because they build the capacity that helps schools continually progress (Levine, 2011; Stoll, 2011). Based on the premise that educators can learn from each other, learning communities can create and maintain an environment that fosters collaboration, honest talk, and a commitment to the “growth and development of individual members and to the group as a whole. [Professional learning communities] work from the assumption that teachers are not mere technicians who implement the ideas of others, but are intellectuals who are doing knowledge work” (Lieberman & Miller, 2011, p. 16). As one teacher at the school articulated, “I liked when the members of the PLC were excited to share their strategies in the classroom, and then I would go back and try something new”.

A collaboration model for professional development is particularly appropriate because of the importance of shared knowledge and expertise in the development of thinking (Hadar & Brody, 2012). Collaborative practice involves professionals working together to develop “effective instructional practices, studying what actually works in classrooms, and doing so with rigorous attention to detail and with a commitment to not only improving one’s own practice but that of others as well” (Mourshed, Chijioke & Barber, 2010, p. 75). Hattie (2009), in his synthesis of over 50,000 studies and 800 meta-analyses of student achievement, concluded the “remarkable feature of the evidence is that the biggest effects on student learning occur when teachers become learners of their own teaching” (p. 22). This is reflected in one teacher’s comment, “I really like how there are other ideas out there. It is great when each member of the group has something they are strong at to help me and give suggestions for feedback”.

As seen in the evidence above, in the literature on professional learning communities, ‘teacher collaboration’ is a widely used concept. However, collaboration is also a problematic concept as it has

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varying meanings with regard to the quality of collaboration and learning outcomes. Further, too much collaboration can emphasize conformity to group norms at the expense of inventiveness and initiative (Opfer & Pedder, 2011). Additionally, high group cohesion may lead to ‘groupthink’ where group members agree too much with other group members and have lost the ability to be critical (Meirink, Meijer, & Verloop, 2010). Further, group processes are dynamic. As such, individuals in the group will exhibit different levels of openness to change and innovation (Hadar & Brody, 2012). As one teacher has articulated to me recently, “I find that the style that we have started with this year where people are assigned to different tasks is a little distracting, as there is a tendency to get bogged down in minutiae rather than exploring the ideas presented”. Furthermore, it is quite possible in some circumstances individuals may benefit from collaboration, whereas for others, possible power structures existing in the group may inhibit learning (Webster-Wright, 2009).

Further, as Opfer, Pedder, and Lavicza (2011) contended, collaboration driven by deep, personal, and enduring interest and motivation is challenging to achieve, as the level of trust and risk-taking required to learn in a collaborative environment is difficult. It must be noted it has taken four years of dialogue, collaborative learning opportunities, feedback, and experimented PLC formats to come to this protocol model of professional learning. Mutual trust, respect and supportive collaborative conversations take time to build. Additionally, each year we reflect on how we’ve organized PLCs at the school and have a conversation about what is working, what is not, and how PLCs should continue. It is in my opinion; this is where the role of the leader is instrumental.

THE LEADER’S ROLE IN PROFESSIONAL LEARNING COMMUNITIES

Professional learning communities do not seem to develop naturally. School principals’ leadership in the area of teacher professional learning is critical to the creation and success of a school learning community (Anderson et al., 2012; Bredeson & Johansson, 2000; Robinson, 2011; Wahlstrom & Seashore Louis, 2008). The school principal is “often the catalyst in intentionally creating a PLC

since ‘this is not the way schools are typically organized’” (Levine, 2011, p. 33). To do this complex work, principals require skills in communication, conflict mediation, and data management (Sackney & Walker, 2006). Furthermore, Speck (1999) suggested in developing learning communities, the principal and staff need to confront questions about expectations for students, responsibility for data, the role of the principal in the PLCs, and how the PLC will know when students have reached the desired outcomes.

Speck (1999) stated the principal “must be the reflective practitioner who is capable of continuous learning and reflecting on practice as opportunities for leadership and modeling throughout the school” (p. 34). Blase and Blase (1999) in their research noticed effective instructional leaders promoted teachers’ professional growth in collegial conversations about teaching and learning. These leaders enhanced the collaborative community in their schools by supporting the development of coaching skills and reflective conversations among educators. Further, they worked to provide time and opportunities for peer connections among teachers. Blase and Blase (1999) concluded that teachers appreciated these opportunities as it demonstrated the belief that growth and development are most likely to occur with open, mutual, critical dialogue among professionals.

I have learned that leading the learning community goes beyond the realm of the work of the school principal; rather, success in a professional learning community occurs when leadership is shared, teachers are empowered to examine the data with their colleagues, and are trusted by the leaders in the school to make informed decisions about teaching and learning (Stoll, 2011). Principals need to “ensure that the strategies, structures, processes, and systems are in place so that educators are touched with inspiration and mobilized to form relationships and thereby transform the school into a learning community” (Sackney & Walker, 2006, p. 354). As Speck (1999) observed, the “essence of principalship is creating a collaborative school where learning really matters and the community of learners cares deeply about each student’s achievement” (p. 5). Therefore, it is up to principals and

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teachers to make certain that professional learning communities remain focused on their original intent: places of collaboration, learning, and community, where professionals strive to ensure their schools and all their students are the best they can be.

CAUTIOUS OPTIMISM

As successful as professional learning communities have the potential to be, the evidence of links between professional learning communities and student learning outcomes is somewhat unexceptional (Stoll, 2011; Robinson & Timperley, 2007). The key to increased student achievement seems to be learning communities with a persistent focus on student learning and achievement by the teachers in the learning communities (Hargreaves, 2008; Stoll, 2011). As well, the opportunity to process the meaning and implications of new learning with one's colleagues appears to be fundamental to the change process (Timperley, Wilson, Barrar, & Fung, 2007). Therefore, if teachers focus on analyzing the impact of teaching on student learning and process new understandings and their implications for teaching, then the professional learning community should positively impact student learning.

At their best, professional learning communities are “powerful organizational strategies to enable and empower teachers and others to learn and work together in improving the quality and results of teaching, learning, and caring for all their students” (Hargreaves, 2008, p. 187). The capacity for reflection, inclusiveness, and collaboration that lead to the attractiveness of models such as this can also be their undoing, especially when followed by compliance, rhetoric, and prescribed normalcy (Hargreaves, 2008). As such, researchers strive to determine which learning opportunities are effective for creating change in teachers' practice (Guskey, 2009; Mesler Parise & Spillane, 2010; Timperley et al., 2007), however the research is broad. This is problematic for practice as it is “unclear whether time and money should be spent on expanding teachers' formal professional development, on working to better enable teachers to learn from their colleagues on the job, or on some combination of the two approaches” (Mesler Parise & Spillane, 2010, p. 324).

Based on my experiences and my reading of the teacher professional learning literature, I recommend effective teacher development activities should be fluid and responsive to the contextual needs of the school. My advice for leaders would be to focus on the richness and relevance of the variety of opportunities for teachers to learn. When teachers work together to deliberate intelligently about student learning and courageously question assumptions within a context that is meaningful to them, improvement is evident throughout the life and learning of the school (Hargreaves, 2008).

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Appendix A

PLC Protocol Roles and Role Descriptions

Presenter	Facilitator	Assessment	Student Engagement	Connecting with Expertise	Technology	Note-Taker
<ul style="list-style-type: none"> - brings planning ideas to the group (at various stages) - brings 'burning' questions - brings problems of practice - brings relevant curriculum - hosts the meeting in his/her classroom 	<ul style="list-style-type: none"> - keeps the conversation going (starts meeting, keeps eye on time) - ensures each participant has an opportunity to be involved - brings in the key resource - documents when necessary (TEF, Inquiry Rubric, Framework for Student Learning) - establishes roles for next meeting - Possible Questions: Why is this important (so what/who cares)? What do you want to improve? What do you hope to see at the end? 	<ul style="list-style-type: none"> - concerned with assessment aspects of the planning & implementation - Possible Questions: How will you incorporate on-going assessment? Peer Assessment? Self-evaluation? Are the assessment criteria collaboratively designed? Have you used a wide-range of assessments to inform your instructional decisions? How will students take this work and establish learning goals & next steps? How do we incorporate teachers, peers, adults from outside the classroom in the assessment of the work? What will be your assessment artifact? 	<ul style="list-style-type: none"> - ensures the inquiry study leads students to build deep knowledge that leads to deep understanding - Possible Questions: Does this inquiry originate with an issue, problem, question, or exploration that provides opportunities to create or contribute to knowledge? Does this work ask students to engage in collaboration with each other and with the discipline? Is this a 'real' problem (one that is central to the discipline?) Are students asked to engage in thinking requiring strong habits of mind, innovation & creativity? Is this inquiry "hard fun"? 	<ul style="list-style-type: none"> - connects the inquiry to the larger community - Possible Questions: Will this inquiry ask students to think, act, and engage with ideas and core concepts as a historian, chemist, biologist, writer, journalist, etc. would? How does this inquiry require students to address relevant outcomes, but still be grounded in life & work beyond the school? Whom should we talk to about further external expertise in this area? 	<ul style="list-style-type: none"> - reflects on using technology appropriately in the inquiry study - Possible Questions: What technologies do you think are most appropriate to the task? How do we ensure ongoing, online access to the study as it develops? Where should you go for expertise in this area? How will students use technology to demonstrate learning (artifacts, etc.)? What is a good timeline for technology use (start of inquiry, middle, end)? 	<ul style="list-style-type: none"> - ensures the conversation is captured (for both the presenter and the group) - posts the minutes on the school's lite-site in the PLC folder

EXPLORING NEW FRONTIERS IN SELF AND PEER ASSESSMENT

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Visible Assessment^{for} Learning

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Inspired by the goal to lead teacher learning and development in language and literacy in secondary humanities, educational leaders from three Alberta school jurisdictions are working together to create a network of research, improvement and innovation in writing instruction and assessment. Drawing from current leadership, literacy and instructional research, this paper presents a collaborative journey in developing innovative strategies in peer and self-assessment of writing. Clear instructional leadership goals saw the emergence of a technology application for peer and self-assessment that is developed locally in Alberta with and by teachers to meet the unique and changing needs of Alberta students.

INTRODUCTION

The benefits and power of feedback on improved student competencies and learning outcomes have been confirmed through a number of studies and meta-analyses (Kluger & DeNisi, 1996; Hattie, Biggs,

& Purdie, 1996; Hattie, 2009, 2011; Hattie & Timperley, 2007). Subsequent attention on a broadened conception of peer assessment as a viable means for providing feedback accompanied by self-assessment, is receiving renewed attention for its potential to improve student self-efficacy, learning, and achievement (Topping, 2009, Andrade & Valtcheva, 2009; Sendzuik, 2010; Panadero & Alonso-Tapia, 2013; Panadero, Romero & Strijbos, 2013). Though these evidence based studies attest to the value of peer and self-assessment, the practical logistics of finding and implementing efficient and effective classroom strategies continue to challenge educators and researchers alike. In addition, providing students with feedback does not ensure that action by the student will be taken since action presumes that students understand what they need to do.

Innovative learning and teaching practices present unique challenges of their own, notably the need for teacher professional learning and support in classrooms. Leadership practices play a key role in guiding teacher learning and development for high quality learning (Robinson, 2011). Teachers who see leaders as deeply involved in collaboratively analysing student learning needs and committed to developing teacher capacity in instructional strategies to meet those needs, are empowered to lead change in their own classrooms: “The most powerful way that school leaders can make a difference to the learning of their students is by promoting and participating in the learning and development of their teachers” (Robinson, 2011, p. 104). This paper describes how leadership practices led to increased teacher collaboration between subject discipline areas (social studies and English) and change in how writing was taught and assessed in senior high classrooms. This change in learning and teaching strategies led to the development of an innovative technological application (*PeerVision*®) that attempts to address some of the complexities as well as barriers to implementing peer and self-assessment strategies.

LEADERSHIP OF TEACHER LEARNING

AISI Cycle 5 provided the opportunity for drawing together three school districts in the goal of improving high school writing instruction and assessment through interdisciplinary learning. The first step was to draw high school Social Studies and English Language Arts teachers together to look at shared goals, common elements of persuasive writing between discipline areas and consider how collaborative practices could enhance student understanding of learning outcomes and competencies. Teachers and department heads were consulted by district senior leaders and invited to information sessions. “Buy in” surveys were conducted to determine next steps. Based on positive feedback, a research oriented professional learning plan was developed with clear, straightforward goals and timelines.

Robinson’s student-centered leadership principles, five dimensions supported by three leadership capabilities (2011, p. 16), were the drivers for planning and action. Time was spent building relational trust prior to the development of instructional goals guided by dimension three - a coherent instructional program (pp. 84-101). Teachers were assisted to develop a common instructional framework representing coherence within and between grade levels in the two discipline areas, reinforcing the same ideas, using similar vocabulary, linking with previous learning and guided by common assessments. Two student learning goals were selected: to improve student critical thinking leading to increased competencies in persuasive writing; to improve student engagement through a more interdisciplinary approach in senior humanities (social studies and English). Instructional goals focused on teacher collaboration in creating a common instructional framework comprising curriculum, instructional strategies and assessments that are coordinated within and between grade levels. Funding was secured to support release time for teachers to attend professional learning sessions facilitated by an external researcher. District learning coaches, who also attended the sessions, functioned as a bridge between teacher learning and implementation of strategies in classrooms, working alongside teachers

with students. Feedback surveys were conducted after each learning session and teachers participated in the ongoing planning for professional learning.

STUDENT SELF AND PEER-ASSESSMENT

While feedback is clearly the most effective formative assessment strategy (Hattie, 2009), its conceptual construct is not straightforward. Hattie and Timperley (2007) provide a deeper explanation than can be covered in this paper but in summary, feedback provides information to students about their performance and can be understood as teachers and students asking and answering three feedback questions (Hattie & Timperley, 2007): Where am I going? How am I going? Where to next? When feedback is utilized by the learner to restructure knowledge, whether it be domain based or metacognitive (Winne & Butler, 1994 in Hattie, 2009) then it is best understood as intertwined with instruction: “the process itself takes on the forms of new instruction, rather than informing the student solely about correctness” (Kulhavy, 1977, p. 212). Feedback does not have to come from the teacher alone – and this is particularly important when considering the realities of timeliness and large class sizes. Feedback from peer review has multiple benefits; not only are students receiving information regarding performance that generates change, there is learning for the student and teacher inherent in the process itself (Topping, 2009). However, the success of the strategy relies on students developing their own personal competence in complex appraisal as well as possessing fundamental conceptual knowledge: “what is required is not peer assessment as routine activity or busyness but purposeful peer assessment that is designed with a clear pedagogical intent, namely to provide students with practical experience and a body of conceptual knowledge” (Sadler, 2010, p. 541). *PeerVision*® is a technology solution that assists with developing student competence in self and peer assessment while at the same time providing support with the domain specific conceptual knowledge base needed for the appraisal process.

THE INNOVATION

Clear instructional leadership goals set the stage for the creation of a technology application developed locally in Alberta with and by teachers to meet the unique and changing needs of Alberta students. *PeerVision*® arose from a non-digital strategy for peer and self-assessment that transformed the writing rubric, an instrument used primarily for summative assessment, into a formative assessment tool. The Annotated Instructional Rubric© (AIR) is a construct that ‘operationalizes’ the category descriptors within the rubric, providing students with the language for appraisal as well as specific directions for re-envisioning and re-working prose. The development of AIR was found to be a powerful tool for student engagement in peer and self-assessment of writing, providing students with ready access to the language for learning in order to provide effective feedback. Results from student surveys and reflections revealed that students felt empowered to analyze their own and peer writing, to take ownership for their work and developed awareness of self as writer thereby regulating and personalizing their own learning (de Leeuw, 2011).

Reinventing this strategy as a web based application further enhanced the application of the non-digital strategy. Figure 1 below provides a visual representation of the process. Students are able to engage asynchronously, anytime from anywhere; the application is housed on local or school servers and provides a safe and secure environment for anonymous peer review of written assignments – student information is protected; student self-assessments are visible to the teacher but not to the peer reviewer; the application has built in scaffolding for assisting students with the language for appraisal while also providing flexibility for creating student generated reflective comments; there is flexibility in the number and order of peer reviews as well as multiple opportunities for re-envisioning written work; students receive anonymous feedback from peers as well as feedback and/or summative assessments from their teacher; there is teacher capacity to create peer review groups (not visible to students) within a class.

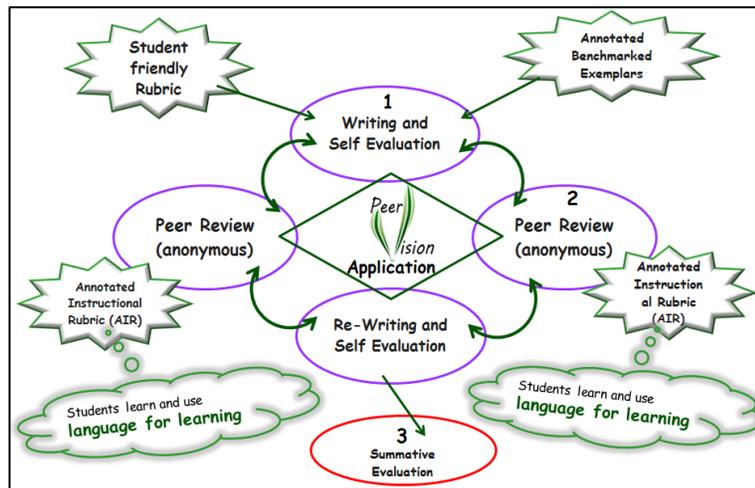


Figure 1: Visual Representation of *PeerVision*® Strategy

CONCLUSION

Next steps involve gathering more feedback from students and teachers as to the effectiveness of *PeerVision*® in improving student engagement, motivation and achievement. Qualitative and quantitative perception data will be analysed as well as standardized assessments. Future goals for *PeerVision*® are to broaden its application to a wider range of learning tasks and age groups and to utilize learning analytics to assist students and teachers with developing targeted learning and teaching goals. Learning analytics is an emergent field of research that aspires to use data analysis to inform decisions empowering students with the capacity to create personalized learning goals and plans in critical thinking and writing. An interface for teachers to create their own annotated instructional rubrics is underway.

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HOW THE USE OF CONNECTIVE WORDS IS RELATED TO LEARNING

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When contributing as engaged citizens in society, learners need to articulate their ideas clearly, precisely, accurately, and succinctly with the use of connective words. Connective words are linking devices that can help state an opinion or discuss an argument so that ideas are communicated effectively. When learners use connective words (e.g. when, next, because, furthermore, and although), they are forced to state their ideas in an organized way, often using prior knowledge to further explain their thinking.

CONNECTIVE WORDS IN WRITING CRITICALLY

To enhance critical thinking skills in writing, connective words are used to link ideas to help form an argument, state a point of view, or develop an opinion. From this work, strategies will be identified to incorporate the use of connective words into writing so that all learners, ranging from early elementary school to adult learners, can clearly articulate the ideas they wish to communicate.

Connective words link ideas between two clauses so that logical connections between ideas can exist (Cain & Nash, 2011; Degand & Sanders, 2002; Halliday & Hasan, 1976; Millis, Graesser, & Haberlandt, 1993; Sanders & Noordman, 2000). Halliday and Hasan (1976) pointed out the four different types of connective words that are commonly used in text:

1. Temporal connective words: indicate a sequence of events such as *before* and *after* (e.g. The teacher gave the assignment to the students *after* they entered the class.)
2. Causal connective words: help learners to understand why things occur, such as *because* or *so* (e.g. The students were happy *because* they had completed their final exams.)
3. Adversative connective words: are used to provide contrasting information such as *but* and *although*. (e.g. The children were happy to be home, *although* they still missed the beach in Mexico.)
4. Additive connective words: are used to show addition such as *also* and *another* (e.g. *Also*, we can get to the beach by walking over the bridge.)

The following chart in Table 1 shows an example of some of the connective words derived from the studies of Crosson and Lesaux (2013); Halliday and Hasan (1976), and Halliday and Matthiessen (2004).

Temporal		Causal		Adversative		Additive	
after	as	because	consequently	Although	Anyhow	Actually	also
before	first	Even if	for	At least	but	and	As well as
next	now	If	In that case	however	instead	In fact	or
soon	then	since	so	only	Or else	furthermore	In addition
when	finally	That's why	Therefore	Even though	yet	For example	For instance

Table 1: Examples of Connective Words

Writing strategies need to be in place so learners can carefully plan and articulate their critical thinking skills. Nosich (2009) explained, “to learn to think critically, is to learn to think things through, and to think them through well: accurately, clearly, sufficiently, and reasonably” (p. 13). By creating an effective writing plan, learners can communicate ideas or thoughts by incorporating the use of connective words that combine logic and organization. Ideas can be communicated and assumptions challenged with the use of connective words. When connective words such as *when*, *although*, and

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furthermore, are used correctly, Brookfield (1987) stated that learners can challenge assumptions, thoughts, and feelings, which is a result of critical thinking.

Brookfield (2005) also reasoned that critical thinking is a lived activity and it is necessary for interacting in a democratic society. One of the important traits of a critical thinker is to arrive at the best possible answer by using reasoning skills (Nosich, (2009). Connective words can be helpful when using prior knowledge to explain an idea, and develop a point of view. For example, when a variety of connective words are used to express an opinion, it can enhance the critical thinking skills that are required in academic writing.

Paul and Elder (2008) believed that the sooner learners develop sound reasoning skills; the more likely they will become more reasonable, open-minded thinkers. They found that learners need to articulate thoughts clearly and use purposeful thinking to state these thoughts. Connective words can be used to link ideas so that thoughts are clearly communicated to others. Facione (2004) argued that in society, people need to become responsible citizens by making good decisions. This can be accomplished by using clear and insightful reasoning skills with the use of connective words.

Browne and Keeley (2010) argued that excellent writing and speaking skills are necessary in helping learners to react critically to information presented in a web site, to judge the quality of information, form an argument, or write an opinion paper. Also, Browne et al. (2010) found that well supported arguments help make inferences, which is the process of reasoning in critical thinking. More important, when learners use specific connectives in a discussion, it helps them to develop a more reasonable argument. For example, by applying connective words to thinking critically, learners will be able to question all assumptions wisely, engage in logical discussions, thus improving reasoning skills. The reasoning skills will help students acquire wisdom and a sense of wellbeing through a supportive and encouraging learning environment (MacKeracher, 2004).

According to Facione (2004), it is important to use tools to think reflectively, gather information, consider options, explore possibilities, formulate thoughts about what to do, and why certain choices are the best ones. Facione (2004) also stated that it is reasoning based on what we have learned through careful analysis, evaluation, explanation, and self-correction to make good decisions in judgment. With the guidance of using connectives appropriately, learners will be able to weigh options and act on reasoning to successfully communicate thoughts.

Fostering a safe learning environment

Using connective words in writing and speaking requires risk taking. First, instructors must build a relationship of trust for a safe environment in which learners will be comfortable in taking risks. By respecting others and valuing their opinions, learners must be encouraged to try out a variety of connectives to enhance their ideas in writing. This risk taking, according to Brookfield (1987) should ensure that the fundamental integrity of individuals is respected.

