WHAT DID YOU DO IN SCHOOL TODAY?

RESEARCH SERIES

REPORT NUMBER TWO:

THE RELATIONSHIP BETWEEN INSTRUCTIONAL CHALLENGE AND STUDENT ENGAGEMENT

SEPTEMBER 2012

J. DOUGLAS WILLMS AND SHARON FRIESEN

Canadian Education Association

Association canadienne d'éducation

What did you do in school today?
Research Series

REPORT NUMBER TWO: THE RELATIONSHIP BETWEEN INSTRUCTIONAL CHALLENGE AND STUDENT ENGAGEMENT, SEPTEMBER 2012

Published by the Canadian Education Association (CEA)
119 Spadina Avenue, Suite 705, Toronto, ON M5V 2L1

Publié en français sous le titre:
Qu'as-tu fait à l'école aujourd'hui?
Le lien entre le défi d'apprentissage et l'engagement des élèves

SERIES INTRODUCTION

What did you do in school today? is a national initiative of the Canadian Education Association (CEA) designed to capture, assess and inspire new ideas for enhancing the learning experiences of adolescents in classrooms and schools. *What did you do in school today?* is one of the few initiatives in Canada that focus specifically on the experiences of adolescent students. And it is the only initiative that focuses on the powerful concept of *intellectual engagement.*

What did you do in school today? has advanced a core set of ideas about adolescent learning and educational change (e.g., students as agents of change) and has popularized a multidimensional framework of student engagement that recognizes the importance of young people's engagement in school (social and institutional engagement) and learning (intellectual engagement). It has also drawn attention to important relationships between engagement and key developmental outcomes for adolescent learners, and to increased student engagement as a pivotal idea for improving the quality of teaching and learning in Canadian schools.

Since *What did you do in school today?* was launched in 2007, more than 63,000 students have shared their experiences of learning and engagement with CEA through an online survey. This significant database forms a foundation of our national research strategy, which examines the policy and practice implications of many types of evidence, both qualitative and quantitative. First-year findings from the initiative were shared in a *First National Report* (Willms, Friesen, & Milton, 2009).

The purpose of the reports in this research series is to present new evidence and to share the knowledge we have gained about student engagement since 2007. Each report also explores trends or relationships in the data, especially as they relate to students' engagement in their learning. For the research questions that frame each report, we thank the educators who have shared their questions with us and helped us to understand what has inspired and challenged them in the course of working with core ideas of *What did you do in school today?* in their schools.

FOCUS OF THIS REPORT

Here, we are pleased to introduce the second report in this series. This report explores the relationship between instructional challenge (the balance between students' skill levels and the challenge of their school work) and student engagement. Findings show that many students in Canada find their school work in Language Arts, Math and Science too easy or too hard because the learning is not synchronized with their skills. The implications of this imbalance have significant implications for student engagement. For example, students with low skills are less likely to feel socially, institutionally and intellectually engaged; but students with high skills who feel under-challenged in class are also prone to disengagement. Shifting the relationship between instructional challenge and student engagement requires a reorientation in the way we think about the qualities of effective learning and a commitment to supporting the organizational, pedagogical and curricular changes required for **all** students to experience intellectually engaging learning environments.

INTRODUCTION

Early results from the ***What Did You Do in School Today?*** initiative showed that on measures of **instructional challenge**, more than 25% of Canadian students did not feel confident to handle Language Arts and Mathematics curricula (Willms, Friesen, & Milton, 2009, p. 26). Findings from the 2009 Programme for International Student Assessment (PISA), conducted by the Organisation for Economic Cooperation and Development (OECD), indicated that about 30% of Canadian 15-year-old students had scores at Level 2 or lower in Reading (Knighton, Brochu, & Gluszynski, 2010; OECD, 2010). Level 3 is considered the minimum score necessary for building skills in most school subjects.

Students with low engagement and low academic skills are prone to dropping out of school before graduation and are at risk of a range of mental health problems (Bagnell, Tramonte, & Willms, 2008; Blanchard, Gurka, & Blackman, 2006). Research studying students' experiences of engagement over time has found that the process of disengaging from school begins early in a student's school career and increases during the middle and secondary school years (Rumberger, 1995). Although the research literature emphasizes the role of the student and family in this process, the role of the school is increasingly being recognized as important. Schools vary in their levels of student engagement, even after taking account of students' family backgrounds, and some of this variation is associated with teacher/student relations, teachers' expectations for success, and the disciplinary climate of the classroom (Willms, 2003; Willms et al., 2009).

In this paper, Doug Willms reports on his measuring of the relationship between instructional challenge (the balance between students' skill levels and the challenge of their school work) and student engagement. Sharon Friesen follows with an exploration of the implications of this relationship for teaching and learning.

## INSTRUCTIONAL CHALLENGE ("FLOW")

This report examines the role of instructional challenge in student engagement using a schema developed by Csikszentmihalyi (1990, 1997). He theorized four general combinations of skills and challenge in students' experience of learning. These four combinations (or quadrants) are described below, and are illustrated in Figure 1:

- low-skills/low-challenge — students are more likely to feel ***apathetic*** about learning because they find themselves in learning situations where they have low skills and the tasks they are asked to perform are of low challenge. These are students who tend to give up because school work is inconsequential.
- low-skills/high-challenge — students are more likely to feel worried or apprehensive or ***anxious*** about learning because they have low confidence in their skills and the tasks they are asked to perform are perceived as too challenging.
- high-skills/low-challenge — students are more likely to find school work ***boring*** because the challenges of learning are too few in relation to their skills, and they are not able to identify how they can make the experience more challenging.
- high-skills/high-challenge — students generally feel that their skills and the challenges of the tasks they are asked to perform are in balance. These are the students who would frequently experience ***flow*** in the sense described by Csikszentmihalyi.

Csikszentmihalyi uses the term *flow* to characterize people who are deeply absorbed in an activity that they find intrinsically interesting. His research with his colleagues found that students who regularly experience *flow* — the right balance between challenge and skill level — are more likely to be deeply engaged, with high levels of concentration, interest and enjoyment (Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003). In Vygotsky's terms, when children are presented with tasks that are slightly more challenging than they can do independently — that is, they require some adult guidance or collaboration with able peers — they are in their "zone of proximal development" (1978).

As mentioned, Csikszentmihalyi maintained that high-skills/low-challenge students are likely to find school *boring*, and will exert little effort; low-skills/low-challenge students are likely to become *apathetic* about learning; and low-skills/high-challenge students will feel *anxious*. Tramonte and Willms (2010) tested Csikszentmihalyi's anxiety hypothesis with data from the *Tell Them From Me 2.0* student survey, and found that students in the low-skills/high-challenge quadrant are nearly twice as likely to experience anxiety as their peers in the flow quadrant. Students in the low-skills/low-challenge quadrant are also more prone to experiencing anxiety problems, but the likelihood is not as great as for the low-skills/high-challenge students.

