

Student Engagement, Equity, and the Culture of Schooling

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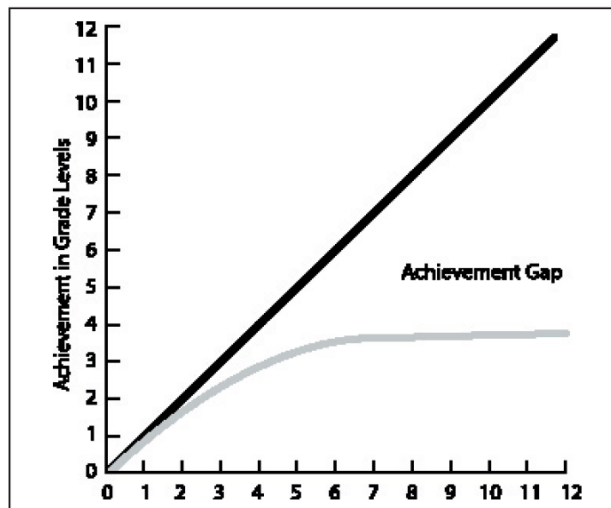
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Eastside Secondary School

It is an ordinary day at Eastside Secondary School. Eastside is classified as a school in need of improvement. Its provincial test scores are significantly below the standard of achievement. It is a high poverty school in a largely immigrant, low socio-economic neighbourhood. The problems the school faculty is focusing on at this time are the implementation of a new math curriculum and improving literacy levels.

Students at Eastend Secondary School fall into the what Edyburn (2006) describes as the achievement gap. "The 'achievement gap' is a well documented problem in schools. In practical terms, the problem can be illustrated in the following graph.



(Edyburn, 2006, p.20).

The diagonal line represents the conventional learning outcome for the 'average' student: one year of academic achievement for each year in school, i.e. one grade per year. The greyed line represents the profile of many under-performing students, including First Nations, Métis and Inuit; those with learning disabilities, those living in poverty and those whose first language is not English. The area between the black line and the gray line is known as the achievement gap.

Edyburn (2006, p.20) says the lessons from the achievement gap are clear:

- Contemporary schooling practices are not effective for some groups of students.
- Continuing to do what we have always done will perpetuate rather than eliminate the gap.
- Repeated failure over time creates an achievement gap that is exceedingly difficult to erase.

(Edyburn, 2006, p.20)

Even though teachers at Eastside Secondary School know that a large percentage of their students fit the profile described by Edyburn's (2006) achievement gap, they are reluctant to change the way they have always approached their teaching. The new math curriculum is clearly posing problems for many of the teachers at Eastside. It requires teachers to teach in a very different way than they are accustomed to. The new Math Program of Studies requires teachers to focus more on solving problems, including complex problems. It asks teachers to adopt instructional styles that are more learner focused, require more active learning on the part of the students and make use of digital technologies to support the creation and sharing of knowledge.

Teachers and administrators in schools like Eastside Secondary, are committed to doing a good job on behalf of their students. They are part of the initiative, *What Did You Do In School Today?* They have data that supports their long standing belief that students are not intellectually engaged in the core academic subjects. However, they are challenged to find ways to teach in new and different ways, ways that have the potential to challenge and engage students in deep, meaningful and authentic ways.

Beachcroft Secondary School

Beachcroft Secondary school has a similar demographic to Eastside Secondary School. Faced with an increasingly diverse student population, declining achievement and increasing school drop out, the school has taken a significantly different approach. Rather than address the problems with numeracy and literacy head on, the administrators and teaching staff have come

together to examine the bigger picture. They have decided to focus on improving, strengthening and changing instructional practices. They began with the following question, “What do we know about learning and how do we act on that knowing?” Working through this question, the school faculty designed and implemented a coherent, responsive, flexible approach to teaching, learning, and when necessary, school organization. They agreed that every student in the school should have fair and reasonable access to educational opportunities and that it was their job to ensure that this occurred.