Being a respectful listener when experimenting with connective words, is achieved by coming to understand viewpoints of others, with positive gestures and appropriate body language in place. According to Brookfield (1987), the worst thing that a listener can do is use a smirk or a sigh to indicate disapproval of the person who is speaking. Brookfield suggested that we assure others through our body gestures and words that they are respected and valued. If instructors provide a safe environment in which connective words can be tried out through experiential learning, then eventually the learners will be able to use them confidently to provide sound reasoning on a variety of issues. As a result, a community of thinkers will be built when strategies are shared on how connective words can enhance ideas in writing. This is established through trying out the use of connective words in a trustful and respectful setting.

Clear Understanding of Criteria

Learners need to know what is expected of them as well as the necessary steps to achieve success when using connective words. Hattie and Timperley (2007) believed that learners need to know the exact steps that need to be taken to make progress in achieving their goal. It is important to model the strategies for the use of connectives to achieve success in writing. For learners to achieve success, they must be taught the meaning and definition of connective words and how each one can be used to enhance their ideas in writing. Also, there must be time to experiment with a variety of connective words to see which ones work best for different purposes.

Although clear learning targets are important for the successful implementation of connective words, learners also need feedback along the way to determine if they are on the right track. Feedback provides the learners with information regarding their progress in using connective words properly. Marzano (2007) believed that clear learning targets and feedback used together are necessary for successful learning to occur. Locke and Latham (1990) also found that feedback allowed learners to make adjustments in their strategies when they learned from their mistakes. Learners can try out each connective word to ensure that it is used correctly with the use of helpful feedback from others. Hattie et al. (2007) stated that when learners are allowed to make mistakes and grow from them, they are more willing to undertake more challenging tasks. As a result, learners are more likely to take risks by using more challenging connective words rather than playing it safe with easier words.

Planning an argument with the use of connective words needs to incorporate a logical sequence of steps, in which a learner is guided in using the type of connective word that best suits each purpose. Learners need to self-reflect to determine if a particular connective word will enhance the ideas in the argument or whether a different connective is best suited for the explanation. Tomlinson and Allan (2000) argued that the instructor's job is to push the learner into his or her zone of proximal development and successfully coach the student to complete a complex task independently. Through

this process, students will be able to master new skills, create new ideas, and become independent thinkers in solving problems. Carbonell-Olivares (2009) argued that the adversative connective *although* can be used to state an opinion, make a claim, or state a position that contrasts an idea. When used correctly, connective words can be used to justify an opinion or express an idea without criticizing a person or making demands.

Paraphrasing

Connective words can effectively be used when paraphrasing ideas. Sprenger (2005) pointed out that paraphrasing is an aid to help memory. By taking notice of important key words that reflect the main idea of a passage, readers can paraphrase the text using these words. Learners are able to recall the main ideas of a passage if they have paraphrased the text. If students are encouraged to paraphrase ideas, they will be able to retell the new concepts they have learned and evaluate whether a specific connective word enhanced the meaning. Also, it is important for the students to understand the meaning of each connective word and each key word in order to use them correctly and effectively. Knowing the definition of each word is important.

Using the following chart shown in Table 2 can help students to paraphrase ideas with the use of a connective word.

Connective Word	Key Word	Key Word	Key Word

Table 2: Template for Key Words

Collaboration

When students work together collaboratively they can build on one another's ideas. Students learn from one another by observing, and modeling while working as a collaborative team (Lindzey & Runyan, 2007). DuFour, DuFour, Eaker, and Many 2010 confirmed that learning by example is a

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powerful teaching strategy. When students use connectives to explain their ideas, they can learn from each other by pooling ideas, strategies, and skills to gain a full understanding of how to use each connective word effectively. Also practicing the use of connective words in sentences orally before writing them down, gives the students an opportunity to try out different ones before choosing the appropriate one to write down.

Nosich (2009) developed the SEE-I strategy (state, elaborate, exemplify, and illustrate) to help students sharpen their critical thinking skills and explain their ideas succinctly.

State it: State the main idea or point in a clear, precise, and relevant manner

Elaborate: Provide an explanation that is clear, precise, and relevant

Exemplify: Given an example that is relevant, precise, and accurate

Illustrate: Use a graphic organizer, a diagram, a metaphor, simile, or drawing

Halliday and Matthiessen (2004) believed that connective words can be used to enhance, extend, or elaborate one's thoughts. For example, if learners wanted to enhance an idea, they would use connective words such as: although, then, so, for, but, yet, and still. If a learner wanted to extend an idea, they would use connectives such as: and, not only, but, also, except, instead of, rather than, if not, then, and while. To elaborate, connectives would be used such as: actually, or, rather, anyway, indeed, that, for example, for instance, at least, and in other words.

Appropriate connective words are needed to allow students to communicate ideas effectively—in both writing and discussions. For students to participate in a discussion, they can use connective words such as on the other hand or even though to respectfully challenge ideas. Then, once all points of view are heard, students must synthesize complex ideas and information. Connective words are used by students to write a persuasive argument with a well thought out conclusion. Beers and Nagy (2009)

point out that complex ideas must be succinct when expressing an opinion in writing. Thus, it is important to use connectives in an opinion paper.

Of course, a learner-centered environment is required for students to challenge assumptions, explain alternate points of view, and deepen thinking (Jacobsen, Lock, & Friesen, 2013). In this participatory learning environment, learners can adopt ideas and arrive at a new conclusion by using appropriate connective words. Jacobsen et al., (2013) also suggested that learners can deepen their inquiry, develop critical thinking skills, and extend other essential competencies to support higher-order learning and encourage intellectual engagement. Thus, connectives are beneficial in building knowledge because they link new ideas to existing ones.

CONCLUSION

The use of connective words is essential in critical thinking because of the importance of communicating ideas clearly, precisely, and accurately. As responsible citizens in a democratic society, it is important for learners to clearly state their point of view and to build on others' ideas in a respectful manner. Connective words, when used properly, can improve the quality of communication by linking prior knowledge to new information. If learners use connective words when debating a point or stating a point of view, a more scholarly and respectful exchange of ideas can occur. Thus, as a consequence, learners can build on one another's ideas and come up with a solution better than they could on their own.

The following guidelines are necessary for the use of connective words to be used effectively:

- A safe a trusting environment where students can take risks
- A learner-centered environment (inquiry; project based learning)
- Questions that demand higher order thinking skills
- Paraphrasing techniques

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- Verbal practice of the use of connective words before writing them
- Teaching the definition of each connective word in order to understand the meaning.

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APPENDIX

Temporal Connectives		Before	
Words that show a sequence in time		<ol style="list-style-type: none"> 1. During the period of time preceding (a particular event, date, or time) 2. In front of 3. Prior to; earlier or sooner than 	<ol style="list-style-type: none"> 1. Before he ate dinner he had to rest. 2. He looked at the map carefully before he proceeded through the busy streets of Paris.
		Definition	Sentence

As		Then	
<ol style="list-style-type: none"> 1. To the same degree or amount. 2. Equally 3. For instance 	<ol style="list-style-type: none"> 1. As she walked down the hall she tripped. 2. Her smile was as bright as a shining star. 	<ol style="list-style-type: none"> 1. At that time 2. Immediately or soon afterward 3. Next in order of time 	<ol style="list-style-type: none"> 1. Then it started to rain. 2. At first the water appeared to be blue, then gray.
Definition	Sentence	Definition	Sentence

When		After	
<ol style="list-style-type: none"> 1. At what time. 2. At or during which time. 3. At the time or in the event that. 	<ol style="list-style-type: none"> 1. When we were at the waterslides, we had so much fun. 2. The baby began to walk when no one was watching. 	<ol style="list-style-type: none"> 1. Following in time or place. 2. Later in time. 3. If something follows something, it is after it. 	<ol style="list-style-type: none"> 1. After a while, the students became bored with the movie. 2. The girl walked across the stage after her brother.
Definition	Sentence	Definition	Sentence

Causal Connectives		If...then ...	
Words that show why things happen		<ol style="list-style-type: none"> 1. In the event that 2. Whether 3. Used for introducing a situation that may happen or may be real, especially when talking about its results. 	<ol style="list-style-type: none"> 1. If we get our work finished, then we can play computer games. 2. If only she listened to the directions, then she would know what to do.
Definition	Sentence	Definition	Sentence

Because		So	
<ol style="list-style-type: none"> 1. For the reason that 2. As a result of 3. On account of 	<ol style="list-style-type: none"> 1. Because of his continued persistence, he finally solved the problem. 2. Because he gets 10 hours of sleep every night, he is alert and ready to learn. 	<ol style="list-style-type: none"> 1. In a manner or way indicated or suggested. 2. Therefore, thus, hence 3. Then; subsequently 	<ol style="list-style-type: none"> 1. So the little boy went home instead of playing in the park. 2. So, why do you think that Terry Fox is a great Canadian hero? 3. So then he ran upstairs and went straight to sleep.
Definition	Sentence	Definition	Sentence

Even if		Therefore	
<ol style="list-style-type: none"> 1. Whether or not 	<ol style="list-style-type: none"> 1. Even if I had two hours to spare for shopping, I wouldn't go out and buy a suit. 	<ol style="list-style-type: none"> 1. For that reason; so 2. Consequently; thus 3. As a result 	<ol style="list-style-type: none"> 1. Therefore, we must always listen carefully to directions so we get a clear picture of what to do. 2. Therefore, based on the facts, I believe that Terry Fox is a great Canadian hero.
Definition	Sentence	Definition	Sentence

Adversative Connectives		Although	
Words that contrast		1. In spite of the fact that 2. Even though 3. Though	1. Although I had two hours to spare for shopping, I couldn't find the suit I wanted. 2. I worked hard, although I barely got it finished on time.
Definition	Sentence	Definition	Sentence

Rather (than)		Instead	
1. With better reason or more propriety; more properly; to the contrary (instead of) 2. More correctly speaking. 3. More readily or willingly; preferably	1. Rather than playing computer games, I would prefer to create our own game. 2. Rather, I think he was a villain based on the facts you have stated.	1. In the place of something previously mentioned. 2. As a substitute or equivalent 3. As an alternative	1. Instead of treating people unfairly, he could have helped them. 2. She could have gone to bed early instead of waking up late.
Definition	Sentence	Definition	Sentence

Yet		But	
1. Nevertheless, still, in spite of that. 2. To a greater degree or extent 3. Despite anything to the contrary (even so, however, nevertheless, until now, nonetheless, notwithstanding)	1. Yet, we still need the oil to keep our houses warm in the winter. 2. Yet many people still do not car pool or take the train to conserve energy.	1. On the contrary; yet 2. Except; except that 3. Unless; if not	1. It never rains, but it pours. 2. But then the worst storm came from the west. 3. But that is not the worst thing that happened; he also forgot to bring his tent.
Definition	Sentence	Definition	Sentence

Additive Connectives		Also	
Words to add additional information		<ol style="list-style-type: none"> 1. In addition 2. Furthermore 3. And; as well 4. Plus; moreover 	<ol style="list-style-type: none"> 1. Also, we will be studying the effects of acid rain on our crops. 2. Also, based on facts, I believe that we need to conserve our water.
Definition	Sentence	Definition	Sentence

For example		Additionally	
<ol style="list-style-type: none"> 1. For instance 2. Such as 3. Like 	<ol style="list-style-type: none"> 1. For example, many people helped to clean up the wildlife covered with oil from the spill. 2. For example, much wildlife had to find new unpolluted waters to swim. 	<ol style="list-style-type: none"> 1. An enhancement 2. In addition to; in or by way of addition 3. Furthermore; moreover 	<ol style="list-style-type: none"> 1. Additionally, the dolphins also help ships navigate through narrow passages. 2. Additionally, the dolphins play in the water at the aquarium.
Definition	Sentence	Definition	Sentence

For instance		Besides	
<ol style="list-style-type: none"> 1. As an example 2. In this situation 3. In this case 	<ol style="list-style-type: none"> 1. For instance, he could sing, dance, and act, which made him perfect for the part in the play. 2. For instance, both resources stated that many birds died due to the oil spill. 	<ol style="list-style-type: none"> 1. Moreover 2. Furthermore 3. Also 	<ol style="list-style-type: none"> 1. Besides, many animals will benefit from our program to help out the environment. 2. Besides, the internet source states that many animals can survive oil spills.
Definition	Sentence	Definition	Sentence

Definitions extracted from *Merriam-Webster.com*. Retrieved May 8, 2014, from <http://www.merriam-webster.com/dictionary>

CONNECTING AESTHETICS AND ENGAGEMENT IN GAME BASED LEARNING

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Learning with games is perceived as highly motivating and engaging, fostering critical thinking and problem solving skills. Choosing games for classroom use however can be a difficult process. In addition to examining the content, we propose that aesthetics of digital games can indicate important information for evaluating games. Using an example we explain how aesthetics of gaming environments reveal the core learning concepts and provide complexities for deeper engagement. Our paper elucidates ways in which aesthetics provide a socio-cultural context for learners and contribute to motivations and emotions resulting in cognitive engagements.

On the Ground Reporter Darfur (<http://www.radiodabanga.org/darfurgame>) is a game that challenges learners to understand journalism in the course of game play. The player as a journalist experiences the harsh realities of the civil war through depictions of real footage from Darfur. As the game progresses the player assesses and analyzes the prevailing situation in Darfur and presents the data by synthesizing his or her understanding of the information garnered through observation and interviews. Games like *On the Ground Reporter Darfur* provide meaningful and relevant contexts for learning and demonstrating conceptual understanding (Gee, 2005; Gee & Shaffer, 2010; Van Eck, 2006). Games are

perfect simulated environments for learners to encounter and solve real life problems (Gee, 2005; Royle, 2008) where they are often positioned as heroes who transform a virtual world (Barab, Gresalfi, & Arici, 2009). In the game *On the Ground Reporter Darfur*, the players become journalists trying to make a difference through their reporting. As learning and socialization platforms, games also allow for collaborative and organized actions through a dimension of play common to human cultures (Van Eck, 2006). Teachers use a range of COTS (commercial off-the-shelf) games such as *Sim City* and *Civilization* for classroom use based on the connections to the curriculum or subject matter (Van Eck, 2006). Various authors offer guidance towards using such games in the classrooms. However, choosing games for classroom use require many considerations including the level of engagement of students, alignment of the curriculum outcomes, student motivation, their prior knowledge and so forth. Constructing engaging activities to advance cognitive development is a challenge for teachers for any type of content (Terry, Mishra, Henriksen, Wolf & Kereliuk, 2013). We propose that aesthetic qualities of games be examined in selecting games for classroom use. We suggest that aesthetics of games help learners engage in critical thinking towards production of assessable artifacts such as written reports as in the game *On the Ground Reporter Darfur*. In the following section, we discuss what we mean by aesthetics of games and how teachers could examine aesthetic qualities of games ensuring their curriculum connections as well as motivational aspects of learning.

LITERATURE REVIEW

Kirkland, Ulicsak and Harlington's (2010) research discovered that teachers are often hesitant to use games for teaching even though they are aware that games can be effective means for acquiring certain knowledge and skills. Their study identified the possible challenges as finding proper pedagogical techniques and learning goals for games. As it comes with any new pedagogical approaches, using games for learning requires appropriate assessment and adequate time to complete activities. Similar concerns over assessment were observed by Sandford, Ulicsak, Facer and Rudd (2007) in using non-

educational or COTS games in schools. Van Eck (2006) further argues for an alignment of the curriculum and the game structure to avoid compromising the learning outcomes for entertainment.

Educational games such as *Pirates!*, *Cuckoo Time* and *BioHazard* which incorporate academic knowledge as a tool for achieving game goals (Squire, 2011) are used in classrooms and chosen exclusively based on their content. However the hurdle faced with wider usage of games in classrooms is due to the lack of understanding of the effects of gaming environments on learning and a corresponding lack of theory and practice for their design and implementation (Shute, Rieber & Van Eck, 2012). Based on the available literature, we understand that the selection of games for classroom use is dependent either on the criteria of relevant subject or skill development such as problem solving. We address the lack of theory and practice in game evaluation by analyzing the aesthetics of games and its significance for evaluation purposes.

An aesthetic experience as Gadamer (2011) explains is similar to being pulled out of one's subjectivity and into a web of relations that demand his or her attention. An aesthetic understanding according to Jardine (2006) depends on the notion of play derived through participation in moments of opening or venture. Such moments are crucial for individuals in deciphering the ways of the world (Jardine, 2006). This notion is reiterated by Egenfeldt-Nielsen, Smith and Tosca (2013) from a purely technical point of view when they define aesthetics in games as not how a game sounds or looks but how all its characteristics including audiovisuals, rules, geography, temporal features and number of players work in unison to showcase the experience of "how it plays" (p. 117).

Within learning environments aesthetic experiences make the learning immersive, meaningful, coherent, complete and transformative (Parrish, 2009). We therefore suggest that learning depends on the aesthetic qualities of an environment and that aesthetics in games will play a crucial role towards understanding what the game is all about. Further Parrish (2009) notes that aesthetic qualities help to establish the theme of learning if the problems or issues arising from the subject are part of the event or

situation. Problems presented through games can be easily understood through the aesthetic qualities of the game. Elements such as rules or geography for example can establish the theme of learning. Aesthetic qualities like patterns routines or motifs help to see the connections or the changes thus supplying an anchor for new learning (Parrish, 2009). Aesthetic elements of a game provide patterns, routines or motifs, which holistically reveal the changes and connections as the game progresses. Visual representations in particular are critical for making sense of a game, as they communicate educational concepts and enable players to see patterns in the gaming process (Squire, 2011). Each aesthetic element of the game not only helps to understand the process but also shapes and reshapes various game elements depending on the player's choices (Egenfeldt-Nielsen, Smith & Tosca, 2013).

Aesthetic learning experiences also involve tension and anticipation in the course of clarifying a problem, making it challenging and engaging for learners (Parrish, 2009). Hence we claim that aesthetic tension or anticipation arising out of the game elements can motivate the player impacting his or her critical thinking skills and emotions towards solving the problem.

The learner visualizes and starts making sense of a problem from a perspective drawn from aesthetic elements. Drawing from Klein, Moon and Hoffman's (2006) concept of sense making, learners create their own frames, which define and shape what count as information. Sense making occurs when the frame is elaborated through addition of details, questioning of its structure, and investigation of the explanations (Klein, Moon & Hoffman, 2006). The aesthetic qualities of the gaming environment thus specify, depict and convey visual representations to the learners. Characters, contexts, events or even objects within game based learning environments, therefore, may serve as emotional anchors of learning depending on their aesthetic capacity (Kim & Kim, 2010). The learners process and undergo the sense making experience of interpreting all of the received information.

PROPOSED FRAMEWORK FOR EVALUATING GAMES

In this section we analyze each aesthetic element of an educational game using *On the Ground Reporter Darfur*. We discuss the contribution of each aesthetic element within the game from a perspective of aesthetic principles for learning design.

Rules Determine Progression and Success

The rules of a game help us to understand its purpose (Egenfeldt-Nielsen, Smith & Tosca, 2013).

Rules in general refer to the liberties and constraints for the players within a game. Rules also lay down the path to progress. In *On the Ground Reporter Darfur* the rules are discovered as the player progresses through the game. It starts with a briefing to the players about an ongoing civil war in Darfur and their play is bound by several rules (e.g., travel restrictions) throughout the game. These rules clarify how they need to be inconspicuous as journalists or how entering Darfur from certain areas may provide easier access to information. As the players visualize a context (Figure 1a) and make the necessary moves their progress becomes visible to them through emerging information and their actions thereof become part of the narrative. Some rules become routines or patterns providing a basis for new understanding of the same context through a change of the situation, such as a bombing of the area in Figure 1a. Such patterns help to sustain the engagement of the players.

Figure 1: Screenshots from *On the Ground Reporter Darfur*



a) A scene depicting the streets of Kornoy



b) A villager providing details of the bombing

The initial and discoverable rules create aesthetic tension and anticipation for the players in the game as there are periods of struggle and expectation. The player gets injured at the site on account of the bombing and has to seek first aid. He or she retraces the route back to the temporary medical centre set up in Kornoy. Once the player finds his way back and gets first aid, he finds his interpreter and moves forward in the game. Such sources of tension and anticipation clarify the key objectives of the game. These rules also exemplify conditions during a civil war. Progressive rules such as requiring an interpreter allow the players to understand the local norms and culture. Thus the rules in the game, *On the Ground Reporter Darfur*, reflect learning by showing us progression, clarifying the subject of the game and helping to sustain the engagement of the players. Even though there are no obvious rewards in the game, the levels reflect their knowledge about the problem and development of strategic thinking.

Geography and Representation Support Understanding of the Problem

The geography encapsulates the physical world of the game, which allows and limits the players' actions (Egenfeldt-Nielsen, Smith & Tosca, 2013). In other words it reflects the different landscapes of the gaming environment. The landscape of *On the Ground Reporter Darfur* can be visualized from a number of geographical perspectives such as the political, economic, human, as well as the physical. In the Figure 1a scene, for example, the player is exposed to the auditory and visual queues on the human, economic and physical landscape, which enables him or her to understand the prevailing situation in Darfur. If the game is extended to incorporate classroom discussions the players will continue to construct and build upon the information through their own perception of the situation. By instilling tension and embedding the problem of civil war through a realistic portrayal of the situation, the aesthetic quality of the game succeeds in enticing and immersing the learner in the subject.

Representations denote the appearance of a game (Egenfeldt-Nielsen, Smith & Tosca, 2013). *On the Ground Reporter Darfur* is a photorealistic game that mimics the aesthetics of cinema and television.

Photorealism is visually powerful and the accompanying auditory information becomes meaningful for the learners in a number of ways. Music for example adds to the atmosphere, which provides visceral link to emotion to evoke feelings and immerses the player in the game. Patterns such as repetition of the music when the players are travelling across the country creates a holistic effect and acts as a measurement for comprehending progress through the change or the connections within the game. Sound effects such as street noise or blast in Figure 1a add to the realism of the narrative. Thus a mix of complexities of both the aural and visual representations presents the theme and prepares the learner for the changes in perspective.

Each interaction in the game with people from the villages or with objects such as cannons or sociocultural contexts such as live bombing of a village street (Figure 1a) may evoke different emotions in the players. This will not only affect the information gathering simply because there may be plenty of human interest stories but create meaningful experiences and relational meanings to draw upon. In the game *On the Ground Reporter Darfur*, the geography and representation help with sense making of the theme compelling the players to act in certain ways (in terms of consequential decisions) depending upon their emotions.

