

The Applied Education Concept

Only the Self-Reliant Remain Free¹

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Applied Education Foundation
Promoting Education in the Useful Arts & Sciences

¹ <http://cnsnews.com/commentary/terence-p-jeffrey/only-self-reliant-remain-free> This article considers the difference between those who are self-sufficient versus those who are dependent upon others and the ramification these tendencies have on free government. A society made up of self-sufficient individuals is driven by free principles, whereas a society made up of those who must rely upon others will lead to an authoritarian state. The proposed applied studies program's foundational principle is to assist as many individuals as possible – regardless of academic talent or socio-economic background – in becoming self-sufficient in order to establish their independence combined with their desire to contribute to the well-being of their communities. Gender and race issues melt away under such principles.

² In this and all my other essays, I will periodically add applicable supplemental information as new information becomes available. Therefore, this published year refers to its first release to the public.

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Part I

The Problem with Our Education System

Introduction

The *Philosophes* of the 18th century French Enlightenment shed a critical light on the optimization of longstanding institutions within a society and the periodic need to remove outmoded impediments and replace them with innovative concepts and methods that are firmly grounded in reason (a contemporary term coined by Clayton Christensen that summarizes this idea is *disruptive innovation*). They rejected the extensive control the Church had over French society, including education, and how it restrained freedom of conscience, thought, and expression.

Kors (1998), in his 21st lecture on the intellectual history of the West, analyzes the French Enlightenment led by the *Philosophes*:

In their self-image the *Philosophes* saw themselves as standing between a sad past of human superstition, despotism, ignorance, and suffering on the one hand and a possible future of human enlightenment in which freed of the presumptive authority of the past,

empirically derived knowledge could be applied toward the reduction of human suffering and an increase in human well-being. This is a remarkable moment in the history of human consciousness. This generation that quite literally thought of itself as leading humanity into a new relationship with nature and into new possibilities of human society, human community, and ways of living human lives. The *Philosophes* worked to alleviate the causes of human suffering, to apply knowledge in manners useful to mankind. They believed nature was our sole source of knowledge and of value and by a common ethical principle, the principle of utility. The view that the happiness of the human species is the highest value and that all things may be judged by their contribution either to human suffering or to the alleviation of that suffering and human happiness.

Kors then references the incredibly extensive and extremely popular encyclopedic work of the *Philosophes* which bore the name *Encyclopedie*, edited by Denis Diderot.

The *Encyclopedie* reflects the Enlightenment's profoundly expanding notion of what constitutes significant human knowledge. For it includes not simply philosophy, but history, the arts, letters, and most interestingly, technology: the mechanical and technical inventions that are changing the human relationship to the application of human power to nature and to production.

As Kors points out, the *Philosophes* were extremely practical and saw the need to apply knowledge to the needs of individuals and society. They are the forebearers of the concept of an applied education. If anyone really want to know the roots of this Foundation's principles, as it relates to the needs of education, they need not look any further than to the French *Philosophes* as expressed in the *Encyclopedie* (but absent their religious disputes, since it is not the intention of this organization to take sides on theological matters). Much of the *Philosophes* views for applied studies are every bit as applicable today as they were then.

* * *

Fundamentally, the concept of this foundation is to analyze education's purpose and how to deliver it in the most effective and efficient manner possible – i.e., no more and no less than what is needed for each individual, and each individual's needs are unique. This requires customization. If an individual's career aspirations do not require postsecondary education, which encompasses the vast majority of a population, then programs should be tailored to those aspirations. The National Education Association (NEA, 1918) points out: “[F]rom the secondary school the majority of pupils pass directly into participation in the activities of our society.” (p. 23) This is still the case today.

Education is not an end in itself but a means to an end, and the quicker and more efficiently we get individuals through the system without all the superfluous baggage that currently attends the credentialing process, the better it is for each individual and for society. The resources of individuals in both time and money are not to be dismissed as unimportant as it currently seems to be. Students waste an inordinate amount of time learning useless information when they should learn relevant information to their future lives. In addition, the resources of society are always stretched to the limit so a balance between efficiencies and effectiveness are a must. We

are currently light years away from this goal, which informs us that our system is bloated with information that takes far too much time to learn but with little to show for it.