Figure 1. Instructional Challenge
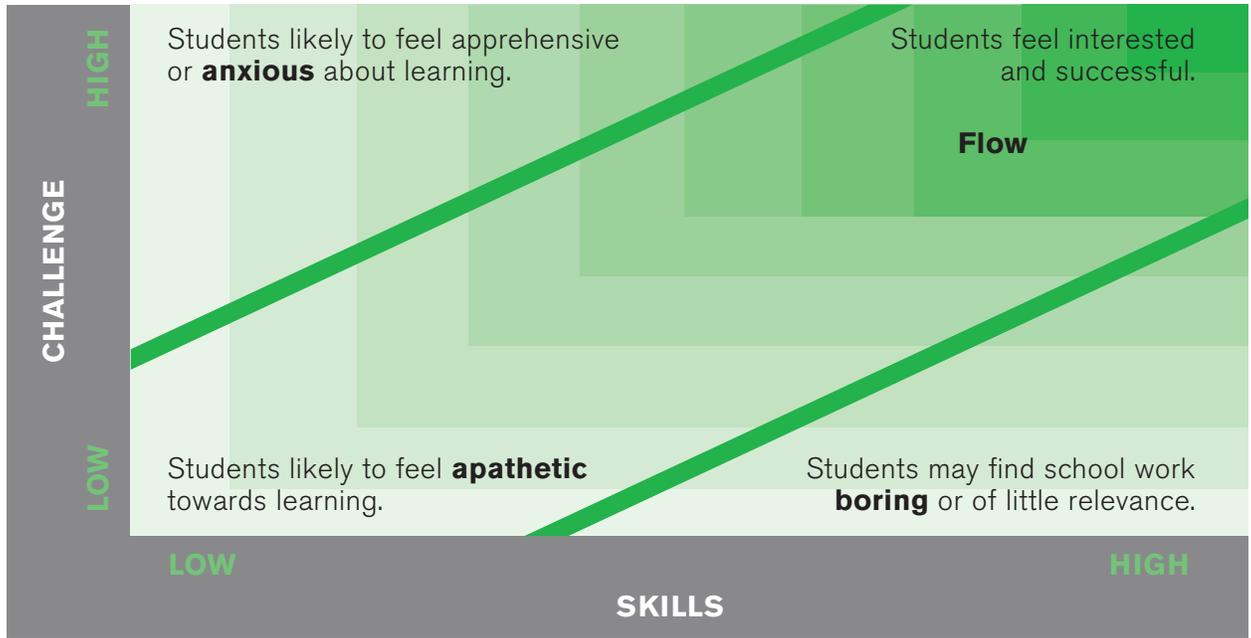
STUDENT ENGAGEMENT

This report uses a multidimensional framework to describe and measure student engagement. Figure 2 shows the three types of engagement — social, institutional, and intellectual — and the three measures used for each. Traditionally, the measurement of student engagement has focused on *social engagement* — students' sense of belonging at school and their active involvement in the life of the school (Finn & Rock, 1997; Goodenow & Grady, 1993; Wehlage, Rutter, Smith, Lesko, & Fernandez, 1989). The first large-scale international study on student engagement conducted by the OECD included a measure of students' sense of belonging, as well as a measure of truancy (Willms, 2003). Truancy can be seen as an aspect of *institutional engagement* — where students value schooling outcomes and are willing to meet the formal requirements of schooling. ***What Did You Do in School Today?*** introduced a third type of student engagement — *intellectual engagement* — which was defined as a "serious emotional and cognitive investment in learning, using higher-order thinking skills … to increase understanding, solve complex problems, or construct new knowledge" (Willms et al., 2009, p. 7).

Figure 2. Measures of Student Engagement

Type of Engagement	Survey Measures
Social Engagement *Meaningful participation in the life of the school*	1. **Sense of belonging** 2. **Participation in sports and clubs** 3. **Positive friendships at school**
Institutional Engagement *Active participation in the requirements for school success*	4. **Attendance** 5. **Positive homework behaviour** 6. **Values schooling outcomes**
Intellectual Engagement *A serious emotional and cognitive investment in learning*	7. **Interest and motivation** 8. **Effort** 9. **Quality instruction** **(a composite of effective use of learning time; instructional relevance; and instructional rigour)**

DATA AND METHODOLOGY

This report uses student- and school-level data that were collected during the 2009–10 school year through the second version of the Learning Bar's online survey, *Tell Them From Me (TTFM) 2.0* (2009). The sample group used for this report comprised middle and secondary students participating in ***What did you do in school today?*** — 11,135 students attending 39 middle schools and 15,823 students attending 32 secondary schools.[1]

DETERMINING LEVEL OF INSTRUCTIONAL CHALLENGE (SKILLS/CHALLENGE)

Using a 10-point scale, students rated the extent to which they felt challenged in their Language Arts, Mathematics, and Science classes. A single score was determined for each student by averaging his or her responses across the three subjects and determining where this score fell on a scale from zero to 10. On this scale, a cut-point of 5.0 was set:

- Students with scores at or above 5.0 (i.e., neutral or higher) are considered **"high-challenge."**
- Students with scores below 5.0 are considered **"low-challenge."**

Students were also asked what their overall mark was in their current Language Arts, Mathematics, and Science courses. If they were not currently taking a course in a subject, they were asked about their most recent mark.[2]

- Students with marks of A or B are classified as **"high-skills."**
- Students with marks of C or lower are classified as **"low-skills."**

These results enabled us to position each student in the appropriate skills/challenge quadrant.

DETERMINING LEVEL OF ENGAGEMENT

The Learning Bar (2009) also set cut-points for each of the nine measures of student engagement (see Figure 2), in order to establish high *versus* low levels of engagement. For example, the measure of *sense of belonging* is based on six questions. Students responded to statements such as "I get along well with others at school" on a scale that is scored as follows:

- 0 (strongly disagree)
- 2.5 (somewhat agree)
- 5.0 (neither agree nor disagree)
- 7.5 (somewhat agree)
- 10 (strongly agree)

The scores were averaged across the six questions to yield an average score ranging from zero to 10. A student with an average score that is 6.0 or higher (i.e., higher than a neutral response of 5.0) is considered to have a positive sense of belonging, while a student with a score that is below 6.0 is considered to have a low sense of belonging.

---

[1] Seven ***What did you do in school today?*** schools were classified as elementary, elementary–middle, or middle–secondary. Data from students in these schools were not included in the analyses.

[2] In Willms, Friesen, & Milton (2009), students' skill level was gauged by self-reporting of how confident they were of their skills in each of the subject areas. Self-reporting of student marks has proven to be a more reliable measure of skills.