Time Embodies Theme and Player's Action

Time as experienced by the player in a game is an aesthetic aspect from the angle of the narrative or the discourse as it unfolds through his or her actions (Egenfeldt-Nielsen, Smith & Tosca, 2013). *On the ground Reporter Darfur* happens in real time where the player or the learners understands the narrative through his or her response to what is happening in the game at that point in time. A change of environment for example through the bombing of a certain part of Kornoy (Figure 1a) or conflicting information from different sources of power in the country helps to sustain the suspense or tension by building up the complication. Such aesthetic moments help to configure the consequences of the player's actions in the game by clarifying the theme of civil war in Darfur. The temporal characteristics

of the game therefore add to the immersion of the player, which reflect his or her motivation while playing apart from furthering the real time strategizing skills of the player.

Number of Players Matter for Learning Interactions

On the Ground Reporter Darfur is a single player game. Being a single player game it is often procedural and required artificial intelligence (AI) responding to the game progress. The represented people in Darfur are AI with sets of discourses (Figure 1b). However the narrative builds up through the AI as all the represented people turn into actors within the game. The narrative also helps to establish the theme of learning. Although the social context of multiplayer games is absent in *On the Ground Reporter Darfur* and the player is directed to defined but flexible paths in the game, he or she has to synthesize the information to present the situation logically and meaningfully as a reporter. Class discussions on the topic after the game play will tie in the collaborative angle to problem solving. The players will have shared understanding of the game's narrative, but formed their own opinions, which will add to the critical analysis of each other's reports with different reporting styles and interest. In *On the Ground Reporter Darfur*, characters in the game (players and AI) establish the theme. Teachers can create opportunities for learners to engage in critical thinking with a single player game.

CONCLUSION

Our primary goal for this article has been to emphasize how aesthetical considerations of game based learning environments help learners understand the content or subject matter by playing the game. We have used an example to show how various aesthetic qualities of game may immerse them in the game play which in turn helps them to progress with the game and to relate to the environment and incidents of game as the narrative unfolds. We have also clarified how aesthetical qualities of a game compel the learner to critically think through the problem for solutions. Our approach draws heavily from some the basic tenets of aesthetical considerations for learning design, which are derived from learning theories. However aesthetics in games is an emerging subject of interest and further research in this area will add

to what is defined as aesthetics of games and how it may help learners further their knowledge using personalized learning environments such as gaming. We feel that teachers stand to benefit from understanding the aesthetic of games as they can evaluate games better for classrooms use based on some of the criteria mentioned in this article. We believe that understanding game based environments from an aesthetic perspective will open up new areas of research.

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LEARNING TO BREATHE, BREATHING TO LEARN: THE ROLE OF MINDFULNESS IN CURRICULUM AND LEARNING

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Teachers are not technicians but self-reflective individuals who work in a holistic manner to connect curriculum to cognitive, emotional and social contexts. Living up to this holistic vision requires teachers to “take seriously the idea that a child’s personal signature, his or her distinctive way of learning and creating, is something to be preserved and developed” (Eisner, 2002, p. 581). Inspiring Education (Alberta Learning, 2010) states that the goal of education is to create engaged, ethical and entrepreneurial citizens who have been “enabled to do well in life” (Eisner, 2002, p. 581). Actualizing this vision requires mindfulness with regards to curriculum and learning.

The purpose of this paper is to explore the role mindfulness plays in curriculum and learning. The topic is explored through my own lived experience as a teacher and researcher, as well as Wilber’s Integral Model (2000, 2008). Currently teachers are feeling increasingly fragmented and disengaged as a result of the intensifying demands they face with regards to students, learning styles and system expectations (Smith, 1999; Jardine, Clifford & Friesen, 2006; Jardine, 2012; McKinnon, 2009; Smith, 1999). Mindfulness, and reflection on our personal experience, is needed to bring us to a place of wisdom in our current educational contexts. Storytelling is a traditional method of transmitting wisdom and

knowledge and “narratives of personal experience are always connected to social, political, cultural and historical dynamics of identity, values and transformative possibilities” (Chambers, Hasbe-Ludt, Leggo & Sinner, 2012, xxvii). This paper examines how teacher narratives may be utilized in professional development with regards to curriculum and learning.

As a young girl I refused to color in the lines. I often felt dismayed when forced to learn in the same way and fashion as all the other children. This factory model of education, with its emphasis on standardization, “provided an accessible, uniform model of education that met the needs of the masses at that time” (Friesen & Jardine, 2009, p. 4). I was expected to take my proper place amongst the crowd, doing what I was told to do. As a result, school became like a suffocating crate I vowed to break out of. When I was no longer the student but the teacher, I continued my silent war against a system demanding compliance and following the doctrine of efficiency where “students and teachers are not required to be thoughtfully engaged in teaching and learning” (Friesen & Jardine, 2009). While others struggled with grammar checklists and spelling lists my students and I conversed and shared our hopes and dreams, which led us into a deeper understanding of the literature and of our interconnected role with the text and our world. My students were engaged in the classroom, understanding their own stories based on their own reflections and considerations, demonstrating the “idea that a child’s personal signature, his or her distinctive way of learning and creating, is something to be preserved and developed” (Eisner, 2002, p. 581). In a deeply ethical way, they understood themselves, their connection to others, and their interconnected roles as beings on earth. My own children’s arrival into the school system demanded that I pay even more attention to the role of mindfulness. My happy, bright boys rapidly morphed into frustrated and angry children as their school systems buried them in worksheets and rote memorization. Their individual gifts and talents were largely ignored as the system strove to standardize their skills and personalities. In response, they fought back to find their own free space—but “free spaces are rare and hard won, and learning to live well within them is hard

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work that requires stillness, generosity and perseverance” (Jardine, 2012, p.8). There was no room for their free space, no room for reflection or mindfulness, and this absence of contemplative room took a mental and physical toil. Upon seeing their frustration I could no longer ignore the call to explore mindfulness in our professional practice. I needed to understand the grand narrative of education in order to find a way to re-author the storyline into a vision that aligned with the current educational context and needs of the system. I was drawn to this concept of mindfulness, its role in education as illustrated by teacher’s stories, and the implication this had for curriculum and learning.

MINDFULNESS

Mindfulness is a vast topic and establishing a definition is a difficult task. For the purpose of this paper mindfulness will be considered with regards to the following definitions.

Smith (1999) considers the Sanskrit word *upaya* with regards to teaching praxis:

In Sanskrit, there is a word *upaya*, used precisely to describe the teaching style of an Awakened One. Literally it refers to “skill in means, or method.” It also has the connotation of “appropriateness”, of knowing exactly what is required in any specific instance. Students under the tutelage of one who is awake often find the teacher to be a bundle of contradictions, because what is said to one may be completely reversed in instructions to another. This is because the teacher understands the unique needs and capacities of each, honoring their differences, and knowing what is best for each. (p. 20)

MacDonald and Shirley (2009) reflect on the concept of mindful teaching as

A form of teaching that is informed by contemplative practices and teacher inquiry that enables teachers to interrupt their harried lifestyles, come to themselves through participation in a collegial community of inquiry and practice, and attend to the aspects of their classroom instruction and pupils’ learning. (p. 4)

Inspiring Education (Alberta Learning, 2010) cites as the goal of effective education the creation of an environment wherein each learner requires what they need when it is required, with “each learner starting and ending on different points” (Alberta Education, 2010, p. 26). It is the “awakened teacher” (Smith, 1999) that is “informed by contemplative practices and teacher inquiry” (MacDonald & Shirley 2009, p. 4) that is needed to reach the goal of *Inspiring Education* (Alberta Learning, 2010). Mindful teachers are required to meet the current needs of our system.

MINDFULNESS AND THE INTEGRAL MODEL

This theoretical framework is based on Wilber’s Integral Model (Esborn-Hargens, 2006, 2009; Martin, 2008; Wilber, 2000). This model allows for the correlation of the data in attempts to find common themes and ideologies. Research has been done in independent areas around the topic of mindfulness in education, but there has not been mindfulness research correlating the interconnected perspectives of the four quadrants of Wilber’s Integral Model. The framework is suited to the current exploration because of its comprehensive nature: in that it serves as a model for seeing from different perspectives, the framework aligns with our original definition of mindfulness as being open to what is needed and required depending on each specific contextual situation. There are several contrasting perspectives within the Integral framework and Wilber believed that this radically different framework offers a mode to study human experiences in a post-modern research context.

The concept of mindfulness is explored through the four quadrants on the Integral model and summarized below in Figure 1.

<p>Interior Individual Upper left – Mindfulness and Self (I)</p> <p>Self- Realization or "Awakening" as part of the process to becoming a mindful instructional leader.</p> <p>“How do teachers personally define mindfulness?”</p>	<p>Exterior Individual Upper right – Mindfulness & Science (It)</p> <p>Current brain research and cognitive neuroscience with regards to mindfulness and the impact upon neuroplasticity?</p> <p>“How do teachers incorporate mindfulness into their curriculum design?”</p>
<p>Interior Collective Lower Left – Mindfulness and Storytelling (We)</p> <p>The sharing of our personal and collective stories and the building of a learning community in a mindful way.</p> <p>“Can storytelling be used to build a common vision in a learning community?”</p>	<p>Exterior Collective Lower Right – Mindfulness & Systems (Its)</p> <p>Working within the frameworks of current policy and system direction in the province of Alberta with regards to the definition of mindfulness.</p> <p>“How is mindfulness related to the current policy mandates in education for teachers in Alberta?”</p>

Figure 1: Integral Mindfulness for Curriculum and Learning (Wilber, 2000/2006)

INTEGRAL NARRATIVE INQUIRY AS A RESEARCH METHODOLOGY

Mindfulness and the role that it plays in curriculum and learning will be examined and explored through four interconnected areas based on Wilber’s Integral model framework (2000/2006). Mindfulness will be considered through the exploration of self, cognitive learning science, storytelling, and current system policy in the province of Alberta. Through the use of narrative inquiry, specific strategies as to how mindfulness can be accessed in the teaching practice and how it can be utilized in a classroom context will be explored. As Leggo (2012) reflects, “Life is abundant, and narrative inquiry is a way of focusing on some particulars of that abundance in order to recognize some of the possibilities of meaning that lie always in the seemingly tangled messiness of lived experience” (p. xiii). An understanding of the role of mindfulness in curriculum and learning seeks, through the personal stories of instructional leaders, the particulars of their interconnected lived experiences in an effort to establish “ a renewed connection between humans, the places, and the beings that dwell in these places” (Hasbe-Ludt, Leggo & Chambers, 2009, p.14). It is hoped that through these

interconnected stories others shall be able to learn about the role of mindfulness in curriculum and learning in a way that is meaningful and relevant as “a collaboration between researcher and participants, over time, in a place or series of places, and in social interaction with milieus” (Clandinin & Connelly, 2000, p. 20). This process will have teachers as researchers exploring their own lived experience of mindfulness and reflecting on how it becomes a part of their classroom context. The data gathered will then be correlated to current brain research and system direction in the province of Alberta.

TEACHERS AS RESERACHERS

Different forms of storytelling challenge us to see the world from varying perspectives, making storytelling a useful counterpart to the comprehensive framework of the Integral Model in that the model’s four quadrants are split between differing points of experience. Pinar (1976) challenges educational researchers “to look inside ourselves as well as outside, and begin to describe, as honestly and personally as we can, what our internal experience is” (p.3). Instructional leaders in the field know this work best and understand the complexities that are presented when personalizing student learning. Reflecting on this complex process requires teachers to have a type of stillness and openness to the research process, which involves “the capacity of beginning to ‘see’ life for what it truly is, without the embellishment of culture or tradition” (Smith, 2012, p. xiv). The process will also involve a type of restoring of the grand narrative of education, marking a return to some of the traditional practices of the past while simultaneously moving toward the future. This is a complex journey to undertake, and “through our writing and our willingness to share our writing with others, we perform our commitment to living with critical intent, critical interrogation, and thoughtful awareness” (Chambers, Hasbe-Ludt, Leggo & Sinner, 2012, p. xxvii). This thoughtful awareness, critical interrogation and intent will be required in curriculum and learning to support the vision of Inspiring Education.

MINDFULNESS, CURRICULUM AND LEARNING

Learning is a complex process and the demands of today are steadily increasing. But as educators we need to slow down, to be present and to pay attention to what truly is required in order to create “engaged, ethical and entrepreneurial citizens” (*Inspiring Education*, Alberta Learning, 2010). My memory as a dismayed young girl refusing to colour in the lines drives my desire to see a new model of teaching and learning, one that focuses on the individuals and their passions and desires. The new model will be mindful of the student and the context at hand, allowing for personalization in student learning, since “students are not uniform, they are not steel, and they do not respond in the same way to pressures of various kinds” (Eisner, 2002, p. 583). Each unique brain will discover its own gifts and passions and will understand its own particular journey. Students will recognize their roles in our interconnected system as individuals “who have particular interests, pursue those interests in depth, and at the same time work on public service projects that contribute to something larger than their individual interests” (Eisner, 2002, p. 583).

The model proposed in this paper will not follow traditional paradigms or assembly-line principles but will be based in the reflective praxis of mindful instructional leaders willing to share their stories of teaching and to reflect upon those stories’ ability to impact curriculum and learning. This is highly significant work, since “the point of learning anything in school is not primarily to enable one to do well in school—although most parents and students believe this to be the case—it is to enable one to do well in life” (Eisner, 2002, p. 581). Through the personal narratives of mindful instructional leaders we can begin to understand how to engage students in the work of life and to provide an ethical framework within which to live. Mindfulness is about creating a better life and “learning to see ourselves and the world in new ways, learning to work in new ways with our bodies and our thoughts and feelings and perceptions, and learning to laugh at little things more, including ourselves, as we practice finding and maintain our balance as best we can” (Kabat-Zinn, 2013, p. iv). Reflecting on the role of mindfulness

in curriculum and learning requires teachers to participate in contemplation and stillness towards rethinking the complex process of education. One means of inciting this reflection is taking the time to share the stories of our experiences as “we learn together what might be” (Chambers, Hasebe-Ludt, Leggo & Sinner, 2012, p. xxvii).

The process of slowing down and taking the time to learn to breathe will allow us to breathe to learn, for “our breathing will be in harmony with our steps, and our mind will be naturally at ease” (Thich Nhat Hanh, 2009, p. 12). When our brains are at ease we obtain a state of mindfulness that current research shows improves learning and brain development (Damasio, 2010; Davidson, et, al, 2012; Doidge N., 2007; Immordino Yang & Damasio, 2007; Siegel, 2010; Sousa, 2010; Ramachandran, 2011). If instructional leaders take the time to reflect on mindfulness, they will effect a process that slows down the fragmented frantic pace of daily life in schools. As a result, we can discover the possibilities available when “we take the time to embark collectively on a new long journey inward, not for the purpose of simply celebrating our personal or collective subjectivities, but for the more noble one of laying down the outward things that presently enslave us” (Smith, 1999, p. 5). When we break free of the enslavement of the factory model of education perhaps we shall then open a portal to a place where there is freedom to color outside of the lines, a place where “spaces are opened up where things can happen to us, and our lives can be shaped with some graciousness and mindfulness” (Jardine, 2012, p.11). In this space of mindfulness, “our narratives, poems and meditations are echoes whose vibrations are like lines of connection that guide our practice” (Hasbe-Ludt, Chambers, & Leggo, 2009, p. 5).

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A GRADUATE COURSE AS A GAME TO LEARN ABOUT DIGITAL GAME-BASED LEARNING

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Recognizing the motivating aspects of games (e.g., points, levels), it is becoming more and more widespread to incorporate game-like elements into everyday practices (e.g., exercising). In education, experimental schools are set up to engage students in “quests” for their learning. Some higher education instructors, especially those who teach courses related to games, are attempting to incorporate game principles into the course activities and assessments. This paper discusses how the author designed and conducted a master’s level course on Digital Game-Based Learning to immerse participants into its concepts and practices, and what lessons were learned from its first implementation.

“Welcome to the first class of the semester. Everyone in this class is going to receive an F.”

(Sheldon, 2011, p. 3)

Lee Sheldon opens up the first chapter of his book, “The Multiplayer Classroom: Designing Coursework as a Game,” with the above statement, describing how he introduced his course as a multiplayer game. Such an opening aroused some of the positive emotions that game players often experience, such as surprise and curiosity (Bateman, 2009), which would focus students’ attention on what Sheldon was about to say. In the NMC Horizon Report: 2014 Higher Education Edition, games

and gamification are highlighted as digital strategies, which transcend conventional learning activities and are likely to drive technology-related decision-making in higher education in the two or three years (Johnson, Adams Becker, Estrada, & Freeman, 2014). In this paper, I introduce the design of the master's level course, Digital Game-Based Learning (DGBL), during which students are required to play digital games and share their educational game ideas. The course design used the game concepts, such as experience points and multiple battles for their learning tasks to immerse students into the concepts and practices of GBL (Johnson et al., 2014; Sheldon, 2011). The participants were assumed to start from "0" score when they first stepped into the classroom, similar to how we earn scores throughout a gameplay. In the following I first introduce some recent efforts to incorporate game concepts in schools and universities, and then discuss the course I conducted in the summer of 2013. This reflective account includes how I designed activities and assessments for the students to gain experience (and points) in digital game-based learning, and what lessons I learned from implementing it.

LEARNING AS QUESTS

Recognizing the motivating aspects of games (e.g., rewards, points, levels), game-like elements are now widely incorporated into our everyday social practices, which people call "gamification." Through business gamification, customers are encouraged to become regulars of an airline or a coffee shop in order to upgrade and sustain their status, and receive rewards. In education, an experimental school called *Quest2Learn* (q2l.org) in New York City has been designing and implementing "quests" for all their lessons since 2009 in order to better engage students (Salen, 2011). Following the lead and success of Quest2Learn, *Chicago Quest Schools* (chicagoquest.org) are expanding their grade offerings, and *PlayMaker School* (playmaker.org) was started in Los Angeles with sixth graders in 2012.

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In higher education, some instructors, especially those who teach game-related courses, have attempted to incorporate principles of games into their courses. Sheldon's multiplayer classroom experimentation (gamingtheclassroom.wordpress.com), initiated in 2009, set out a prominent example for instructors. The course starts with the assumption that students will earn their experience points (XP as in games) by embarking on quests and participating in guilds (collaboration) in order for them to eventually receive grades beyond F (Sheldon, 2011). Inspired by various efforts mentioned above, some universities and researchers have started exploring how their Learning Management System (LMS) can support "gameful" activities and assessments. Kaplan University, for example adopted Badgeville's business and training gamification system for their LMS and reported seeing changes in students' behaviors (Badgeville, 2013). The team of educational researchers at the University of Michigan has developed GradeCraft, exploring how grading system within traditional higher education can become gameful (Holman, Aguilar, & Fishman, 2013). Queso, on the other hand, is an LMS developed from a game designer's perspective on how learning can be organized like a game (Ewing, 2013).

COURSE DESIGN: DIGITAL GAME-BASED LEARNING

The course was designed to give all of the participants, including the instructor, an opportunity to think of a course from a gaming perspective and to enable them to consider (digital) game-based learning as one of the various learning designs. The intention was to explore and discuss the designs for digital games, their learning principles, and their uses for teaching and learning. The course was organized around topics, starting from broader issues of how learning happens with any types of games and how society perceives and influences games and vice versa. Topics became more focused on educational use of games, including how COTS (commercial off-the-self) games and social games can be used for learning, how researchers have developed games for learning, and how teachers and learners may create digital games for learning or make learning activities more game-like. Each day (a 3-hour

session) was similarly structured: 1) discussion on readings and game play, and brainstorming on design principles; 2) sharing of game design tools (e.g., storyboards, game design components); and 3) time for group work.

Learning Tasks and Assessments as Experience Points and Boss Battles

I positioned this course as a chance for the participants to deconstruct their current learning, teaching and gaming experiences, to examine how learning theories unfold in the play of good games, to explore the possibilities and constraints of learning with games, and to consider the use of educational and commercial games in the classroom and out-of-class settings. In order to immerse themselves into such experienced discourse and examined practices, I emphasized participating fully in the course as a game, through which they score for experience points (XPs).

XPs were designed to earn through the everyday activities throughout the 2-week intensive course time. They came to the 3-hour session everyday in order to collectively develop and articulate design principles for learning and games, informed by theories and practices. They were also participating in the community of designers (teachers) to exchange and develop ideas. This was not only happening face-to-face, but also in the online community (Google+ in this case) to share, cumulate, and trace evolving ideas and digital resources. Most importantly, it was essential for them to engage in the group's design brainstorming for their projects. These activities were articulated as learning tasks and experience points they should earn (see Figure 1).

“Boss battles” are how I (as well as many other pioneering instructors who turned their courses into games) positioned their written assignments. In video games, a boss battle happens at the end or climax of a level in order to move on to the next level. It requires a player to use all the skills learned along the way and is the most challenging part of the level. For the game-based learning project, I

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suggested three battles: forming the team, sharing the project plan, and developing the game design as seen in Figure 1 below.

Students could receive 100% or less of the maximum points for the attempted items, based on the level of expertise: Superhero (100%), Master (90%), Expert (80%), Experienced Novice (70%), and Novice (60%). The course and the scoring mechanism were being explored together with the students and hence, could be modified together. The total of maximum points (10,000) was used so that it would be comparable to the grading conventions (i.e., 100%). In order for them to receive the perfect grade point value (4.0), they needed to gather 9000 or more points. In the next two sections, I will talk about XPs and boss battles in more details as to how this design was actualized and modified in the class.

Learning by playing games (Experience Points)		Maximum XP per event	Max. scored repetitions	Max. points to be earned (5000)
Checking-in	Class attendance	90	9	990
	Daily game play survey	20	9	
Microblogging	Prototype sharing (Group)	90	9	4100
	Article reaction/game review	100	25	
	Commenting	20	50	
	Resource sharing	20	20	
Boss Battles (GBL group project)				Max. points to be earned (5000)
First battle	Forming and introducing your team		100	
Second battle	Poster sharing on your project plan		1000	
Final battle	Your game-based learning project		150	
	- Extended team rationale		3000	
	- GBL project document		750	
	- Individual reflection			

Figure 1: Points in the DGBL Course

EXPERIENCE POINTS: LEARNING BY PLAYING GAMES

In addition to coming to class everyday for full participation, I asked the students to play games of their choice, submit their reviews on them, and log their play (which game they played, how long they played, how many levels they progressed, and whether or not they recommend the game for others to play). I made an online survey form for this activity, and named it SuperGamer. The intention of this everyday survey was to collect data and provide the tally back to them similar to a leaderboard in order

to give them additional motivation to play games. All the digitally mediated activities used Google+ community page as a portal as seen in Figure 2.

Microblogging within the Google+ community page had multiple purposes. They include: 1) prototype sharing (any stages of the group’s work); 2) reaction to the reading(s) and game review; 3) commenting on the classmates’ entries; and 4) resource sharing. For each activity, I prepared and shared some guidelines as exemplified in Figure 3.