Teachers formed multi-disciplinary teams of five teachers. Each of the teams worked together to organize their respective disciplines so that students had a coherent experience. They decided to dispense with the idea that all classes would consist of the same number of students. Rather, they analyzed what it was they needed to address, the ways they wanted to address those topics and organized the 150 students assigned to them in various configurations. The school had decided to purchase laptop computers for every grade nine student in the first year. By the third year, every student in the school had a laptop computer, some purchased by the school and others student-owned.

Today when you walk into Beachcroft Secondary, you would see students everywhere: seated around tables in the hallways, huddled together on window ledges, gathered in small groups, in hallways and in classrooms. The teachers would be working with one or two students, with small groups of students, or classes of 25 - 70 students and sometimes even with all 150 students.

For the past four years, teachers at Beachcroft have had access to personalized, professional development in the form of mentorship. In second year of the initiative, teachers decided they needed to work more collaboratively in order to create more responsive teaching. They decided to come together once a week to analyze student work and their own practice. This practice of coming together to strengthen instruction and student learning created transparency in both teaching and learning. School faculty have a strong sense that collectively they are getting better together in meeting the learning needs of the students at Beachcroft.

Today, after four years of focused attention directed at strengthening, improving and changing teaching practices and building the leadership to create and sustain this change, you would see school leaders who use research to inform and evidence to guide their decision-making. They use evidence from the classrooms and from ongoing research in their school both from their *What Did You Do In School Today?* survey, teacher action research and ongoing contracted

research. The leaders have deep knowledge of strong instructional practices and invest themselves in helping teachers strengthen the instructional practices.

Teachers speak about how they have benefitted personally and professionally from making their own and the students' learning visible through their weekly meetings. They speak about how technology has made a difference to the types of complex problems and issues the students inquire into. Assessment has become integral to their teaching as they scaffold the learning of their students.

Most students at Beachcroft now score above the provincial mean on standardized testing at Grades 9 and 12. The levels of intellectual engagement continue to increase each year. The ongoing three-year longitudinal research study has shown that the teachers' strengthened instructional practices (authenticity of task, cognitive investment required and supported, and instructional style) show a statistically significant correlation (0.97) with students' intellectual engagement.

This paper is about intellectual engagement in schools like Eastside and Beachcroft Secondary Schools. The schools have taken very different approaches to improvement. Both of these schools are composites of schools where teachers and administrators are concerned about finding ways to intellectually engage students. It is about what it means to teach and learn in a digital, knowledge or learning society and how that differs from what it has meant to teach and learn in previous times. It is about how contemporary school structures, curriculum and assessment processes need to be rethought. It is also about how the achievement gap that consistently marginalizes groups of students (such as First Nations, Métis and Inuit; those with learning or other disabilities, those living in poverty and those whose first language is not English) may be an artefact of school practices. And it is about the relationships between knowledge and social justice; equity and difference; and the meaningful use of technology in schools. That is, it is about the need to create schools that are intellectually engaging places for teachers and students.

Rethinking Student Engagement

Student engagement first emerged as a concept in the late 1980s. Early in the development of the concept some researchers tended to attribute it to a set of individual demographic and social risk factors. Understood in this manner, student engagement belonged primarily to the domain of psychology. However, as early as 1990, Csikszentmihalyi identified student

engagement as a growth-producing activity through which the individual allocates attention in active response to the environment. This shift conceptually also located student engagement within the domain of teaching and learning, while psychology remained involved, particularly through the work of Carol Dweck (2006).

Within the past two decades a number of researchers (Appleton, Christenson & Furlong, 2008; Bransford, Brown & Cocking, 2000; Engle & Conant, 2002; Jacobsen, Friesen & Saar, 2010; Kuh, et.al., 2007; Marks, 2002; National Research Council, 2003; Nelson Laird, Garver, A. & Niskodé, 2007; Nelson Laird & Kuh, 2005; Newmann, Wehlage & Lamborn, 1992; OECD, 2007; Pope, 2001; Shernoff, et.al., 2003; Willms, 2003; Willms, Friesen & Milton, 2009) have turned attention to studying various aspects of student engagement. This has resulted in student engagement emerging as a multifaceted, multidimensional concept with specific connections to social, academic and intellectual environments.