It's time to assess what is really needed and then refine the system so individuals can make it through the credentialing process while they are still young.

An Education in the Useful Arts & Sciences

Bowen (1972) points to the problem our country has faced for as long as academics have controlled the educational establishment: “there is the rivalry between liberal and technical education with their respective antagonists considering the former a meaningless and decadent social ideal, the latter an illiberal and mindless kind of vocational training.” (p. xv) We humans tend to assert that, “That which is most important to ‘me’ should be equally important to everyone else as well.” It is a human weakness that we have yet to come to terms with.

This points to the resistance from the academic community as it relates to the need for change from an almost exclusive abstract world – which is so important to academics – to an applied one – which is typically quite foreign to academics and therefore uncomfortable to them. Historically, academics perceive utilitarianism as belonging to the “laboring classes” and therefore shun it as beneath them since they tend to see themselves as aristocrats. In addition, they believe those who must labor, must be serfs of some imaginary bogeyman. In this cultural mindset, no one should have to study to be in the “laboring class,” and academics certainly want no part of it; therefore, it is an unacceptable program of study due to their misguided prejudices. Working with one's hands is abhorrent to them, even though surgeons are glorified mechanics who deserve all kinds of accolades in the minds of academics. The hypocrisy is glaring.

In the latter part of the 19th century, German pedagogical concepts were imported to the U.S., joined with German political philosophical ideas. Statism in particular was embraced where it was seen that government, through bureaucracies guided by science, would solve mankind's challenges and create a utopian world. A new American crusade was underway that came to be known as the Progressive Movement. It radically changed our educational systems in extreme ways by centralizing authority and standardizing the system regardless of individual talents, weaknesses, or needs.

A key point of the Progressive movement's intention was to indoctrinate the country's youth in Statist ways and to marginalize freedom and individuality since statism was at odds with individual rights and freedoms. It was believed that in order to achieve the level of indoctrination sought, compulsory laws were required by keeping students in school until they were 18 years old – though this was not fully realized in most States. Economic considerations of individuals and society were secondary to indoctrination efforts. This explains why high school graduates are still ill prepared for the real world of work since we haven't abandoned what the Progressives implemented all those years ago. Most are unaware of what happened under Progressive domination so it has simply become an institutional norm. (see Kliebard, 2004)

In response to this confusion, an unrealistic attitude eventually developed regarding education. In the latter half of the 20th century, the mistaken notion that everyone can and should get a college degree came to prevail over the minds of academics and citizens. It is stated that those with

college degrees, on average (and this statistical “on average” is an important and misleading caveat that will be considered in other essays), have higher incomes than those with only a high school degree. This is true “on average” which is due, in large part, to cultural biases unrelated to ability, skill, or knowledge. Instead of addressing the reasons and biases for this situation, we simply accept the belief that the academy is the only path to success. While education for all is very important, we must consider the quality, the kind of education, and the amount needed to give young people a running start in achieving success in their lives; lives that are very different from one another and that have very different needs and destinies that a one-size-fits-all approach has, and always will, prove to be an utter failure. It cannot be otherwise.

The NEA (1918) addressed this problem when it stated:

The tradition that a particular type of education, and that exclusively nonvocational in character, is the only acceptable preparation for advanced education, either liberal or vocational, must therefore give way to a scientific evaluation of all types of secondary education as preparation for continued study. (p. 20)

[P]upils who, during the secondary period, devote a considerable time to courses having vocational content should be permitted to pursue whatever form of higher education, either liberal or vocational, they are able to undertake with profit to themselves and to society. (p. 20)

Here lies the fundamental difference between Germany and the United States. Germany has a rigid tracking system that inhibits, if not outright prohibits, transferring from one track to another. The NEA (1918) points to the principle of freedom in our society.

Exploration and guidance. – Especially in the junior high school the pupil should have a variety of experiences and contacts in order that he may explore his own capacities and aptitudes. ... These decisions should not be imposed upon him by others. (p. 21)

This period in youth is a critical stage of development. The hunting and shooting sport communities have discovered that in order to instill an appreciation and respect for these activities, children of middle school years must be exposed to them or the chances of discovering an interest in later years is diminished significantly.

