

Creating Innovators

Tony Wagner and Robert Compton (2012)

Text Analysis

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Text Analysis of Creating Innovators

Introduction

As human civilization has advanced through the millennia, each new age has brought challenges. Yet, through the ingenuity of many people, these challenges have been faced and overcome. The present day is no different, because we are beset by vexing social, physical, and economic problems that have the potential to profoundly affect human civilization and the ecosystems of our planet. For Dr. Tony Wagner and Robert Compton in *Creating Innovators*, the solution to our economic and social challenges is the same: Creating a viable and sustainable economy that creates good jobs without polluting the planet. And there is general agreement as to what the new economy must be based on. One word: Innovation (2012, p. 2).

In theory, innovation seems simple: Find a person with the right mix of creativity, experience, and cognitive skill, give him or her a novel task, and reap the benefits of a new idea or product. In practice, innovation is difficult because producing people (through the education system) and cultures (in the family or work environment) with the characteristics of innovators is challenging. *Creating Innovators* considers the stories of eight young American men and women who are considered innovators in science, technology, engineering, and math (STEM) or the social sector, and examines how the education system of the United States helped or hindered their progress as innovators. *Creating Innovators* also offers a different vision for the education system of the United States so that more young people have the opportunity to become innovators in any field. This paper will analyze major points of *Creating Innovators* that concern teaching and learning in the United States education system and offer commentary on the various points.

Claims

The pace of globalization has increased significantly since the 1950s, bringing about many changes to the global workforce. The days of having a high-paying skilled labor job have virtually disappeared in developed nations, whereas occupations relying on problem-solving and creativity have flourished. As we continue to advance in the 21st century, the highest-paying and most fulfilling vocations will belong to those individuals who create new ideas, products, or services. According to Wagner and Compton, “if we are to remain globally competitive in today’s world, we need to produce more than just a few entrepreneurs and innovators. We need to develop the creative and enterprising capacities of all our students” (2012, p. 4). However, the education system of the United States is stuck; instead of helping students with the skills necessary to succeed in the twenty-first century, we are educating students for positions in the twentieth century. In Wagner’s last book, *The Global Achievement Gap*,

[Wagner] described the new skills all students now need for careers, continuous learning, and citizenship in an increasingly flat world. [Wagner] called these the Seven Survival Skills. They are:

1. Critical thinking and problem solving
2. Collaboration across networks and leading by influence
3. Agility and adaptability
4. Initiative and entrepreneurship
5. Accessing and analyzing information
6. Effective oral and written communication

7. Curiosity and imagination (2012, p. 12).

However, as “[Wagner] researched what is required to be an innovator, [Wagner] has come to see this list of skills as necessary but not sufficient” (Wagner & Compton, 2012, p. 12). When studying the attributes of successful innovators, Wagner and Compton (2012, p. 16) found the following additions to the Seven Survival Skills:

- curiosity, which is a habit of asking good questions and a desire to understand more deeply
- collaboration, which begins with listening to and learning from others who have perspectives and expertise that are very different from your own
- associative or integrative thinking
- a bias toward action and experimentation.

The curriculum of an education system always seeks to answer the question of “what knowledge has the most value,” and combining these two lists gives educators an idea about the type of knowledge and skills necessary for students to succeed as innovators. The concepts on the two lists should help inform the curricular decisions of the education system in the United States and around the world, because the continuation of technological, economic, and social advances is dependent on the knowledge and skills of the next generation.

Evidence

Because the word “innovation” has been used often in the last decade, there is an overwhelming consensus that innovation is a good idea. Wagner and Compton (2012, p. 5) list two such examples for the importance of innovation:

- According to a 2008 Conference Board report, ‘U.S. employers rate *creativity/innovation* among the top five skills that will increase in importance over the next five years, and

stimulating innovation/creativity and enabling entrepreneurship is among the top 10 challenges of U.S. CEO's.'

- A 2010 report entitled "Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5," prepared for the presidents of the National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, asserts, "America's competitive position in the world now faces even greater challenges, exacerbated by the economic turmoil of the last few years and by the rapid and persistent worldwide advancement of education, knowledge, innovation, investment, and industrial infrastructure." The report calls for "an urgent national dialogue to ensure the future competitiveness, innovation, capacity, economic vitality, and job creating in the opening decades of this century."

