Executive Summary

Challenge Based Learning

The Major Findings of the Implementation Project

An NMC Research Summary

Suggested Citation

Johnson, L. and Adams, S., (2011). Challenge Based Learning: The Major Findings of the Implementation Project. Austin, Texas: The New Media Consortium.

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The Major Findings of the Implementation Project

The first major study of challenge based learning (CBL[1]) took place in the fall of 2009, when 321 students and 29 teachers in six US high schools embarked on a set of projects that spanned some 17 disciplines. The outcomes of that study, conducted by the New Media Consortium, were remarkable on a number of levels, not the least of which was the clear efficacy of the approach.[2]

Based on these results, in 2011 a second more in-depth study was conducted by the NMC with 19 institutions that collectively range from primary to graduate education, 62 teachers, and 1,203 students. This report summarizes and provides context for the major outcomes of that study.

Executive Summary

We know we have work to do to address the problems that face American public education.

We've known this for nearly three decades, since the publication of *A Nation at Risk* in 1983,[3] which powerfully documented that the United States had lost the advantage it briefly held in the world in science, commerce, technology, and industry; that as custodians of the education of the young, we were failing; that without immediate, conscious, and focused effort, that failure would only compound itself; and that in countries all around the globe, students were being better prepared to take part in a rapidly flattening marketplace than our own students were.

No such immediate, conscious, and focused effort has taken place. Until now.

After two major studies involving 24 schools in three countries and 15 states, over 1,500 students, and 90 teachers, it is clear that challenge based learning (CBL) is one of the strongest ideas that has emerged over that time, with replicable, scalable results for students at nearly every grade level. The approach is consistent with standards-based curricula, and does not require a massive reinvention of schools, or the kind of top-to-bottom overhaul that some say is needed. It is based on a simple but powerful idea — make learning relevant.

CBL makes learning relevant by giving kids problems big enough so that they have to learn new ideas and tools to solve them, but immediate enough so that they care deeply that solutions are found. Young people want to solve real problems, and that is exactly what challenge based learning is designed to do — give students and teachers a framework that makes learning relevant, and then let them dive in.

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[1] Apple Education wrote a concept piece on the topic in 2008 that describes the method in considerable detail. See http://images.apple.com/education/docs/Apple-ChallengedBasedLearning.pdf

[2] This report can be downloaded at http://www.nmc.org/pdf/Challenge-Based-Learning.pdf.

[3] National Commission on Excellence in Education. (1983). *A Nation at Risk: The Imperative for Educational Reform*. Retrieved from http://www.ed.gov/pubs/NatAtRisk/index.html

Simple, powerful, and even better, it works. Over the course of two major studies, the efficacy of CBL has been firmly established. Consider these four overarching findings from the Challenge Based Learning Implementation (CBLi) Study:

- *CBL is extraordinarily effective in building 21st Century Skills.* Ninety percent of teachers reported that 12 key skill areas improved significantly, including Leadership, Creativity, Media Literacy, Problem Solving, Critical Thinking, Flexibility, and Adaptability. Seventy percent of teachers reported some improvement in *every* area of the 21st Century Skills
- *CBL engages students in learning.* Over three-quarters of students, across every age group, felt that they had learned more than what was required of them, were part of solving a big problem, and worked harder than they normally do.
- *Teachers find CBL effective in engaging students and helping them master the material — and easy to learn.* Over 90% of teachers, across every grade level, felt that CBL was a good use of their limited time and would use it again. Over three-quarters of teachers, again across every grade level, felt that their students mastered the expected material and that their overall engagement increased.
- *CBL is ideally suited to teaching in a technologically rich environment.* CBL is particularly effective in one-to-one classrooms where every student has 24/7 access to the device and persistent access to the Internet, as well. Today's teachers and students already have the technical skills needed to engage with CBL effectively.

Thirty percent — three of every 10 kids — fail to graduate from high school in the United States. Put in more concrete terms, there are about 4.1 million kids entering the 9th grade in fall 2011. 1.25 million of them will not graduate, and that number is adding to similar numbers year after year.