The rejection of secondary career preparation by a large majority of those in our educational establishment demands a paradigm shift. It would require us to abandon the "unifying principle" which was used by Progressives as the excuse to ignore career needs of individuals at the secondary level and require their participation in an extended education for collectivist indoctrination purposes. This indoctrination superseded everything in their minds. In addition, the pursuit for status and prestige came into play that had little to do with achieving skills for use in life. Therefore, schools have been optimized as indoctrination centers for political ends as well as credentialing agencies for status attainment as a means to rise socially at the expense of others. After all, status, by definition, means to rise as a superior above others.

Junior high schools must be of the comprehensive type, whatever policy be adopted for the senior high schools, since one of the primary purposes of the junior high school is to

assist the pupil through a wide variety of contacts and experiences to obtain a basis for intelligent choice of his educational and vocational career. (NEA, p. 24)

[O]nly one American youth in about three reaches the first year of the four-year high school, and only one in about nine remains in school to the end of the high-school course. This condition is, in the last analysis, due principally to four causes: First, the limited range of instruction commonly offered by secondary schools; second, the failure on the part of the school adequately to demonstrate to young people and their parents the value of the education offered; third, the lure of employment, together with the desire for increased economic independence on the part of young persons; and fourth, economic pressure in the family, real or imagined. (NEA, p. 30)

Therefore, compulsory education marginalized these four concerns. Rather than changing the system to fit the needs of citizens, laws were enacted that disregarded those needs. Only a monopoly, with the power of government behind it, can get away with such a strategy.

Spencer (1860) summarizes the state of education in his time and which still holds true in ours: Citizens are “[p]ossessed by a superstition which worships the symbols of knowledge instead of the knowledge itself....” This is why the sheepskin from college has greater value than the knowledge. We know this is true due to the fact that if an individual were one credit shy of graduating college, and therefore lacked a degree, the economic outcome of that individual’s life would, on average, be little different than an individual who possessed no further education beyond a high school degree. This is mindboggling to think about given the tremendous investment in college to whatever level is achieved! If we were to remove the illusion of status and prestige that the symbols of education possess, educators would be more concerned about the value and application of knowledge rather than the status symbols – dressed in credentials – assigned to them. After all, credentials are supposed to be symbols of knowledge and competence rather than empty vessels of mere prestige. If status and prestige were no longer part of the mix, who would invest so much time and money in something that provides little to no return on knowledge and competence?

Spencer was highly critical of the educational system of Britain in his day, and in reading his work on the subject, it is clear that we followed the same path and little has changed as it relates to his criticisms. He admitted that there were many independent educators experimenting with new ideas with varying levels of success and

untiring in his efforts to make known its success – each of them merciless in his criticism on the rest – there cannot fail, by composition of forces, to be a gradual approximating of all toward the right course. Whatever portion of [a successful] method any one of them has discovered, must, by the constant exhibition of its results, force itself into adoption; whatever wrong practices he has joined with it must, by repeated experiment and failure, be [abandoned]. And by this aggregation of truths and elimination of errors, there must eventually be developed a correct and complete body of doctrine. (p. 99)

This may be true under normal circumstances. Trial and error tends to lead human activity to a higher good as history reveals. However, when an “instrument of expansion,” becomes an “institution,” as defined by Quigley (see below pages 17-18), barriers are set in place that inhibit

or outright prohibit progress in order to protect the interests of those in the institution at the expense of society. In the late nineteenth century, the U.S. educational institution fell into this pit of self-serving immorality with teachers in the trenches struggling to make it work for their students. The bureaucracy is filled with petty tyrants asserting their will upon society, while accumulating as much money, power, prestige and influence as they can extract from society. Consider how fast the cost of education rises compared to the rest of the economy to see just one aspect of this truth. Greed is rampant in this self-serving institution.