DETERMINING THE RELATIONSHIP BETWEEN INSTRUCTIONAL CHALLENGE (SKILLS/CHALLENGE) AND ENGAGEMENT

To determine the relationships between instructional challenge and student engagement, we began by estimating the percentage of students in each of the Csikszentmihalyi quadrants:

- low-skills/high-challenge
- high-skills/high-challenge (flow)
- low-skills/low-challenge
- high-skills/low-challenge

We then estimated separate logistic regressions to discern the relationships between each of the nine measures of student engagement (see Figure 2) and students' classification in the skills/challenge quadrants.
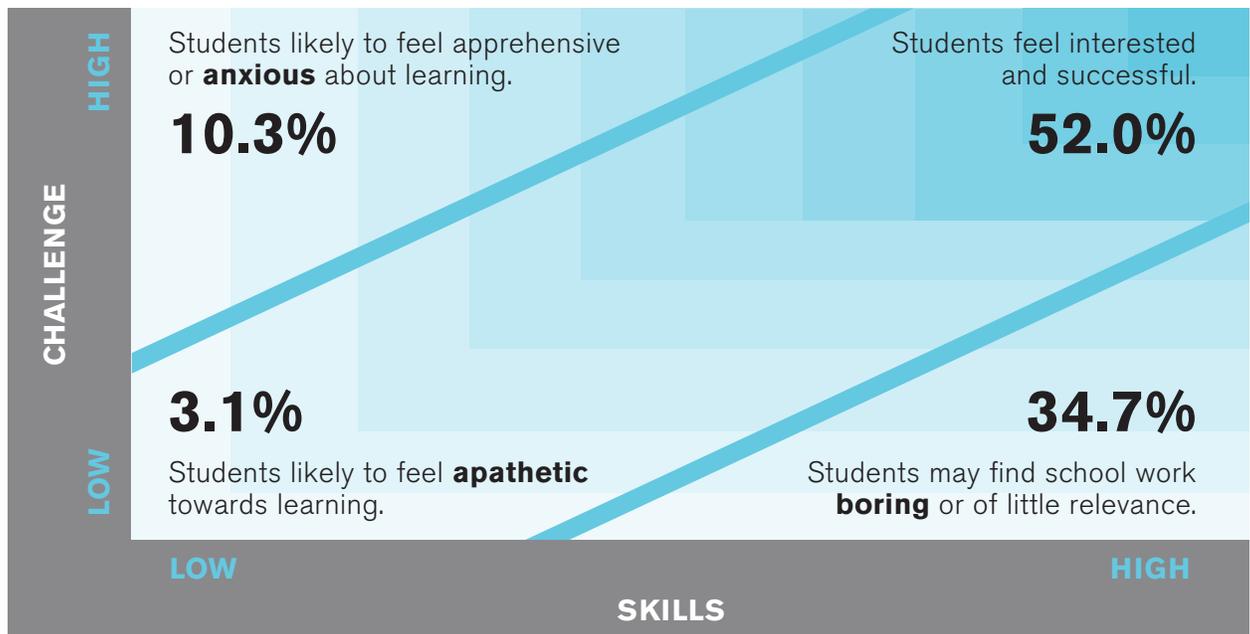
RESULTS

INSTRUCTIONAL CHALLENGE IN MIDDLE AND SECONDARY SCHOOLS

The results for the skill/challenge combinations for Language Arts, Mathematics, and Science are reported in Figures 3, 4, and 5 for middle schools, and in Figures 6, 7, and 8 for secondary schools.

Middle schools

In Language Arts (see Figure 3), slightly more than one-half of all middle school students are in the flow quadrant — that is, high-skills/high-challenge. Relatively few students — 13.4% — have low skills, and of these, the majority feel challenged Over one-third of middle school students are in the high-skills/low-challenge quadrant.

Figure 3. Instructional Challenge for Language Arts, Middle Schools, 2009–10

Students likely to feel apprehensive or **anxious** about learning. **10.3%**	Students feel interested and successful. **52.0%**
3.1% Students likely to feel **apathetic** towards learning.	**34.7%** Students may find school work **boring** or of little relevance.

In Mathematics (see Figure 4), a higher percentage of students have low skills than in Language Arts, and the majority feel challenged in their classes. Among the high-skills students, most feel challenged in their classes. However, about one-quarter of all students do not feel challenged.
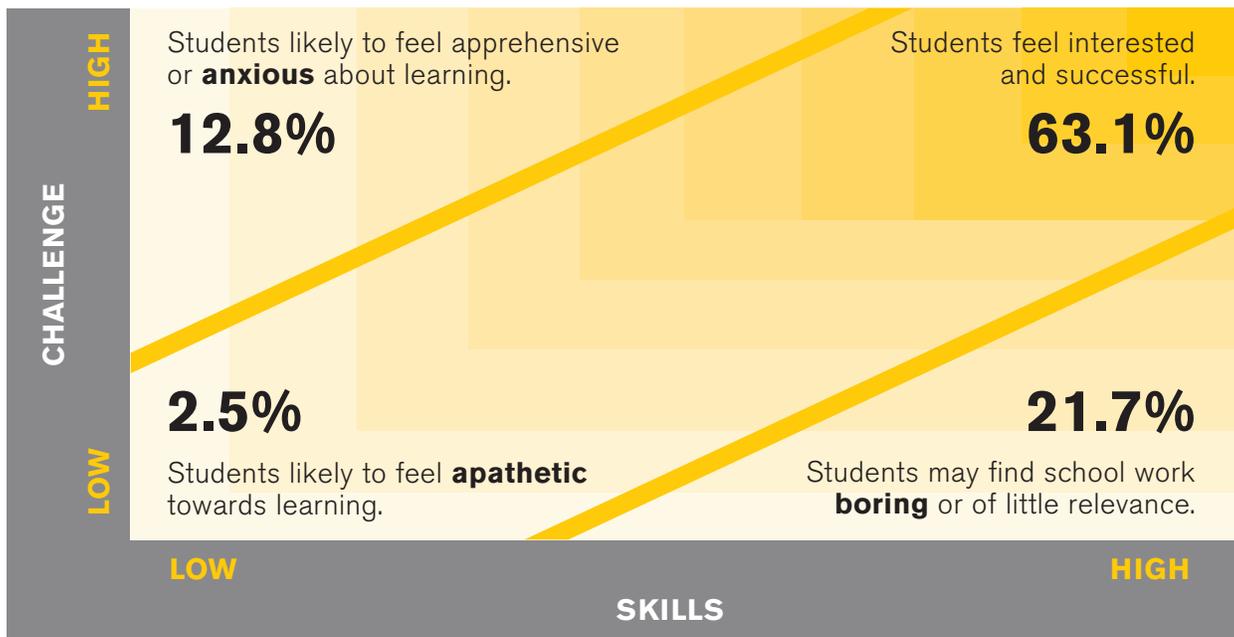
Figure 4. *Instructional Challenge for Mathematics, Middle Schools, 2009–10*

Students likely to feel apprehensive or **anxious** about learning.
15.8%

Students feel interested and successful.
57.7%

2.0%
Students likely to feel **apathetic** towards learning.