The Case for New Ideas

The reality remains that 28 years after *A Nation at Risk*, high school achievement for American students has not improved.[4] Even in the first five years under No Child Left Behind (NCLB), American students showed no gains whatsoever in reading, and very small ones in math.[5] While students in other nations enjoy rising scores and better preparation for a global workforce, our students suffer under a system that is known to not support their needs, stifled by a crippling inertia that limits new ideas.

Further, American students have a lower graduation rate compared to students in other industrialized nations.[6] Any benefit that would be gleaned by remaining in school is lost to those who drop out. According to the National Center for Education Statistics (NCES), the proportion of American students who leave school before completing their degrees is

[4] Strong American Schools. (2008). *A Stagnant Nation: Why American Students Are Still at Risk*. Retrieved from http://www.strongamericanschools.org/a-stagnant-nation-why-american-students-are-still-risk

[5] Sanchez, C. (2007). U.S. Test Results Show Growth in Math, Not Reading. *All Things Considered*, National Public Radio. See http://www.npr.org/templates/story/story.php?storyId=14698611

[6] *Op. cit. A Stagnant Nation.*

increasing — and in recent years, researchers have reported that the figures may have been even higher than suspected due to inconsistent measurements.

We're failing our students because we are failing to engage them, and the results of this are dire.[7] In *One Third of a Nation*, Paul Barton describes the situation as an underreported problem and voices his suspicion that there is a tendency for schools to avoid classifying non-degreed high school students as dropouts in order to avoid penalization by national accountability standard requirements. [8]

Although the situation has drawn considerable attention from political leaders in the United States, we are still losing 30% of our students; it was only recently that we could even agree how to count dropouts. Students are also leaving school earlier; in the past, students who left high school before graduation typically left between their junior and senior years. More recently, the majority of dropouts leave high school between grades 9 and 10.[9]

The evidence shows that one of the main reasons students are leaving is because they are disengaging from school.[10] While some factors leading to disengagement are related to their home life and family issues, it is becoming clear that an important factor is that students feel very strongly that what they are learning in school is not relevant to their lives.[11] Surveys of students who have left school have revealed that a lack of perceived connection between the curriculum and their everyday life or future work was a key factor, and many former students felt that more could have been done to keep them engaged through the type of schoolwork they were asked to do.[12]

Bruner describes school as it exists today as a place that demands an orderliness and neatness beyond what most children have known before; it requires a restraint and immobility never asked of them before; and it all too often puts students in a spot where they do not *know* whether they know what is going on, and can get no indication from anybody for minutes at a time as to whether they are on the right track.[13] Sadly, there is considerable evidence that he is right.

We need new ideas.

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[7] Studies conducted by four independent researchers during roughly the same time period (1998-2000) reported similar findings. Each study indicated that as many as a third of high school students do not complete high school (Barton, 2005). The most recent NCES findings for the 48 states for which comparisons between 2002–03 and 2005–06 could be made found that dropout rates increased for 26 states and decreased for the remaining 22 (NCES, 2008).

[8] Barton, Paul. (2005). Barton also notes that this likely results in inflated graduation numbers as well as underreported dropout rates.

[9] See Haney (2004). Haney and others interpret these findings to be an indication that more students are being flunked to repeat grade 9, possibly in an effort to avoid passing students who are not likely to score well on 10th grade accountability tests and to keep reported passing numbers higher.

[10] See Alspaugh (1998); Hernandez Jozefowicz-Simbeni (2008); Neild et al. (2008).

[11] United States General Accounting Office (2002).

[12] See Bridgeland, et al. (2006), in which 71% of respondents reported losing interest in their freshman or sophomore year; 47% reported that they left school because the class work was uninteresting.

[13] "The Will to Learn" (Dr. Jerome S. Bruner, 1969).

We need ideas that will engage students and keep them learning. We need ideas that will encourage students to want to understand the world around them, and to help them see the relevance of math and science to their own lives.

Relevance is key, but too often it is all but absent from educational curricula. At the same time, genuine challenges are easy to find, and young people see the world as a place rife with problems they will need to solve in their lifetimes. They want and expect their schooling to prepare them for it, and when it does, engagement has shown to increase dramatically.[14] Even young children are deeply aware that the world economy is in a fragile state, and they have a clear sense of what a collapse would mean — to themselves, their families and friends, and to people across the country and around the globe. They realize that the planet's temperature is climbing, slowly but perceptibly, and that they may see the effects of that change in their lifetime. They understand that their lifestyles are built upon nonrenewable energy sources and they know some of what that implies. And, they see desperate hunger and poverty, sometimes not even very far from home.