Applied Science and Math Are Largely Ignored

Spencer (1860) pointed out important economic roles of his day:

[L]eaving out only some very small classes, what are all men employed in? They are employed in the production, preparation, and distribution of commodities.³ And on what does efficiency in the production, preparation, and distribution of commodities depend? It depends on the use of methods fitted to the respective natures of these commodities; it depends on an adequate knowledge of their physical, chemical, or vital properties, as the case may be; that is, it depends on Science. This order of knowledge, which is in great part ignored in our school courses, in the order of knowledge underlying the right performance of all those processes by which civilized life is made possible. Undeniable as is this truth, and thrust upon us as it is at every turn, there seems to be no living consciousness of it: its very familiarity makes it unregarded. (pp. 32-33)

Spencer then provides examples of the knowledge required of so many economic activities that require an understanding of applied math and science. He didn't look at such professions as "merely CTE" type of education, but, rather, the real need for understanding of foundational principles that can be applied to the real world of human activity in all their manifestations. He summarizes the need for foundational understanding of the applied sciences:

Thus, to all such as are occupied in the production, exchange, or distribution of commodities, acquaintance with science in some of its departments, is of fundamental importance. Whoever is immediately or remotely implicated in any form of industry (and few are not) has a direct interest in understanding something of the mathematical, physical, and chemical properties of things; perhaps, also, has a direct interest in biology; and certainly has in sociology. Whether he ... succeed[s] well in ... getting a good livelihood, depends in a great degree on his knowledge of one or more of these sciences.... For what we call learning a business, really implies learning the science involved in it; though not perhaps under the name of science. ...

That which our school courses leave almost entirely out, we thus find to be that which most nearly concerns the business of life. All our industries would cease, were it not for that information which men begin to acquire ... after their education is said to be finished. And were it not for this information, that has been from age to age accumulated and spread by unofficial means, these industries would never have existed. Had there

³ "Commodities" in this case has a far broader meaning than our current use of the word implying raw materials. Spencer was basically implying economic activity that most people partake in for their livelihood.

been no teaching but such as is given in our public schools, England would now be what it was in feudal times. That increasing acquaintance with the laws of phenomena which has through successive ages enabled us to subjugate Nature to our needs, and in these days gives the common laborer comforts which a few centuries ago kings could not purchase, is scarcely in any degree owed to the [educational system]. The vital knowledge – that by which we have grown as a nation to what we are, and which now underlies our whole existence, is a knowledge that has got itself taught in nooks and corners; while the ordained agencies for teaching have been mumbling little else but dead formulas. (pp. 41-44)

I think Spencer's summary of the condition of education, hits the mark well.

Why a new program?

An applied studies program is an innovative concept for middle and high school levels (hereafter collectively referred to as secondary school) designed for the largest sector of the school age population. It cannot be categorized under a career technical education (CTE) program that had historically been narrowly tailored as vocational education – which, Gray et al. (1995) state, encompassed approximately 10% of the school-age population – because it would provide a much broader education. However, it is conceptually a program focused on developing knowledge – combining application with theory – necessary for pursuing careers and participating in a civil society.

Spencer (1860) has this to say about application and theory:

Observe ... that ... formal instruction ... is carried on with but little reference to the laws of mental development. Intellectual progress is of necessity from the concrete to the abstract. ... Nearly every subject dealt with is arranged in abnormal order, definitions, and rules, and principles being put first, instead of being disclosed, as they are in the order of nature, through the study of cases. (p. 52)

An applied studies program would seek to connect disciplines, which have heretofore *appeared* to be unrelated to one another. It cannot be categorized under the contemporary academic program – which has been optimized for particular learning type of abilities – since it does not embrace the predominately disconnected abstract curricula utilized by the public system, which fits approximately 20% of the school age population that many mistakenly believe to be the “smarter bunch.” Therefore, approximately 80% of the population is simply passed through the system until they either quit school or graduate, regardless of comprehension of material taught. A large portion that may go on to college require remedial classes, most of whom will not complete these classes or, in the end, will not complete a college program; yet they will be burdened with debt but with no economic benefits accrued, demonstrating the uselessness of much of that which passes for “education.” If this doesn't define a broken system, I don't know what else could.