Willms, Friesen and Milton (2009) building on the research of many prior researchers, used the following three constructs in their three-year research and development initiative into student engagement in Canadian secondary school students: social engagement, academic engagement and intellectual engagement. The researchers defined the three dimensions as follows:

- Social Engagement – A sense of belonging and participation in school life.
- Academic Engagement – Participation in the formal requirements of schooling.
- Intellectual Engagement – A serious emotional and cognitive investment in learning, using higher order thinking skills (such as analysis and evaluation) to increase understanding, solve complex problems, or construct new knowledge.

Engagement: A Focus Of Attention

Student engagement has become a focus of attention as one approach to improving student success in both secondary and post secondary education. From early in the 1990's Csikszentmihalyi's (1990, 1997) research showed people learn best when trying to do things that are challenging and of deep interest to them, reflecting the close interplay of the emotional in cognition and the development of capacity. The teachers at Beachcroft Secondary School are strongly invested in designing learning for their students that is deeply challenging and also of deep interest to them, or finding ways to spark interest. Csikszentmihalyi (1990, in OECD, 2007) calls the 'flow' state, a state of intrinsic motivation manifested by intense emotional and intellectual excitement. Friesen (2007) defines this state as intellectual engagement, the state in which the learner is so focused, so intensely engaged, that time itself seems to disappear. The OECD report (2007) explains that at this point the brain begins to make connections and see

patterns in the information, which results in a “powerful illumination which comes from understanding” (p. 72). This state of sudden epiphany is described as “the most intense pleasure the brain can experience in a learning context” (ibid., p. 73) and naturally, is an experience that fosters motivation as students experience the pleasure inherent in deep learning.

A number of researchers (Jacobsen, Friesen & Saar, 2010; Kuh, 2001, 2003; Pascarella & Terenzini, 2005; Willms, Friesen & Milton, 2009) have focused on the connections among student engagement, the learning environment, and teaching practices. These studies have shown that student engagement is related to a number of factors such as: (i) the types of instructional practices teachers enact, (ii) nature of the work students are asked to do, (iii) the types of technologies students utilize in their learning and (iv) the amount and type of ongoing feedback students receive while they are learning. These researchers have established clear correlations between various factors present in the learning environment and students’ levels of engagement. Their research confirms a finding by the *Learning Sciences and Brain Research* project sponsored by OECD (2002, 2007). “The more closely the goals of teachers, learners and educational systems are matched, the more effective the learning will be... the more closely this learning is linked to external stimuli of ‘real world environment’, the more it will engage and stimulate the learner” (OECD, 2007, p.200).

A number of studies have focused on the connection between student engagement and the depth of student learning. A recent synthesis of social sciences research has shown that the extent to which people retain in the long-term and the depth of understanding they gain is related to how important it is to them (OECD, 2007). Studies in the early 1990’s by Newmann, Wehlage & Lamborn (1992) also showed connections among depth of student understanding, student learning, student achievement and levels of student engagement.

Measuring Engagement

A number of measures related to matters of the social and academic life of the learning have dominated in the past decade. Many of these measures are framed as social and academic engagement. Willms, Friesen and Milton (2009) published the first year findings of a three-year research and development project measuring secondary school Canadian students’ social, academic and intellectual engagement. While both social and academic engagement were well established in the research literature, intellectual engagement was a new construct. This new construct allowed the researchers to explore what students were doing in their classes, how they felt about their experiences of learning; and, whether the work they did contributed to learning (Willms, Friesen & Milton, 2009, p.6). Jacobsen, Friesen and Saar (2010) have added

additional classroom observation measures and interviews to further study how instructional practices and student engagement might be related.