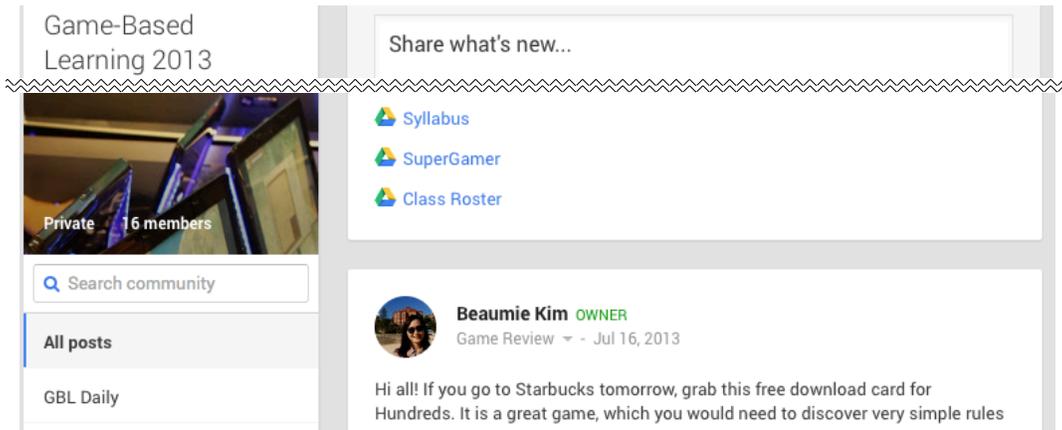


Figure 2: Google+ Community Page

	Full Experience Points	Warning!
Checking-in: Class attendance (90 each)	You will easily score the full experience points every day if you fully participate in the class activities.	<ul style="list-style-type: none"> ● Answering your phone or having a longer break than others will not give you the full experience. ● Having no voice or dominating the conversation may not give you the full experience of the class, either. ● The only time you lose your previously earned experience points is when you do not let us know you are not coming.
Microblogging: Resource sharing (20 each)	Sharing a relevant resource with a short annotation will also give you extra scores.	<ul style="list-style-type: none"> ● Make sure that the resource you are sharing is not already shared by me or others. ● You can share as many resources as you wish until the end of the term, but maximum repetition for scoring is limited to 20.

Figure 3: Guideline Examples for Earning Experience Points

Modifications and Observations

On the second day, I displayed the XPs of students based on their participation in day one, to give them a sense of how they would be accumulating their points. The points were quite dispersed between those

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who got on with microblogging and those who could not. The activities were all visible to everyone, but putting them into numbers had a different association (i.e., grades) and created some resistance. The XPs remained private for the rest of the course.

As the university course instructor, I also needed to navigate through these conflicting frameworks between the game and the university assessment. In retrospect, I was expecting students to do well in both experiencing the course as a game and doing a graduate level work of reading and writing. Considering the intensity of the course, both students and I were being challenged to keep up with all the activities. Some may learn to play this “game” of getting more points, which raised concerns for those who might take advantage of it. We made multiple joint decisions on XPs, including limiting the number of game reviews, getting commenting XPs for their overall performance, and so forth.

For class attendance XPs, I was used to being generous on students coming late or looking at the computer screens during the discussion in my other graduate courses. I was unable to make a transition from my previous practices to what I had written into the guideline (see Figure 3). If you do not pay attention to what is going on during a game play, you may actually lose the game. The constant discourse on the course design may need to be part of everyday activities in order to co-reflect on how the learning activities and assessments compare with game elements.

Even though I designed the course to work like a game, I also needed to go through the process of accepting students’ drive to accumulate as many XPs as possible. I initially felt uncomfortable that many of them successfully exceeded course requirements, even though game-based learning should aim for that. Students also had mixed reactions to the course format: many students were initially comparing the course with other graduate course formats, but some were transforming the way they were seeing the course itself, creating strategies to keep up with their progresses.

BOSS BATTLES: LEARNING BY DESIGNING GAMES

Three battles (forming the team, sharing the project plan, and developing the game design) align well with regular graduate courses assignment. The main difference might be how forming the team itself was considered as a recognized, important battle in this course. Through this activity, they had to recognize the strengths of the team members and pay attention to how the team members could complement each other. Sharing of their project plan gave them a chance to test out their ideas and receive feedback for the final battle. Given the choices for the format of their final project, three groups chose to develop a new game design blueprint, while one group decided to develop a proof-of-concept (actual making of a game). I also provided a guideline on how they could earn points for the components in these battles. Figure 4 includes some parts of the guideline, which was intended to give them choices since the sum of the points with all items would go over the maximum points they could earn.

Battle	Points that can be earned during the battle
1. Forming and introducing your team (100)	<ul style="list-style-type: none"> ● Introducing your team to the community on time (20) ● Demonstrated understanding of team members' interests and skill sets (50) ● Demonstrated understanding of how members might contribute to the team's collective goal (30) ● Creating/sharing a representation(s) for the team (e.g., team name, a photo taken together, logo, etc.) (20)
3. GBL project: Individual reflection (750)	<p>You may decide reflect more on particular components and sometimes they might be all interrelated. No matter what, you can decide what would be meaningful for you to write about.</p> <ul style="list-style-type: none"> ● Thoughtful reflection on everyday gameplay (100) ● Thoughtful reflection on design activities and the project work (100) ● Thoughtful reflection on online and in class conversations (100) ● Thoughtful reflection on the format of the course (100) ● Thoughtful reflection on microblogging (100) ● Thoughtful reflection on what gaming and learning mean to you (100) ● Other areas of course experiences you identify (100) ● Thoughts on your next battle in the area of game-based learning (100) ● Self-assessment on the project (100) ● Good length (40) ● No spelling and grammatical errors (40)

Figure 4: Guideline Examples for Boss Battles

Modifications and Observations

The task of sharing their group work, preparing project document, and writing a reflection was similar to the usual graduate course assignment. As a result, the guideline in Figure 4 was interpreted similarly as course assessment rubric. We decided that group project sharing would be a presentation with short game play, and that points would be based on overall assessment of the presentation rather than point-based items I listed. More often than not, these items were taken as required components. The course was positioned as a game, but premise behind remains a university credit course with which one does not get infinite chances to fail and repeat.

CONCLUSIONS

Overall, students seemed to appreciate their learning experience through the course and were able to take away many ideas for their own classrooms. They especially valued the time for the group work, appreciated what group members brought to the table, and were very proud of their designs and what they were able to accomplish within two weeks. As a next step, I plan to redesign the course rethinking the point system, which, in my opinion, was only successful in engaging few students in the gameful experience.

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DEVELOPING PRESERVICE TEACHERS' ASSESSMENT LITERACY: A PROBLEM-BASED LEARNING APPROACH

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The changes in the provincial achievement assessments reflect the government's initiatives to provide every child with the opportunity to master core subject areas and contemporary competencies. The success of these initiatives requires Alberta teachers to be competent in using authentic assessment and assessment for learning (AfL) strategies. Assessment curriculum in preservice teacher education plays a pivotal role to prepare student teachers to become assessment literate. Using Lee Shulman's signature pedagogies, this paper aims to discuss the rationale for and the benefits and challenges of adopting a Problem-based Learning (PBL) approach in an assessment course taught at the University of Calgary.

INTRODUCTION

Since the inception of the 21st century learning outcomes by the Partnership for 21st Century Skills (2002), curriculum frameworks in many educational systems around the world have shifted to a balanced focus on mastery of core content knowledge and contemporary competencies such as critical thinking, problem solving, creativity and innovation, communication, collaboration, self-directed learning, and information and technological skills. This set of competencies is deemed to enable students to thrive in a competitive global knowledge economy. According to Rotherham and

Willingham (2009), it is important that the contemporary competencies are taught intentionally and effectively to all students. Every child in the 21st century school context should have an equal opportunity to learn and master these competencies, which will enable them to succeed in life, career, and citizenship. Hence, there is an urgent need for deliberate and collective efforts to redesign curriculum, assessment, and teacher training programs, with an eye towards the infusion of the contemporary competencies to the teaching of core subjects.

In line with the global curriculum reforms, the province of Alberta has launched *Inspiring Education* at the systemic level. Students across Alberta schools are expected to master literacy, numeracy, and a range of competencies designed to enable them to become engaged thinkers and ethical citizens with an entrepreneurial spirit (Alberta Education, 2011). The vision of *Inspiring Education* has led to two key initiatives: curriculum redesign and student learning assessments. However, the success of these initiatives at the systemic level requires all Alberta teachers to be competent in using authentic assessment and assessment for learning (AfL) strategies. The assessment literature has consistently pointed out that teachers' lack of assessment literacy is largely due to inadequate preservice training in the area of educational assessment (Mertler, 2003; Stiggins, 2002; Volante & Fazio, 2007). Hence, assessment curriculum in preservice teacher education plays a pivotal role to prepare student teachers to be assessment literate. When they move into their teaching careers, they will be able to implement good assessment practices to promote student learning of the competencies as desired by *Inspiring Education*.

Typically, didactic whole-class lecture is a predominantly used pedagogical approach with large undergraduate classes in higher education institutions. Such a didactic approach places students in a passive role in learning and minimizes their ability to develop higher-order thinking skills and other essential competencies. Similarly, the extant literature on assessment has clearly shown that traditional assessment methods such as standardized testing and summative examination are not effective to

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promote students' mastery of higher-order competencies. Such traditional approaches to instruction and assessment are not only detrimental to student learning at the K-12 levels, but also ill-suited to the education of creative professionals who need to develop new knowledge and continually further their own understanding.

This paper aims to discuss the rationale for and the benefits and challenges of adopting a Problem-based Learning (PBL) approach to prepare student teachers at the University of Calgary to be assessment literate. Contextualizing within the framework of signature pedagogies (Shulman, 2005), the PBL approach to the teaching of the assessment contents and practices to student teachers is deemed to promote their professional competence in three key areas: intellectual, technical, and moral. Preliminary findings from this innovative practice will also help assessment instructors and BEd program administrators to reflect upon and to improve the pedagogy for the teaching profession in Alberta.

SIGNATURE PEDAGOGIES AND PROBLEM-BASED LEARNING

Lee Shulman (2005) defines signature pedagogies as “the types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions” (p. 52). The novices are often instructed in critical aspects of the three fundamental dimensions of professional work – to think, to perform, and to act with integrity. Learning to teach requires new teachers and student teachers not only to think like a teacher but also to act as a teacher (Darling-Hammond, 2006). It is essential that the design of curriculum and assessment in teacher education programs is informed by the three dimensions of signature pedagogies. In Shulman's (2005) article, he has not defined a particular type of teaching to be the signature pedagogy. Over the past two decades, a variety of instructional approaches have been used as signature pedagogies across different disciplines and professions. Problem-based learning is one of the most commonly used instructional approaches and has been touted as the signature pedagogy of medicine and nursing.

PBL approach is becoming widely used across a considerable range of disciplines and professional areas in higher education. It was originated by Protagoras and Aristotle. The approach became popular when it was used as an alternative pedagogical approach to train physicians at the School of Medicine in McMaster University in 1969 (Barrows & Tamblyn, 1980). It has subsequently been taken up in many other areas of professional education such as law, nursing, pharmacy, social work, engineering, and business and management. As a learner-centered approach, PBL enhances students' higher-order competencies by engaging them in critical thinking, complex problem solving, communication, collaboration, and self-directed learning. Typically, students work in groups first and then individually to solve contextualized, ill-structured problems as the primary pathway of learning. The problems are complex and rooted in real-world situations. In addition, they must be current and reflect a typical problem encountered by the professionals in the field. For example, a teacher must know how to strike a balance between formative and summative assessments in view of the current assessment for learning movement. The presentation of problems through real-world scenarios creates authentic learning opportunities for students to understand the relevance of underlying knowledge and principles in their future professional practice. A critical feature of PBL, that is group learning, facilitates not only the acquisition of knowledge but also important dispositions such as sharing of information, communication skills, teamwork, problem solving, independent responsibility for learning, and respect for others. These competencies correspond to the moral dimension of signature pedagogies and are deemed to prepare students adequately for their future professions.

Assessment in Problem-based Learning

Although assessment is widely recognized as one of the most powerful influences on the learning approaches and behaviors adopted by students, it has not been given much attention in PBL. Some educators have misconstrued PBL as an assessment method. Conventional assessment methods are considered at odds with PBL approaches used in professional courses and higher education to develop

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students' professional competence. Biggs (1999) stresses the need to realign curriculum objectives, teaching and learning activities, and assessment tasks in PBL. This is especially so where the intention is to encourage deep, rather than surface learning. Further, he notes that: "The essential feature of a teaching system designed to emulate professional practice is that the crucial assessments should be performance-based, holistic, allowing plenty of scope for students to input their decisions and solutions" (Biggs, 1999, p. 210). This implies that the use of authentic assessment tasks is essential for promoting student learning and mastery of professional competence in the contexts of professional courses and higher education.

The following four features of authentic assessment (Wiggins, 1989) suggest a close alignment between authentic assessment and PBL: First, authentic assessment tasks are designed to be truly representative of performance in the field. The tasks are contextualized, complex intellectual challenges involving students' own research or application of knowledge in messy, ill-structured tasks. As such, they provide ample opportunities for students' learning styles, aptitudes and interests to serve as a source for developing higher-order competencies. Second, explicit performance criteria and standards as in the form of well-developed rubrics are openly shared with students and others in the learning community. Third, self-assessment plays an important role in developing students' capacity to evaluate their own work against standards; to revise, modify, and redirect their efforts; and to take initiative in monitoring their own progress. Such formative assessment practice promotes students' self-directed learning because students take responsibility for their own learning. And fourth, students are generally expected to present and defend their work to a real audience. This will help enhance their communication skills.

THE RATIONALE FOR REDESIGNING AN ASSESSMENT COURSE USING PBL

In 2014, the course was redesigned by the author using the PBL approach. Student teachers enrolled in the two-year BEd program were divided into small groups and each group had its own facilitator. To

develop student teachers' assessment literacy, the contents of the assessment course provide student teachers with rigorous training and support in five key areas: (1) How to strike a balance between formative and summative assessments; (2) Designing, selecting, and using assessment tasks with high intellectual demands; (3) Designing high-quality rubrics; (4) Implementing effective assessment for learning strategies; and (5) Sound grading and reporting practices.

BENEFITS AND CHALLENGES OF PBL IN THE ASSESSMENT COURSE

Through some informal conversations with instructors and student teachers who have just completed the assessment course, the benefits of using a PBL approach to design the course contents and materials are clearly evident. In each assessment topic, the problem is contextualized in real-world situations and exposes student teachers to the contemporary assessment issues around the world and in the province. The readings and resources provide good support to student teachers in their group investigation and creative solutions of the problems. In general, student teachers are able to make meaningful connections between what they learn in the course and what is required in their teaching professions. Such authentic learning has increased their motivation to learn the course contents and materials within a short framework. Our adoption of PBL in the delivery of the course has enabled student teachers' mastery of both assessment content knowledge and professional competence, which are much needed for their future teaching professions. The real-world, complex problems and highly intellectual authentic tasks help develop student teachers' higher-order competencies such as critical thinking, real-world problem solving, creativity and innovation. In addition, a tight coupling between student-centered PBL approach and formative assessment has fostered collaboration, communication skills, and self-directed learning. Student teachers' demonstration of these competencies supports the rationale for using PBL as signature pedagogy in the assessment curriculum at the preservice teacher training level.

Two challenges that we have encountered in our adoption of PBL are as follows: First, facilitators' lack of understanding and experience in PBL, which makes it difficult for them to facilitate the PBL

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process; and Second, student teachers' time constraints as they are taking three courses simultaneously and may be unsure how to balance between group collaboration and self-directed study.

In short, the use of PBL, authentic assessment, and formative assessment in the preservice assessment course has demonstrated good instructional and assessment practices to student teachers. We are hopeful that they will be able to transfer what they have learnt to their professional practice. Further, we assume that the course contents and innovative practices used in the course have improved their levels of assessment literacy to some extent. This will need to be verified by some empirical data collected in another study.

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PEDAGOGY FOR JUSTICE: AN INTERSECTIONAL DIALOGUE
EXPLORING CRITICAL CONVERSATIONS INVOLVING PRE-SERVICE
TEACHERS AND YOUTH SOCIAL JUSTICE ACTIVISTS

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Two duoethnographic research projects come together to explore critically conscious education; one resides within the context of teacher education programs, and the other mainly within school-based youth activist groups. The authors fashion a dialogue between these interrelated studies in order to inform the work of teacher and teacher educators around a pedagogy for social justice in schools.

INTRODUCTION

This article is based on two independent duoethnographic studies that explore social justice from different angles; one study delves into the perspective of student social justice activists, while the other approaches the topic within a teacher-education context. We will focus here on some emerging themes around the dynamics of the student-teacher relationship, and how teacher education programs might foster critical consciousness for teachers to be strong advocates and allies for student social justice activists in schools.

PROJECT A: ENGAGING STUDENT LEADERS IN RESEARCH ON SOCIAL JUSTICE ACTIVISM

Jodi and Shashi: This SSHRC-funded project, under the direction of Dr. Darren Lund at the University of Calgary, examines how student activists understand their collaborative work to address racism and discrimination in schools across Canada. Discrimination is a common and destructive experience in schools (Henry & Tator, 2009; Meyer, 2009; Pruegger & Kiely, 2002; Statistics Canada, 2003). The need for respect in schools is well recognized; however, little research exists that seeks to understand the anti-oppression work already going on in educational settings. Guiding research questions for this study include: 1) the various forms and models of social justice activism; 2) the specific ways actual activists conceptualize their collaborative work; and 3) best practices that can inform pedagogy and advance theory and policy development in this field.

PROJECT B: FOSTERING CULTURAL HUMILITY AMONG PRE-SERVICE TEACHERS: CONNECTING WITH CHILDREN AND YOUTH OF IMMIGRANT FAMILIES THROUGH SERVICE LEARNING

Darren: This study examines an approach to teacher education that moves away from “cultural competency training” and towards an approach that strengthens “cultural humility” among pre-service teachers. In collaboration with a number of community partners¹, the Werklund School of Education and the University of Calgary’s Centre for Community-Engaged Learning developed a program entitled, “Service-Learning Program for Pre-service Teachers.”

Lianne: This community-initiated program is included in a Bachelor of Education course, “Diversity in Learning,” and uses a social justice framework to counter deficit-model thinking and foster a sense of humility in how pre-service teachers bring into check the power imbalances that exist in education,

¹ *c.a.r.e.* for Ethno-cultural Children & Youth (an initiative of the Immigrant Sector Council of Calgary), eight community organizations, and two public school boards.

classrooms, and in the broader community (see also Lund, Bragg, Kaipainen, & Lee, 2014). Guiding research questions for this study include: 1) How do pre-service teachers understand the needs of immigrant youth and their families? 2) How might their experiences in service-learning placements inform their own critical understandings of the role of the teacher and schools?

THEORETICAL FRAMEWORK

Lianne and Darren: These research projects are informed by critical pedagogy (Giroux, 2011; Kincheloe, 2008; Sensoy & DiAngelo, 2012) to examine the complex structures surrounding privilege and power that underlie these educational approaches and projects. Informed by Freire's (1970) emancipatory educational framework, these research projects strive to honour the experiences of pre-service teachers, community partners, practicing teachers, and former youth activists as active agents in their collaborative pursuit of equity and social change. We seek to foreground critical conversations that consider:

Under what conditions and by whom are concepts of equity and excellence constructed? What do they look like for different groups and in different circumstances? How can equity and excellence be achieved in a society in which historically the dominant culture has determined their meaning? (Jenks, Lee, & Kanpol, 2001, p. 93)

Shashi: According to Gorski (2009), it is the job of critical multicultural educators to “uncover power relationships,” “understand their work in larger geopolitical contexts,” and to “expose these relationships and reconstruct schooling in ways that dismantle, rather than reify, social stratification” (p. 311).

METHODOLOGY

Jodi: Following the protocols of a relatively new methodology articulated by Norris and Sawyer (2013), duoethnographic interviews for both studies have been conducted with the personal identities

and experiences of the researcher and participants forming a basis upon which to mutually construct new understandings (Norris & Sawyer, 2013). As a dialectic form of inquiry that regards participants as co-researchers, duoethnography has generally been employed between peer researchers (Norris, Sawyer, & Lund, 2012); conducting this type of research with youth has provided benefits and also presented new challenges.

Shashi: I have found that duoethnography is a more democratic way to engage youth in authentic conversations, although the power dynamic between researcher and participant necessarily continues to have an influence.

Participants: Jodi: Thus far, eight youth social justice activists have been selected through a process of “convenience sampling” (Creswell, 2007), drawing on the professional networks of the researchers. The participants must have held leadership roles in social justice activities for at least one full year; most have undertaken these roles within a school-based context, although two were active in community-based settings.²

Lianne and Darren: Of the 380 of pre-service teachers required to take the course, “Diversity in Learning,” 27 pre-service teachers were accepted into the service-learning option. Of these, a total of 10 pre-service teachers participated in the research.³

Data Collection: In both studies, research participants completed in-depth interviews: the pre-service teachers participated in one initial-placement interview and one post-placement interview, while the youth social justice activists completed one interview with the option for follow-up communication.

² All research participants were female and were between the ages of 18-26. Of the 8 participants, 8 identified as White. One participant identified as Métis and one participant immigrated to Canada at age 12. One identified as a member of an LGBTQ minority group.

³ All research participants were female and all had a previous undergraduate degree. Of the 10 participants, 9 identified as White and noted that English is their first language. One participant identified as an immigrant that moved to Canada as a teenager. One identified as a member of an LGBTQ minority group. Ages of participants ranged from 23 to 49 years old. The term “White” is capitalized here to denote its description of a social category of racialization and to differentiate it from the colour or other meanings.

Data Analysis: The data for both studies is derived from recorded interviews and transcripts. Themes were coded and clustered along meaningful recurrent topics based on protocols of critical ethnography, following Madison (2010), with the principal researcher and a research assistant providing a form of data triangulation on the eventual key emergent themes.

EMERGENT THEME 1: THE RIPPLE EFFECT: HOW MIGHT CRITICAL MULTICULTURAL TEACHER EDUCATION CULTIVATE THE CONDITIONS FOR EMPOWERING STUDENT LEADERS?

Darren: Pre-service teachers expressed a variety of reasons for enrolling in a diversity-focused course, and spoke about the various life experiences that influenced their understandings of diversity. For example, one pre-service teacher joined the Service-Learning Program because of her personal experience as an immigrant and her desire to “help [children and youth of immigrant families] through their transition.”

Lianne: Other pre-service teachers shared that they had limited exposure to diversity. For example, one pre-service teacher said she “grew up in a small town where there was no diversity” and joined the Service-Learning Program because she wanted to “be a better teacher” and “take care of the more diverse needs of the students.” Our analysis of the data suggests that there is not an “ideal” or “typical” teacher candidate to engage in social justice work.

Jodi: We also noticed that students expressed a “spark” of recognition that “something was not quite right,” without necessarily being aware of the broader issues. For example, one student stated that: “We weren’t experts right... as sixteen year olds... it was more just like ‘this is awful. We need to do something...’”

