Theory of Change

There are many aspects of education systems that influence the quality of learning in a particular school or classroom: socio-economic status, school culture, professional development, teacher quality, pressure from standardized tests, etc. For every factor, there are many related reform efforts aimed at improving teaching and student outcomes, and these vary in approach and effectiveness. Here we ask a different question: Knowing what we know about how children learn and what is necessary for individuals and societies to succeed and thrive, what should students be learning?

Our hope is to create a framework that can serve as the foundation for deep discussions about our educational design goals and how well we are achieving them. Assessment drives change in education, and we believe that it is crucial to align curriculum and assessment to our values, so that educators can teach in an environment that supports and rewards deep learning across the framework of what needs to be learned.¹

By creating a framework of educational goals, we can influence the discussion about standards for education, and how standards will pave the way for crafting the deep re-design of assessments to make them more holistic and relevant. When assessments reflect updated views on what is important to learn, it will be necessary to redesign curriculum to align with the new assessment approaches, and concurrently, professional development to prepare educators to help students learn the updated curricula, as shown here:

![Goals Diagram](image)

Progress will be staggered. When renovating a house, it is important to drastically change only one section at a time, while living in the other sections. In trying to change a large entity like the education system, we must understand that it will not happen all at once. Both the what (standards and assessment), and the how (curriculum and professional development) need to change over time.

The CCR is now focused on the first two rooms of renovation—standards and assessment. We are focusing on these levels in order to eventually effect change across all levels. Assessment is a powerful lever for change across the system; as the saying goes, “what gets counted ends up counting.” It will then be up to individual countries and jurisdictions as to how specific progress will be made on the curriculum and professional development, in ways that are aligned and harmonious with the updated education goals, standards, and assessments, and are best suited to the specific style, needs, and values of each education system.

In addition to the four areas of standards, assessments, curricula and professional development, there is often, in many jurisdictions, a silent influence that has gone mostly unchallenged: college entrance requirements. Such requirements, with their entrance tests, have been constructed to ascertain the student’s ability to succeed in university courses, mostly from a traditional knowledge perspective. They very rarely, if ever, reflect skills, character, and the meta-learning abilities of the student, and are not a predictor for life success outside academia. They often bias the requirements of school systems, in

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¹ Educators who have reviewed this framework sometimes ask, “Why aren’t you including in your efforts a particular focus on students who are struggling in various ways—low socio-economic status, learning differences, and so on?” We believe these are very important issues, and that there will be a wide variety of ways to adapt and modify learning practices for each learner no matter where they are on the spectra of individual learner needs. CCR is stimulating change at the systemic level, for all students, by working with influential stakeholders (such as the OECD) in creating a framework that is robust, comprehensive and adaptable for all.
deciding for instance how much algebra should be required irrespective of how useful it may be, and not realizing that it may simply be functioning as a sorting mechanism, by approximating persistence.

As this realization starts to sink in, colleges such as Bard and jurisdictions such as British Columbia are challenging their higher education environments to deeply rethink their entrance requirements. More research, analysis, concentration, and innovative problem-solving are needed to understand how to address the need of higher education to fairly sort applicants, yet assess the full individual, and most critically, not hold back progress in transforming education standards and assessment systems.

Of course, there are feedback loops from each level to each of the other levels in this model. Education is a large and complicated system, which is why we need to take a step back, look at the big picture, and be intentional with how we approach this historic education challenge.

The CCR Process

As an independent, non-partisan, international organization, the Center for Curriculum Redesign (CCR) uses an evidence- and research-based process for developing and refining its frameworks. This process draws from three distinct collaborative efforts: synthesis, analysis, and organization.

**Synthesize:**
- prior & existing frameworks
- input from employers
- research from the learning sciences
- future studies and global trends

**Analyze:**
- surveys from teachers
- feedback from global conferences
- social media
- literature reviews + expert panels

**Organize:**
- comprehensive: no major elements missing
- compact: actionable and deployable
- uncorrelated: no duplication or confusion
- appropriate layer of abstraction: sensical
- globally relevant: for broad acceptability

Synthesize

The CCR recognizes that a lot of work has already been done already in identifying promising areas of education reform. In order to not reinvent the wheel, the CCR uses meta-syntheses on prior and existing frameworks developed by jurisdictions and national bodies (such as ministries of education), professional bodies (such as the National Council of Teachers of Mathematics) and organizations (such as P21.org). It also draws from analyses of employers’ needs (such as an IBM study of 15,000 CEOs from 60 countries and 33 industries). The CCR also ensures that its concepts are current by constantly monitoring and synthesizing research from the learning sciences and by aligning itself with analyses of global trends and future studies.
Analyze

The CCR believes in the importance of collaboration with relevant parties in the creation of a framework that will support them in their goals. To do so, we have gathered feedback from over 600 teachers from around the world, and held international conferences and colloquia on issues discussed in the framework (such as mathematics, character, metacognition, employability etc.). The CCR also will begin to gather information via social media regarding what students and parents want from their education. Finally, the CCR conducts specific literature reviews and draws from experts from a global network of thought leaders and partnering organizations (such as the OECD).