Given the importance of innovation, creativity, and problem-solving to business leaders, it seems the educational institutions in the United States and abroad would place equal importance on the same knowledge and skills. However, most of the curriculum in the education system "is charged with an essentially 'conserving' task—preserving and transferring our knowledge 'capital' to the next generation" (Wagner & Compton, 2012, p. 141). Although there is an argument for learning knowledge in a traditional manner,

one problem with this traditional approach to learning, however, is that the way in which academic content is taught is often stultifying: It is too often merely a process of transferring information through rote memorization, with few opportunities for students to ask questions or discover things on their own—the essential practices of innovation (Wagner & Compton, 2012, p. 141).

Another challenging aspect of the traditional model of curriculum and instruction is the explosive growth of information. As more content is delivered at an ever-increasing rate, students of all ages begin to drown in the information and lose their inherent curiosity. However, pockets of educators are creating a better way to integrate the necessary knowledge and skills with academic content so that students can create and innovate. This is important work, because

increasingly in the twenty-first century, what you know is far less important than what you can do with what you know. The interest in and ability to create new knowledge to solve new problems is the single most important skill that all students must master today. All successful innovators have mastered the ability to learn on their own ‘in the moment’ and then apply that knowledge in new ways (Wagner & Compton, 2012, p. 142).

Secondary Sources

Other authors agree with the ideas of Wagner and Compton related to using information rather than simply regurgitating it. Jay McTighe and Grant Wiggins have created a body of work known as *Understanding by Design*, and in *Essential Questions* (McTighe & Wiggins, 2013) they

propose that education should strive to develop and deepen students’ understanding of important ideas and processes so that they can transfer their learning within and outside school. ... The [essential] questions thus serve as doorways or lenses which learners can better see and explore the key concepts, themes, theories, issues, and problems that reside within the content (p. 4).

Additionally in *Essential Questions* (2013), McTighe and Wiggins argue that

a key long-term goal of education is for students to become better questioners because in the end—with much knowledge made quickly obsolete in the modern world—the ability

to question is central to meaningful learning and intellectual achievement at high levels (p. 18).

In *Creating Standards-Based Integrated Curriculum* (2012), Susan Drake discusses the impact problem-based learning (PBL) has on learners:

A synthesis of a large number of meta-analyses of PBL research on problem-based learning indicated that PBL was superior to traditional education for long-term retention of knowledge, skills development, and the satisfaction of students. In contrast, traditional education was more effective for short-term retention of knowledge (Strobel & van Barneveld, 2009). Also, students who had been taught with PBL learned more of the 21st Century Skills than did their counterparts taught traditionally (Ravitz, Hixson, English & Mergendoller, 2011) (p. 23-24).

Drake, McTighe, and Wiggins share a theoretical framework with Wagner and Compton, because they recognize the importance of having students perform tasks relevant to their lives and embedded with appropriate content. Problem-based learning is essentially a training exercise for real-world situations, and the practice of solving problems at an early age helps to develop the intuition and questioning ability for students to become successful innovators.

Theoretical Key Concepts

Two key education concepts related to *Creating Innovators* are progressivism and essentialism, but for contrasting reasons. Progressivism aims “to promote democratic living [and] to foster creative self-learning” and knowledge focuses “on growth and development; a living-learning process; [and] active and relevant learning” (Schramm-Pate, n.d., p. 2). This movement was “influenced by the philosophy of John Dewey (1938, 1966), ... and promoted an integrated curriculum that would motivate students because it was relevant and followed the principles of

constructivism” (Drake, 2012, p. 7). Essentialism endeavors “to promote the intellectual growth of the individual” and knowledge centers “on essential skills and academic subjects; [and] mastery of concepts and principles of subject matter” (Schramm-Pate, n.d., p. 4). This movement was promoted by William Bagley as a rebuttal against John Dewey’s progressive methods, and Bagley “called for mastery of essential skills and academic subject matter. [He] argued that ... the student’s role is one of obedience to authority and [is a] passive consumer of knowledge and content” (Schramm-Pate, n.d., p. 4). *Creating Innovators* is closely aligned with the progressive movement, because the twenty-first century skills and other skills necessary to be an innovator are developed better through active and relevant learning. These skills are content-agnostic, meaning that they may be developed in any content-specific course. This is the antithesis of essentialism, which promoted the mastery of specific content.