Several significant findings emerged from Willms, Friesen & Milton (2009) study:

- Between 50 and 70 percent of the differences in the levels of student engagement among the 93 schools were a result of school and classroom climate factors.
- The outcome differences among schools in the *What Did You Do In School Today?* sample far outweigh the differences associated with students' family background. These findings reveal that levels of engagement vary among schools, and suggest that the role of the classroom teacher may be as important, or even more important, than students' family background.

Jacobsen, Friesen and Saar (2010) released the findings of a three-year design-based research study measuring levels of student intellectual engagement, teachers' instruction, teachers' designs of learning, types of assessment practices, students' technology use, and leadership practices. Their study employed both multiple measures of social, academic and intellectual engagement but also incorporated numerous data sources beyond the *What Did You Do In School Today?* survey data. These additional data sources included: classroom observations; artefacts of student learning; teachers' planning documents; and focus group and individual interviews. Their study introduces additional measures such as: (i) a classroom observation protocol, (ii) criteria in the form of a rubric to assess teachers' planning documents and (iii) criteria in the form of a rubric to assess student learning and depth of understanding.

Lessons Learned: What Works and For Whom

Teaching Matters. First and foremost, effective teaching practice begins with thoughtful and intentional challenging designs for learning—designs that deepen understanding and open the disciplines to genuine inquiry. One of the hallmarks of the new science of learning is its emphasis on learning with understanding. This means that teachers must go beyond developing techniques to implement learning outcomes. Learning topics are not objects that can be disassembled and whose disassembled parts can be treated as if they are authentically learnable independently of the relations between those parts. Any seemingly isolated curricular mandate or objective needs to be re-thought in terms of the fields of relations to which it belongs. This is a move that the faculty at Beachcroft Secondary undertook when they decided to create learning environments that were more coherent, cohesive, and responsive. The faculty at Beachcroft came to the understanding that teaching needs to begin with teachers rethinking: (i) what is fundamental within the disciplinary topic, (ii) the culture that produces

that knowledge (iii) ways to immerse students into the ways of knowing, doing and being of the culture, (iii) the types of relationships that will cultivate deep understanding and (iii) the types of assessment practices through which: (i) teachers/faculty have access to students' misunderstandings and students ongoing learning and (ii) ways in which students might demonstrate deep learning and deep understanding. Through personalized professional learning opportunities and working together each week they learned how to create learning designs that went beyond merely "learning about" to learning the ways of knowing, doing and being within a discipline—that is learning their way around. Traditional learning activities which require students to merely remember, recall and regurgitate facts needed to be rethought. This is echoed by Swartz & Fischer (2006) who contend metaphors underpinning many current teaching and learning practices need to be rethought.

Teaching practices that rely on traditional lecture and textbook need to be rethought. This is the place where the teachers at Eastside Secondary School struggle. They know this rethinking needs to occur; however, they have no supports in place to assist with this task. Student learning that requires a mere recall of information needs to be placed within the "field of relations to which it belongs" so teachers and students are able to make connections within and outside of the discipline. Thought of this way, the disciplines are now open to questions, extension, investigation and exploration. A design process focused on teaching and learning for understanding and intellectual engagement ensures that teachers come to know their own way around the learning landscape and are thus prepared to recognize and greet new knowledge that comes to meet them as they and their students inquire into various topics.

The Work Matters: Secondly, the work students undertake needs to be relevant, challenging, meaningful, and authentic—in other words, it needs to be worthy of their time and attention. Too frequently work students are asked to do does not allow them to use their minds well. The work has no intrinsic meaning or value to students beyond achieving high marks. A number of researchers (Csikszentmihalyi, 1997; Dweck, 2006; Jardine, Clifford and Friesen, 2008; OECD, 2007; Schlechty, 2002) and the students themselves are clear, the work they want to do, need to do, needs to be intellectually engaging (Willms, Friesen & Milton, 2009). Effective teachers thoughtfully and reflectively design learning tasks that require and instil depth in thinking, immerse the student in disciplinary inquiry, are connected to the world outside the school classroom, have intellectual rigour, and involve substantive conversation. High levels of substantive conversation are indicated by three features: 1) there is considerable interaction about the ideas of a topic; ii) the dialogue builds coherently on participants' ideas to promote improved collective understanding of a theme or topic; and iii) sharing and/or coherent promotion of collective understanding occurs briefly and involves a flow of consecutive

interchanges with many students participating (Newmann & Wehlage, 1993).

