

The Perpetual Crisis: Early and Modern Ideas on Education

“No one will doubt that the legislator should direct his attention above all to the education of the youth”
–Aristotle, *Politics*, VIII

Guillermo Farfan

An underlying belief on the positive relationship between educating the young, on the one hand, and the economic, political, and cultural survival of a nation-state, on the other, seems present in virtually all modern and modernizing societies in the world (Chabbott & Ramirez, 2000). In the United States, this belief takes on many forms, but chief among them is the idea that education in science, technology, engineering, and math (STEM) plays a vital role in the health and preservation of the country as a whole (Holdren & Lander, 2012). This belief can be justified, to some extent, by how reliant we all have become on the products of STEM disciplines. A democratic society in which large numbers of people are dependent on using these products but are otherwise unfamiliar or uncomfortable with the scientific and technological principles behind them is arguably setting itself up for failure.

Nonetheless, contemporary arguments in favor of STEM education often employ narratives that are not novel but instead resemble certain philosophical antecedents. Hence, my interest here is not whether justification for the belief in the fundamental role of STEM education is necessary or sufficient for how we function as a society. Rather, what I wish to call attention to in this essay is how, in advocating for more mathematics and science education, national leaders often make use of a trope not unfamiliar to the Western philosophical tradition: education as the solution to a societal crisis.

I will use three short historical readings to illustrate my point. First, I will show how Plato’s *The Republic* and Rousseau’s *Emile, or On Education* could be read, *inter alia*, as elaborated responses to a critical societal problem or threat the author wished to resolve. I will then sketch out how STEM education developed in the United States, paying attention to how it has been officially defended. Finally, I will contrast and critique the similarities and differences between these narratives and give some reasons for being critical of them at the end.

The Crisis in Plato’s *The Republic*

In ancient Greece, the *paideia* was an early curriculum for elite young males which included military training, horse riding, athletics, singing, playing an instrument, and reciting Homer (Griffith,

2015). Completing the *paideia* was the mark of a ‘civilized’ man and ensured entrance into the political and economic activities of a small, Greek *polis* (city-state).

By the 5th century BCE, the rise of participatory governments and other aftermath effects of the Greco-Persian wars significantly changed the face of Greek education (Raaflaub, 2015). The needs of growing city-states could no longer be met by the traditional curriculum, and soon many cities were flooded with itinerant teachers—called Sophists—offering every kind of education to those who could afford it (Wolfsdorf, 2015).

Although the work of the Sophists was of great significance to the democratization and internationalization of education in classical antiquity, it also contributed to a leadership dilemma since anyone with a modicum of education could now sway the assemblies and courts that made up the body politic of big democratic cities such as Athens (Hatzis, 2017). There was also no agreement as to what sort of education democratic leaders should aspire to, whether in rhetoric, law, or military history; consequently, collective decision-making was inconsistent and occasionally disastrous: ostracism and even death of prominent generals, failed and expensive campaigns in Sicily and Egypt, and the massacre at Melos are a few of the instances where the crisis of Athenian leadership was severely felt.

The Republic, one of Plato’s main works, is set against this socio-political background. One of its major themes is the establishment of a strong and balanced society that will nurture the right kind of happy and just individuals according to reason (Lane, 2006). To do this, Plato suggests a curriculum where all men *and* women—remarkably, for the time—are educated in music and gymnastics. Mathematics, literature, and dialectic were reserved exclusively for those chosen to be guardians and rulers of the city. As such, the education that Plato had in mind for the city’s leaders would not only instill courage but also nurture reason (Collins, 2000).

As noted earlier, the crisis for Plato was that education in his native Athens was nothing of that sort. The city that had condemned his master Socrates to death was also the city which had allowed various political and economic interests to compete and outdo each other, producing programs of education that were not concerned with truth, but with the appearance of truth, and where men saw the advancement of their careers in political influence and honor as their ultimate goal. In Plato’s eyes, the Sophists were major culprits in this, and he thus positioned himself (and Socrates) squarely as their enemy: Socrates claims that he knows nothing and refuses to be paid for his advice—in direct opposition to how Sophists operated. And again, unlike the Sophists, Plato’s Socrates does not believe that truth is relative to whatever the circumstance needed it to be; instead, truth resides in the unchangeable, immutable world of Forms (Lane, 2006).

Similarly, Plato presents the education of the city’s leaders in Books II-VII of *The Republic* chiefly as an alternative to the errors in leadership among Greek *poleis* of his time. Through the cultivation of reason, the philosopher-king and her guardians will be equipped to lead their subjects in a manner that is above all rational: they will know how to avoid unnecessary wars (375c), they will know what is true from what is false (376d), they will put the needs of the city first before their own (412b ff), they will have no need for material accumulation or gain (415e ff), etc. (Bloom, 2016). Only when men

and women in leadership are able to live their lives according to reason, free from worldly bondage, will the city and its inhabitants experience true happiness and justice (Natali, 2000).