There are real problems that need solving, and young people understand that no less than adults do. They see these important issues taking the international stage and they know that school is not preparing them to address them. One in three makes the choice to leave.

We need new ideas and we need them to scale. As the scope and potential causes of the nation's dropout problem are more fully realized, school reformers are attuned to innovative ways to help keep student engagement high. Connecting class work to the real world is one obvious way to attain this goal.

The same theme has appeared over and over in educational literature for many, many years. As far back as 1938, John Dewey argued for teaching practices that would bring students together to work on real problems using real resources.[15] Through the years, similar approaches including project-based learning and contextual teaching and learning have been attempted, evaluated, and enjoyed by teachers and students alike. Student learning in problem-based courses has been documented;[16] yet the norm continues to be lecture-based instruction focused on what will be on the test.[17]

These approaches have not yet taken hold in K-12 education, partly because within teaching environments heavily influenced by the demands of standardized testing, it can be very difficult for problem-based learning approaches to flourish.

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[14] *Op. Cit. Challenge Based Learning: An Approach for Our Time* (2009). This study of six schools produced self-reported engagement rates from students of 90% and higher among 9th graders.

[15] Dewey (1938) held that it is the responsibility of the educator to present students with problems that have some bearing on their current experience, and to make the problem sufficiently interesting to engage learners and arouse their curiosity and natural desire to learn.

[16] Varied opinions on what defines a problem-based learning project make it difficult to research its effectiveness beyond non-comparative, anecdotal recommendations, of which there are many (Thomas, 2000). Several comparative studies, however, have generally validated problem-based learning's impact on student achievement. See Boaler (2002), Vanderbilt University (1992), and Ward and Lee (2004), for example.

[17] See, for instance, Pearlman (2006); Saye and Brush (2004); Ward and Lee (2004); Maxwell et al. (2001); and Berns and Ericson (2001).

Instead, what is needed is a new idea that incorporates the best aspects of problem-based learning, project-based learning, and contextual teaching and learning while focusing on problems faced in the real world. This new model must engage students' curiosity and desire to learn. It must make the solving of real problems the center of the curriculum, give students access to 21st century tools, and require them to work collaboratively and manage their own time. And, it must allow students to direct the course of their learning and engage teachers in a supportive, very necessary role as guides.

That new idea is challenge based learning.

As the teachers and students who participated in the Challenge Based Learning Implementation Project found, this new approach brings considerable real world relevance to class work — because the students themselves bring most of it. By giving students the opportunity to focus on a challenge of global significance, yet apply themselves to developing local solutions, challenge based learning creates a space where students can direct their own research into real world matters and think critically about how to apply what they learn.

The result is increased engagement; extra time spent working on the challenge; creative application of technology; and increased student satisfaction with schoolwork. Not incidentally, students also mastered the subject-area content and developed many of the skills identified as vital for 21st century learners.

These results were remarkably similar across all of the 17 schools and three universities in the study, which collectively spanned grades three through 20. The results were compelling; challenge based learning was found to be effective across 18 grade levels, with three-quarters of students reporting that they worked harder on the CBL project than they normally did on other schoolwork; that they felt like they were doing something important; that they learned a lot; that they helped to solve part of a big problem; and — especially for minority groups — that they realized they could be leaders.

The reports of teachers echoed these findings: overall engagement of their students increased during the project; students mastered the expected material; and CBL was a good use of class time and resources. These conclusions, and those related to the student outcomes listed in the previous paragraph, replicated and expanded the results of an earlier study of six schools conducted in 2009.

Fresh, new, relevant to today's issues, challenge based learning is an approach that has been shown to effectively engage students at all levels of learning. The findings of the Challenge Based Learning Implementation Study are clear, and they are encouraging. They validate the findings of the pilot study, and solidly support further experimentation, further research, and further work in the field around robust new ideas. More than that, these findings show that there is a better way to reach young people and engage them around important issues.

We know we need to make learning relevant to the challenges youth will face in their lifetimes. And now, we know we can.

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