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Creativity to the Core: How the KY Core Academic Standards can Enhance Creativity

RESEARCH

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Abstract

The Common Core State Standards (CCSS) were developed by the Council of Chief State School Officers (CCSSO) and the National Governor's Association in response to concerns about the poor performance of US students in comparison to students in other industrialized nations. A lack of understanding of the standards has led some to assume that any standards-based curriculum is going to focus on lower-level thinking skills and therefore impede critical and creative thinking. While Kentucky's English language arts and mathematics standards are derived from the CCSS, Kentucky's learning targets and standards are not limited to the CCSS standards. That is, there are additional Kentucky learning targets and standards that are *not* in the CCSS, from first grade reading to Arts and Humanities. Kentucky's curriculum meets all of the requirements of the 2009 Senate Bill 1, including Practical Living and Vocational Studies, World Languages, and Arts and Humanities. This paper describes the creative process as requiring a deep foundational knowledge, extensive practice, and a strong work ethic. The skills and habits of mind that are required for creativity can be aligned with the Common Core Standards (and the KY Core Academic Standards in particular) and explicitly taught at all grade levels. Teachers and instructional leaders must utilize their own creative thinking skills to redesign curriculum and schools to meet the demands of these more rigorous standards.

Keywords: common core standards, creativity, skills, Kentucky

The Common Core Standards

The Common Core State Standards (CCSS) were developed by the Council of Chief State School Officers (CCSSO) under the auspices of the National Governor's Association in response to:

- An alarming high school dropout rate, especially for poor, minority males
- A lack of alignment between the high school curriculum and college and work expectations
- Low postsecondary education completion rates
- Data indicating that reading and math performance of American students has continued to lag in comparison to other industrialized nations
- Inconsistency in state academic standards, curriculum rigor, and content expectations at each grade level
- P-12 schools' emphasis on low-level skills at the expense of problem solving, analytical thinking, and innovation

> *"The Common Core State Standards were written by building on the best and highest state standards in existence in the U.S., examining the expectations of other high performing countries around the world, and careful study of the research and literature available on what students need to know and be able to do to be successful in college and careers. No state in the country was asked to lower their expectations for their students in adopting the Common Core. The standards are evidence-based, aligned with college and work expectations, include rigorous content and skills, and are informed by other top performing countries."* (Common Core State Standards FAQ's http://www.corestandards.org)

Clearly embedded in the CCSS is an expectation that students will be able to independently analyze complex text, generate solutions to difficult problems, and express ideas orally and in writing, creating new products. As the lead authors of the CCSS explain, "To help students meet the new standards, educators will need to pursue, with equal intensity, three aspects of rigor in the major work of each grade: conceptual understanding, procedural skill and fluency, and applications" (Coleman, Pimental, & Zimba, 2012, p. 12).

As of this writing, 45 states, Washington, D.C., four territories and the Department of Defense Education Activity have adopted the Common Core State Standards (http://www.corestandards.org/in-the-states). Rarely have 90% of our states agreed on anything, but there is something very profound about these standards that is building consensus during one of the most divisive political environments in our history as a nation. However, there is now a concerted effort to create a political "wedge" issue out of the Common Core. This criticism is bolstered by myths and misunderstandings of the development of the standards, their specific content, and how they should be implemented.

The CCSS promote a more rigorous curriculum and demand that teachers make significant changes in their own knowledge and instructional approaches. Even though the standards are more complex, some believe that the standards will somehow eliminate the joy and art of teaching, while promoting boring, rote learning of low-level knowledge and skills. Such criticism demonstrates a lack of understanding of the Common Core Sate Standards, their history or purpose.

The concerns raised range from the use of assessments to evaluate teachers and the speed of implementation of standards, to the suggestion that the CCSS are a fascist plot by the federal government to control our children (Malkin, 2013; Beck, 2013). Others are making the assumption that any "standards" must be minimal and therefore mediocre. Such concerns are bolstered as high-stakes assessments are being implemented in several states this year. If you believe that schools can't (or won't) assess higher-order thinking, then it is easy to assume that the standards that will be taught will only be those that address low-level learning.