Assessment Matters: Teachers' use of assessment to improve learning and guide teaching. Research in the field of assessment clearly indicates that effective teachers intentionally design assessments into their pedagogical practice to enable students to think deeply about their own learning and provide a road map to their next steps enabling students to become self-directed in their learning. Research has shown that students who co-create assessment criteria with teachers based on powerful performances of what constitutes quality work within the “field of relations to which it belongs” demonstrate deep learning, deep understanding and make achievement gains (Bransford, Brown & Cocking, 2000; Jacobsen, Friesen & Saar, 2010; Newmann & Wehlage, 1993) . As students discern the criteria of powerful work, they are able to use these as guides for their own learning. In addition, evaluating learning achievements are now transparent to the students. Clearly, merely memorizing facts is not enough.

To have students show real learning of concepts, not just memorization and recitation, instructors need to consider how many pyramids students can climb and re-climb multiple times in a semester in order to build a concept or skill. This contrasts with the linear view of education that is assumed by most textbooks and lectures and that is prominent in our society, which expects progress to move in a linear and upward fashion. (Swartz and Fischer, 2006, p.9)

The learning sciences, seeking to understand how people create and use knowledge, has consistently demonstrated that learning involves the active construction of knowledge. The conduit metaphor works to some degree for learning bits of information, but for using knowledge instead of reciting facts, new metaphors for learning and assessing learning look to ecology (Bransford, Brown & Cocking, 2000; Jacobsen, Friesen & Saar, 2010; Jardine, Friesen & Clifford, 2008; Sawyer, 2006).

Relationships Matter: The importance of relationships is one of the important findings from the research on student engagement. Relationships of various sorts are critical in educating students in building social cohesion and producing minds that thirst to build knowledge throughout the course of their lives. In the end, consideration of relationships In a knowledge-building space, all ideas are regarded as constantly improvable through others' ability to pose theories, build on contributions, ask questions, posit different theories, offer evidence from contrary perspectives, challenge interpretations. In order to learn to their full potential, individuals must develop and contribute ideas that are both shared and extended by others. (Clifford, 2004, p.7).

In this space, teachers and students involved in robust inquiry enter into a relationship with each other and the discipline. That is, they become mindful and attentive to each other and to what comes to meet them.

Through various individual and focus group interviews (Friesen, 2007; Jacobsen, Friesen & Saar, 2010; Pope, 2001) and students' engagement surveys (Willms, Friesen & Milton, 2009), students repeatedly tell us, they want stronger relationships with their teachers, with the work they do, with each other and with their communities locally, provincially, nationally, and globally.

Research highlights that students want their teachers to also know how they learn, to take into account what they understand and use this knowledge as a starting place to guide their continued learning. Bransford, Brown and Cocking (2000) call this being learner-centered. The research also indicates that students need teachers who establish learning environments that build interdependent relationships which promote and create a strong culture of learning. Bransford, Brown and Cocking (2000) also highlight the necessity of creating these types of community-centered learning environments. These mediated relationships include pedagogical (teacher to student); peer to peer (student to student); student to community outside of school; and student to subject disciplines. In the context of these relationships, over time and in a learning environment that supports risk-taking and fosters a level of trust, students' confidence in themselves as learners grows. The caring that lives in these dynamic interdependent relationships fosters further risk taking and learning. Relationships such as these develop people's ability to connect with one another, work together across their differences, and add value to each other.