With the high school non-completion rate⁴ at approximately 25 to 30%,⁵ and with college non-completion rates also showing dismal numbers, a large sector of our youth, for all intents and purposes, are disenfranchised. In particular, disadvantaged socioeconomic youth (many of whom eventually end up on the margins of society) are most vulnerable. Upon graduation, this sector is left to its own devices with little to no guidance and with no preparation for what they will face in the real world. The disciplines of academia are not transferable to the working world at this level of education. When adolescents should learn skills that are necessary for life, during their age-sensitive stages of development, they are instead expending the majority of their time and energy on academic and abstract fields of study having no relation to life's requirements.

During the height of influence of the Progressive education movement in the late 19th and early 20th centuries, it was argued that this sector of the school-age population should be kept in the system for indoctrination purposes (i.e., to teach the ways of statism imported from Germany), rather than for the interests of individuals (individuality was ridiculed by Progressives). While most have forgotten this negative Progressive influence, the uselessness of much of what passes for education, coupled with compulsory laws, reveals the legacy of Progressives' indoctrination efforts.

It is well known that, *on average*, a higher education improves the lives of citizens and reduces the risk of maladjustment or socially deviant behavior – incarceration rates in the U.S. are at unacceptable levels, attributable, in large part, to insufficient and/or improper education. “Crimes, drugs, extramarital births, unemployment – you name the problem and I will show you a stack of claims that education is to blame, or at least implicated.”⁶ The question therefore begging an answer is, why hasn't anything substantial been done about this? Simply passing students through the presently entrenched system, hoping they will pursue higher education, does not address or solve the problem. A major change to the curriculum for this sector of the population is required – hence the need for an applied education program.

This idea is nothing new. There were many before and after the turn of the last century who argued for this kind of change. Krug (1964) reflects on this:

In March and April of 1912, the *Saturday Evening Post* published two vigorous assaults against the academic tradition. One of them, by William Hughes Mearns, was entitled, “Our Medieval High Schools: Shall We Educate Children for the Twelfth or the Twentieth Century?” What was wrong with the high school was “culture,”⁷ and “the culture chaps” had controlled the high school for a long time. The spell of culture had even taken over manual training.

⁴ I will avoid the term “dropout” since it demonstrates an unwarranted prejudice, which has the effect of relegating this population to the margins of society, yet many have come from this sector who have changed the world.

⁵ The data for high school graduation rates are far too unreliable to know what the actual numbers are. In addition, those who passed a GED exam are included in high school completion rates, which is not at all appropriate. If it were to be appropriate, then we should allow for a college equivalency exam for any degree one desires.

⁶ *On education: Intelligence in the Classroom*, Charles Murray of the American Enterprise Institute, The Wall Street Journal, p. A21, Jan. 16, 2007.

⁷ Since “culture” was not defined, one may assume that Mearns meant traditional European culture rooted in classical antiquity of Greece and Rome since Greek, Latin and mathematics of antiquity were prominent in any college prep program up to the time of this article, which served a **very** small portion of society, typically coming from the upper classes.

... The other *Post* article came from William D. Lewis, formerly Principal in Syracuse, but then of the William Penn High School in Philadelphia. “Isn’t it true,” he asked, “that the high school’s largest service is the best possible training for economic efficiency, good citizenship, and full and complete living for all its pupils?” To achieve this, he said, the high school should provide English, but not dissection of literary masterpieces under a “pedantic microscope.” It should provide a wide range of mathematics, but not require algebra. Foreign languages were fine for those who wanted them, but “at present, nearly every pupil in an American high school is compelled to study at least one foreign language” Two years later Lewis presented an expanded version of his ideas in a book, *Democracy’s High School*, to which an enthusiastic foreword was written by Theodore Roosevelt. In the first chapter, called “A Social View of the High School,” Lewis called for training “in citizenship and in right social thinking,” both through the curriculum and through participation in the organization and management of the school. The American people, he said, had “no concern for academic traditions evolved from a scheme of education aimed to serve an aristocratic or leisure class.” Classical education, he conceded at one point in the book, was still needed, but the new type of education was equally necessary....