Shashi: A responsive teacher education course that builds on the diverse backgrounds of teachers cultivates a readiness in those same teachers to recognize what students bring to social justice work,

thus creating spaces for dialogic and trusting relationships in schools. These “problem posing educators,” as Freire describes them, can then seek to create a consciousness within their students, and move them from listeners to co-investigators (Freire, 1970).

Jodi: Entries into topics through critically relevant curriculum offered safe and trusting spaces for students to confront and explore their own identity questions and challenges, as shown in the following exchange:

Student leader: “I had [a teacher] for media studies where we kind of looked at gays and lesbians in the media.”

Researcher: “In what scenario were you able to tell her about your sexuality?”

Student leader: “We were doing a written assignment on different groups and how they are portrayed in the media and I mentioned it.”

Sashi: Those who were encouraged by teachers in classroom settings to engage in conversations around social justice would often be inspired to delve more deeply into activism.

Student leader: “In IB English we had to study different international authors’ works,

Nobel Prize winners. In all these phenomenal books, the authors used very subtle literary devices to somehow send their political interests or political views to their readers.”

Jodi: Through dialogue with critically conscious teachers, students’ emerging understandings of identity and anti-oppression were kindled through curriculum connections across the disciplines, enlivening the classroom space and invoking passionate responses.

EMERGENT THEME 2: TRANSFORMATIVE PEDAGOGY: HOW MIGHT TEACHERS' CRITICAL REFLECTION CULTIVATE RELATIONSHIPS AND DEMOCRATIC SPACES THAT FOSTER SOCIAL JUSTICE ACTIVISM?

Lianne: Prior to the start of the service-learning placements, several teachers expressed the challenges that they anticipated in working in the community, several of which were based on negative assumptions. One pre-service teacher expressed her anxiety as follows:

Pre-service teacher: If you take, let's say East Indian or Arabic, those are two good examples... Hispanics are generally agreeable... but you know where a kind of White-looking woman is going to be telling you how to do math, by "telling" I mean "teaching" but they are going to see it as telling... I feel like I will always have to know what I am doing and I would always have to be right because if I am wrong, then that will be an excuse for [the children and youth] to be like "ah, a woman," because it is a mentality that I know a lot of people have in those cultures. Being stereotypical, again stereotypes exist for a reason, I know people hate hearing that but it's true.

This pre-service teacher's comments align with Montgomery's (2005) description of the ways that racializations are represented through "division or separation" of humanity into groups; "naturalization" of groups by assuming these groups are inescapable facts of Nature; and "essentialization" of people by reducing people in these groups to a set of static characteristics (p. 319).

Darren: During the same pre-service teacher's post-interview, she said, "I learned that I am slightly racist. I use my racist predisposition for knowing the stereotype and knowing that you can exploit a child's weakness." This pre-service teacher's self-critique at the end of the Service-Learning Program illuminates her willingness to confront her assumptions and apprehensions about children and youth of immigrant families. This pre-service teacher may not have experienced a transformation in her "racist

predispositions” but did comment on her newfound ability to be “more self-aware” (see Lund, Bragg, Kaipainen, & Lee, 2014).

Shashi: When teachers become more self-aware of their prejudices, they are then more capable of leveraging their power as authorities in the school to create and model democratic decision-making processes, which empower students to explore equitable interactions in a safe space (Sammel & Martin, 2008, pp. 96-97). Teachers gain the ability to be allies for students, offering resources and support for student-led initiatives. As one student noted: “We need rights and responsibilities... it’s very simple and non-bureaucratic when you’re working with a relatively consensus-based model.” Another student commented: “I would go to [the teacher] and say this is my plan, this is my vision and this is what I want to do and she’d [say], ‘these are the resources I can give you so I can be helpful to you,’ and she was there step-by-step with me.”

EMERGENT UNDERSTANDINGS

Darren: Just as cultural humility education requires a willingness to negotiate mutually acceptable alternatives to communication, engagement, and education (Chang, Simon, & Dong, 2012), teachers need to approach students with a humility that recognizes the dynamic and reciprocal nature of teaching and learning.

Lianne: Yes, a reciprocal process that reconciles the “teacher-student contradiction,” as Freire (1970) might describe it (p. 72). For example, one pre-service teacher speaks of feeling unprepared for an activity, but the children were so kind and understanding that she felt comfortable and supported in her vulnerability.

Shashi: We had a similar example, when a group of students were campaigning for healthy food in the cafeteria. They had a teacher ally, who was told by the principal that he must stop the campaign or face disciplinary action. The students recognized the position they had put the teacher in and chose to end

the campaign. The trusting relationship that they had built with that teacher motivated them to put his needs before their own agenda.

Jodi: The work that pre-service teachers do in reflecting critically on their role in schools and the community is crucial to developing a self-awareness that recognizes the need for a dialogical relationship with students (Sammel & Martin, 2008). This is a transformative and reciprocal process which not only provides teachers with the agency to engage in critically conscious conversations with students, and it also empowers students to become agents for social change.

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EXPERIENCES OF A COLLABORATIVE INSTRUCTIONAL TEAM IN SUPPORT OF ONLINE LEARNING

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Through the intentional design of a community of practice, a team of instructors engaged in professional conversations and meaningful collaboration to empower themselves as online educators and to promote critical reflection ‘in’ and ‘on’ action. This community of practice helped inform course design, development and implementation, which strengthened the overall online program. In this article, the instructors share their experiences and insights into working as a collaborative team and present three recommendations for collaborating in support of the development and facilitation of an online graduate program.

INTRODUCTION

Acknowledging the importance of teachers’ agency in defining and shaping their online teaching experiences, a collaborative instructional team was formed. The purpose of this team was to facilitate

the empowerment of three online sessional instructors and support the overall program cohesiveness of the Assistive Technology for Learning in the Inclusive Classroom graduate certificate. Baynton, Groen, Willment and Slater (2003) have recommended a collaborative approach for practice “because it can provide instructors with the opportunity to exchange ideas, concepts and other strategies throughout the online development, teaching and learning process” (p. 47).

Building a collaborative instructional team in support of online learning required a perspective of envisioning the content of individual courses, as well as the knowledge building required for the overall program. It also required empowering instructors as ‘learners’ and creating conditions that nurtured the examination of their online teaching experiences. ‘Reflection in action’ occurred as individual instructors examined their online teaching experiences during teaching of the courses they designed. ‘Reflection on action’ played an important role in the community of practice that was created by the instructional team.

CONTEXT

In 2013, the Werklund School of Education launched an innovative online graduate certificate program (four courses) entitled Assistive Technology for Learning in the Inclusive Classroom. The focus of the certificate is on current assistive technology and inclusive learning research and practices. Students in the program inquire into “design, development, delivery, and evaluation of technology-enabled learning experiences for all learners, and for addressing the needs of exceptional learners” (Graduate Programs in Education, 2014). Four sessional instructors and an academic coordinator formed the original instructional team responsible for transforming the program proposal into rich, meaningful learning experiences for the online students.

COLLABORATIVE DESIGN

Collaboration played a critical role in the success of the instructional component of this online program. From the start, the sessional instructors agreed to work collaboratively to support each other in the development of each other's course outlines and the creation of a common assignment that went across the program. They were responsible for their own course development, but the work was not done in isolation which often occurs in higher education. Through online communication, the sessional instructors shared drafts of course outlines and assessment rubrics to seek input from their colleagues. They committed to meeting on a regular basis (e.g., on-campus or online) for the purpose of sharing their learning based on the teaching, to help provide direction for the next course and future assignments, and to learn with and from each other in terms of content, technological and pedagogical issues that emerged as part teaching in this program. The nature of their collaborative work and professional conversations over the one year has helped to foster alignment, continuity and cohesion across the program and assignments. Further, it has helped to set direction for the next iteration of the program.

The courses had similarities in terms of using the latest knowledge about learning sciences and technology with the goal of having students build on the knowledge from the previous courses in the program. For example, one of the assignments required students build a "toolkit" of technology tools that would support their work in promoting the use of assistive technology to support inclusion in their various professional roles. This toolkit began in the first course where the students contributed two entries to their kit. They summarized each tool and also identified ways that it could be utilized to support inclusive environments. Students shared their toolkits with their classmates for further peer feedback. All students grew through the knowledge they gained from their own work, as well as from the exploration of their classmates' toolkits. The students contributed more entries to their toolkit for the second and third courses. Each time, they further refined their purpose for the tools they chose to

include. For example, in the third course students chose a specific compensatory support to focus on and included three different assistive technology for learning tools that provided that particular compensatory support. In addition to summarizing each tool and identifying ways that it could be utilized to support inclusive environments, they also critically analyzed each tool to identify its affordances and constraints. In the fourth course, students will draw upon these tools to complete a practical final assignment. The “toolkit” assignment supported a deeper investigation of tools that aligned with the research around inclusion, universal design for learning and assistive technology.

ROLE OF REFLECTION

Working in collaboration as a team of instructors for a program, also empowered the instructors as ‘learners’. Conditions were created where these instructors engaged in ‘reflection in action’ examining their online teaching experiences and practices based on developing and teaching their courses. This was primarily a solitary reflection. However, it contributed to ‘reflection on action’ when the instructional team debriefed a course and considered design revisions for the next course and / or the next section of a particular course. This collaborative ‘reflection on action’ required a relationship of trust within the group where everyone contributed to constructive criticism, feedback and active reflection.

These critical reflective practices contributed to the ‘evolution to becoming online instructors’. The experience of this instructional team demonstrated that professional conversations created a deeper learning experience for instructors and contributed to an enriched experience for the students taking the certificate program.

INSIGHT INTO THE SHARED EXPERIENCE

Using a community of practice approach, a trusting, open collaborative environment was nurtured that created conditions where instructors shared their experiences, sought advice from their colleagues, and

learned from each other. Within this community, there was a fostering of open-mindedness to new ideas and new ways of doing things. The conversations had a communion focus, where it was not about an individual gain, but rather how the work and decisions would have a pedagogical impact on student learning in the program.

This community of practice approach was especially beneficial for the first-time instructor(s), who had no experience teaching at the university level, or teaching a course online. This collegial environment was a welcome source of support and resources not typically found in a more traditional approach of utilizing sessional instructors. The community of practice created a healthy support network for the instructors where they could share and seek insight from their colleagues. “It is through critical reflection that [online] teachers can be empowered as autonomous and self-directed professionals who constantly engage in a dialogue about solving complex problems, making decisions, reflecting in action, and collaborating with other key actors.” (Baran, Correia & Thompson, 2011)

The community of practice discussions also provided each of the instructors with a clear understanding of how individual courses fit within the certificate framework so they were better able to scaffold instruction and build on assignments; avoiding repetition of content. For example, when the students took the second course, Universal Designs for Learning (UDL), the instructor knew that the students had been introduced to the topic of inclusive environments in the previous course. Given this knowledge, the instructor of the second course was able to take the students from their introductory understanding to a space where they deeply explored the theoretical perspective of UDL. Further, the instructor assured students that although the course did not focus on technology and UDL, the next course would carry on through with studying assistive technologies. Given the working knowledge of all courses in the certificate, each instructor was able to talk about the work of the course and scaffold the learning to support students as they developed their knowledge and understandings through each course.

Working together, the instructors were better able to respond to the needs of the students, both within each course and in the implementation of subsequent courses. For example, the instructors modified the toolkit assignment based on student feedback. Getting together on a regular basis throughout the year helped to build perspective for planning the teaching of other post secondary courses based upon lived experiences and student input.

RECOMMENDATIONS

Drawing from their experiences in the design, development and facilitation of the program, three recommendations are shared for best practices for collaborating as an instructional team in support of online graduate programs. First, the academic coordinator is essential in creating the conditions required for meaningful and purposeful collaboration. Understanding that collaboration cannot be imposed, the coordinator has a major role in selecting instructors who are open to new ideas and willing to take risks, as well as bringing them together in a shared space on a regular basis. The leadership of the coordinator needs to support the creation of a meaningful learning environment where the instructional team members feel valued and supported.

Second, all instructional team members must be reflective practitioners, open to growth and improvement. They must be able to weigh new ideas and advice from colleagues against their own understanding of teaching and learning and be willing to implement change where needed. Through conversation and collaboration, their teaching practice is public and is open to feedback from colleagues. This openness and sharing of information needs to be reflected on and enacted in ways that support the instructor, the students and the program.

Third, the collaborative instructional team must be responsive to the needs of their students, recognizing their diversity, valuing their strengths and willing to incorporate a variety of methods to facilitate student learning. Being responsive to student feedback is addressed by the individual

instructor and shared with the team. Through the conversation as a team, decisions can be made related to the specific course and/or the program. As such, opportunities need to be made available for student input, as well as analyzing the input to inform next steps.

CONCLUSION

The collaboration of the instructors allowed the varied personal experiences and perspectives of the team to influence the course design and course facilitation. Constructive criticism and team planning enriched the process. Students benefitted from having the instructors working in concert with each other: the communication of the instructional team meant that each instructor knew where the students were coming from and what would be happening once they moved to the next course. Regular meetings provided the instructors with opportunities to continue to build knowledge about the students' journey and enriched the learning experience of all.

The design and implementation of an online graduate certificate program is strengthened when instructors work as a program team. They personally gain from the experience working in a community of practice. Students and the overall program benefit from collaborative instructional practice that fosters continuity and cohesion. The investment of time and support for a collaborative instructional team results in a robust program.

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EXPLORING AND EVALUATING EXOGENOUS AND ENDOGENOUS GAMES FOR EDUCATION

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Most educational, exogenous video games present a drill and practice experience for learners. Ironically, commercial video games, endogenous games can elicit a more rigorous and in-depth learning experience (Gee, 2007b; Squire, 2006), as compared to their educational counterparts. The purpose of this paper is to explore and evaluate the literature that addresses the issues associated with educational, exogenous games and the potential role commercially produced endogenous games have for digital-aged learners. Commercial video games such as Civilization represent a more viable choice for teachers to ensure the game experience is aligned with the participatory needs of digital-aged learners.

SETTLING THE LANDSCAPE OF EDUCATIONAL VIDEO GAMES

Clip clop. Clip clop. Clip clop. Those are the sounds of your gallant oxen that guides your wagon along the Oregon Trail. As the sun sets each day, you wonder what struggles and travesties will transpire on the days to come. Will it be dysentery that will rapidly and curiously take the lives of those who are mounting this treacherous journey with you? Will it be the lack of bullets to be able to shoot the bison that cross your path? Or will it be an underhanded trade that depletes your rations to unsettling levels?

These are common if not defining narratives of those who played *Oregon Trail* during their most formative years. In as early as 1981, the video game *Oregon Trail*, originally produced by the Minnesota Educational Computing Consortium (MECC), introduced young minds to the perils of traveling in the open country during the mid 19th century. However, playing *Oregon Trail* also construed a limited, if not misleading, reality that brought dysentery and wagon tongues into the forefront of children's vocabulary. In fact, with all the countless hours logged playing *Oregon Trail*, it brings to question what did these millions of children learn from playing the game? Beyond the simple graphics and narrative, the game does very little to actively engage or teach the player about the history and geography of this historic wagon route, and any learning that may occur is tangential at best. It is very possible that many of the students who played *Oregon Trail* struggle to actually define the very namesake of the video game.

The learning experiences derived from playing *Oregon Trail* are not unlike many of the educational video games that are still being made available to students in today's classrooms. Games such as *Math Blaster*, *Number Munchers* and *Castle of Dr. Brain* present a similar game narrative, in which learning is framed in a drill and practice, or perhaps more aptly termed, drill and kill learning paradigm. The concern associated with these drill and kill games frames the overarching purpose of this paper, to explore and evaluate the literature that poignantly addresses the issues associated with educational, exogenous games and the transformative potential commercially produced, endogenous games serve to the digital-aged learner.

Distinguishing Between Exogenous and Endogenous Games

Rieber (1996) identifies the differences between games found in the classroom and games found at home, through exogenous and endogenous games. Exogenous games, or educational video games are analogous to adding sugar to tea or cereal; it doesn't add any more additional nutritional value to the food, but it does make it taste a little bit better. Endogenous games, or good video games offer a

different reality from this sugar coating effect, as it is often “difficult to tell where the game stops and the content begins” (Rieber, 1996, p. 50). Consequently the context of an endogenous game is “inextricably linked” (Squire, 2006, p. 24) to the experience of the gamer. Squire (2006) clarified the different aspects of a game experience in both exogenous and endogenous games in Table 1.

Aspects	Exogenous Games	Endogenous Games
Learner is...	An empty receptacle. An example is <i>Math Blaster</i> , where the learner is "motivated" to learn a prescribed set of skills and facts.	An active, sense-making, social organism. An example is <i>Grand Theft Auto</i> , where the learner brings existing identities and experiences that color interpretations of the game experience.
Knowledge is...	Knowledge of discrete facts. The facts are "true" by authority (generally the authority of the game designer).	Tool set used to solve problems. The right answer in <i>Civilization</i> is that which is efficacious for solving problems in the game world.
Learning is...	Memorizing. Learners reproduce a set of prescribed facts, such as mathematics tables.	Doing, experimenting, discovering for the purposes of action in the world. Players learn in role-playing games for the purposes of acting within an identity.
Instruction is ...	Transmission. The goal of a drill and practice game is to transmit information effectively and to "train" a set of desired responses.	Making meaning/construction, discovery, social negotiation process. Instruction in <i>Super Charged!</i> involves creating a set of well-designed experiences that elicit identities and encourage learners to confront existing beliefs, perform skills in context, and reflect on their understandings.

Table 1: Exogenous and Endogenous Games (Squire, 2006)

Exogenous games, drill and kill games have also been referred to as edutainment, “which refers to electronic games that use entertainment in the service of education” (Egenfeldt-Nielsen, Smith & Tosca, 2012, p. 233). Edutainment offers little intrinsic motivation to the learner as they simply “feed the player information rather than encouraging curiosity and exploration” (Egenfeldt-Nielsen et al., 2012, p. 234). Consequently, edutainment games facilitate a relatively poor learning experience (Chee & Tan, 2012; Egenfeldt-Nielsen, 2007; Egenfeldt-Nielsen et al., 2012; Foster, 2008; Gaydos & Squire, 2012; Gee 2005, 2007b), which counters the reality often experienced from playing commercially produced video games.

As ironic as it may seem, commercially produced video games such as *BioShock* or *The Legend of Zelda* produce more rigorous and higher-order learning experiences when compared to games designed for education (Gee, 2005, 2007b; Egenfeldt-Nielsen, 2007; Egenfeldt-Nielsen et al., 2012; McGonigal, 2011; Papert, 1980, 1993; Prensky, 2007; Salen, 2007; Salen & Zimmerman, Shaffer, 2006; Squire, 2006, 2011). Gee (2005, 2007b) identifies these commercial video games, as “good video games” as they distribute learning in a well-ordered, personalized and just-in-time format (Gee, 2007a), which can facilitate a performance before competence experience (Gee, 2007b). Gee (2007b) suggests, “in a good video game you have to try lots of different things and then you have to think about the result you get and try to make sense of what they mean for you and your progress through the virtual world of the game.” (p. 88)

A Curricular Disconnection with Exogenous Games

If good, endogenous video games firmly establish good learning experiences, the obvious question is why are they not more common in today’s classrooms? The problem partly resides in the fact that very few educators understand that there is a contextual difference from the games that are purchased from an educational catalogue and the games that are purchased from a gaming store. This problem also identifies the fact that educators don’t play video games on a regular basis (Kenny & McDaniel, 2011), which creates difficulties when integrating games into the curriculum. How will an educator devise a unit plan around a game, if they have never played the game before? This would be analogous to a Language Arts teacher who hasn’t read the text for an upcoming book chosen for study. A lack of situated knowledge generally equates to an unsubstantiated curricula.

This problem continues to become complex, as the structure and pedagogy located in many of today’s classroom is more aligned with the drill and practice reality found in most educational video games (Cuban, Kirkpatrick & Peck, 2001; Kenny & Gunter, 2011; Kynigos, 2004; Lim, 2008). Some classrooms continue to be designed to support a more structured, black box learning environment that

disseminates knowledge to the students. In fact, Papert (1993) suggests this behavioristic model only locates the teacher as the active subject in the classroom, “as the teacher is in control and is therefore the one who needs skill; the learner simply has to obey instructions” (p. 83).

A Curricular Connection with Endogenous Games

This disparity between good video games and traditional classroom systems suggests that many educators not only lack the pedagogical understanding of how to integrate endogenous games into the classroom, but also the support and guidance. Educators generally have access to a repository of tools and guides that allow them to locate effective and useful learning resources. For example, Alberta Learning (2005) has created an authorized resource list for English Language Arts, in which a group of specialists gathered together to select titles that further enhance the study of English. This authorized resource list is selected through the following process:

All short-listed titles were read, reviewed and validated by a minimum of three readers. As the teacher review teams read the texts, they looked for and selected titles that:

- offered a variety of human experiences
- provided an interesting and challenging reading experience suitable for the age, ability and social maturity of the students
- elicited thoughtful responses and a critical appreciation of literature. (Alberta Learning, 2005, p. xiv)

This selection process facilitates a thoughtful integration of significant novels and nonfiction resources, but it also brings to question the disparity that exists in guiding educators in selecting good video games. Rice (2007) is one of the few researchers’ who has developed an evaluative measure to support educators in locating good video games into the classroom. The evaluative gaming measure, known as the *Video Game Higher Order Thinking Evaluation Rubric*, asks educators to place a value next to

specific gaming criteria. The value of the entire game is then “weighted against lower scoring games” (Rice, 2007, p. 92), and thus a high score will suggest a high cognitive viability and a low score will suggest a low cognitive viability.

Although this evaluative measure begins to support educators in exploring and selecting good video games, the results of this measure can be misleading and inaccurate, particularly as video games continue to evolve at a rapid pace. In fact, *Minecraft* and *Minecraft Edu* scored relatively low on this rubric, even though game construction programs such as *Minecraft* have produced higher-level thinking (Salen, 2007), analytic and conceptual thinking (Clark & Sheridan, 2010), and reflection and evaluation (Dickey, 2006).

The best advice that can be given to teachers in exploring and integrating endogenous games, is to first close the teacher catalogues that sell educational video games, and instead look to commercial video games that are readily available on the market. Commercial, good video games will produce higher-order thinking and Squire (2011) suggests games such as *Civilization* or *Sid Meier's Pirates!* are excellent representations of commercial games that have become effective tools in the classroom. Beyond locating commercial games, educational versions of commercial games offer an additional resource. Two particular examples are *Minecraft* and *Minecraft Edu* and *Kerbal Space Program* and *Kerbal Edu*. *Minecraft* is based on the premise of building and breaking blocks to create and interact with varying structures, while *Kerbal Space Program* allows users to build and manage their own space station. These constructionist game experiences are extended through an educational version allowing students to play and build together in a closed virtual environment, while maintaining the overall integrity of the game experience.