At the heart and soul of the Common Core Standards is a belief that all children can learn at high levels – a belief that is also the core of American democratic principles. The standards were created to "spell out the academic knowledge and skills all students need at each grade level to be ready for college and careers" at the end of high school (Coleman et al., 2012, p. 9). If you do not believe this, it is therefore unlikely you can accept that any standards expected of all learners can possibly be rigorous. Those who believe public education ought to differentiate and separate the best and brightest from the average and mediocre will have difficulty accepting a standards-based curriculum.

The CCSS consist of Mathematics and English / Language Arts (Reading, Writing, Listening and Speaking) college- and career-readiness expectations (end of Grade 12) that have been "back-mapped" by grade to Kindergarten. The Next Generation Science standards (NGSS) have been developed and approved by the National Research Council, the National Science Teachers Association, the American Association for the Advancement of Science, and Achieve, Inc. (Next Generation Science Standards, 2013). Standards for the Arts and the Social Studies are still in development by separate consortia.

Kentucky's Curriculum and Assessment System

After Kentucky became the first state to adopt the CCSS in 2010, Kentucky teachers, teacher educators and district and state content specialists formed Leadership Networks for math and English language arts. Meeting monthly for two years, these networks "deconstructed" the standards, creating learning targets for each standard at each grade level, K-12 (www.education.ky.gov)

While Kentucky's English language arts and mathematics standards are derived from the CCSS, Kentucky's learning targets and standards are not limited to the CCSS standards. That is, there are additional Kentucky learning targets and standards that are *not* in the CCSS, from first grade reading to Arts and Humanities. Kentucky's curriculum meets all of the requirements of the 2009 Senate Bill 1, including Practical Living and Vocational Studies, World Languages, and Arts and Humanities.

Schools are more likely to teach what is assessed. Kentucky's accountability system includes assessments in reading, writing, mathematics, science, and social studies. In addition, each school must complete "program reviews" regarding its curriculum for arts and humanities, writing, practical living and vocational studies, and, beginning in 2015, world languages. These assessments hold schools and districts accountable. Each school is assigned an overall composite score based on their students' performance in all of these subject areas. In addition n to different subject test scores, Kentucky's school accountability scores include a calculation for average student growth, change in "gap" scores (for low-performing sub-groups), attendance, college- and career-readiness, and for high schools, the graduation rate (http://education.ky.gov/AA/Pages/default.aspx). It is not a simple formula, but the intent is to provide an honest snapshot of the school's performance in all aspects of the curriculum.

Contrary to popular assumptions, Kentucky does not impose "high stakes" tests for students. There is no Kentucky state regulation that requires students to make a particular score on any test to be promoted or to graduate. The accountability consequences apply to the school and the district, school and district leaders, and ultimately the local school board. Individual schools or districts can establish policies that hold students accountable in some way; however, most schools do not. Many schools offer rewards and incentives to students who demonstrate a good faith effort during testing – usually in the form of parties and special events. Only the End of Course Assessments for high school Algebra II, U.S. History, English II and Biology have a direct impact on a student's course grade, but even then the test counts for a small percentage of the overall, final grade. The required ACT score can impact postsecondary options, but not graduation. Students are provided a menu of optional college- and career-readiness indicator tests in addition to the ACT. Schools use formative and interim assessments to evaluate individual student growth, identify unmet standards, and provide interventions to ensure that all students make satisfactory academic progress throughout the school year. The Kentucky Board of Education has consistently supported an assessment and accountability system that requires schools to ensure access and opportunity to learn all components of the Program of Studies.

What is Creativity?

Could these new Core Standards actually encourage innovation? When defining creativity, we tend to think of individuals who are artists and make

unusual, unique works and spend time in playful, random thought. There is considerable agreement among experts that creativity is "the ability to produce work that is both novel and appropriate (or useful)," (Sternberg & Lubart, 1999, p. 3 as cited in Dietrick, 2004) or "imaginative processes with outcomes that are original and of value" (Robinson, 2001, p. 118). Csikszentmihalyi (1996, 1999) points out that while the mental activity required for creativity is a documented cognitive process, there is also a societal component to that process.