Technology Matters: While the presence of new technologies can and does make an important difference to the experiences of students in classrooms, it too frequently is used as an add on to existing instructional practices. As reported in the research literature, such use of technology generally makes little to no difference to student achievement or student learning.

However, as noted by Friesen (2008) students with obvious, or identified, problems with learning may well be the first among many beneficiaries of well-designed media. But all learners who have access to multiple representations and means of expression will also benefit (Friesen, 2008).

Everyone experiences the limitations of printed text from time to time, and educators grapple with the well-documented alienation of large numbers of students from the learning

environment of the classroom (OECD, 2003, 2005, 2006a, 2006b).

That is, our schools and classrooms are not working nearly as well as they might. In the early years of special education, much attention was directed to fixing the disabled or struggling learner. As the student population becomes increasingly diverse, more and more students appear to fall into the category of special needs, it becomes clear that:

- The development of further and further categories to describe those students who struggle with learning and motivation in a print environment may not be working in either a conceptual or a practical way. Teachers now joke about needing a new coding category for the severely normal student—and that teasing joke reveals, in fact, how close we may be to the end of the logic of fragmentation.
- Barriers to learning do not occur “solely in the capacity of the learner” (Rose, Meyer and Hitchcock, 2005, p.20). Instead, they are best understood to occur in interaction between learner, environment and the work they are asked to do in school (Friesen, 2008; Jacobsen, Friesen & Saar, 2010; Willms, Friesen & Milton, 2009).
- When the needs of special needs students are well met by providing increasing diversity in learning environments and tasks, all students actually benefit (Friesen, 008; Jacobsen, Friesen & Saar, 2010).

Teachers and administrators in schools have to get better at thinking about how students use technology in school, what they use it for, and the gap between out-of-school and in-school use. The teachers at Beachcroft Secondary were not much interested in the ways students use technology to do familiar things in new ways (e.g. copying notes from the board or a presentation using a word processor, filling in electronic worksheets, writing reports from information they have found on websites). Rather, they were interested in the ways that technology lets students into new areas of knowledge in new ways. In order to leverage the potential power of digital technologies, the teachers need to ask, “What technologies are used within this discipline?” “How might students use the technology to: collaborate, publish, create, juxtapose ideas, build on others’ ideas, create ‘what if’ scenarios, gather data and information, etc.

Contemporary strains are beginning to show that if students are not given the opportunity to design, create, and critique media of their times, they can be reduced to the role of consumers alone. Educators have an important role to play in designing learning environments that are technologically rich and pedagogically sound. Absent this commitment, what kids do with technology outside school hours is unlikely to be informed by what they learn inside.

Jacobsen, Friesen and Saar (2010) have shown when students are introduced to systems thinking through the use of simulations, relational databases, robotics, etc. intellectual engagement increases particularly when these technologies are used to access to ideas of the system in which they exist (i.e. climate change, population growth, environment etc.).

Recent research studies (Friesen, 2008; Jacobsen, Friesen & Saar, 2010) have shown technology does make a difference, but only in the presence of strong, effective teaching that emphasizes challenging tasks, formative assessment practices, disciplinary ways of knowing and evidence-based practices. Teachers, in schools, like Beachcroft, routinely ask: to what extent do all students have access to multiple means through which ideas and information can be represented? To what extent are all students given multiple means to express what they know? To what extent are there multiple opportunities for engagement in the work students are asked to do in school? To what extent can each student learn to make sound choices from a wide range of available options when they go looking for information; when they explore and express what they know; and when they decide what, for each piece of work, is the best possible way of setting out to learn what they need to know? That is, what is the role of technology within intellectual engagement? How does the authentic, meaningful use of technology help teachers create more challenging tasks for students and the ways in which students use digital technologies to develop deep understanding of complex topics, concepts and ideas.