In addition to exploring educational versions of commercially produced video games there is a fledgling library of learning opportunities that has emerged on-line. Mini games or not-games potentially represent an additional entry-level good game experience for students. These games are

short and relatively accessible that can be integrated effectively into a lesson. They are often an artistic representation of a particular idea, designed to provoke thought or to question existing ideas and generally ask the gamer to take a reflective stance. For example, a self-proclaimed not-game, *The Killer* (Magnuson, 2011) presents a very rudimentary graphic representation of being a guard that is marching a prisoner to his death in Cambodia. Upon playing the game, the students were then asked to reflect on the game through questions and discussions. Another not-game, *Every Day the Same Dream* (Pedercini, 2010) explores the repetitive nature of human existence. Again the students explored this game through questions and made further connections to the classic play *Death of a Salesman* or perhaps the popular film *Groundhog Day*. These not-games are excellent, manageable game experiences, however they do require the educator to frame the experience by making direct connections to the curriculum to ensure the game is a valuable and useful contribution.

CONCLUSION

Integrating good, endogenous games into the classroom often goes against the overarching drill and practice reality that is located in today's classroom. Although educational video games are relatively easy to integrate, they produce relatively low-order thinking skills. In looking to ensure good, endogenous video games are effectively integrated into the classroom, commercial video games seem to be the best fit. Although some of these games are relatively expansive in nature and take a considerable amount of time, mini games or not-games can be an excellent place to begin to integrate good video games into the classroom. Good video games have the potential to play an important role in the learning experiences of digital-aged learners, however as a collective community it is important we strive to locate and integrate games that strengthen the overarching experiences of the participatory learner. Perhaps in the future, we may come to fully understand what in fact transpired for 19th century settlers who travelled along the historic Oregon Trail. It is very possible an endogenous version of the *Oregon Trail* is on the horizon.

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FROM STUDENT TO COACH: EXPERIENCES OF THE D2L COACHES IN THE SCHOOL OF EDUCATION

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Triggered by the implementation of a new learning management system, a graduate student coaching team, led by the Associate Dean of Teaching and Learning, was created to provide instructional and technical support to academic staff and sessional instructors in the Werklund School of Education. Drawing on their background as teachers, as well as, on their knowledge developed as educational technology students, these coaches share insights into their experiences as members of a coaching team within a larger technology support network. Further, recommendations are identified in how student coaches can play a key role during new technology implementation.

Instructors using Learning Management Systems (LMS) must not only be technologically competent in the workings of the LMS but also require support for their technology skills, course design and delivery (Kyei-Blankson & Keengwe, 2011). This becomes even more important when a new LMS is implemented. As the Werklund School of Education embraced the implementation of a new LMS, Desire2Learn (D2L), strategies needed to be in place to provide ongoing at-the-elbow support for academic staff and sessional instructors who were engaged in blended and online learning.

To address this need, a group of educational technology graduate students were invited to become members of the D2L coaching team. Coaching in education, according to van Nieuwerburgh and Lane (2012), is “an activity with educational observation at its centre, and professional learning as its aim” (p. 7). As graduate student coaches, their purpose was to provide both technological and pedagogical support during the first semester of D2L operation. This innovative approach to implementing and supporting D2L involved going beyond the basic sharing of technical support. It required all stakeholders, coaches, instructors, and trainers to engage in an organic grassroots collaboration for a more comprehensive support network. To achieve this end, the graduate student coaches engaged in an ongoing, dynamic exchange of ideas and support with each other, which led to more informed decisions with regards to finding solutions and supporting academic staff and sessional instructors. Also in this approach, they gathered information that in turn helped to inform protocols and practices. This led the coaches and instructors into a cyclical process of learning about the adoption of the new LMS into people’s teaching practice.

This paper is based on the experience of three graduate students who engaged in a coaching initiative to provide additional support to academic staff and sessional instructors during the implementation of D2L. They share four themes that emerged from their experience as members of a D2L coaching team. Drawing on their perceptions of this learning process, they discuss how this can influence the development and/or refinement of formal and informal training and support when implementing new technology using a coaching model.

THE D2L COACHING TEAM

Following the decision to adopt D2L as a new LMS for the institution, several measures were implemented throughout the University of Calgary to ensure a smooth transition. Focusing on academic staff and sessional instructors, large-group workshops were offered on D2L which addressed such items as the creation and management of content, the use of various communication tools, and how to

set up and use assessment and grade tools. These workshops, combined with self-guided tutorials, allowed many instructors to learn how to use D2L. However, it was identified that further support was needed during the implementation phase of the LMS while instructors were both preparing for its use, transitioning to D2L and also using it in their teaching.

To address the need to provide additional assistance beyond telephone support, tutorials and structured workshops, several faculties organized in-house coaching teams. The purpose of the coaching was to complement the large group workshops and to deliver a more personalized and directed support that would not only instruct, but foster the development of skills in using D2L. The Associate Dean of Teaching and Learning in the Werklund School of Education initiated the creation of a D2L coaching team within the School. The Werklund D2L team consisted of two doctoral students and one master's student, all studying in the area of educational technology. A host of well-rounded work and life experiences contributed to the richness of the team's pedagogical and technological knowledge and skills. In addition to being graduate students, they brought their own expertise from a multitude of teaching experiences including K-12, higher education and corporate training, as well as knowledge in online learning. The Associate Dean of Teaching and Learning supervised the work of the team, helped to organize the management of their work, and ensured resources were in place for the fulfillment of the task, bringing in her extensive expertise in online learning.

Initially, the Werklund School of Education offered this type of coaching support for instructors during the first two months of implementation of D2L. This was achieved through one-on-one and small group support offered by appointment or on a drop-in basis.

In their role as coaches to support the adoption and effective use of D2L, the three students developed and maintained their own knowledge and skills needed to provide the necessary support in three ways: 1) attending the same workshops offered to academic staff and sessional instructors; 2) engaging in weekly meeting of the graduate student coaching team; and 3) participating in the monthly meetings of

coaches from other faculties supported by the University of Calgary's D2L training team. Although this triad of learning secured much of the technological knowledge required to assist and guide the work in supporting people in learning and using D2L, they found as a team they relied heavily on the assistance of each other through spontaneous "on the fly" troubleshooting sessions.

LEARNING FROM DEBRIEFING THE WORK

Drawing upon their field notes and activities over the first two months of implementation of D2L, the three graduate student coaches identified the following four major theses based on their experiences and insights from the weekly debriefing sessions.

Nurturing confidence

The first theme addresses the unanticipated need to nurture confidence in participants attending the D2L coaching sessions. Although attendees came with varying degrees of technological and online teaching experiences, many arrived with some degree of insecurity surrounding the use of the new LMS. It was observed by the coaches that for many, the D2L implementation meant the safety net of a system that had previously worked for the instructors was now gone, and many required confidence in the use the new LMS, but for different reasons.

For example, some individuals would attend the coaching sessions on a drop-in basis to get assistance on a basic how-to. In these instances, it was observed not only were these individuals looking for instructions on how to include audio feedback or how to link a rubric to a gradebook item, but they were also seeking reassurance that the new LMS could meet their needs. Those who booked a coaching session for this reason developed the necessary confidence by simply having the coach on hand. This was seen when instructors would book appointments for assistance with a specific tool, for example with entering marks into the grades area of D2L, but they would require little to no guidance

from the graduate student coach. It appeared that some individuals felt more confident by having a coach present to watch and affirm that their process was correct.

The participants of the coaching sessions required some degree of technical support, the coaches observed these participants to also need support in the fostering of confidence. In some instances, the participants required confidence that the technology itself could meet their needs, and with the same degree of ease, as the previous LMS. The coaches also perceived that the participants required assurance in their own abilities to work with the features of the new LMS. In other cases, the confidence building centered on technological confidence that came as competence with the new LMS developed.

Team support

A second theme that emerged from the coaches' debriefing sessions related to the support needed by the coaches. They were required, at times, to provide immediate troubleshooting support that often went beyond the basic training they had received. Therefore, more than consulting documentation for information, they relied on other members of the team for help. This mutual support was vital to the success of their coaching.

Even though the D2L coaches were trained in the system and were able to provide support to instructors on our own, there were times when help was needed. In those moments, it was essential that they acted as a team, learning to rely on each other for assistance. This collaborative atmosphere allowed them to not only develop their skills individually, but more importantly, it helped them form collegial bonds that went beyond the work of this project. It enabled a form of support that can be applied to other components of their academic journey.

D2L Coaches as change agents

A third theme centers on the D2L coaches' role as co-leaders in the transformation of online pedagogical practice in the School. Entering into this project, they questioned how their support, particularly with regard to pedagogical support, would be perceived by academic staff members and sessional instructors with immense experience and expertise in the teaching profession. Although as graduate students the coaches lacked the formal credentials that put them on par with the participants of the coaching sessions, of Teaching and Learning Newsletter by offering suggestions and best practice recommendations in the use of D2L. A larger group of D2L coaches and trainers from other faculties also formed. The Werklund coaches were invited to contribute best practices within this group that would then be shared with other faculties as they began their adoption of D2L.

Moving to the driver seat

A fourth theme related to a transition. The specific goal of this initiative was to provide support to instructors in adopting the new LMS. However, a positive consequence, as perceived by the members of the coaching team during the weekly debriefing sessions, was the realization that they were agents in affecting positive impact throughout campus. These experiences as change agents, having a direct and appreciated influence on the School and University led them to a transformation of perspective from students to professionals. They were no longer considering themselves as students who received the influence of professors. They were able to act as educational developers working closely with instructors, creating an influence in the way these instructors structured courses and their practice. The coaches were engaged in a dynamic and organic process of learning, teaching and growth. It was an authentic learning environment, where the coaches were implementing what they had learned during their classes and projects into real-world situations, with meaningful results. They were drivers of change both in the educational development of instructors, as well as in their own professional growth and development.

LESSONS LEARNED

Based on coaches' experience with this initiative, three key recommendations to guide the development of a LMS student coaching team have been identified. First, preparing coaches involves more than technical training. As instructors seem to seek help not only to address their technical challenges, but also to receive pedagogical and psychological encouragement when using a new LMS, coaches have to be prepared to offer such complex and integrated support. Technological training may lie at the roots of a coaching team, however being open to recognize the need for support beyond the basic "how-to's" is vital.

A second recommendation involves developing a sense of unity within the team structure. Due to the innovative aspect of the LMS being implemented, the success of this endeavor relied heavily on true teamwork that promoted confidence and competence in being a team. As such, special attention should be paid to personal characteristics when selecting members of the team and a willingness to prioritize the collective.

A third recommendation is the need to allow and foster an organic evolution of support networks. A strong commitment to reach the goal (in this case successful transition from one LMS to another) is essential, but must occur without rigid expectations on how this goal can or should be achieved. When team members can carry a sense of openness and responsiveness to instances and circumstances, they can take advantage of "unplanned" opportunities to fulfill their duty and to provide the responsive support required. It can often be within this realm that the achievement of the goal can be most successful and additional benefits of the program can emerge.

CONCLUSION

For the three graduate students involved in this program, the experience of being part of a D2L coaching team was both empowering and rewarding. Although they perceived themselves to lack the

employment status necessary to have such an impact, their experiences as coaches, educators and students were highly valued by the participants they came in contact with during the coaching sessions. It was powerful for the coaches to recognize that their coaching was not only appreciated, but also respected while also having concrete results that will ripple through the School and University and in their own professional growth.

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COMPARING STUDENT AND TEACHER SELF-ASSESSMENT PRACTICES

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In constructivist models of education, teachers are positioned as co-learners. This paper raises the question of how we might then apply what we know about student learning to teacher learning through the example of comparing student and teacher self-assessment. A review of academic and professional literature reveals that while the perceived benefits of both student and teacher self-assessment are similar, the current practices are quite different.

One of the many shifts in education in recent years has been the repositioning of teachers as learners. Often this phrase is used to promote the importance of authentic learning through professional development (Bilimaira, 2000; Craig, 2010; Hanna, Salzman, Reynolds, & Fergus, 2010); however, in constructivist models of education, teachers and students are also reconceptualized as co-learners (Holbrook, May, Albers, Dooley, & Flint, 2012) and co-producers of knowledge (Hill & Sewell, 2010). As the concepts of learner and teacher are seen more as interconnected orientations toward knowledge than as defined and discrete roles in the classroom, it allows us to consider how we might also re-envision learning practices for both students and teachers.

This paper will explore one particular aspect of this question by looking at self-assessment. The perceived benefits and current practices of student self-assessment and teacher self-assessment will be discussed and compared. Both academic literature and internet resources that are readily accessible by

teachers in the field will be used to inform the discussion. As this work is in its preliminary stages, the implications will be raised as questions for further thought and research.

Benefits of Student Self-Assessment

The value of having students assess their own learning is linked to the concept of formative assessment, also known as assessment for learning. Early advocates of formative assessment Black and William (1998) declare that "Self-assessment by pupils, far from being a luxury, is in fact an essential component of formative assessment" (p. 143). Canadian assessment for learning researchers Rolheiser and Ross (2000) and Davies (Davies, n.d.) also include self-assessment as a central part of their work.

Studies of student self-assessment demonstrate many ways in which the practice enhances student learning. Rolheiser and Ross (2000) and Ross (2006) cite higher levels of cognitive achievement, motivation and self-efficacy, particularly in writing. Rolheiser and Ross (2000) and Black and William (1998) both claim that self-assessment is especially helpful for low achieving students. A Report by the Ontario Literacy and Numeracy Secretariat (2007) adds that self-assessment promotes metacognitive skills, increases student responsibility for learning and reduces disruptive classroom behaviour. There is one substantial caveat to these studies, however, and that is the need to teach students how to assess their work and to provide plenty of opportunities to do so: "Simply requiring self-evaluation is unlikely to have an effect on achievement" (Rolheiser & Ross, 2000, p. 33). However, when these conditions are met, students become increasingly able to accurately assess the products of their learning and set goals for future learning (Boud, Lawson, & Thompson, 2013; Davies, n.d.).

Benefits of Teacher Self-Assessment

While student self-assessment is a relatively new practice, the recognition of the value of teacher self-assessment has a longer history. Nearly a century ago, an American education professor published a

book with a lengthy list of questions new teachers ought to ask themselves in order assess "the myriad of little things which vitally affect a teacher's success" (Wemett, 1915, p. 4). By the 1950s and 1960s, teacher self-assessment was seen as essential not only to a teacher's individual success, but also to the recognition of teaching as a profession (Kinney, 1958; Simpson, 1966). Since then, teacher self-assessment has increasingly focused on the effective implementation of teaching methods (Haysom, 1985), personal reflection as a means to self-improvement (Airasian & Gullickson, 1994; Mälkki & Lindblom-Ylänne, 2012), and providing evidence of specific outcomes (*A quality teacher in every classroom: Creating a teacher evaluation system that works for California*, 2010).

While the focus of teacher self-assessment has changed over time, its broad aim to promote and support professional development has remained relatively consistent. Arbizu, Olalde, and Del Castillo (1998) contend that "self-evaluation can offer impressive insights into the whole range of teaching evaluation procedures that are aimed at ensuring the improvement of teaching" (p. 351). It makes sense, therefore, to draw parallels between teacher self-assessment and formative assessment; in both cases, the purpose of the assessment is further growth and learning. As the Alberta Teachers' Association website describes it, self-assessment is integral to "ongoing, coherent and coordinated" professional development of teachers as "self-directed learners" ("Professional development," n.d.).

Recommended Student Self-Assessment Practices

The literature on student self-assessment highlights three important factors necessary for effective practice: viewing self-assessment as a skill that improves with time and practice, involving students in the setting of criteria, and including self-assessment as one among many sources of evaluation.

Self-assessment is presented as a complex skill that needs to be both modeled and explicitly taught; like any other skill, it develops over time and with many opportunities for practice. While students focus on assessing their own learning products, teachers can also assess the progress of individuals and

groups of students in their growing ability to generate and use criteria and to construct appropriate goals for ongoing learning (*Capacity Building Series: Student Self-Assessment*, 2007). Davies emphasizes that self-assessment can be introduced to even the youngest students (Davies & Herbst, 2013) but also that it is an "on-going journey" that allows students to improve over time (Davies, n.d.).

One of the factors that improves over time is students' ability to articulate the qualities of good work. Self-assessment is not the same as having students simply mark their own tests or assignments according to a pre-determined key or rubric. Instead, it involves students in the "negotiation" of criteria for assessment: "Neither imposing school goals nor acquiescing to student preferences is likely to be as successful as creating a shared set that students perceive to be meaningful" (Rolheiser & Ross, 2000, p. 34). Student involvement in setting the criteria is considered essential to the learning potential of self-assessment activities (*Capacity Building Series: Student Self-Assessment*, 2007; Davies & Herbst, 2013).

Although self-assessment based on negotiated criteria is a skill that has been shown to improve with time and practice, it is not suggested that it be the only source of classroom assessment. A variety of perspectives and assessment approaches are necessary for authentic learning. Students need feedback from their teachers and their peers in order to have meaningful dialogues about their learning and their self-assessment skills (*Capacity Building Series: Student Self-Assessment*, 2007). The concern that students may over- or under-estimate their learning can be mitigated through the use of ongoing training in self-assessment and through teacher and peer assessments that provide a more comprehensive view of student learning (Ross, 2006).

Recommended Teacher Self-Assessment Practices

It is not difficult to find parallels between the benefits of self-assessment for both students and teachers; however, the recommended practices for both groups reveal significant differences. Using the three

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most common recommendations for student self-assessment practices (skill development, negotiated criteria, and multiple sources of feedback) provides an interesting starting point from which to review current modes of teacher self-assessment.

While teachers are encouraged to explicitly instruct students how to self-assess, there seems to be an assumption in the literature that teachers are already skilled at self-assessment. Airasian and Gullickson (1994) provide a thorough discussion of teacher self-assessment characteristics, but the growth resulting from the "constant cycle of experience, reflection, and improvement" is described solely in terms of changes in teachers' work with students as opposed to teachers' increasing ability to effectively assess their work. Arbizu, Olalde, and Del Castillo (1998) describe teacher self-assessment as a "capacity" that can be developed, but that development is seen as the natural outcome of having more opportunities to reflect on others' opinions of the teacher's practices. Ross, whose work with Rolheiser (Ross & Rolheiser, 2000) encourages the ongoing teaching of self-assessment skills to students, begins his work on teacher self-assessment (Ross & Bruce, 2007) with the assumption that teachers know how to assess their work but need more influence from "peers and change agents" to achieve professional growth (p. 146).

Paradoxically, a case could be made that the current practices for teacher self-assessment undermine this assumption by mandating ready-made tools that do not require nor account for any prior self-assessment skills. Government jurisdictions like Washington State ("Teacher self-assessment form," n.d.) and New York State (Silver Strong and Associates, 2011), book publishers like Pearson ("Teacher self-evaluation form," 2008) and Scholastic ("Self-assessment checklist," n.d.), and the Alberta Teachers' Association (ATA) have developed charts and questionnaires that are apparently for all teachers, regardless of skill or experience, to use. The ATA does emphasize that "self-assessment must be continuous and seamless with professional growth" (Alberta Teachers' Association, n.d.), but there is no indication of how teachers might improve their self-assessment skills.

The most significant difference between student and teacher self-assessment practices emerges from these ready-made tools. In each case, the criteria for quality work is already set. Although it is considered critical for students to be involved in determining the criteria by which they will assess their work, there are no ready examples that afford K-12 teachers that opportunity. Airasian and Gullickson (1994) describe teacher self-assessment as a process based on "standards or performance expectations set by the teacher" (p. 199), but this is not reflected in the current models. In Ross and Bruce's (2007) case study of effective teacher self-assessment, the case teacher's growth is documented by the example of how he moves from using teacher-made rubrics to those that are collaboratively developed with students. However, it is hard to miss the irony that this study starts with a teacher self-assessment rubric in which all the criteria are pre-established. Both the models of teacher as professional and teacher as learner would indicate that teachers should be involved in the setting of criteria for self-assessment.

The one area in which teacher self-assessment practices begin to align with those for students is in the area of multiple sources of feedback. Ross and Bruce (2007) recommend a model for professional growth which includes self-assessment, peer coaching and formal expert observations; Simpson (1966) and Kremer-Hayon (1993) also cite peer and expert support as helpful to effective self-assessment. Arbizu, Olalde and Del Castillo (1998) advise including student assessments as a catalyst for teacher self-assessment. Nevertheless, some of the literature and many of the tools for teacher self-assessment continue to conceive of it as a solitary, internalized practice (Airasian & Gullickson, 1994; Haysom, 1985).

IMPLICATIONS

While some educational theorists are beginning to challenge the very notion of teacher as co-learner (Biesta, 2014), the scope of this paper is to raise questions about what it might mean in practice to consider teachers as learners. If teachers are considered co-learners, how then shall we enhance this

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capacity? Is it appropriate or helpful to apply the methods and measurements used for student academic development, such as assessment for learning, to teacher professional development? Should traditional ideas about teacher self-assessment give way to align such professional practices with current recommendations for student practices? Is there something inherently different between the two, or are they best seen as occurring along a continuum of self-assessment skills and practices? Can teachers become directly involved in the negotiation of the criteria by which their work is assessed? Is the current situation due more to political and administrative policies than to best learning practices? These questions demonstrate the need for ongoing research into the role of teacher in constructivist paradigms and, specifically, into the purpose and practice of teacher self-assessment.

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HISTORICAL THINKING, GHOSTS AND HAUNTINGS: IMAGINATION AND THE POETICS OF ON-LINE LEARNING

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This innovative collaborative research project and practice began with a critical pedagogical and curricular concern about how to incorporate “historical thinking” and knowledge into an on-line graduate course, Current Issues in Early Childhood Education. Drawing on the work of interpretive scholars who wrote about “living” ghosts, phantoms, and memory we strove to offer different insights into the context of teaching and learning in post-secondary programs of study. We invited Enlightenment philosopher and early childhood advocate Jean-Jacques Rousseau (1712-1778) to class as a way to re-image critical historical and socio-cultural notions of childhood, and child care in Western curricular traditions and inheritances.

APPEARANCES OF THE DEAD¹

In a recent on-line graduate course entitled, *Current Issues in Early Childhood Education* (ECE), Carolyn invited a ghost to class. More precisely, she *summoned* Enlightenment philosopher and early childhood advocate Jean-Jacques Rousseau (1712-1778), as a way to re-image critical historical and socio-cultural notions of childhood, and child care in Western curricular traditions and inheritances. Rousseau (who was listed as a class participant) spoke directly with the students (*through Carolyn as*

¹ We draw this title from R.C. Finucane’s seminal 1984 study *Appearances of the Dead: a Cultural History of the Ghosts* (Buffalo: Prometheus).

the medium) and expanded contemporary, interdisciplinary ideas about childcare and early years learning with relative historical beliefs and pedagogical practices. The fourteen graduate student participants were all working in national and international preschool to post-secondary level education settings. Throughout the six week graduate level certificate course – part of the M.Ed. degree program at the Werklund School of Education – students viewed contemporary ECE issues through theoretical, historical, cultural and personal lenses². For class participants, inviting Rousseau to discuss his controversial book *Émile or On Education* (1762), and his Enlightenment ideas within a contemporary technological platform complicated the origins of modern child developmental discourses and showed how such concepts were not fixed and eternal but rather located, interpreted, and contingent (Caputo, 1987).