24.6%
Students may find school work **boring** or of little relevance.

CHALLENGE — HIGH / LOW
SKILLS — LOW / HIGH
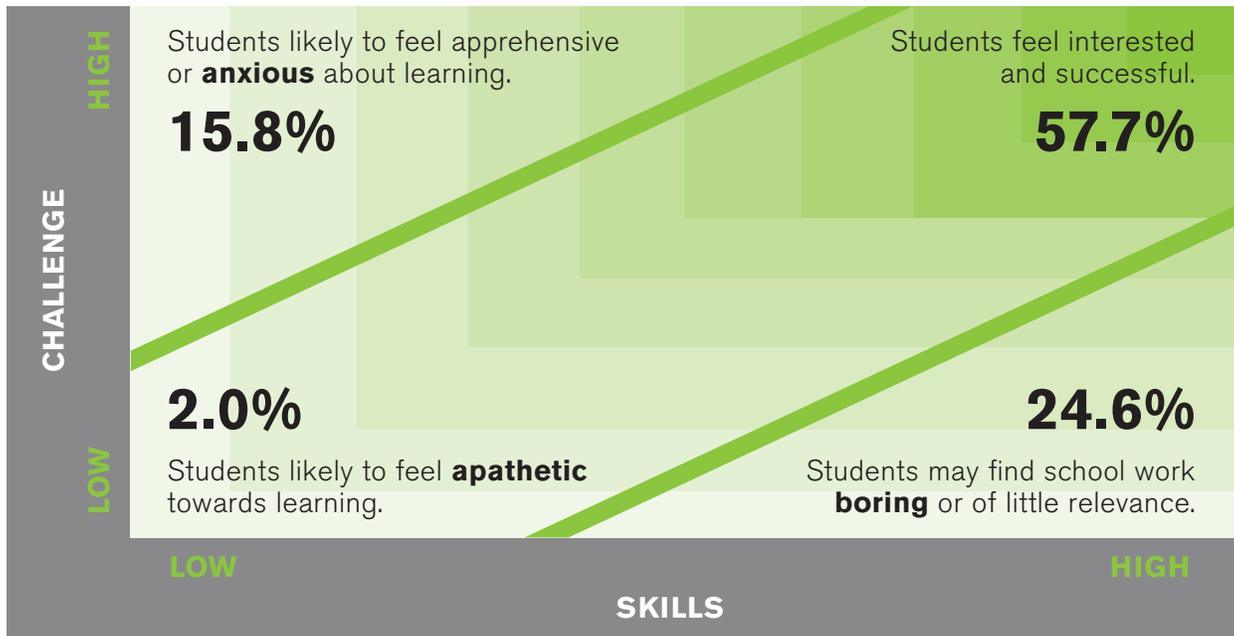
The results for middle school Science (see Figure 5) are similar to those for Mathematics, but slightly more students are in the flow quadrant, and fewer are in the high-skills/low-challenge quadrant.

Figure 5. *Instructional Challenge for Science, Middle Schools, 2009–10*

Students likely to feel apprehensive or **anxious** about learning.
12.8%

Students feel interested and successful.
63.1%

2.5%
Students likely to feel **apathetic** towards learning.

21.7%
Students may find school work **boring** or of little relevance.

CHALLENGE — HIGH / LOW
SKILLS — LOW / HIGH
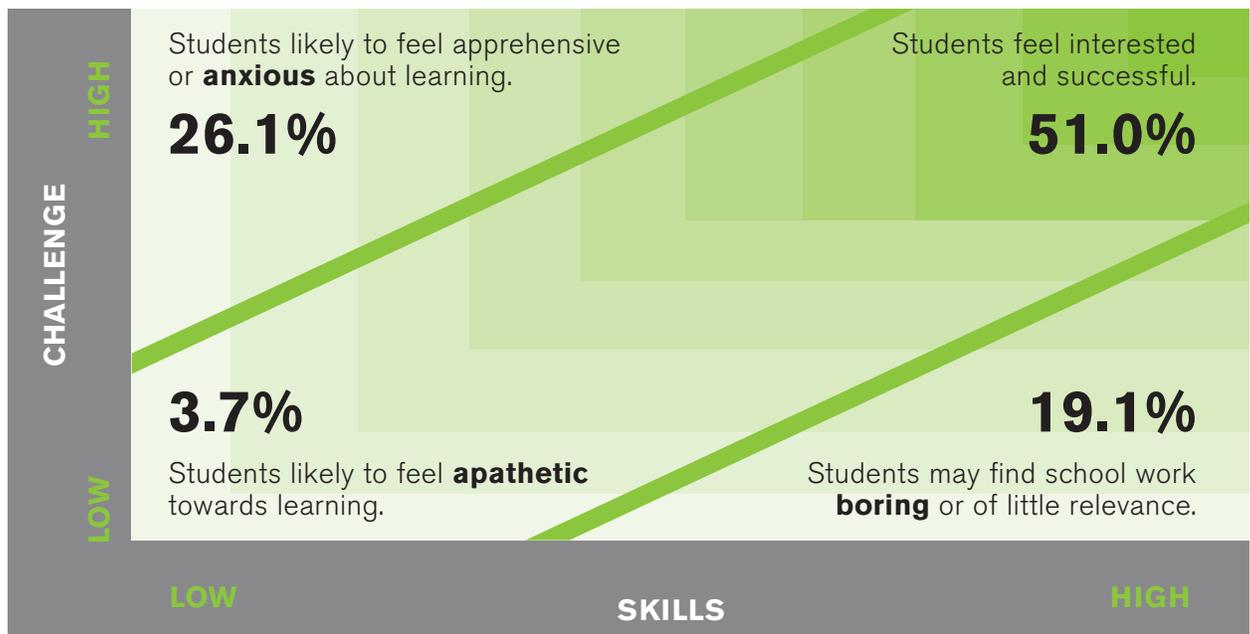
Secondary schools

At the secondary level, in Language Arts (see Figure 6), about one-quarter of all students have low skills, which is consistent with the findings of the large-scale national and international surveys such as the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS).[3] Only 45% of all students are in the flow quadrant, and another 30% of students are in the high-skills/low-challenge quadrant.