Although it is not entirely clear to what extent Plato's fears of a crisis of leadership were justified, nonetheless, it provided the perfect backdrop to contrast his solution of a universal and socially stratified education against what was in offer at the time (Wolfsdorf, 2015). His views on education fit very well his larger philosophical agenda of seeing the city as a reflection of the soul, moving it away from temporal and ordinary matters and towards the ideal and perfect Forms.

The Crisis in Rousseau's *Emile, or On Education*

In the 18th century, the nation of France was at a crossroads. Many Frenchmen at the time welcomed the reign of Louis XV as a return to peace and prosperity that has all but disappeared during two long and debilitating wars of the preceding century. Many others, however, grew disenchanted with what they saw as excesses of the monarchy and the Church, principal institutions of the *Ancien Régime* (old order).

When the Genevan philosopher and composer Jean-Jacques Rousseau moved to Paris to try his fortunes in 1742, he encountered an educational system that was divided between various religious orders, whose core business were producing clergy, and the state, which encouraged the training of bureaucrats, merchants, and doctors that populated the ranks of the *bourgeoisie*, or middle-class (Bloch, 1995; Riley, 2001).

There was no shortage of criticism for the old educational system in the years prior to the French Revolution, though it was less clear what should take its place. A popular view among philosophically minded people was that education should be used to subdue personal interest in the service of national regeneration (Gill, 2010). Rousseau, however, believed that such a solution would produce nothing but unjust men. For even if a reasonably stable social order could be established, with toleration, fine manners, sophisticated works of art, and high-minded laws, in the end it would be all a charade, because underneath all of that men will still manipulate, exploit, oppress, and eat one another (Melzer, 1980).

The crisis Rousseau was responding to in *Emile*, then, was not the necessity of taming human nature but the need to replace an educational system that corrupted the nature of man. Nothing was more symptomatic of this system than those individuals (which Rousseau identified with the bourgeoisie) whose only concern with education was to protect and perpetuate their own way of life. For Rousseau, these people were weak-willed conformists who were directed by the whims of their desires and the whims of their culture's desires (Jonas, 2010). Not surprisingly, much of what happens in *Emile* takes place far away from the influences of the *Ancien Régime* and the people who lived in it.

As a result, a major premise of the book is establishing a system or environment that is conducive to self-motivated learning: a child should have as much freedom to explore as possible (p. 43ff), should seek to learn from first-hand knowledge rather than books (p. 109ff), should be introduced to subjects only when he is ready to take an interest in them (p. 169), should be allow to

use his intuition when solving geometric problems (pp. 145-146), etc. (Bloom, 1979). In Rousseau's eyes, children in the traditional educational system were taught too many things before they were ready to absorb them, and they ended up learning nothing that was useful. Rather than producing a student capable to repeat the ideas of others, education should produce a person who can think on his own and judge accordingly (Melachrinou, 2012). It must be noted in passing that this applies to male students only; the education of women was an entirely different matter (Israel, 2012).

For these reasons, and unlike many of his contemporaries, Rousseau was wary of public education: Emile's education is *individual* education, entirely customized and overseen by his all-knowing tutor (Rosenow, 1980). The traditional education offered by the state and the Church, where students were grouped in classes and told what they needed to know, is written-off by Rousseau for its failure in balancing personal interest with mutual dependence (its greatest achievement, the bourgeoisie, Rousseau clearly despised). In its place, he proposes a radical new pedagogy that will make not only free-thinking men but men capable of giving back to their community.

The Rise and Fall of STEM Education in The United States

From the time of colonial America to the early 1800s, most children and servants were taught rudimentary arithmetic and other basic facts about the world at home; only in New England could a handful of public schools be found. At the higher level, college education was focused on learning classical languages and matters of religion: of the nine colonial colleges, only Harvard required proficiency in arithmetic in 1726 (Willoughby, 1967).

As the pace of innovation and economic expansion brought by the industrial revolution of the mid- to late 19th century continued to accelerate, the value of a scientific and mathematical education increased (Franceschetti, 2000). Some progressive ideas, such as attending to how children think mathematically, also started to catch on (Sinclair, 2008). Elsewhere, the use of statistics and the scientific method to persuade policymakers and the public about the virtues of free, universal education became more and more commonplace (Klein, 2003). Importantly, these developments often went hand-in-hand with a sense of national opportunity, the natural outcome of the United States becoming a world superpower (Engel, Lawrence, & Preston, 2014).