“Scholarship is not our chief business,” declared a committee of teachers at the Washington Irving High School of New York City in 1911. Edward O. Sisson, Professor of Education at the University of Washington, criticized a conference of high school teachers that had stated the purposes of English as the development of ability to write and speak, the acquainting of the pupil with the best literary products, the cultivating of a sense of style, and the inculcating of a love of literature. Commenting on these purposes, Sisson said: “The fact is that the secondary school teacher is too absorbed in the intellectual aspects of his particular subject.” (pp. 280-81)

Krug compares the above opinions to the flipside, which still seems to dominate the educational establishment to this day:

Some of the protests came from professors of education and from school administrators. James L. McConaughy, professor of education at Bowdoin College, criticized the notion that “algebra, because it may not help a girl to earn a bigger salary or make a more comfortable home, is to be thrown into the scrap heap.”⁸ He argued for the academic subjects on the grounds of enjoyment. “Should not high school boys and girls,” he asked, “go into life trained to use the wonderful pleasure giving opportunities which literature, art and history afford? How many of the pupils trained in the new vocational subjects know how to read with pleasure – and what bigger gift can education bring us?” Superintendent James Harris of Dubuque, Iowa, criticized efficiency as an educational aim, contending that it ignored or possibly even condemned “the reflective and contemplative side of life.” (p. 283)

⁸ This is a common response by many academics. It is an “either/or” scenario. It is seen as either black or white but certainly anything between the extremes is incomprehensible. It demonstrates small minds!

Besides preparing for college, here is another reason secondary schools are designed the way they are: because they give pleasure to the subject specialists and subject specialists expect it provides pleasure to everyone else. If it doesn't, then there is something wrong with the person. No doubt, such pleasures are wonderful, but they are not for everyone, just as being an artist, a musician, an athlete, or a craftsman is not for everyone. To project one's interests onto all others is a human weakness that must be overcome. Let those who take great pleasure in literature and math pursue these fields of study with gusto and leave the rest of us to pursue our own fields of interest.

A primary difference between an applied and a college prep program is the way in which abstract and theoretical concepts are used in teaching. An applied program would utilize abstract and theoretical concepts as support for real-world usage – making application and practical use the primary focus. College prep's focus, on the other hand, is based on the hypothesis that the abstract and theoretical concepts will eventually be absorbed through some unknown and undefined cognitive mechanism and that individuals will eventually develop the ability to apply such knowledge to life at some later point in their lives. Cognitive psychologists have discovered that, for the most part, this does not occur. Therefore, we are using a teaching methodology that is based on a hypothesis that has been, in large part, disproven. It has been discovered that even instructors of academic disciplines are frequently unable to apply what they've learned to real-life scenarios. The bridge between knowledge acquired in academia and its use in the real world, is for the most part absent until one focuses on occupational training.

This is due to the fact that teachers know how to instruct in their individual disciplines but, for the most part, they don't know how to connect it to its use in the real world or other disciplines – they were simply not taught how to accomplish this and the educational system does not provide for it. They therefore, unknowingly, teach their individual disciplines as though their students will pursue a career in that discipline since they know no other way. This is no different than a vocational program teaching to a specific career. This is not conducive to a general education. This is why most individuals did not pursue a high school degree, let alone higher education, in the late 19th century and for most of the first half of the 20th century. Most individuals were able to sense, without knowing why or how, that an education beyond 8th grade was not applicable to their lives. Education beyond this point simply avoided instruction that provided something useful to the vast majority of people. People intuitively pursue those things that are advantageous to themselves.

Benjamin Franklin said, "Tell me and I forget. Teach me and I remember. Involve me and I learn." This exemplifies the principles behind applied studies.

While vocational education trained individuals for a career in a narrow field of endeavor as a skilled worker of some sort, which certainly has its place at the secondary level, applied studies is to educate individuals for innovation, invention, creativity, and design; dexterity and agility of mind and body; plus, preparation for potential leadership roles such as supervisor, manager, and/or entrepreneurial pursuits.