Figure 6. *Instructional Challenge for Language Arts, Secondary Schools, 2009–10*

CHALLENGE

HIGH
Students likely to feel apprehensive or **anxious** about learning.
17.8%

Students feel interested and successful.
45.4%

7.3%
Students likely to feel **apathetic** towards learning.

29.6%
Students may find school work **boring** or of little relevance.

LOW
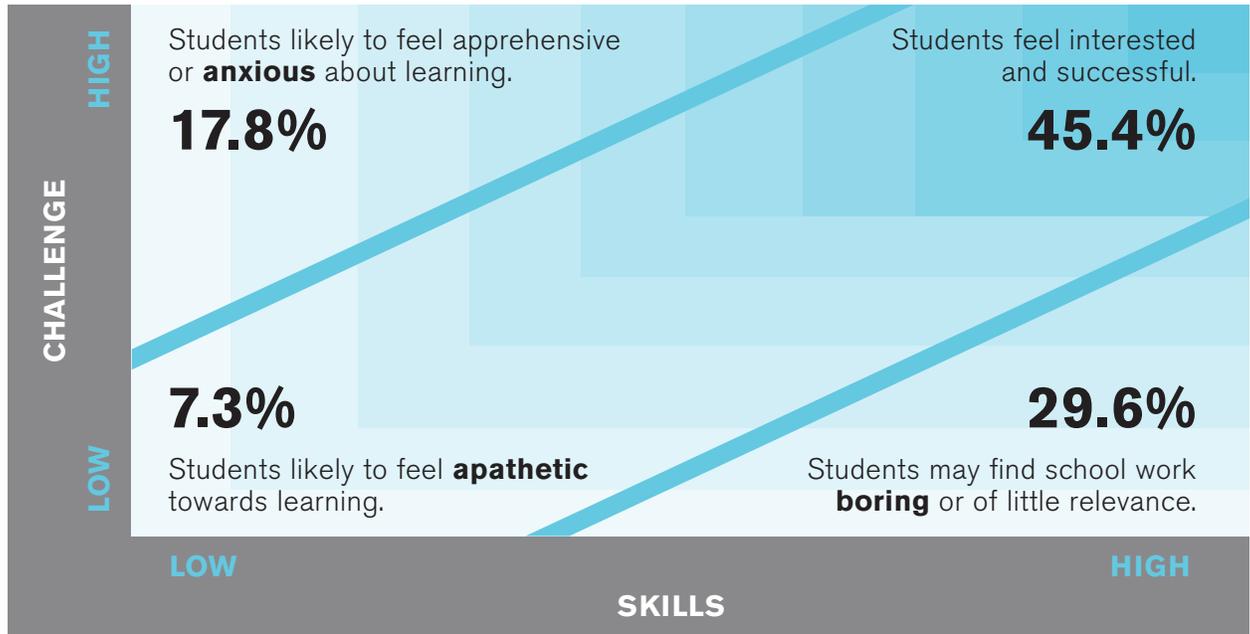
LOW   SKILLS   HIGH

In Mathematics (see Figure 7), over 25% of all secondary school students are in the low-skills/high-challenge category, while only about 4% are in the low-skills/low-challenge quadrant. About one-half are in the flow quadrant, while about 20% are in the high-skills/low-challenge quadrant.
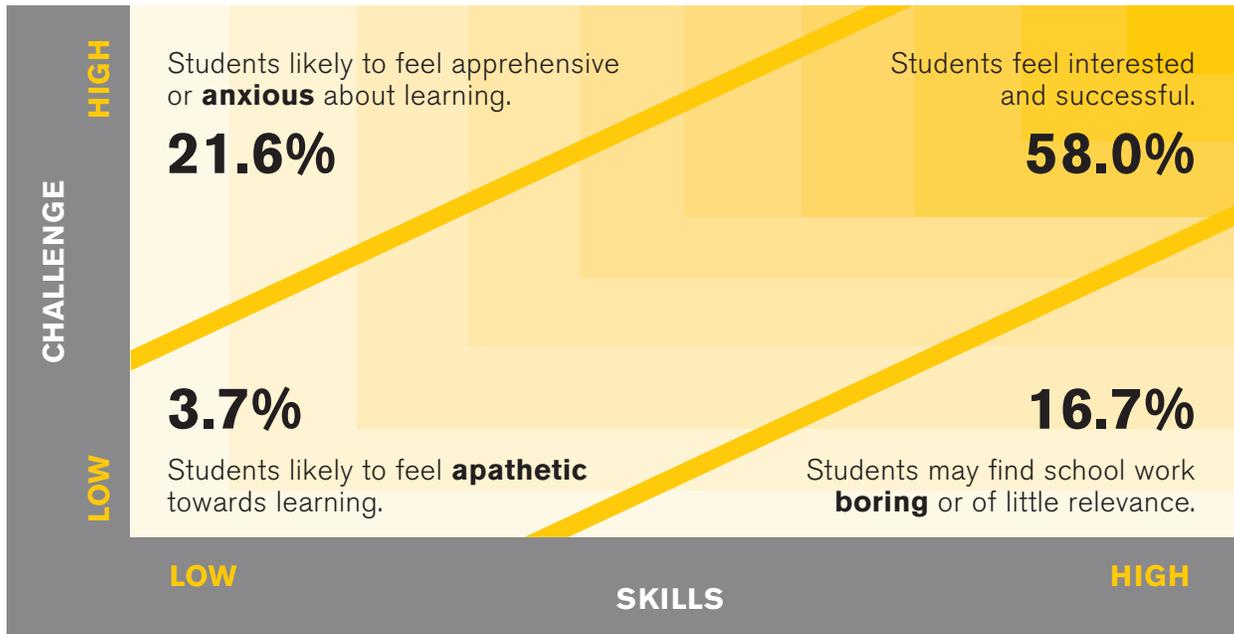
Figure 7. *Instructional Challenge for Mathematics, Secondary Schools, 2009–10*

CHALLENGE

HIGH
Students likely to feel apprehensive or **anxious** about learning.
26.1%

Students feel interested and successful.
51.0%

3.7%
Students likely to feel **apathetic** towards learning.

19.1%
Students may find school work **boring** or of little relevance.

LOW

LOW   SKILLS   HIGH

[3] To review results from the OECD's PISA, go to: http://www.pisa.oecd.org/ | For results from TIMSS, go to: http://nces.ed.gov/timss/

In Science (see Figure 8), 58% of students are in the flow quadrant, while about 17% are high-skills/low-challenge. Most of the low-skills students feel challenged in their classes, as is the case for Language Arts and Mathematics.

Figure 8. Instructional Challenge for Science, Secondary Schools, 2009–10

CHALLENGE

HIGH

Students likely to feel apprehensive or **anxious** about learning.

21.6%

Students feel interested and successful.