Although such enthusiasm was dampened somewhat during the 1930s, the aftermath of World War II brought new attention to the American educational system from both federal and state governments. A major impetus for this came from outside the United States: the launching of *Sputnik* in October 1957 created both paranoia and concern that the Soviets had beaten America into space (Vinovskis, 1998). The next year, Congress approved one billion dollars—worth roughly 9 billion today—for the National Defense Education Act, or NDEA, to help American students compete with their Soviets counterparts. It was the first of a series of policy initiatives (many of them spearheaded by scientists, not educators) that directly involved the federal government in all levels of American education for the first time.

The changes brought by the NDEA could be seen at local schools in the form of lab kits, overhead projectors, and educational films; gifted students were handpicked for upper-level courses,

and matching funds for mathematics, science and even foreign languages abound (Abramson, 2007). Incidentally, it was also during this period that the idea of a national, standardized assessment of students led to the creation of the National Assessment of Educational Progress (NEAP) and the many aptitude tests that followed.

By the early 1970s, however, interest in mathematics and science began to wane. There was a sense among some politicians and academics that the United States had entered a period of decline, and even a longing for another *Sputnik* to boost education and innovation again (Abramson, 2007). The rise of Japan in the 1980s provided such an opportunity to develop STEM education around the idea of national security (Thorsten, 2012). The most famous and influential document from this period was the widely circulated report, *A Nation at Risk*, which in 1983 challenged Americans to return to the basics in education and to focus attention on student academic achievements (Vinovskis, 1998). Written by the National Commission on Excellence in Education at the behest of then Secretary of Education, Terrel Bell, the report asserted:

“...the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people [...] If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war.” (p. 9)

Although not the first such national report (that honor goes to the *Higher Education for American Democracy* in 1947), it was significant in its demand for increasing mathematics and science education. In its wake, the leading organization of mathematics education in the United States, the National Council of Teachers of Mathematics (NCTM), published *Curriculum and Evaluation Standards for School Mathematics* in 1989. The American Association for the Advancement of Science (AAAS) likewise produced the *Science for All Americans* (1985) and *Benchmarks for Science Literacy* (1989) in an effort to standardized science education.

Without diminishing the importance of having a consistent and informed STEM policy and curriculum, the narrative structure found in *A Nation at Risk* set a template for many reports that followed: an ominous threat is identified (pp. 9-10), past failures and warnings are named (pp. 11-13), proposals to remedy the situation are put forward (pp. 15-16), evidence is marshaled to defend the viability of said proposals (pp. 17ff; National Commission on Excellence in Education, 1983). Even the titles of some of these reports are derivative: *Before It's Too Late* (2000), *Rising Above the Gathering Storm* (2007), etc.

Public figures, likewise, are not strangers in using dire language when defending STEM education efforts. Former President Barack Obama, for instance, occasionally made references to *Sputnik* and to the idea that rival nations (e.g., China) are outpacing children in the United States in both mathematics and science (e.g., “for we know that the nation that out-educates us today, will out-compete us tomorrow;” Nagesh, 2011). John Holdren, then director of the President’s Council of Advisors on Science and Technology (PCAST), made similar remarks when advocating for 1 million more college graduates in STEM fields (Holdren & Lander, 2012). More recently, the Trump

administration has singled out the lack of high-quality STEM education as a critical problem facing the nation (United States Department of Education, 2019). Secretary of Education Elisabeth DeVos, in fact, has stated that mathematics and science education in the United States has stagnated, though she blamed the previous administrations' policies rather than efforts by foreign nations for the situation (Stahl, 2018).

Early and Modern Education: Contrast and Critique

What do these narratives have in common? On the surface, the characterization of education appears distinct in these three historical accounts. For Plato, education (including mathematics education) is a state-run affair that is subordinate to the search for first-principles, or Forms, which alone guarantee a just and contented society (Knorr, 1981). In contrast, Rousseau puts his faith in the rational and moral education of the individual, rather than on the state or any other institution, to sustain society (Rosenow, 1980). Lastly, American education is concerned, at least in principle, with extending the same learning opportunities to all communities and age groups (Noddings, 2018).

Yet, even though the issues Plato, Rousseau, and the United States government were responding to differ, there is also a sense in which education is seen as a remedy against some societal ill (Melachrinou, 2012). In the case of Plato, it was the Sophists' free-market approach to education that posed a threat to the principled, elite culture embodied in the *paideia* (Curren, 2000). Rousseau, on the other hand, was afraid that the noble virtues of the past—such as charity, courage, and self-reliance—would disappear under the pressure of the *Ancien Régime* and bourgeoisie values (Melzer, 1980). Modern American anxieties are attached to the idea of the nation slipping into global irrelevance (Herman, 2019). These threats are as much part of the narrative as are matters of strict pedagogy.