Conclusion

Creating environments which intellectually engage students call for something different than those that dominated previous models of teaching and learning. Today's teachers are called upon to work with colleagues to cultivate and strengthen practices and become practiced in designing learning environments that promote intellectual engagement. Their practices need to help students learn with deep understanding rather than promote the acquisition of disconnected sets of facts and skills. Teachers who design and teach for intellectual engagement help students develop interconnected pathways within a discipline so that they “learn their way around in it” and not lose sight of where they are. They provide students with ongoing, helpful, constructive feedback so they are better able to know where they are, where they are going and have a strong sense of how to get there—that is they can start to direct their own learning. Teaching practices that cultivate intellectual student engagement take into account the need to develop strong pedagogical relationships to build social cohesion and produce minds that thirst to build knowledge throughout the course of their lives. They utilize the technologies of the times to build challenging, robust, intellectually engaging work for students. They make school an intellectually exciting place to be for every learner.

There is a passion and generosity about teaching for intellectual engagement that drives teachers to extend the very best of themselves in the service of learning and scholarship.

References

- Appleton, J. J., Christenson, S. L. & Furlong, M. J. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools*, 45 (5), 369-386.
- Bransford, J., Brown, A., & Cocking, R. (Eds.). (2000). *How people learn: Brain, mind, experience and school*. Washington, DC: National Academy Press.
- Clifford, P. (2004). Where's the beef: Finding literacy in computer literacy. Paper presented at *Learning Through Literacy Summer Institute*, Toronto, Ontario.
- Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience*. New York: Harper and Row.
- Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life*. (Masterminds Series). New York: Basic Books.
- Dweck, C. (2006). *Mindset*. New York: Random House.
- Edyburn, D. (2006). Failure is not an option: Collecting, reviewing, and acting on evidence for using technology to enhance academic performance. *Learning and Leading With Technology*, 34(1), 20-23.
- Engle, R. A. & Conant, F. C. (2002). Guiding principles for fostering productive disciplinary engagement: Explaining an emergent argument in a community of learners classroom. *Cognition and Instruction*, 20(4), 399-483.
- Friesen, S. (2007, October). How students would design a school [Podcast]. CEA Workshop, Rethinking Adolescence, Rethinking Schools. <http://www.cea-ace.ca/dia.cfm?subsection=aut&page=07&subpage=recap>
- Friesen, S. (2008). Learning mathematics in an accessible classroom. A research report prepared for Alberta Education.
- Gilbert, J. (2005). *Catching the knowledge wave: The knowledge society and the future of education*. Wellington, N.Z.: NZCER Press.
- Jacobsen, M., Friesen, S. & Saar, C. (2010). Teaching and learning in a one-to-one mobile computing environment: A research report on the personalized learning initiative At Calgary Science School. Report delivered to the Board of the Calgary Science School, March 2010.

Jardine, D., Clifford, P., & Friesen, S. (2008). *Back to the basics of teaching and learning: Thinking the world together 2nd Ed.* New York, NY:Routledge.

Johnson, A. (2003). The Learning Game - Researchers Study Video Gaming Principles that Apply to Education. *Wisconsin Technology Network..* Retrieved September 30, 2010
<http://wistechnology.com/article.php?id=243>

Kuh, G. (2001). Assessing What Really Matters to Student Learning: Inside the National Survey of Student Engagement. *Change*, 33 (3), 10-17, 66.

Kuh, G. D. (2003). What we're learning about student engagement from NSSE. *Change*, 35 (2), 24-32.

Kuh, G., Cruce, T., Shoup, R., Kinzie, J. & Gonyea, R. (2007). Unmasking the effects of student engagement on college grades and persistence. Paper presented at the annual meeting of the *American Educational Research Association*, Chicago, April 2007.

Marks, H. M. (2000). Student engagement in instructional activity: Patterns in elementary, middle, and high school years. *American Educational Research Journal*, 37 (1), 153-184.