58.0%

3.7%

Students likely to feel **apathetic** towards learning.

16.7%

Students may find school work **boring** or of little relevance.

LOW

LOW   SKILLS   HIGH

Taken together, these results indicate that about one-third of all students at the middle and secondary levels do not feel challenged in their Language Arts classes. In Mathematics and Science, about one-quarter of all students do not feel challenged.

RELATIONSHIPS BETWEEN INSTRUCTIONAL CHALLENGE AND STUDENT ENGAGEMENT

Figure 9 shows the strength of the relationships between students' skill/challenge levels and the three types of engagement — social, institutional, and intellectual — for middle and secondary schools in 2009–10. For these analyses, the results for each measure of engagement were averaged across the three subject areas. **The relationship results are reported as *odds-ratios,* with students in the high-skills/high-challenge (flow) group set as the reference group, and assigned an odds-ratio of 1.0.**

When an odds-ratio is less than 1.0, the chances of a student in that group having a positive outcome are less than those of a student in the reference group. When the odds-ratio is greater than 1.0, the chances are greater, and when the odds-ratio equals 1.0, the chances are equal.

In Figure 9, for example, the odds-ratio for "Low-Skills/High-Challenge" is 0.51 for "Interest and motivation" (the first of the three measures under "Intellectual Engagement"). This means that the odds of a low-skills/high-challenge student having a high level of interest and motivation is 0.51 (about one-half) that of a high-skills/high-challenge student. Similarly, the odds of a low-skills/low-challenge student having a high level of interest and motivation is 0.50 that of a high-skills/high-challenge student, while the odds of a high-skills/low-challenge student having a high level of interest and motivation is 0.62 that of a high-skills/high-challenge student.

Figure 9. *Instructional Challenge and its Relationship with Student Engagement – Middle and Secondary Schools, 2009–10*

	LOW-SKILLS/ HIGH- CHALLENGE	HIGH-SKILLS/ HIGH- CHALLENGE (FLOW)	LOW-SKILLS/ LOW- CHALLENGE	HIGH-SKILLS/ LOW- CHALLENGE
Social Engagement				
Sense of belonging	**0.53**	1.00	**0.42**	0.96
Participation in sports and clubs	**0.53**	1.00	**0.53**	1.05
Positive friendships at school	**0.59**	1.00	**0.52**	1.02
Institutional Engagement				
Attendance	**0.26**	1.00	**0.21**	1.09
Positive homework behaviour	**0.31**	1.00	**0.24**	**0.74**
Values schooling outcomes	**0.46**	1.00	**0.35**	**0.87**
Intellectual Engagement				
Interest and motivation	**0.51**	1.00	**0.50**	**0.62**
Effort	**0.34**	1.00	**0.25**	**0.81**
Quality instruction	**0.41**	1.00	**0.37**	**0.88**

Note: odds-ratios that are statistically significant are in **bold** text.

The results in Figure 9 reveal that:

- Low-skills/high-challenge students are less likely to be socially engaged in school — the odds-ratios range from 0.53 to 0.59 — and so we can say that on average these students have about one-half the chance of being socially engaged as their counterparts who are in flow (high-skills/high-challenge). These relationships are even weaker for institutional and intellectual engagement, where the odds-ratios range from 0.26 to 0.51.

- Low-skills/low-challenge students are also less likely to be socially, institutionally and intellectually engaged at school than their in-flow counterparts. In fact, the odd-ratios, which range from 0.21 to 0.53, are even lower than those for the low-skills/high-challenge students.

- High-skills/low-challenge students are as likely to be socially engaged at school as their high-skills/high-challenge peers: the odd-ratios range from 0.96 to 1.05 and do not differ significantly from 1.0. The attendance of the high-skills/low-challenge students is also comparable to that of students in flow; however, they are less likely to value schooling outcomes or have positive homework behaviour. The biggest difference in engagement between high-skills/low-challenge students and those in flow is associated with intellectual engagement: students who are not appropriately challenged are less interested and motivated, exert less effort, and consider the quality of instruction to be less satisfactory.

The research literature on student engagement has focused on the relationship between academic achievement and student engagement. As a result, when we think about "disengaged students" it is natural to think of those students who have poor academic skills. The results above confirm that, on average, students with low skills (regardless of their level of challenge) have lower levels of engagement. This is evident across the measures of social, institutional and intellectual engagement. However, students who have high skills but are not challenged at school are also prone to being disengaged. They are less likely to value schooling outcomes; they are more likely to have poor homework behaviours; and they have low levels of intellectual engagement.

IMPLICATIONS FOR SCHOOL REFORM AND TEACHING

Educational reform has been a recurrent theme in Canadian education for the past 30 years. In the 1980s, the Excellence Movement called for an intensification of existing practices, while the Restructuring Movement of the 1990s emphasized site-based reform (DuFour & Eaker, 1998; Fullan, 2007). Recent reforms echo these movements, with many efforts — such as lengthening the school day or adding new course options — amounting to little more than tinkering around the edges of the problems. If there is anything to be learned from the past reform efforts, it is that it is easier to change educational policy and resource documents than to fundamentally change how schools function.

Findings from **What did you do in school today?** suggest that educators look carefully not only at the ways in which schools function but also at the heart of the enterprise itself — teaching — and the conditions necessary to sponsor deep, meaningful learning.

The high-skills/low-challenge students profiled in this report — that is, the students who receive high marks but experience low challenge — inform us that, for them, learning in academic core subjects at school is problematic. They are less interested and motivated, exert less effort to do well, and feel the quality of instruction is less satisfactory than do their peers who experience levels of challenge appropriate to their skills. Their low level of intellectual engagement is accompanied by a decreased valuing of school outcomes. These students remind educators that certain fundamental aspects of school reform are systemic: historically, schools were not designed to be intellectually engaging places (Callahan, 1964). Learning in school was not originally intended to be pleasurable. Today, however, we believe differently.

Recent research indicates that people learn best when trying to do things that are challenging and of deep interest to them (Archambault, Janosz, Fallu, & Pagani, 2009; Boekaerts, 2010; Csikszentmihalyi, 1990; Fredericks, Blumenfeld, & Paris, 2004; Friesen, 2009; Hinton & Fischer, 2010; National Research Council, 2003; Willms et al., 2009). This relationship between challenge and interest reflects the close interplay of emotion in cognition and the development of intellectual capacity. It is in this interplay that the brain begins to make connections and see patterns in information, resulting in a powerful experience that comes from understanding (OECD, 2007, pp. 71–72). This state of sudden epiphany is described as "the most intense pleasure the brain can experience … in a learning context" (OECD, 2007, p. 73). Contemporary researchers argue that children should experience such pleasure in learning early and frequently so that they come to know how gratifying learning can be (Brown, 2009; Csikszentmihalyi, 1990; Dai & Sternberg, 2008; Dweck, 2006).