But is this emphasis on threats and crises completely unwarranted? In hindsight, the mistakes made by the Athenian leadership cost them their hegemony over much of Greece. Rousseau was certainly not the only one dissatisfied with the French old system in the years leading to the French Revolution. And almost by any metric, the United States is lagging behind other nations like Singapore or China in STEM education. If there is any truth in the old maxim that it is better to be feared than to be loved, then perhaps framing things in terms of crises in order to mobilize people into action is not such a bad idea.

However, in my view, there is a danger in relying too much on fear or a 'crisis' to rally support and get things done, particularly in education (cf. Herman, 2019). The urgency of solving a crisis might inadvertently favor quick solutions over deliberating on long-term ones, inclining people to overlook possible consequences in an effort to get results. Let me illustrate this point with one final example.

After years of sounding the alarm about America's failing in education, in December of 2000 then-upcoming President George W. Bush called for a bipartisan summit to overhaul the Elementary and Secondary Education Act (ESEA). A legacy of the Johnson's administration, the ESEA was signed into law in 1965 and revised several times after. But Bush's vision for the law was far more ambitious,

calling for an expansion of the federal role in education not seen since the *Sputnik* era (Klein, 2015). The proposal was spearheaded by Rep. John Boehner and the late Sen. Ted Kennedy who, alongside members of the House, the Senate, and the White House, met regularly to work out the details. However, in the aftermath of the September 11th terrorist attacks, the pressure to get the proposal over the finish line suddenly doubled (in the words of former Secretary of Education Margaret Spellings, “we had to strike while the iron was hot;” Samuelsohn & Vinik, 2015). The final proposal was presented to then-President Bush on January 4th, 2002—just over a year from its conception—and signed into law four days later. It became known as the No Child Left Behind (NCLB) Act.

The most salient feature of the NCLB was the idea of withholding federal Title I money to any school that did not demonstrate yearly progress in mathematics and reading. States were required to test students grades 3 to 8 every year, and at least once in high school. Consequently, many teachers began to “teach to the test,” spending less time to cover other subjects like social studies or the arts in order to increase standardized test scores (Hanley, Roehrig, & Canto, 2012). By 2010, however, it was clear the law had become so unpopular and controversial that the Obama administration had to waive most of its provisions (Klein, 2015).

Now, there were certain things in the NCLB (and its successor, the Every Student Succeeds Act or ESSA) that are commendable: it sought to help historically disadvantaged students, it instilled a sense of accountability from states and schools, and it gave credibility to having national educational standards (Turner, 2015). But the NCLB failed to achieve its larger objectives, and it is clear in retrospect that part of the reason why is that it was rushed.

This case, I hope, elucidates why I see acting out of fear or in crisis mode as risky in practice. It makes it easy to overlook an important philosophical question: Assuming the government is a major player in spreading educational equity, what forms of discourse are acceptable for the state to use in achieving its educational goals?

In *The Republic* and *Emile*, Plato and Rousseau were free to shape the narrative as they saw fit—it is clear that their “solutions” were meant to be considered as *philosophy* and not as workable and sensible educational programs (Bloom, 2016). The education of children in the United States, on the other hand, does not afford one such luxury.

Conclusion

This paper aimed to call attention to the idea that the portrayal of education (in particular STEM education) as a solution to a social dilemma or crisis has precedents in the Western philosophical tradition. It showed, briefly, how a historical reading of Plato’s *The Republic* and Rousseau’s *Emile* highlights the ways their authors used education as a response to societal threats they saw as critical. Similarly, in attempting to promote STEM education, American officials oftentimes frame its importance in terms of national security. On this reading, the fear of an imminent crisis is used to mobilize support. Finally, I offered a few reasons why I think it may be a bad idea to lean on such a strategy.

To be sure, there is more to Plato's *The Republic* and Rousseau's *Emile* than fears of society collapsing under the Sophists or the bourgeoisie, and for that reason, both these works deserve the attention and critical consideration they have enjoyed to this day. I believe the same could be done to reports like *A Nation at Risk*, or the history behind the NCLB, which may contain lessons of philosophical interest. Given that education is always caught in a moment of transition—between the culture it wants to preserve and the culture it wants to become—there is much to be gained by putting old and new ideas about education in critical dialogue.

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Address Correspondences to:

Guillermo Farfan

Doctoral Candidate in Learning and Cognition

Dept. of Educational Psychology and Learning Systems

FSU College of Education

Email: gjf14@my.fus.edu