The creation of something that is both unique and useful requires a deep foundation of knowledge and skills. One must be able to analyze the current status of a problem and then generate possible solutions. This is impossible without having a deep understanding of the domain, its language, and methodologies. It is myth that geniuses are born with innate knowledge and skill. Creativity is a highly "disciplined process" (Azzam, 2009, p. 23-24) that requires daily commitment and technical, analytical thinking (Rutledge, 2008). One must clearly understand and be able to think critically in the particular field (Sternberg, 2006). The elegance of the creation often belies the time, effort and errors that preceded it.

Creativity requires both the divergent thinking necessary to generate ideas as well as the analytical skills to evaluate and make revisions. Current research in neuroscience is finding that creativity involves different brain processes that interact with each other. These include the spontaneous and emotional functions we commonly associate with creativity, as well as those that are deliberate and cognitive. While "emotions do not require specific knowledge, insights based on emotional processing are not domain specific... (However), creative work based on these insights might require specific skills for appropriate expression," (Dietrich, 2004).

While there are certainly some "creatives" who have expertise in more than one domain (da Vinci, for example), most hold vast, deep knowledge and skill within only one field. They are artists, *or* musicians, *or* mathematicians, *or* astronomers, *or* writers who commit a lifetime of study and practice (Csikszentmihalyi, 1996). Certainly they may find inspiration, respite, or metaphor in other domains, but they are rarely experts in that area.

It is estimated that true creatives spend 10 years or 10,000 hours learning and perfecting their skill before their first successful creation (Sternberg, Grigorenko, & Singer, 2004; Gladwell, 2008; Coyle, 2009). Those who have been successful in their fields as very young adults or teens either began their studies as young children (Bach and Mozart, for example) or worked intensively, learning and practicing their craft over a shorter time (Bill Gates and the Beatles). Whatever the start date, true creativity can only occur with a solid foundation of domain-specific knowledge and skills. Although the new standards can certainly provide that foundation, creativity requires more than knowledge and skill.

There are certain habits of mind that are the hallmark of successful creatives. First, creativity requires a strong work ethic – a willingness to focus on a task for hours, days, and even years. To be innovative, one must not only generate ideas, but set goals and monitor progress toward these goals (Combs, Cennamo, & Newbill, 2009). In his book, *The Talent Code*, Dan Coyle (2009) stresses the role of focused, intensive practice in athletics and music. The success of the many Chinese pianists is largely due the fact that they begin lessons as young

children and practice 3-5 hours daily. Through her research, Carol Dweck has found that some individuals develop the belief that they can improve with practice, that failure is an opportunity to learn something new. She has termed this the "Growth Mindset" (Dweck, 2009). Individuals with a Growth Mindset are intellectual risk-takers who do not fear making a mistake and do not give up when their first attempt to solve a problem fails. These individuals believe that they can control their performance through trial and error and work. Those with the opposite "Fixed Mindset" are threatened by difficult situations, believing their own or others' success is due to "talent" or an inborn "gift." Dweck (2009) has found that students can be taught to have a Growth Mindset and has developed a series of training materials and web-based resources that parents and teachers can easily implement (Dweck, 2009; http://mindsetonline.com/). With the success of his book, *The Talent Code,* Coyle (2009) has also developed an extensive website that primarily focuses on the role of "deep practice" on athletic performance (http://thetalentcode.com/). We can teach our students, at any age, to develop a growth mindset and learn to value practice, trial and error, and effort. To do this, we must help our children recognize what they know and what they need to know. We must give our students control of their learning.