Themes, Ideology, and Values

A major theme that came from interviews in *Creating Innovators* was the progression of innovators from play to passion to purpose, which are three interrelated aspects of intrinsic motivation. Play is “just doing something for the fun of it ... [and] is part of our human nature” (Wagner & Compton, 2012, p. 28). Passion is a desire to take on a difficult or worthwhile task and attempt to achieve a goal, but “passions evolve through learning and exploration into something far deeper, more sustainable, and trustworthy—purpose” (Wagner & Compton, 2012, p. 29). Each of the eight innovators profiled offer specific examples of progressing from play to passion to purpose, and Wagner discusses this development with educators. When Wagner interviewed Amanda Alonzo, a science teacher at Lynbrook High School in San Jose, California, he found that “[Ms. Alonzo] makes science fun, and she empowers her students to pursue projects that deeply interest them. Her success [of students in the Intel Science Talent Search]

has been achieved by putting *play*, *passion*, and *purpose* at the center of her teaching” (Wagner & Compton, 2012, p. 151). Play, passion, and purpose also represent a specific ideology and set of values for Wagner and Compton, because they suggest intrinsic motivation is a crucial aspect to help develop a child into an innovator. If the adults in a student’s life do not believe or provide limited opportunities for play, passion, or purpose, it will be difficult for a student to develop a curiosity about the world and a questioning mindset.

Another theme in *Creating Innovators* centers around collaboration, multidisciplinary learning, and creating. These elements must also be the worldview and values of an organization designed to create innovators. Wagner and Compton (2012) describe the culture of Olin College in great detail, because

the culture of Olin is radically different from the culture of most high schools and colleges in five fundamental respects.

Individual Achievement versus Collaboration

The culture of schooling in America celebrates and rewards individual achievement, while offering few meaningful opportunities for genuine collaboration. ... When [Wagner] asked students sitting at my lunch table what they most valued about their college experience, the signaled out collaboration.

Specialization versus Multidisciplinary Learning

In most colleges, the expectation is that students will begin to specialize early in their academic career, and interdisciplinary courses are the rare exception. ... Courses at Olin aim to create better problem-solvers, first and foremost, and this is one of the skills its graduates value most highly.

Risk Avoidance versus Trial and Error

Students' risk aversion in conventional classes takes a particular form. To get an A, students learn to discern what their teachers want—the “right” kinds of answers or papers for each class—and give it to them. ... Olin students, on the other hand, have been taught to view trial and error—or failure—as an integral part of problem solving.

Consuming versus Creating

In most conventional education settings, learning is overwhelmingly passive. ... In classes at Olin, the primary goal is not the acquisition of knowledge. The goal is to develop a set of skills—or, in Jon Stolk's terms, competencies—by solving a problem, creating a product, or generating a new understanding.

Extrinsic versus Intrinsic Motivation: Play, Passion, Purpose

Conventional academic classes rely on extrinsic incentives as motivators for learning. You learn in order to get a good grade on the test so that you can have a good GPA. ... Olin's founders and teachers understand that the desire to invoke is not primarily driven by extrinsic incentives. Teachers at Olin have an explicit goal of strengthening students' intrinsic motivations to be lifelong learners, to be the architects of their own learning, their own careers, to bring into being that which they desire. So courses at Olin provide numerous and varied intrinsic incentives for learning—which can be viewed through the lenses of play, passion, and purpose that we have used throughout this book (p. 172-176). These five aspects distinguish Olin from other colleges and help students develop the twenty-first century skills necessary to become innovators. Whereas this culture may seem idealistic, other schools are taking note of Olin's program and emulating their model.

Interests

Creating Innovators discusses the interests of many parties, from students to parents to educators to business leaders. Students are served by understanding the skills necessary to become innovators and develop a plan to develop these skills so that they are well-prepared for their careers. Parents and educators learn how to help students progress in their learning and growing by creating a culture of play, passion, and purpose with collaboration and creation, because this culture lays the foundation for the success of students. Business leaders are satisfied because they can find employees who create new ideas, products, and services, bringing greater revenue to the business.

Platform

My reaction to *Creating Innovators* was one of both sadness and hope. The sadness was due to the current landscape of my teaching situation; the hope was due to the knowledge that I can inspire change in my courses, school, and district. I teach a course also taught by seven other teachers, and we are directed to keep the curriculum closely aligned. Our curriculum is content-driven, so there is not much time to incorporate the twenty-first century skills necessary to create innovators. However, this book has opened my eyes to the examples of other teachers and educational institutions that have a culture of collaboration and multidisciplinary learning; I am excited to bring elements of those cultures into my own school. I believe there is a moral and ethical obligation to give students the best possible chance to become productive citizens with successful careers, and creating opportunities for students to increase their capacity for innovation is a good way to help students. *Creating Innovators* has impacted my work as an educator, and I will be recommending it to other educators so that they too may have an answer to the “what knowledge has the most value” question.

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