An outstanding article published by the Brookings Institution (Petrilli, 2016)⁹ explains the failure of our contemporary educational establishment in preparing individuals for an economic future:

Education reformers are obsessed with getting many more low-income students “to and through” four-year colleges. ... The trouble is, few children from poorer homes are likely to end up with a BA. As Andrew Kelly of the American Enterprise Institute shows in his chapter of my new book, just 14% of children from the bottom third of the income distribution will complete four-year degrees. Even if we doubled that number, most poor and working-class kids will still need other paths to the middle class.

“Bachelor’s degree or bust”: A failed strategy

The academic-dominated approach is not working, especially for economically disadvantaged students. Of this group, about 20% of teenagers don’t graduate from high school.... Of those who do graduate, about half matriculate to some form of college, but many are not ready: two-thirds of low-income students at community colleges start in remedial classes.

... Only a third of community college students who start in remedial courses complete a credential within six years. Forty percent don’t ever get beyond the remedial stage.

The common outcome of our current strategy – “bachelor’s degree or bust” – is that a young person drops out of college at age 20 with no post-secondary credential, no skills, and no work experience, but a fair amount of debt.

... A better approach for many young people would be to develop coherent pathways ... into authentic technical education options.... But, right now, 81% of high school students are taking an academic route; only 19% are “concentrating” in a career and technical education.

... High-quality career and technical education programs, culminating in industry-recognized ... credentials, have great promise in engaging students, helping them succeed academically, boosting college completion rates, and brightening career prospects. By age 20, graduates of such programs have academic credentials, technical credentials, and work experience – and, usually, well-paying jobs.

There is a fear of “tracking” in high school, for obvious reasons. But it simply doesn’t work to wait until kids are 18. Generic high school experiences are not preparing low-income students to successfully pursue either academic or technical routs after they receive their diplomas. A student must be able to choose their own path. But there should be a real choice.

... If we are serious about social mobility, we need to move past the singular obsession with four-year colleges, and give more weight to career and technical education.

⁹ See <http://www.brookings.edu/blogs/social-mobility-memos/posts/2016/04/01-not-just-college-technical-education-pathway-middle-class-petrilli>

Origin of the idea

The applied studies concept was first conceived as a means to provide a different type of education to that segment which is currently not being well served by the public educational system due to its primary focus on college prep, or a narrowly focused vocational program. The former lives almost exclusively in the abstract, theoretical realm, totally detached from the living world of the vast majority of citizens; while the latter lived predominately in the narrowly tailored, hands-on world with little to no theory supporting a deeper and broader understanding of the world – though this narrow focus is a thing of the past with the evolution of CTE. The intent of the applied studies concept is to couple the two and to bridge knowledge between the various subjects that are to be taught.

The decline of the steel industry in the U.S. and the subsequent hardships experienced by many thousands of steel workers – who were highly paid skilled laborers – was the primary impetus for the conception of this idea.¹⁰

The collapse of the steel industry began in the late 1960s and has only grown worse since then. Old-line firms like Wisconsin Steel and Republic Steel went bankrupt and ceased operations. Even survivors like U.S. Steel closed old plants in order to cut back capacity. ... The elimination of much of America's steel capacity devastated the communities that had depended on these mills, including [Gary, Indiana], Pittsburgh, Pennsylvania, and Youngstown, Ohio. The Monongahela River valley around Pittsburgh lost approximately thirty thousand jobs during the 1980s. Many of these workers experienced significant psychological distress as they went from having high-paying jobs to joining the ranks of the long-term unemployed. Alcohol and drug abuse, depression, and suicide all increased dramatically as deindustrialization progressed.¹¹

Whole regions of major cities degraded into economic depression. Instead of shifting from one industry to another with relative ease, laid-off workers were at a loss as to where to turn for a job, since they had no other skills besides what they had learned in the steel mills or in their narrowly focused education. This is a gross injustice to these many thousands of individuals given our capacity to have offered them a proper education suited to their needs, just like Switzerland offers their citizens. Instead, during their formative years, the vast majority were forced to focus on an academic track, which was not suited to their needs. *This tears at the social fabric of communities. Social support, a sense of identity, and a respected place in one's community are, in large part, lost.*¹²