We assume that Bach was born a great composer or that Monet invented Impressionism without any prior study. Bach began his music studies at an early age because his father was a "piper" (one who builds and repairs organs) and many of his relatives were musicians. He was the first of his family to complete school (Latin School) at the age of 18 and took his first professional post with a church shortly after. However, he wasn't immediately recognized as the genius we know today. Monet began studying art at the age of 11 and had several influential teachers and mentors before he began to find success as an artist. Impressionism was largely a collaborative creation involving experimentation and trial and error among a group of innovation artists. While he had some acclaim as early as 25, he was not initially accepted by the established art community, and the style that is now known as Impressionism was not recognized in a formal exhibit until 1874, when Monet was 34! (http://en.wikipedia.org/wiki/Claude_Monet). Michael Jordan, recognized as both a gifted and creative athlete, was cut from his high school basketball team his sophomore year of high school, later allowed back on the team after a growth spurt sent him to 6' 3". But his success is due less to his height and more to his commitment to practice http://www.nba.com/history/players/jordan_bio.html).

The Math Common Core Standards include Math Practices that address some of these habits of mind. For example, CCSS MP.1 requires that students, "Make sense of problems and persevere in solving them," and MP.6 asks that they "attend to precision."

To develop something unique or find a solution to a problem, one has to be open not only to new ideas, but to new combinations of ideas. Whether mixing oil paints, trying out new rhythms, or splicing genes, experimentation is necessary to the process. Of course, more often than not, these new combinations and trials will end in failure. The work ethic and commitment to the task is what leads them on. When one of Thomas Edison's colleagues expressed disappointment in the lack of progress on a project, he is quoted as responding, "I have gotten a lot of results! I know several thousand things that won't work"

(http://quoteinvestigator.com/2012/07/31/edison-lot-results/).

Creativity is not limited to what occurs "inside people's heads, but [lies] in the interaction between a person's thoughts and a sociocultural context. It is a systemic rather than an individual phenomenon," (Csikszentmihalyi, 2009, p. 313; Beghetto & Kaufman, 2013). There is no doubt that sometimes the utility or appreciation of an invention or work of art may at first elude understanding (Picasso, the Beatles, and Galileo to name a few) but in time, these great works are recognized as groundbreaking and highly valued.

Trying new ideas, therefore, can take a certain amount of emotional courage or cognitive risk-taking. There are countless stories of great scientists and artists who were criticized or even punished by others in their field, the church, or even the government. Their single-minded focus on their own knowledge was more powerful than any public scorn.

The opportunity to learn an art or musical skill, at least at a rudimentary level, seems to be another factor that is critical to developing creative thinking (Root-Bernstein & Root-Bernstein, 2013). While the great creatives are not necessarily accomplished artists or musicians, the arts seem to provide the mental abilities to think metaphorically, envision possibilities, and generate options. We have become a society in which only those with access to specialized training can truly develop their artistic skill through private lessons, out of school activities like camps and select schools. Schools must ensure that every child, regardless of income, has regular access to experience art, music, theater and dance. All students need to learn *about art*, to learn *through the arts,* and to *do art.* In Japan, for instance, all students are expected to select an activity to study intently.

Generating ideas takes time. It is a mental process that often takes place unconscientiously during "defocused attention" such as rest, play, or even sleep. "Associative combinational creativity during altered states such as dreaming or daydreaming can play a vital part in the creative process for the arts and the sciences" (Dietrich, 2004, p. 1018). Human beings need to have time to "let our minds go" and to simply let our thoughts wander. The best environment for this is nature. Research has demonstrated that simply being outside can improve cognitive functions (Jonides, 2010)! Actual exercise is even better (Medina, 2008). Eliminating recess in an attempt to increase time on task in the classroom is pure folly. We cannot function without water, food, or sleep – and we cannot learn and think effectively without exercise and simply spending time outside.

Creative thinking is commonly described in two different levels, "Big-C" and "Little-c." The great creatives possess the "Big-C," while those who use creative thinking to solve routine tasks at home or work practice "Little-c." Beghatto and Kaufman (2013) propose a Four-C Model that provides a framework for integrating creativity in Birth – 12 learning environments:

- **Mini-c – Interpretive creativity:** Individual "aha's" or discoveries that are creative to the child, and may be valued by the child's social group and family, but do not necessarily have a value to the society at large. This would encompass children's artwork, structures built with blocks, stories and poems, and problem solving, to name a few. Within the child's world, the discoveries are unique and are valued by family, friends, teachers, and peers.