The innovative collaborative research project, which was prompted from Carolyn's *spirited* invitation to a ghost, has centered on the critical pedagogical and curricular concern about how to incorporate historical thinking, and knowledge into graduate curricula offerings (in all its course *manifestations*—face-to-face, blended and on-line). Haunted by a pervasive, 'single' curricular focus on modernist child developmental psychology in the various teacher education courses she has taught, Carolyn wondered how knowing historical perspectives might account for contemporary western childrearing and educational practices, and dominant discourses about children and childhood. A former early childhood educator herself, Carolyn was never introduced to the views of 18th and 19th century early childhood pedagogues and philosophers in either her post-secondary programs of studies nor in the field of early learning. When Lisa, Carolyn's doctoral supervisor, suggested that she read *Émile or On Education*, Carolyn discovered that ideas included in Rousseau's Enlightenment treatise on child rearing and education both echo and disrupt modern and postmodern childhood pedagogical theories

² Formal Ethics approval for this research was received in September 2013. Ethics ID: REB13-0696.

and practices. New understandings and worlds opened up to Carolyn as she related and connected past to present early education and childcare customs and beliefs.³

Now acknowledging the critical importance of knowing and imagining bygone events, ideas and figures, Carolyn continues to view current ECE issues, through a historical lens and attempts to find creative ways to raise students' awareness of the past in teacher education classrooms. Although many ECE post-secondary programs remain ahistorical (and perhaps even anti-historical) and emphasize modern science-based pedagogical theories and practices we believe that, "[t]raining institutions for early childhood educators might also examine how critical reflection is incorporated within their daily practice. As ... educators [in all disciplines] we need to understand why we practice as we do and to be aware of the discursive genealogy that underlies our beliefs" (Kummen, 2010, p. 110).

Likewise Lisa, a cultural historian has always been deeply interested in the connection between on-line learning, historical inquiry and visual representation. As early as 2001, and while preparing to design and teach a course entitled the *History and Philosophy of Adult Education*, she pursued a study entitled: "Constructing a Critical Historical Practice in on-line Learning."⁴ In that research, she strove to create a course shell in the evolving *Blackboard* platform that would richly embody historical knowledge, not only through text but in multimodal (visual, spatial, artifactual) contexts. Primary and secondary textual narratives of adult education were analyzed in light of contemporary theories of historical and philosophical interpretation, and particularly around methodological considerations which have inscribed the "visual" as a determining constituent of knowledge construction. Consequently, historical images (paintings, photographs, murals), artifacts/constructs (heritage plaques, monuments, spaces, and

³ In her thesis, *The space-in-between: Ontology and the place of curriculum in the culturally diverse early childhood education post secondary classroom*, Carolyn is examining how immigrant educators understand and situate their self with a western post secondary ECE curriculum. Using an interpretive narrative approach that focuses on the life stories of the research participants, Carolyn wants to know how immigrant educators juxtapose their own cultural ideas and beliefs about childcare and early learning with relevant western pedagogical theories and practices. Moreover, Carolyn asks - if immigrant educators are not invited to share their personal and cultural ideas in post secondary classrooms, how might it ultimately affect their work with children and families in Canadian ECE settings?

⁴ The study was funded through a "Learning Commons Fellowship" (University of Calgary) and the Graduate Division of Educational Research (now Graduate Programs in Education, Werklund School of Education).

other public commemorations) as well as other communication technologies (video, film, radio, and the Internet) were incorporated as a central theorizing tool of analysis in this course. The course (and successive iterations of it) was grounded in emerging discussions in history around historical thinking, consciousness, and memory.

While incorporating historical knowledge and discussion in the *Current Issues in ECE* graduate course was likely the expected (and traditional) approach an instructor might have taken, we decided to follow interpretive scholars who metaphorically wrote about ghosts, hauntings and memory as a way to offer different insights into the context of teaching and learning. Buse and Stott (1997) have noted that the metaphor of haunting and spectrality has been employed by seminal thinkers such as Karl Marx, Sigmund Freud, Carl Jung, and most principally by French Philosopher Jacques Derrida, as an intellectual concept to theorize our indebtedness to our historical inheritances and all that it offers us in the present. Working backwards and forwards from Derrida, who first coined the term “*hauntology*,” (1993/1994) - which Kenway (2008) notes “refers to the metaphysical logic of the ghost” - we unravel how “hauntology is built on problematizing the notions of presence and present”(p. 3), reviving and conjuring up the inheritances we consciously or unconsciously refuse to address and critically interrogate. Derrida (1991) provocatively suggests that “the future belongs to ghosts” (p. 349). Significantly, we are interested in the ethical imperative at the heart of Derrida’s summoning of ghosts (*revenant*) and how it connects to his notion of hospitality and the receiving of the other — whether it be the ghost, the guest or the troubling curriculum text or knowledge (Derrida, & Dufourmantelle, 2000). We share Derrida’s notion that “speaking to” not just “seeing” ghosts is a deeply ethical practice that is grounded in our collective responsibility to ourselves and others.⁵

⁵ In a longer paper, we will flesh out the intellectual debates (among French continental philosophers such as Derrida) in the mid-century 20th around the visual, orality and writing (Jay, 1994), and its possible relation to on-line learning and teaching.

More recently, debates in the discipline of history (some drawing on Derrida and other hermeneutic scholars) have pointed to a similar concern about paucity of historical thinking and consciousness in K-16 classrooms. Such concerns have been exacerbated by Neo-Liberal agendas in post-secondary institutions which focus on individualism, notions of progress and economic and politic advantage, aimed at producing future-oriented students. For Peter Sexias, historical consciousness is critical to how we understand the past, the present and future. The implications for our forgetting of the past in the name of the present and future are more profound than we might imagine. The past is being increasingly conceived not as a sterile progressive continuum embedded in linear time but as a space/place (beyond time) that allows us to bring something to life (Munro-Hendry, & Winfield, 2013). Claudia Ruitenberg (2009), suggests provocatively that education should be seen as a *séance* - “a place where ghosts are summoned in order that we may come to (speaking) terms with them” (p. 295). William Doll (2002) suggests that such “ethereal presences” serve to “awaken us from our slumber” (p. 23). Doll (2002) adds “it is odd to think of ghosts—ethereal, ephemeral, elusive as imagistic metaphors for the way things are, have been, or could be” (p. 27), yet imagining curricula haunted by the ghosts of the past represents “unrealized possibilities” (p. 24).

In the present paper,⁶ our intent is two-fold and dialogically interrelated. First, we examine the educational historiography and veritable curiosity in curriculum ghosts and hauntings in the educational literature. We ask: what does the appearance of the dead, and allusions to ghosts and hauntings signal in contemporary curriculum scholarship? And how does it speak to weighty and ethical concern about the importance of memory and remembrance? Second, how might this be linked to digital and imaginal innovation, particularly as it is associated to multimodal, embodied and poetic aspects of on-line learning environments? We wonder: How do learning technologies such as *Blackboard* and now *Desire2Learn* both suit and enhance ghostly appearances and imagining of the past?

⁶ See also Bjartveit & Panayotidis (In press).

The metaphor of ghosts and hauntings has found a productive context in educational discussions particularly around the historical and socio-cultural discourses that underwrite all our K-12 curricula. An examination of the literature produces an eclectic array of titles for one's delectation and wonderment (Bakker, 2013; Doll, 2002; Kenway, 2008; Morton, 2013; Ruitenbergh, 2009; Taylor, 2010). To speak of the practice of hauntology and the *appearance* of the dead in our classrooms and curricula is to envision historical discourses, ideas, and ideals from the past in wholly imaginative terms. And what is historical writing after all if it is not (more or less) an imaginative and poetic practice, according to historian Hayden White (1985).

Crossing Thresholds and Boundaries

The topic of ghosts and hauntings in the curriculum has admittedly an enthralling theatricality to it which elicits poetic inquiry, fictional writing and performativity, and lends itself powerfully to on-line learning. We believe that part of the success of this *haunting* was due in no small measure to the course delivery technology. In this respect, digital environments, with its disembodied and ethereal virtuality becomes a dramaturgical space that elicits and problematizes students' sense of presence and present, and their sense of the known and all knowing, invoking past worlds, voices, and ideas not yet encountered. In the western cultural tradition ghosts and hauntings have always *played* an important part in the theatre, in literature in art, and most recently in film. From classical Greek tragedies, to Shakespearian plays and to Dickens, *Christmas Carol* (1843), the appearance of ghosts has been a way in which the living have grappled with their fears, imaginings and dreams. However, Derrida implores us to not only see ghosts but to address them — to critically engage and learn from them. Owen Davies notes that ghosts have historically always been considered “purposeful.” He asks: “Why would the spirits of the dead want to haunt the world of the living? There was always a reason — or to be more precise people always found a reason” (Davies, 2007 p. 4).

This innovative curricular and pedagogical practice — summoning the dead— enabled us to imagine and re-envision multiple pasts, providing diverse understandings of historical contexts, contingencies, and agents relative to present day beliefs and pedagogy. The graduate students in the course expressed curiosity and some suspicion regarding the ghost’s arrival in the virtual classroom and yet they playfully engaged with Rousseau in an animated dialogue. The students risked crossing boundaries and stepped into a liminal space where they were recipients of the unforeseen. An ahistorical ECE curriculum summoned the ghost of Rousseau. As Derrida has noted: ““A place of haunting... “is a place with no phantoms. Ghosts haunt places that exist without them; they return to where they have been excluded”” (Derrida & Dufourmantelle, 2000, pp. 151-152).

Through these ideas we invited class participants to further imagine, create and dream of innovative ways to engage their own students, raising a critical and dialogic historical awareness. In an email sent to Carolyn (Sept. 22, 2013), one student explained how her ghostly encounter was a conduit to her re-thinking and presenting historical perspectives —she planned to use similar haunting ideas in an ECE post-secondary course she instructed. We argue that in preparing students for an unknown (and digital) world we need to develop their historical thinking about the storied past. We need to support students to address the diverse and often troubling and difficult knowledge from history. As we move forward with this research we hope to forge a greater awareness of the deep and ethical regard we must hold for the past, however unpalatable or distasteful to our modern sensibilities.

Significantly, on-line learning technologies may serve as a *medium* through which to bring forward the ghosts, as they act as actual and illusory thresholds and boundaries that mark past and present, life and death, this world and the afterlife (Ellis Davidson, 1993). Our contribution to this body of work on the metaphors of ghosts and hauntings in education is to theorize and apply these complex understandings to on-line teaching and learning. We sense that ghosts are calling out from beyond the grave —

pleading to be remembered and inviting us to take up this challenge — perhaps then they will rest in peace.

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MÉTIS REMEMBRANCES OF EDUCATION: BRIDGING HISTORY WITH MEMORY

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The authors invite a deep listening of memories of Métis people in Alberta that represent an unofficial yet significant account of history. Engaging with a critical pedagogy of decolonization means revisiting history written from the colonizer's perspective (Smith, 1999). These memories are explored for points of connection with official history and mainstream interpretations. We aim for hopeful remembrance by opening up the present to its insufficiencies with history (Simon, 2000). We ask: What Indigenous memories are missing from the official history of your community? What would it mean for you as an educator to really hear those memories?

In this paper, the authors argue for a deep listening of history – one that would mean living our lives as if the lives of others really mattered (Simon, 2002). History is more than the official history of the powerful. Hannah Arendt (1958) has written about meaningful existence as more than the power to enact change but to also be memorable. The authors invite a deep listening of the memories of Métis peoples' experiences with education that contribute to an unofficial account of history that is not often considered nor heard. These are examined for points of connection with the official history of Indian residential schools and mainstream historical interpretations.

Native American scholar and philosopher N. Scott Momaday (1997) considers the act of storytelling to be a ‘sacred exchange’ that involves the storyteller, listener, words and the place including context within which the storytelling event takes place. The act of listening to a story is a subjective experience that delivers the message necessary for each listener, at that point in time. Other indigenous scholars, including Thomas King (2003), remind us that once we have heard a story, particularly a memorable story, we can never return to our uninformed state. Stories carry our memories – real, imagined or envisioned (Archibald, 2008; Panegoosho, 1962). Non-Indigenous scholars too, have noted the power of stories to “make sorrows bearable” (Ricoeur, 2004, p. 157). We challenge you to take the stance of a deep listener to the stories that follow. In doing so, we ask you to consider: What memories of First Nations, Metis, and Inuit peoples might be missing from the history you have heard of your community? What would it mean for you as an educator to listen deeply and really hear these memories?

In this study of two Metis women’s experiences with education in the early twentieth century, we recount the less familiar, lived experiences with colonial education, followed by the familiar refrain of official history. We highlight the oral followed by the official account of similar events. The first story, by Rose Durocher, was documented in a digital video format (see *Meaningful Media: An Ethnography of a Digital Strategy in a Métis Community*) and the other story by Angie Crerar appears in a print collection of stories and interviews from Métis people who attended Indian residential schools (see *Métis Memories of Residential School*, 2009). These life stories are counter narratives of the ‘Other’ and challenge the dominant and official version of history. Yet they hold truth. When contextualized within a critical framework of decolonizing methods that invite a deep listening to history, these accounts disrupt our “invested understanding of ourselves, our government and the regulating political, economic and technological frameworks we unconsciously use to negotiate our world” (Simon, 2000, p. 78). Should you hear elements that challenge the dominant version of Alberta’s history and

encounters with Aboriginal peoples, then in Roger Simons (2000) view you have been “summoned to witness” (p. 67). To be summoned requires a sensibility that “instantiates the proximity of self and another, an Other who calls, who summons me, and who thus puts me under an encumbrance in which I must consider my response-ability” (p. 66). Testimony involves bearing witness and as such “one always bears witness to someone, so that in speaking, the witness who speaks summons another to witness this speaking” (p. 67). To accept the summons means that you have accepted a “testimony-witness relation and the burden of being obligated to testimony beyond one’s a priori instrumental concerns and (then you) are approaching testimony with a summoned sensibility” (p. 67).

I’M A SURVIVOR – DIGITAL STORY OF ROSE DUROCHER

In this self-narrated digital story of long-time resident and Fishing Lake Métis Settlement Elder Rose Durocher, we hear about the old days and how Métis people had to work hard to make a living off the land. Yet, because “we would share what we had” with others, they were happy times. Rose tells of how her father taught her, “his only daughter,” about trapping – revealing that women once shared equal standing with men in this small northern community. Rose narrates stories of trapping, farming, gardening, living off the land, and intergenerational teaching and learning in the Metis Settlement. When the daily trip over the frozen lake in sub-zero temperatures made going to school difficult, we “just stayed home.” In the last segment of Rose’s story there is a video clip of her demonstrating and explaining how to make tea and dry fish over an open fire, thereby concluding the storytelling by virtually sharing some tea, fish and bannock. She speaks confidently and fluently in Cree/Michif in this segment in contrast to her somewhat halting use of English in the introduction. Rose’s story ends with a memorable one-liner: “Seems to me things are harder today.”

While her story may be interpreted as representative of a simpler time, the authors hear instead, a critique on the difficulty of adapting from a collective orientation to an individualist way of living in contemporary times. Maori scholar Linda Tuhiwai Smith (1999) critiqued the modernist notion of

history and the way it is presented as a natural and continuous “development [that] implies progress and that societies advance through similar stages from simple, primitive, emotional to more rational, complex and civilized” (p. 30). From the perspective of a group who knows what its like to have “history erased before your eyes, dismissed as irrelevant, ignored or rendered as the lunatic ravings of drunken old people” (Smith, 1999, p. 29), we know the importance of history for understanding the present. Smith argues that reclaiming history is necessary for decolonization and Rose’s story on education situated within the context of her family and broader Metis Settlement community provides a glimpse into Metis forms of traditional education that are linked to the land. On the other hand, her memories of the school across the lake are scarcely mentioned.

A mainstream perspective on Metis peoples’ history with education can be found in the Report of the Royal Commission Appointed to Investigate The Conditions of the Half-Breed Population of Alberta (1936). In particular, this report brought to light that there were differing viewpoints held by policy makers during the Depression era with regard to the objectives of educating the Métis. The appointed commissioners noted that “many are of the opinion that it is advantageous to take the half-breed child into a large boarding school and teach him the conveniences and amenities of modern life” (p. 10), while others felt that this education would be wasted upon their return to colony life. For their part, the commissioners proposed a different policy solution and rationalized that, “[this] controversy cannot affect the desirability of giving to the Métis child an ordinary public school education, coupled with an elementary training in agriculture, and in addition giving the girls elementary training in sewing and knitting” (p. 11). After intense debate with members of the Famous Five about the membership of the Métis population, the commission recommended that farming colonies be established for the destitute northern-based Métis and that these social experiments would also include the provision of basic education to colony members:

The evidence is that in all these settlements where there are no white schools large numbers of children are growing up without any education. Certain church or denominational schools are doing splendid work on a purely voluntary basis. Bishop Guy points out that 100 half-breed children are being educated in the Grouard district without cost to the parents or to the Government. It was stated that 80 percent of the half-breed children of the Province of Alberta receive no education whatsoever. Even those Métis children who live within an area served by a public school are adverse to going to such a school because they are ridiculed and humiliated by the white children. (p. 11)

The report's emphasis on a policy solution of education by volunteer religious organizations in the colonies, at no cost to taxpayers, echoes the Canadian government's preoccupation of how to provide education for First Nations children that began in the late 1800s. With this solution, policy makers could continue to overlook the alarming fact that eighty percent of Metis children in Alberta did not attend public schools due to the racism they experienced there. It is now emerging, that the character of the voluntary work of religious instructors initiated by this commission, was extremely abusive and provides one possible explanation for why Rose was largely silent on her experiences in the school across the lake.

In Miller's (1997) comprehensive history of Native residential schools, the Metis are mentioned only a handful of times, and in reference to the industrial school model, the predecessor to Indian Residential schools. It was Canada's treaty obligations to education for First Nations that initiated the plan for Industrial Schools (Bull, 1991), and the role of Metis children in this original scheme was seen to be important. Nicholas Davin, charged with researching the industrial model of education in the United States, included in his report that "the mixed-blood is the natural mediator between the Government and the red man, and also his natural instructor" (p. 101). But by the 1930s, in Alberta, the Ewing Commission was firm in their resolve to reject the "scheme which would give to the half-breeds the

status of the Indian and thereby make him a ward of the Government” (p. 13) as this was deemed to be too costly. Further, the commission refused to recognize Aboriginal rights for the Métis believing that such a move would “undermine his initiative, destroy his sense of responsibility and prevent his ever becoming a self-supporting citizen” (p. 13). The Government of Alberta decision to provide basic education for the Métis through the program of religious voluntarism in their farm colonies was based on cost effective measures. But Metis children did attend Indian residential schools and the degree to which this particular history of Metis peoples’ education has been ignored is particularly apparent in this study of early twentieth century education for Metis peoples in Alberta.

ANGIE CRERAR – MÉTIS MEMORIES OF RESIDENTIAL SCHOOLS

Within the collection of Métis Memories of Residential School, Métis Elder Angie Crerar recounts her personal story of the time she spent at the Fort Resolution Indian Residential School. “I cannot express in any language the horror that I lived. I cannot express or try to explain how I feel about the government, the churches, and everybody that was involved,” (Metis Nation of Alberta, 2004, p. 128). Her acknowledgement of the inability of language to embody the horror of her experience reflects Ricouer’s (2004) understanding that the “suffering of extermination exceeds the resources of narrative” (p. 157). Still she had a lot to say about the current focus on “healing.” “I’d like to know how in the heck they [the government] are going to heal us. How do they heal something that you endured? How can they make it up? There’s no way that they can make it up for those thousands of boys and girls that are buried, who never knew a smile, never knew a hug, never knew those simple words that we all say to each other, ‘I love you’ and to heal,” (p. 127). Angie was brought to the school, along with her two sisters, soon after her mother was stricken with a deadly bout of tuberculosis. According to Angie, the residential school was paid to keep the Crerar children by her widowed father who was ill-equipped to meet the demands of six young children. “And the way they dressed [us], we were not allowed to wear our own clothes although my dad paid for us to be there, we were not government--we were not

attached to government in any shape or form though [as Metis] we were treated worse than the others,” (p. 126). Angie recalls: “As far as I can remember, the nuns, the priests and the Brothers, they were all hypocrites. One minute they tell us, ‘We come here to answer the call of Jesus. We were sent up here to educate you savages with the love of God,’ and [then] they treated us worse than dogs. I have witnessed many, many brutal things that happened to the girls and boys in those ten years. Some were beaten so badly they couldn’t walk,” (p. 126). Angie managed to evade the more horrific attacks that took place in this school because, in her opinion, she stood up for herself. Yet the rod was likely spared for a family of orphaned children who likely represented a source of much-needed income for the school and whose unpaid labour was required to keep the school running. Miller (1997), for instance, found that although the senior bureaucrats in Ottawa wanted to discharge the Metis children from the Indian Residential school in Red Deer, the Methodists insisted on keeping them because ““many of the halfbreed children are the stay of the Institute as far as the routine work is concerned”” (p. 288). This statement alludes to the racial structure or pecking order that was implemented by religious staff to control the residents of these institutions.

In seeking to make sense of this traumatic experience, Angie has committed her life’s work to helping others. Recently, she created a digital story of her own life experience and her continuing pride in her Métis heritage. In this regard, she exemplifies Tuhiwai Smith’s (2012) recognition of those “who choose to remain, to wear their identities with pride and work with and for their own communities and nations” (p. 232). In placing her story on the bridge from memory to history, she serves as a catalyst of social transformation from within her community.

CONCLUSION

Our aim in documenting Metis life stories and making them public is to attempt to create what Simon (2002) described as a “sphere of public memory as a transactional space...for mobilizing practices of remembrance learning [where] one’s own stories might be shifted by the stories of others,” (p. 62). As

educators, our challenge to you to re-examine history arrives at a timely point in our history - the time of truth and reconciliation. Without the truth of accounts of our shared Canadian history from First Nations, Métis, Inuit perspectives, we contend that there will be no easy reconciliation. Without these accounts, reconciliation may otherwise prove to be another rhetorical device of manipulation to be used by Canadian governments, just as civilization, assimilation, and integration were rhetoric for previous generations of Aboriginal peoples. This rhetoric can detract from the actions and inactions that governments take (that continue to confine us) while proclaiming a new policy era in education. As educators in Alberta, we have been tasked to shape the minds of our young learners, and future educators, into “ethical and engaged” citizens. As Aboriginal educators, we ask that you take the time to listen deeply - and *remember* - the stories of all. They, and their stories, matter.