The implications of the findings from this study, when combined with findings from other studies on engagement (National Research Council, 2003), highlight students' need for "worthwhile tasks, some autonomy in how to do them, good feedback, good colleagues to work with, opportunities to learn and improve" (Levin, 2010, p. 77). Knowing how to learn, being inspired to continue learning, and learning together with others are essential in today's world. As a result, in an education system designed on older, different notions of teaching and learning, educators continue to search for ways to redesign schooling so that it sponsors deep, meaningful learning. Merely adding "more interesting courses" or contemporary media to existing structures can be alluring, but our findings suggest a different, more fruitful direction.

Since learning requires students' effort and interest, reforms need to take into account the ways in which the emotional and cognitive aspects of learning work in tandem to create the optimal conditions for deep, engaged learning. Such reforms also require supporting teachers in their designing of flexible, adaptive learning environments that can be manipulated according to the emerging needs of learners and the learning situation. The following case study provides an illustrative example of how this type of organizational, pedagogical and curricular change is being worked out in one of the high schools participating in **What Did You Do in School Today?**

Engaging Students in Challenging, Meaningful School Work – One School's Experience

In 2010, Galileo Educational Network was contracted to help district staff and educators at an urban high school to develop and implement strategies for improving student achievement and engagement. The school is located in a low socio-economic neighbourhood, more than 50% of its students are identified with some form of learning disability, and a high percentage are of First Nations, Métis or Inuit heritage.

Both the province and the school district identified the school as needing improvement. Its standardized diploma test scores were significantly below the provincial standard of achievement, and the school was performing well below provincial averages on all accountability measures — including, for example, high-school completion rate, parental involvement, diploma exam participation rate, and high-school-to-post-secondary transition rate. In addition, results from the school's first set of data showed that levels of intellectual engagement were low and only 44% of students experienced flow in their learning (see Figure 10).

Figure 10. *Levels of Instructional Challenge*
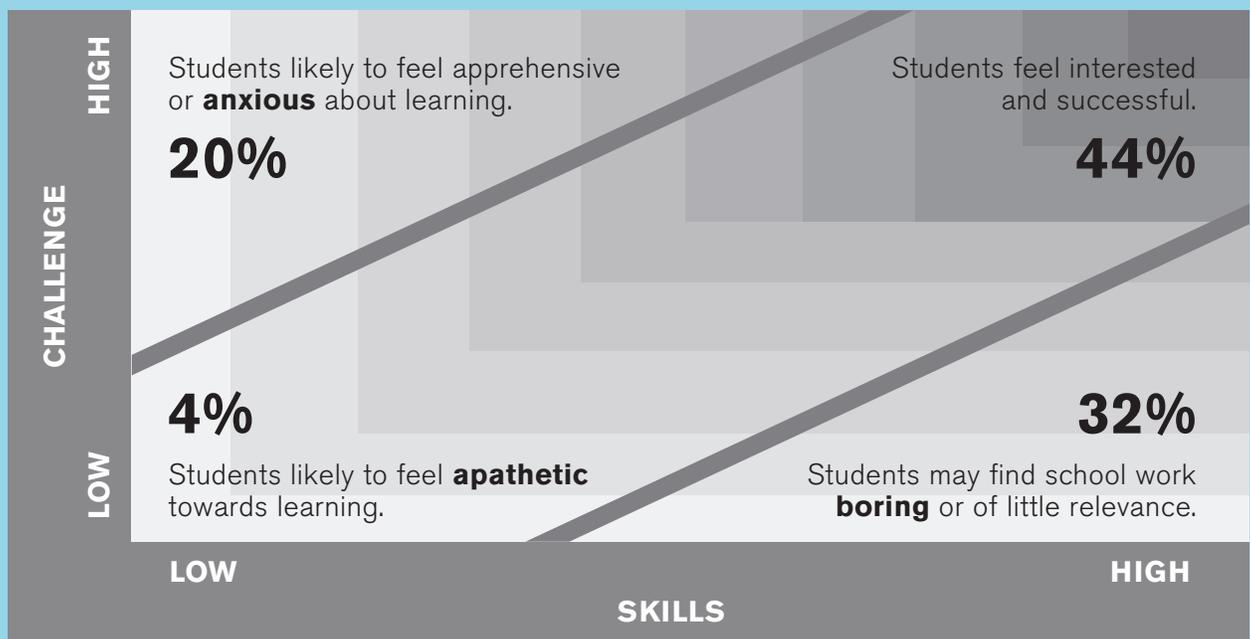
Many students at the school fell into what Edyburn describes as the "achievement gap" (2006). While the "average" student at the school was achieving one academic year for each year in school (i.e., one grade per year), many students could not do this, including First Nations, Métis and Inuit students; students with learning disabilities; students living in poverty; and students whose first language was not English. According to Edyburn, "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" (2006, p. 20).

Even though leaders and teachers at the school knew that a large percentage of their students were falling into the achievement gap, they were reluctant to change the way they had always approached the curriculum, teaching, and the organization of the school. Many of them believed, like many educators, that the achievement gap was primarily a feature of the students' characteristics and/or their experiences outside of school.

With the support and encouragement of the senior leadership within the district, and drawing upon best evidence from research, Galileo consultants designed a plan to:

- increase student engagement and student performance, including achievement outcomes
- work collaboratively with teachers to design studies and strengthen their instructional practices using the features identified in Friesen's *Teaching Effectiveness: A Framework and Rubric* (2009)

Drawing upon a variety of data sources — including results from *Tell Them From Me 2.0*, and best evidence from research in education — to guide the development work, Galileo researchers and consultants worked collaboratively with administrators and teachers to design different school organizational structures and strengthen instructional practices.

Beginning with two cohorts of Grade 10 students that would stay with the same teachers through to Grade 12, a school-within-a-school structure was created. Teachers formed multidisciplinary teams, and the teams worked together to organize their respective disciplines so that students had a coherent experience. The school bought a mobile computing device for each student. Galileo consultants and researchers worked alongside teachers to:

- design challenging, meaningful studies and lessons
- strengthen pedagogical practices, including assessment practices (see *Mockingbird Mashups*)

Mockingbird Mashups (see http://www.iostudent.com/7236) was designed by teachers and consultants who had a strong understanding that Harper Lee, author of *To Kill A Mockingbird*, used words on a page to convey important ideas about her world and the human experience. Although this story takes place in another time and place, the events could just as easily be playing out at this very moment in cities and towns across Canada and elsewhere in the world. Unfortunately, the racism, bigotry and other key ideas in *To Kill a Mockingbird* are alive and well in today's world.