- **Little-c – Everyday creativity:** Day to day problem solving and innovations that require some degree of domain-specific knowledge. Examples might be building a unique garden, making up a new recipe, a class project, or a teenager's poem, artwork, or song. These may solve problems, be individual artistic expressions, or the result of a class assignment, but they are none-the-less unique and valued by the social group, though represent relatively low levels of knowledge and skill.
- **Pro-C – Expert or Professional creativity:** Professional innovations built from years of deliberate practice. These include research, books, works of art, music, and engineering innovations that may not have a long-term impact or a paradigm shift.
- **Big-C – Legendary creativity:** These are groundbreaking developments that are recognized over time to have long-term value and / or paradigm-shifting breakthroughs. While often recognized at the time of the creation (Polio vaccine, the light bulb, radio, etc.), these may not be valued initially or even during the creator's lifetime and would initially be categorized as **Pro-C.**

Using this model, the goal of public education should be to develop mini-c and Little-c in order to prepare individuals to move into Pro-C (college and career), and maybe, Big-C. It is the responsibility of communities, schools, colleges, and workplaces to provide the opportunities, experiences and environments children need in order to practice creativity. The Common Core Standards can be the vehicle to accomplish this goal.

How Can We Teach Creative Thinking?

The Common Core Standards are not a checklist of facts and skills. These standards identify knowledge and skills that must be developed with increasing complexity as student progress from grade to grade. Embedded within the standards is the expectation that we will ask our students to think more deeply, to apply what they learn to real situations, and to create unique products and models. Creative thinking is not the top of the thinking pyramid so much as it is part of the problem-solving process that leads to innovation and invention. Creative thinking skills "are the cornerstones of productive, generative thinking in the rich, rigorous, and relevant curriculum espoused in the CCSS" (Bellanca, Fogarty, & Pete, 2012).

Which standards explicitly require creative thinking skills? If creativity is a building, the standards are the foundation and framework. The specific content represents the type of building; the grade level represents the complexity. Just as a building has many systems (electrical, heating, plumbing, exterior, décor, for example), the curriculum is equally complex. The standards should be intertwined and integrated across and within content, spiraling up the grades, much like the electrical systems that connect all of our structures. In their book, *How to Teach Thinking Skills within the Common Core,* Bellanca, Fogarty and Pete (2012) analyzed the CCSS to identify the high-frequency words that identify the expected thinking skills. In this exhaustive list, "create" is found 11 times in the K-5 ELA and Math standards and 30 times in the 6-12 standards. Related terms, such as "write," "develop," and "produce" also appear often.

Bloom's Revised Taxonomy (Anderson, 2001) clearly depicts these relationships. Standards that specifically require higher-order thinking, such as analysis and synthesis include:

- CCRA R.4 *Interpret* words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and *analyze* how specific word choices shape meaning or tone.
- CCRA R.5 *Analyze* how knowing the author's point of view helps the reader identify the true meaning of the text.
- CCRA.SL.2 *Integrate* and *evaluate* information presented in diverse media and formats, including visually, quantitatively, and orally.
- CCRA.SL .3 *Evaluate* a speaker's point of view, reasoning, and use of evidence and rhetoric.
- CCRA R.7 *Integrate and evaluate* content presented in diverse media and formats, including visually and quantitatively, as well as in words.
- CCRA R.9 *Analyze* how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.
- CCRA W.8 Gather relevant information from multiple print and digital sources, *assess* the credibility and accuracy of each source, and *integrate* the information while avoiding plagiarism.
- CCRA W.9 *Draw evidence from* literary or informational texts to *support analysis, reflection*, and *research*.
- CCSMP.1 *Make sense* of problems and *persevere* in solving them.
- CCSS.Math.Practice.MP2 *Reason abstractly* and quantitatively.
- **CCSS.Math.Practice.MP3 *Construct viable arguments* and *critique the reasoning* of others.**
- **CCSS.Math.Practice.MP8 Look for and express regularity in *repeated reasoning*.**