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LEARNING ABOUT RESEARCH BY RESEARCH DESIGN: STUDENTS' PERCEPTIONS OF A MASTER'S ONLINE COURSE IN EDUCATION

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Informed by signature pedagogies, the course EDER 603 Research Methodologies in Education requires students to write their "Research Commitments" as a major assignment. This assignment is very similar to a research proposal and participants in the course had to identify a research topic, problem, and purpose, as well as create research questions and identify an appropriate methodology. The course involved feedback cycles from both peers and the instructor. In this paper I reflect on the technological tools used for the online course, including challenges and students' perceptions of the course design.

INTRODUCTION

In Fall 2013 I had my first experience with online teaching. The course was *EDER 603 Research Methodologies in Education*, which I had taught on-campus twice before, and for which I had received excellent comments from my former students. In this paper I elaborate on how signature pedagogies and formative assessment informed the design of the course, describe the online tools I used for team discussion and class conversation, and offer a reflection about the contrasting experiences from the two sections of the course. Through reflection on my first experience, I want to elaborate on, and add to, instructional strategies for online courses in general, and discuss particular issues related to this course

in research methodologies. Instructors, program designers, and students might be informed by my story in this paper.

SIGNATURE PEDAGOGIES AND FORMATIVE ASSESSMENT

The term *signature pedagogies*, introduced by Schulman (2005), refers to "the types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions" (p. 52). While instructors at the university level commonly include information and ways of doing characteristic of the professions that the courses are preparing students for, signature pedagogies stress the importance of engaging students in the authentic activities and ways of creating knowledge.

Both formative assessment (Vaughan, Cleveland-Innes, & Garrison, 2013) and the creation of virtual communities (Garrison, Anderson, & Archer, 2001) have been identified as key components in online courses. Dibbs, Glassmeyer, and Jensen (2011) in a phenomenological study of graduate students enrolled in an online master's program concluded that formative assessment tasks involving virtual communities can help to promote student learning and satisfaction. They provided specific advice for teachers: "Online instructors should structure formative assessment tasks to allow interaction, collaboration, and trust between students" (p. 32).

Formative assessment is usually integrated in my courses through discussion forums. Students are required to post drafts of their assignments and provide feedback to their peers. I also provide feedback in the same discussion forums, which serves as a model for effective feedback. In my experience, I have seen that this process is beneficial for both students receiving and students providing feedback.

DESCRIPTION OF THE COURSE

The course *EDER 603 – Research Methodology in Education* provided a general introduction to research methodologies and challenged students' epistemological assumptions about knowledge and research. The main goal was to examine diverse issues, methods, and techniques in educational

research. Participants were expected to approach primary research, as opposed to research reviews, with a critical eye. Informed by Creswell (2012), the course included the following components related to research: critical and efficient literature review; selection of research purpose, problem and question; selection of an appropriate methodology; academic writing style; and skills for problem solving, including solving puzzles.

Three major assignments were required for this course: 1) Research commitment, similar to a research proposal; 2) Critical review of an academic journal; and 3) Presentation of a research methodology by teams. Additionally, I required participation through weekly activities including: a) discussion of the content of the course, based on Creswell (2012); b) peer feedback for the major assignments; c) general class conversations; and d) puzzle solving. It was mainly in the fourth requirement where formative assessment was integrated into the course. Commonly, in face-to-face versions of the course many of these weekly activities took place during class allowing me to provide instant feedback based on the comments during class, and helping me to plan the next session accordingly.

From face-to-face to online

It was easy to export and adapt the three major assignments from my previous courses into the Blackboard shell for this online course. Finding an alternative to the rich in-class conversations taking place in the on-campus course was more challenging. I decided to use the Discussion Forum in Blackboard for feedback rounds and general class conversations and VoiceThread for team conversation. In this fashion, students would have the opportunity for personal interaction and debate, and I would be able to provide feedback and interventions on a weekly basis. The course workload for students should be similar to the amount of time and effort invested in the on-campus version.

VoiceThread is an online platform that allows asynchronous conversations around images or video. The left image in Figure 1 shows an example of a thread, or conversation, in VoiceThread. Images are

presented in the centre of the screen and participants can comment using voice, text, or even video. Every participant has an icon that can be replaced with a photograph, or any other image. Additionally, it is possible to doodle lines on top of the central image while making a comment.

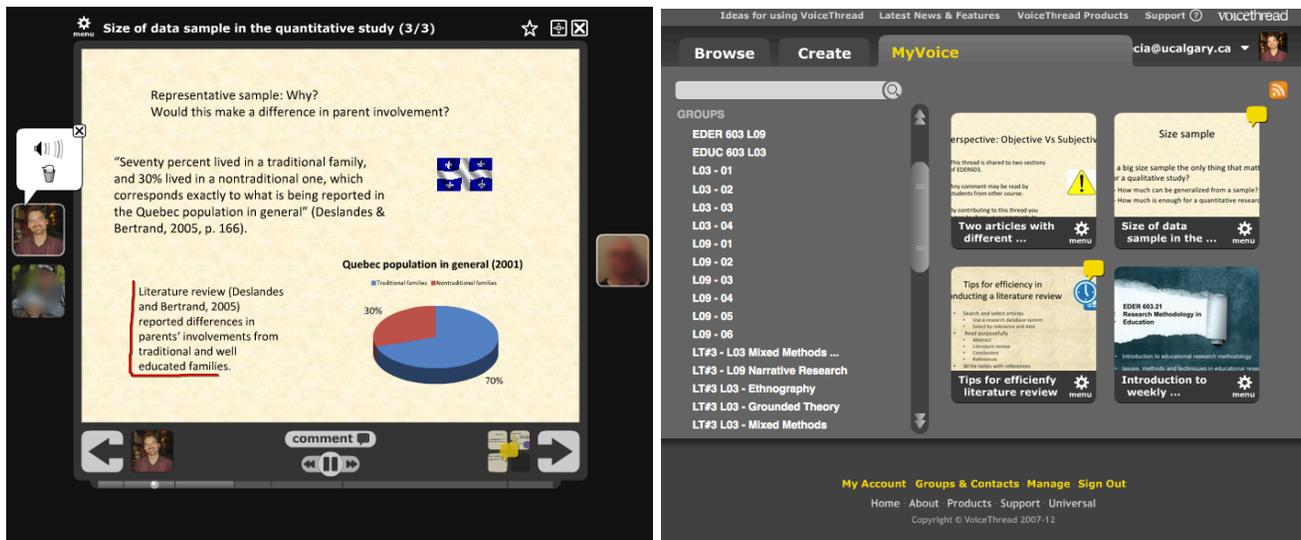


Figure 1. Conversation thread (left) and course organization (right) in VoiceThread.

Reproduced with authorization of VoiceThread LLC

Although basic features of VoiceThread are offered for free, the license for teachers provides convenient features for course management for the reasonable fee of \$100 per year, with no extra cost for students. An example of the instructor's view in VoiceThread is presented in the right image in Figure 1. In the left part of the image there is a list of all the groups.

Students were expected to participate actively in both class discussions and team conversations during the first weeks of the course. Weekly participation in Blackboard included an initial comment and responding to three posts—approximately 250 words for each post. Similarly, students were expected to participate in VoiceThread three times per week: 1) a comment on the question or activity of the week; 2) a response to peers' contributions; and 3) a one-minute-maximum personal reflection and summary of the conversation. The total amount of time students needed to participate in VoiceThread was 5 to 10 minutes per week.

Formative Assessment

Every major assignment undertook both peers and instructor's feedback. Particularly, for the Research Commitments learning task three cycles of feedback were planned. The first one was conducted during the second week when students were asked to identify a problem that justified research, post it, and provide feedback to other classmates. The second cycle took place during week four when students had to submit a four-page-maximum advance overview of the task including the topic, the problem, a tentative research question, an indication of the methodology, and references to relevant literature.

The last round of feedback was conducted two weeks before final submission, by the end of the course. I used a rubric for assessing this learning task, which helped to set expectations and facilitate the formative assessment for the last round. The 'excellent' category reflected high quality work and the highest description, 'outstanding,' compared the quality of students' work with actual published research papers.

Another form of formative assessment was conducted through my participation in the team discussions in VoiceThread. By participating in these conversations I was able to add further comments, ask questions to trigger deeper conversations, and clarify doubts about the readings.

ISSUES

In a reflection on the experience of teaching this online course, I identified two major issues representing opportunities to improve both my practice and the graduate programs at the Werklund School of Education.

Perception on Workload

There were two sections of this course, each one corresponding to a different cohort. In one cohort students were advanced in the program and this was one of the last courses, whereas in the other cohort students were starting the program.

During the first week some students wrote emails with concerns about the workload and the expectations for the course. I met with the Associate Dean of the graduate programs to revisit the course outline and student workload. While we agreed that students' workload seemed to be reasonable, we decided to make a few adjustments in response to students' concerns, as summarized in Table 1.

4 posts in Blackboard per week	2 post in Blackboard per week
250 words approx. per post in Blackboard	250 words max. per post in Blackboard
3 comments in VoiceThread	2 comments in VoiceThread
5 to 10 min in VoiceThread per week	3 to 5 min in VoiceThread per week

Table 1. Changes to course requirements

Once the changes were announced, students from the cohort who were at the beginning of the program wrote emails indicating that they did not have trouble with the previous expectations of the course and that the discussions in both Blackboard and VoiceThread were actually very useful for understanding the weekly readings.

Even though modification were made, some students from the advanced cohort kept indicating that the course workload was excessive compared with previous courses they had taken in the program, which included only three learning tasks. I conferred with colleagues about an expected amount of time per week for students in a master's online course in the program, concluding that a range between seven to eight hours would be reasonable. With this range in mind, I asked students to report how they were spending their time for the weekly activities in the course.

After exchanging emails with a couple of students, there were two major issues: 1) engagement of up to six hours in Blackboard and VoiceThread per week, and 2) the need to read more than 300 pages for the submission of the four-page advance of the Research commitments. I explained thereafter that two hours per week should be enough for weekly posts and comments and that they did not need to read all

of the subsequent chapter from the text to write the advance of the Research Commitments: The draft was to be written based on the readings covered at that point.

At the end of the course I received positive comments from both groups. I also receive an email from a student who was initially reluctant to engage in the puzzles. This student understood the purpose and importance of puzzles in the course and apologized for the previous harsh comments.

The issue with the advanced cohort seemed to be a problem of communication and a mismatch of expectations, particularly for the amount of hours per week spent in weekly discussions and the number of tasks students were required to undertake for this course. From the comparisons with other courses and the fact that the concerns were raised from the advanced cohort, it is reasonable to conclude that students' experiences with previous courses in the program represented a factor for this issue.

Perspective on research

The second issue I reflect on in this paper is also related to students' background; more precisely, with their perceptions of research. Although students read the first chapters of Creswell (2012) and the class discussed research methodologies in education, identifying an academic journal that publishes empirical research was a common challenge.

As the critical review of an academic journal was one of the major tasks in the course, students were asked to: 1) post in Blackboard a description, with the corresponding web-link, of the journal they wanted to review; and 2) provide feedback to their peers. From the discussion forum I identified several people choosing journals such as the *Educational Research Review*, which only publishes reviews—as opposed to papers based on empirical data. Although studies in these reviews may also be considered research, the course focused on issues in primary research, such as ethical concerns involving human beings.

Identifying the type of research published in an academic journal was not an easy task in some cases. I asked students to look at the description of the journals, the aims and scopes, and the instructions for authors. Sometimes, it was necessary to actually look at some papers to have an idea of the type of articles published in a journal. To my surprise, it was hard for several students to identify a research report using empirical data.

Some students commented that they used best-evidence syntheses as a research methodology for papers in previous courses. Additionally, some students wanted to describe meta-analytic reviews for the Presentation of a Research Methodology task of the course. I explained that such strategies would be interesting and useful, but that they fall beyond the scope and focus of this course. Besides, they should be able to critically evaluate empirical studies in order to conduct a research review. So, I asked them to choose a methodology for primary research—research based on empirical data.

In summary, students' previous experiences with, and perspectives of, research framed their choice for an academic journal. As one of the goals for this course was to critique empirical-based research, not being able to distinguish primary research from research reviews became a major problem.

CONCLUSION

Through reflecting on this first online experience as an instructor, I have three specific actions suggestion for the instruction of this online course on research methodologies in education: 1) make explicit the expected time per week students should allocate for the course; 2) allot more time for the selection and analysis of academic journals; and 3) consider VoiceThread for weekly team conversation.

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MAKING LEARNING VISIBLE IN HIGH SCHOOL SCIENCE CLASSES

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This session will present results of a collaborative research project between a high school science teacher and university professor specializing in early childhood education about the potential and challenges in using pedagogical documentation, a process for making students' learning visible to themselves and others that originated in the preschools of Reggio Emilia, Italy, in the content focused context of a high school science class.

BACKGROUND IN PEDAGOGICAL DOCUMENTATION

The Reggio Emilia educational philosophy originates in the infant-toddler and preprimary schools in the municipality of Reggio Emilia, Italy. In April 2011, a conference was held at the University of Calgary on Reggio inspirations in elementary school contexts that attracted international speakers and participants. Following this conference and a connected graduate course, Kenzie Rushton, indicated that he would be interested in exploring possibilities of incorporating pedagogical documentation into his high school science classes that set the stage for our collaboration. While there is increasing experience with the Reggio philosophy in elementary contexts, there is only very limited examples of pedagogical documentation in high school settings (Krechevsky, Mardell, Rivard & Wilson, 2013;

Soble & Hogue, 2010; Krechevsky, Mardell, Rivard & Wilson, 2013). The high school science context provides a unique challenge because of the amount of content that must be covered. This has meant that teachers tend to adopt traditional lecture, laboratory and testing approaches with less emphasis on inquiry, or how students are making sense of the content.

Pedagogical documentation as inquiry into individual and group learning involves the collection of artifacts, digital or video images, notes, audio recordings of educational events, and the process of collaborative reflection to understand how these events influence and respond to teaching and learning practices. Inviting participation and collaboration, the process of documentation makes students' learning visible to the students themselves and to teachers through the creation of documentation panels or posters combining photography and text. According to Soble and Hogue (2010):

Through exploring and even creating documentation (collecting, selecting, organizing, and sharing indicators of learning in order to advance their own and their classmates' learning), students would see themselves in actual learning moments, understand the roles they played in advancing their own and one another's learning, and realize their potentials as learners, group members, and citizens. (p. 48).

The significant difference between pedagogical documentation and collecting data for assessment is that pedagogical documentation is an on-going, collaborative, interpretive process. The process not only makes students' learning visible but also makes visible the documenter's perspectives, assumptions and constructions (Dahlberg, Moss & Pence, 1999/2007). In pedagogical documentation, it is essential for teachers to reflect collaboratively so that they may develop more finely tuned lenses for understanding how students think and learn. We entered our work believing that this process has the potential to transform teachers' practice and shift the perspective from teacher-centered delivery to a process in which the students become co-constructors of learning in the classroom. Teacher as

researcher and as reflective practitioner are concepts central to this work (Giudici, Rinaldi & Krechevsky, 2001).

PEDAGOGICAL DOCUMENTATION IN A HIGH SCHOOL SETTING

We began our collaboration in the fall of 2012, having received approval from The University of Calgary Cojoint Faculties Research Ethics Board and the Calgary Board of Education late the previous spring. I made approximately monthly visits to his science classes with the goal of understanding his context, reflect with him on his strategies for “making student learning visible” and to offer feedback and suggestions. My last visit to his class was in May, 2013. Through engaging in the process of pedagogical documentation and our collaborative reflection, Kenzie’s teaching practice has become more visible to himself. He has expanded my vision of what pedagogical documentation looks like. Three shifts have become apparent in his teaching: 1) incorporating different strategies for making learning visible, 2) using a pedagogy of listening (Rinaldi, 2006), and 3) the use of metacognitive approaches to learning. This has been a non-linear, organic and divergent process. One insight led to another, providing the opportunity to explore a different aspect of how to bring pedagogical documentation to high school science teaching. The following is a narrative where these themes emerge separately and concurrently depending on the situation.

KENZIE’S STORY: EXPLORING HOW TO MAKE LEARNING MORE VISIBLE

At the onset of this research project I had a strong desire to effectively bring pedagogical documentation to the high school science context. In the past, documenting learning involved the completion of worksheets or textbook questions, lab reports, students writing quizzes culminating in a final summative evaluation for the unit. Exploring the possibility of capturing learning in a different way, as inspired by the Reggio philosophy, led me to incorporate drawings, photos, writing and video as alternative approaches to documentation. These artifacts were then shared through one of two

platforms: an online course shell called Desire2Learn (D2L) and teacher led sharing with the whole class.

Of these four ways to document learning, I introduced drawing as a modest first step. The first drawing activity involved the complex topic of photosynthesis. Students were asked to draw the processes out in a number of different ways: 1) on a sheet of paper, 2) on a whiteboard with others, and 3) on a sidewalk with chalk in small groups. There were opportunities for conversation, communicating understandings and misunderstandings, a socio-constructivist approach to learning. As they observed others in the act of generating their drawing, the various ways to represent the same thing became clearly evident. Students were gaining insight into their own learning and the learning of others through the act of illustration. It was not just the act of drawing, but the process of generating the illustration that was important. This process provided the opportunity for me to give formative feedback in a timely and accurate way for the students. It became obvious to me that drawing is a very powerful tool to document learning and I incorporated drawing into other large conceptual topics throughout the semester.

The second form of documentation was photography, both by students and myself taking pictures of classroom activities. Photos are a powerful form of documentation when they become an artifact of learning that can be shared with others and can act as a record of learning. I used photos in an effort to capture learning in the moment and students would use it as a record or a tool by which to display their understanding of a concept. I found that the photos themselves were not enough to fully capture students' learning conversations, and so I requested students to complete written component along with the photographs.

The power of photography today is the ease of which it can be shared with others through digital forms. Further to taking the photos, students would then post their work to a discussion forum online within a password protected D2L course shell. This took the documentation out of the immediate experience of

the photographer to a greater audience. Classmates could respond in a written way to the images that were being shared. Through these comments students received feedback about the accuracy of their representations. The responses were initially superficial in nature so the class brainstormed on specific focusing questions that would guide them in their response to the work. For example: “What did you really like about how your classmate displayed their understanding of the topic?” and “How could that individual change their text or illustrations to improve your understanding of their thinking on the topic?”

The Development of a “Pedagogy of Listening”

Listening to students often can be overlooked as complaining or adolescent banter about being in school. I have been influenced by two key components in the philosophy from Reggio Emilia: an image of a child as described by Fraser and Gestwicki (2002) as “competent, strong, inventive, and full of ideas”; and provocation, “listening closely to children and devising a means for provoking further thought and action” (p. 11). This attentive listening, using all of your senses as part of documentation is referred to by Reggio inspired educators as, “the pedagogy of listening” (Rinaldi, 2006, p. 65). With these in mind, when a particular student vocalized the fact that they were not learning from a lecture, it was time to listen. Biology is a content driven course that often has lessons which are centred on a presentation which may last 50-80 minutes in length. When asked to recall what was discussed during the lecture, a student may shrug their shoulders and vocalize a grunt. With listening, it became clear that students were gaining little from this form of instruction. The pedagogy of listening can be simplified into two primary components: the act of listening resulting in a call to action and the implementation of a response to the call. Intentionally listening and the moral and ethical responsibility to respond to the student voice that is characteristic of sound pedagogy shifted my teaching.

The realization that students were not learning from the note taking process and the act of reflecting upon this led to an activity which involved a blank sheet of paper. I asked students to write what they

remembered about a concept or a lesson onto a blank sheet of paper (without references to aid them). In the act of starting with a blank slate, the student is faced with the question of “What do I know and can I communicate it to others?” The emergent answer was unavoidably: “What you know can only be found in your ability to share it with others.” There are a number of different ways in which you might share your understanding but I summarized it as: “If I can speak it, write it or show it, I know it.”

A Metacognitive Shift

I had few metacognitive conversations with students prior to embarking on this research project. I now include metacognitive questioning as an integral part of the classroom discourse. Not only am I interested in *what* my students learn but *how* they know if they are learning. This is clearly evident in the example that is provided above and the second example of making learning visible on tests.

During parent teacher interviews a number of students appeared to be greatly disheartened at the difference between the high level of effort they were putting into their studies and the poor results their summative evaluations were showing, there was a disconnect. This also appeared to be a recurring theme that could be heard in the statement: “My son/daughter has always done poorly on tests.” Listening led to a call to action. The response was how to make learning visible on tests and quizzes.

I started small: applying an approach of self-evaluating performance on tests for students. The first attempt was during a quiz. Upon completion of the quiz the class corrected it together. Students were given the opportunity to talk with others in the class and share their quizzes. Students milled about talking to friends and classmates, trying to determine why they got certain questions wrong. Emerging from the moment were three simple questions: 1) “Did I have the background knowledge to answer this question? If not, why not?” 2) “If I did have the background knowledge, what was it about the question that I did not understand?” 3) “Did I just make silly mistakes? If so, what can I do next time when I write a quiz or test to ensure that I do not make the same silly mistakes?”

Asking these three questions is an important step but I wondered how this could be further enhanced to ensure that learning moments become more visible for the student. I extended this idea to summative unit exams, asking students to write on their tests after getting the corrected test back. I would ask them to write beside each incorrect response why they got it wrong. Taking the time to write out the reason why they got the questions wrong gave students an opportunity to see that they need help in test taking: they needed help ensuring that they are studying properly or they needed to be more careful when writing tests. After completing this self-evaluation, I asked students to write themselves a letter about the test. In this letter they were to give themselves hints about what they need to do differently for the next test as well as include ideas about what to study at the end of the year for their final exams. In this way the students became researchers and reflective practitioners about their own learning that paralleled my own reflection and research into my teaching.

PAT'S PERSPECTIVE: SUMMARY

The results of a collaborative research project between a high school science teacher and university professor about the potential and challenges in using pedagogical documentation has been insightful. This iterative approach to professional development has led to three shifts in the teaching practice for Kenzie including a shift in 1) the intentional use of documentation to make students' learning visible for themselves, their peers and teachers alike, 2) the development and implementation of the call and response as a result of a pedagogy of listening and 3) the enhanced teaching and learning through the use of metacognitive strategies concurrent with content. While still faced with covering 108 learning outcomes (Alberta Education, 2007), through this process of documentation and making learning visible, Kenzie has provided students with more opportunities to learn from each other, represent their learning in diverse ways, and has begun to take up inquiry as an approach to learning. He has become a teacher researcher of his own teaching and of students' learning.

From my perspective as the researcher and collaborator, he has extended my understanding of documentation beyond panels of photos and text on the walls of the classroom. While students created some photo documentation about a study of a local park with the intent of providing a record of their learning, and Kenzie has created some poster size documentation of investigations, these have not been the major focus of his work, often due to time constraints for creating these documents. He has explored the notion of making learning visible as a process to open up opportunities for dialogue and support student learning through the use on-line forums. He has investigated ways for students to reflect on themselves as learners and has incorporated drawing, group work and other strategies that bring students into dialogue about their learning. In this way their processes of documenting, learning from each other and reflecting on their learning have paralleled his processes of documentation and reflection on his teaching. Both students and teacher have become researchers of their learning through the process of making learning visible.

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