The students in the two cohorts were invited to bring forward the ideas from the novel using a digital mashup.[4] Their learning was supported and scaffolded throughout the process through ongoing feedback and various other forms of formative assessment. Throughout the entire process, teachers worked collaboratively with students, students with each other, and teachers with other teachers.

The experiment is well into its second year, and school and district staff are beginning to see improvements in student engagement and learning. For students in the two school-within-a-school cohorts, intellectual engagement scores in the school have increased from 44% twelve months ago to 47%. While still below the national norm, the percentages of students who report experiencing either anxiety or boredom have decreased. Individual measures of the learning environment and of drivers of student outcomes have increased. Students' attendance has increased. Many students attribute this increase in attendance to "showing up 'cause there is interesting stuff to learn."

Teachers say they have benefitted personally and professionally from making their own and the students' learning visible through their weekly meetings with each other and with the consultants and researchers. They speak about how access to new technologies has increased the range of complex problems and issues the students inquire into, the types of expertise teachers can access, the resources available to the students, and the authenticity of the students' performances of learning. Assessment for learning in the form of feedback is becoming integral to their teaching as they continue to learn to scaffold the learning of their students.

Galileo consultants are confident that the work at this school, a school similar to many other schools in which they have worked, will show one way that high schools can re-create themselves so that all students, including students who have typically not been successful, can be engaged and can experience success in their learning.

---

[4] A *digital mashup* is a combination of text, graphics, audio, video and animation drawn from pre-existing sources to create a new work.

CONCLUSION

Instruction is not well matched to skill levels for many middle and secondary students in Canada. The implications of these findings for students who feel that their work is too difficult or too easy are significant for student engagement in school *and* for students' learning in their Math, Language Arts and Science classes. Middle and secondary schools are clearly in need of change. However, what is even clearer is the need for reforms to focus more clearly on what is happening in classrooms, not just schools, and for policy to shift away from a narrow focus on individual students towards the larger effort of creating the conditions needed to engage *all* students intellectually. When teachers are supported in a way that enables them to work with the principles of effective teaching, including the expectation that they open their practices to colleagues and others, and given the time and space to build productive working relationships with each other and with students, learning really begins to engage students intellectually.

REFERENCES

Archambault, I., Janosz, M., Fallu, J., & Pagani, L. (2009). Student engagement and its relationship with early high school dropout. *Journal of Adolescence, 32*(3), 651–670.

Bagnell, A., Tramonte, L., & Willms, J. D. (2008). *The prevalence of significant mental health problems among Canadian youth and their comorbidity with cognitive and health problems*. Ottawa: Human Resources and Skills Development Canada.

Blanchard, L. T., Gurka, M. J., & Blackman, J. A. (2006). Emotional, developmental, and behavioral health of American children and their families: A report from the 2003 National Survey of Children's Health. *Pediatrics, 117*(6), e1202–e1212.

Boekaerts, M. (2010). The crucial role of motivation and emotion in classroom learning. In H. Dumont, D. Istance, & F. Benavides (Eds.), *The nature of learning: Using research to inspire practice.* Paris: Organization of Economic Cooperation and Development.

Brown, S. (2009). *Play: How it shapes the brain, opens the imagination, and invigorates the soul.* New York: Penguin Group.

Callahan, R. (1964). *America, education and the cult of efficiency.* Chicago: University of Chicago Press.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience.* New York: Harper & Row.

Csikszentmihalyi, M. (1997). *Finding flow: The psychology of engagement with everyday life.* New York: Harper & Row.

Dai, D., & Sternberg, R. (2008). *Motivation, emotion and cognition: Integrative perspectives on intellectual development and functioning.* New York: Taylor & Francis.

DuFour, R., & Eaker, R. E. (1998). *Professional learning communities at work: Best practices for enhancing student achievement.* Bloomington, IN: Solution Tree Press.

Dweck, C. S. (2006). *Mindset: The new psychology of success.* 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.

Finn, J., & Rock, D. A. (1997). Academic success among students at risk for school failure. *Journal of Applied Psychology, 82*(2), 221–34.

Fredericks, J., Blumenfeld, P., & Paris, A. (2004). School engagement: Potential of the concept, state of evidence. *Review of Educational Research, 74*(1), 59–109.

Friesen, S. (2009). *Teaching effectiveness: A framework and rubric.* Toronto, ON: Canadian Education Association.

Fullan, M. (2007). *The new meaning of educational change* (4th ed.). New York: Teacher College Press.

Galileo Educational Network & Axia NetMedia Corporation. (2012). *Mockingbird Mashups: An Intelligence Online (iO) project.* Available at: http://www.iostudent.com/7236

Goodenow, C., & Grady, K. E. (1993). The relationship of school belonging and friends values to academic motivation among adolescent students. *Journal of Experimental Education, 62*(1), 60–71.

Hinton, C., & Fischer, K. (2010). Learning from the developmental and biological perspective. In H. Dumont, D. Istance, & F. Benavides (Eds.), *The nature of learning: Using research to inspire practice.* Paris: Organization of Economic Cooperation and Development.

Knighton, T., Brochu, P., & Gluszynski, T. (2010). *Measuring up: Canadian results of the OECD PISA study.* Ottawa: Minister of Industry.

Levin, B. (2010). Evidence in education. *Learning Landscapes, 3*(2), 73–80.

National Research Council. (2003). Engaging schools: Fostering high school students' motivation to learn. Washington, D.C.: National Academies Press.

Organisation for Economic Cooperation and Development (OECD). (2007). *Understanding the brain: The birth of a learning science.* Paris: Author.

Organisation for Economic Cooperation and Development (OECD). (2010). *PISA 2009 results: What students know and can do — Student performance in Reading, Mathematics and Science (Volume I).* Paris: Author.

Rumberger, R. W. (1995). Dropping out of middle school: A multilevel analysis of students and schools. *American Educational Research Journal, 32*(3), 583–625.

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

The Learning Bar. (2009). *Tell Them From Me 2.0.* Available at: http://www.thelearningbar.com/ttfm/student-survey.php

Tramonte, L., & Willms, J. D. (2010, November/December). The prevalence of anxiety among middle and secondary school students in Canada. *Canadian Journal of Public Health, 101*(9), S19–S22.

Vygotsky, L. S. (1978). *Mind and society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.

Wehlage, G. G., Rutter, R. A., Smith, G., Lesko, N., & Fernandez, R. (1989). *Reducing the risk: Schools as communities of support.* Philadelphia: Falmer Press.

Willms, J. D. (2003). *Student engagement at school: A sense of belonging and participation.* Paris: Organization for Economic Cooperation and Development.

Willms, J. D., Friesen, S., & Milton, P. (2009). *What did you do in school today? Transforming classrooms through social, academic, and intellectual engagement — First National Report.* Toronto: Canadian Education Association.