National Research Council – Institute of Medicine (2003). *Engaging schools: Fostering high school students' motivation to learn.* Washington DC: The National Academies Press.
http://www.nap.edu/catalog.php?record_id=10421

Nelson Laird, T., Garver, A., & Niskodé, A. (2007). Gender gaps: Understanding teaching style differences between men and women. Paper presented at the annual forum of the Association for Institutional Research, Kansas City, MO.

Nelson Laird, T. & Kuh, G. (2005). Student experiences with information technology and their relationship to other aspects of student engagement. *Research in Higher Education*, 46 (2), 211-233.

Newmann, F. M., Wehlage, G. G. & Lamborn, S. D. (1992). The significance and sources of student engagement. In F. Newmann (Ed.), *Student engagement and achievement in American secondary schools.* New York: Teachers College Press.

Newmann, F. & Wehlage, G. (1993). Five standards for authentic instruction. *Education Leadership* 50(7), pp.8-12.

Organisation for Economic Co-operation and Development (OECD). (2002). *Understanding the brain: Towards a new learning science.* Paris: Centre for Education Research and Innovation.

Organisation for Economic Co-operation and Development (OECD) (2003). Student engagement at school: A sense of belonging and participation. Results from PISA 2000. Retrieved September 15, 2010 from <http://www.pisa.oecd.org/dataoecd/42/35/33689437.pdf>.

Organisation for Economic Co-operation and Development (OECD) (2005). School factors related to quality and equity: Results from PISA 2000. Retrieved September 15, 2010 from <http://www.pisa.oecd.org/dataoecd/15/20/34668095.pdf>.

Organisation for Economic Co-operation and Development (OECD) (2006a). *Are students ready for a technology-rich world?: What PISA studies tell us*. Retrieved September 15, 2010 from http://www.pisa.oecd.org/document/31/0,2340,en_32252351_32236173_35995743_1_1_1_1,00.html.

Organisation for Economic Co-operation and Development (OECD) (2006b). *Personalising education*. Retrieved September 15, 2010 from http://www.oecd.org/document/49/0,2340,en_2649_201185_36168625_1_1_1_1,00.html.

Organisation for Economic Co-operation and Development (OECD). (2007). *Understanding the brain: The birth of a learning science*. Paris: Centre for Education Research and Innovation.

Pascarella, E. & Terenzini, P. (2005). *How college affects students, Volume 2, A third decade of research*. San Francisco, CA.: Jossey-Bass.

Pope, D. C. (2001). *Doing school: How we are creating a generation of stressed-out, materialistic and miseducated students*. Yale University Press.

Rose, D., Meyer, A. & Hitchcock, C. (Eds). (2005). *The universally designed classroom: Accessible curriculum and digital technologies*. Cambridge, MA: Harvard University Press.

Sawyer, R.K. (ed) (2006). *The Cambridge handbook of the learning sciences*. New York, NY: Cambridge University Press.

Schlechty, P. (2002). *Working on the work: An action plan for teachers, principals and superintendents*. San Francisco, CA: Jossey-Bass.

Schwartz, M. & Fischer, K. (2006). Useful metaphors for tackling problems in teaching and learning. *On campus*, 11(1), 2-9.

Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Steele Shernoff, E. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School Psychology Quarterly*, 18 (2), 158-176.

Willms, J. D. (2003). *Student engagement at school: A sense of belonging and participation results from Pisa 2000*. <http://www.unb.ca/web/crisp/pdf/o3o6.pdf>

Willms, J.D., Friesen, S., & Milton, P. *What did you do in school today? Transforming classrooms through social, academic and intellectual engagement.* Toronto, ON: Canadian Education Association.

Yair, G. (2000). Reforming motivation: How the structure of instruction affects students' learning experiences. *British Educational Journal*, 26 (2), 191–210.

Zyngier, D. (2007, Autumn). (Re) conceiving student engagement: What the students say they want. Putting young people at the centre of the conversation. *LEARNing Landscapes*, 1 (1).
<http://www.learnquebec.ca/export/sites/learn/en/content/learninglandscapes/documents/LL-OCT-2007-LR-link.pdf>