Organize

As the CCR draws from so many sources, it is crucial that the final product be accurate and actionable. The CCR framework aims to accomplish this using the following five design goals:

1. Comprehensive
   This attribute is the most self-explanatory. It is not enough to create a framework for a subset of the educational goals one hopes to achieve (for example, only skills). Education suffers from an overabundance of programs attempting to fix a single aspect of education. No one approach is a silver bullet, and one needs to think carefully and holistically about education as a system. Furthermore, by focusing on just one aspect at a time, discussions become polarized and force a choice between aspects of the current education system. It is crucial to not leave out any important ideas, so that others who have been thinking of similar concepts in different formulations are able to see the ways in which their thinking can be mapped onto our framework. For example, resilience (a character quality), includes the concepts of grit, perseverance, and so on. By creating a framework that is comprehensive, the CCR is hoping to organize all of the high-level thinking about education design, so everyone can consider how the different elements interact and fit together.

2. Compact
   As described above, it is a difficult task to synthesize research in a way that makes the conclusions actionable, yet keeps them accurate. Frameworks that attempt to include all of the nuances of the research literature end up being too difficult to deploy, realistically. Miller’s law from psychology states that people can remember only seven (plus or minus two) items in their working memories, but they can chunk items into groups, thus remembering more items using a hierarchical structure, with the maximum remaining seven plus or minus two. Our framework therefore has four categories, each containing fewer than seven components. This ensures that the framework is concise enough to be memorable and thus actionable.

3. Uncorrelated
   In reality, many of the goals of education (creativity, optimism, courage, etc.) are correlated to various degrees. That is, someone who is optimistic may also be more likely to have zest, compared to someone who is not optimistic. Research into these concepts often tries to isolate the effects of each factor to understand its importance. To synthesize these different constructs, most correlated items are grouped together, and least correlated items (or uncorrelated, or anti-correlated) are kept separate. Questions guiding this process include: Is it possible to have one without the other? How often does that happen? Has research shown a relationship? That way, each concept is important on its own, and its importance is not mostly captured in another concept, making it more confusing to think of each one independently.
This clears up confusion that results from different constructs having different origins and overlapping definitions. For example, by separating meta-learning into its own dimension, decision-making is removed from the realm of critical thinking. Now it suggests that one uses all of her knowledge, skills (including critical thinking), and character qualities when making decisions. Linguistic and ontological perfection is illusory, because the concepts all interact to various degrees. The ultimate goal, however, is for the concepts to be a useful grouping that reflects how these ideas are used in everyday learning and for educators to keep them as helpful checklists in their educational practices.

4. **Appropriate**

People naturally think of the world in a variety of ways and at a variety of levels. Tying one’s shoelaces and learning how to learn are both referred to as skills, but at very different layers of abstraction. Clearly, it’s important for our students to be good people, and it’s also important that they know how to add. In this framework, goals and concepts are placed in a sensible way according to their level of abstraction, and their origin. So, addition and ethics belong in different dimensions and in different levels of the framework. Low-level mechanical skills (e.g., multiplication) are in subcategories according to their relevant academic knowledge concepts, while ethics is in a category at a higher level, under character qualities. In this way, the framework becomes a foundation for clear discussions that respect the complexity of the many related variables relevant to each educational component.

5. **Globally Relevant**

As the world is increasing in connectivity, it becomes more important to be mindful of cultural differences and the spectrum of deeper human goals and connections. The CCR framework is meant to be broad and deep enough to not be culture-dependent, but rather to provide a common understanding for effective cross-cultural communication. The ideas discussed here are relevant to everyone in the world who will be participating in constructing the future together. All countries, then, can use this framework and customize it according to their own values and needs.

The CCR framework synthesizes existing research with the overarching complementary goals of maximizing both accuracy and clarity. This leverages all the findings from scholarly research and exemplary practice without getting bogged down in hair-splitting, endless academic debates. By establishing a framework that incorporates the foundational work that has been done on these topics, and formulating it in a clear way, the design goals of education become clearer and provide a common ground for engaging in meaningful work toward redesigning education. On the cognitive science side, the questions that need more empirical research become clearer, so that educators may make their educational decisions as informed as possible.

Is CCR’s framework radical or incremental? We prefer to call it “incrementally ambitious”: if it were too radical, it would stand no chance of being adopted, given how complicated it is to modify the course of the formal education system. But if it is too incremental, it will continue missing the mark on what is relevant and needed for this century. The analogy is that of a butterfly compared to its caterpillar: they both share the same DNA, but clearly the butterfly has b Ellioted from a substantial transformation—it has become unrecognizable as a caterpillar, yet reflects the foundational tenets.