Standards that promote creative achievements are:

- CCRA.W.2 *Write informative/explanatory texts* to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
- CCRA.W.3 *Write narratives* to develop real *or imagined experiences* or events using effective technique, well-chosen details, and well-structured event sequences.
- CCRA.W.6 Use technology, including the Internet, to *produce and publish* writing and to interact and collaborate with others.
- CCRA.W.7 Conduct short as well as more sustained *research projects* based on focused questions, demonstrating understanding of the subject under investigation.
- CCRA.W.10 *Write routinely* over extended time frames (time

for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) *for a range of tasks, purposes, and audiences*.

- CCSS.Math.Practice.MP4 *Model* with mathematics.

If each of these standards can be addressed in developmentally appropriate ways throughout the grades, then creative endeavors can be integrated as well, initially as "Mini-c" tasks, then as "Little-c" products. Resources such as the Partnership for 21st Century Schools (www.p21.org) and Project Based Learning (www.bie.org) provide the tools and machinery to facilitate this mode of instruction. Schools must redesign curriculum so that it integrates discipline-based content, infuses that instruction with the standards, and provides the environment and experiences to encourage creative achievements that apply those standards.

In order to ensure that we teach our students to think creatively, schools must specifically provide:

- Specific instruction for the development of broad general **foundational knowledge and skills**
- Access to develop **deep knowledge and skill in at least one domain**
- Opportunity for **sustained and coached practice in one or more specialty areas**
- The development of and appreciation for **hard work and persistence** by promoting a Growth Mindset and **valuing experimentation and inquiry**
- Opportunity for all children and youth to **experience, develop skills in and practice the arts**
- Regular **play, collaboration, and brainstorming within a community of learners**
- An environment that supports intellectual **risk-taking and the safety to learn from failure**
- Opportunities to **apply** knowledge and skills and to **create unique models, writings, and products**
- **Exercise, recess, and regular periods of time in nature**

The Common Core Standards do not prevent or discourage the teaching of creativity. The assumptions made by school leadership, teachers and the general public are what impose constraints on the curriculum. Bellanca and his colleagues (2012) identity three creative thinking skills that can be explicitly taught across content and throughout the grade levels: Generating, associating and hypothesizing. They propose a three-step instructional process for each thinking skill. First, the skills must be *explicitly taught,* the "talk-through" phase. This is a critical component as the teacher provides the students with a clear explanation of the thinking skill through a concept development process. The teacher first defines and helps students recognize and practice the skill. Then the teacher helps the students assess their skill proficiency, reflecting metacognitively about their progress. The second phase is the "walk through" in which teachers guide students to practice the skill with the specific content. In the third phase, the teacher can use a "drive through" in which the students use the skill in a specific, standards-based assessment task. This three-phase, scaffolding approach is grounded in Vygotsky's theory and the gradual release of responsibility. "The teacher teaches the skill explicitly, demonstrating and vocalizing the learning; the teacher and student try it together, with the teacher monitoring and

providing guidance and finally the student performs the skill on his or her own with confidence" (Bellanca et al., 2012, p. 5). The selection of skills to be taught and the timing of that instruction depends upon the grade and subject area. However, schools and professional learning communities should vertically and horizontally align their curriculum to ensure all skills are addressed across all subjects and grades.

The Common Core State Standards, and especially Kentucky's Core Academic Standards, provide the bricks and mortar to reinvent schooling. But just as innovations in electricity and plumping have changed the way we build our homes, these standards demand change in our schools. We cannot continue to teach as we did even 10 years ago. If we are to guide the next generation to be creative, we must be innovative in our approach to instruction. Our school organization, schedules, and even their physical structures will have to adapt. Teachers will have to work hard and have the intellectual courage to apply their own Pro-C creativity, and instructional leaders will have to support and value their efforts.

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