A similar situation has taken place in the automotive industry with Detroit having degraded into an environment not unlike a city in a third world country. Two other industries that have experienced major declines are the textile and farming industries (until around 1920 the majority of Americans lived a rural farming life; after that, the majority lived in cities). Most textile jobs have moved overseas and farming has become highly mechanized with only 1 to 2% of jobs

¹⁰ See *New Economic Landscape Rises Where Historic Steel Mill Stood*, PBS, WTTW clip, 7/10/21: <https://www.pbs.org/video/new-economic-landscape-rises-where-historic-steel-mill-stood-1625938194/>

¹¹ <http://www.answers.com/topic/iron-and-steel-industry>

¹² Paraphrased from *On-Ramps to Good Jobs*, Strada Institute for the Future of Work, 2019, p. i.

remaining that are directly related to farming. A recent example is the devastation President Obama wrought on coal country with his war on coal.¹³

And the most recent example is the huge displacement of jobs that the Covid-19 pandemic caused. Winck and Kaplan (June 2, 2021) cite a Chamber of Commerce report, stating:

The mismatch between displaced workers' skills and new job openings is among the biggest challenges facing the US labor market, economists at Fitch Ratings said last week. The rapid change in worker demand by sector "can lead to lasting increases in unemployment" if Americans aren't able to quickly pivot, the team said in a note.

These are just some examples of major shifts in economic activity and they are part of the reality of economic systems and out of control politicians who acquire the seat of power. Citizens being unprepared for such predictable eventualities is a travesty. They are predictable because it's not a matter if they are going to happen, it's strictly a matter of when.

Economic pressures direct employment opportunities. United States' industrial history has shown that industries can move offshore or out of State as economic or political conditions change and for those individuals who are specialized, without broad technical knowledge, unemployment, underemployment, or low skilled employment – along with substantially lower wages – is, more often than not, the end result. A recent article addressing this age-old issue is *When Skills and Jobs Don't Match*.¹⁴

We need a highly skilled and flexible workforce that can change direction as economic forces dictate. Whether within an individual company that must change product direction, or leaving one industry for another, a broad-based flexible workforce is the best way to change with the times rather than seek government intervention to protect an economic sector.

Industries will come and go due to a variety of causes, but citizens remain. We owe it to them to provide an education that serves them well. In addition, for those who are inclined to climb the "corporate ladder," we must provide our youth the foundational tools required to open this door for every one of them so inclined. In particular, those who are not college bound – due to monetary constraints, lack of academic inclinations, lack of academic programs suited to their talents and interests, etc. – we must provide them with an appropriate education so they may advance in whatever economic sector they wish. Otherwise, we are serving a narrowly focused segment of the school-age population and completely ignoring the rest. This is a situation utterly unacceptable in a country that is supposed to be dedicated to providing the needs of every citizen, including the underclass. Are we to remedy the needs of the underclass only after the damage has been done through remediation once they are adults, or should we provide them with the tools and skills during their formative years so that they too can advance in our society and contribute to it?

¹³ See *Community Colleges Tackle Retraining Challenge in Coal Country*:
<http://diverseeducation.com/article/90442/>

¹⁴ <http://www.heraldtribune.com/news/20170816/when-skills-and-jobs-dont-match>

Why Now?

Why not now? Why not 100 years ago or when public education was established in the various States? Career oriented education is not romantic or glamorous unless it is associated with the “professions.” It is not seen or promoted as something to aim for. In addition, academics don’t believe public school should be used to prepare individuals for personal economic gain, since they tend to be anti-capitalistic. Only the academic path, it is claimed, will lead to our “salvation,” as though it were omnipotent. Of course, if you had a product to sell, wouldn’t you claim the same thing, i.e., that your product or service is the best money can buy? This is exactly what occurs in the monopolistic academic system in order to protect the vested interests.

We merely need to look to history and the origins of education in the Western tradition to understand why the academic path is believed to be the superior one. As far back as the time of Greek antiquity it was believed that working with one’s hands was inferior and mundane and that intellectual pursuits were the only endeavors worthy of an upper-class citizen’s time. John Dewey points to this bias in the Greek culture. He stated that we inherited the “Aristotelian conception of a ‘natural divorce’ between significant knowledge and practical achievement.” (Kliedbard, 1999, p. 233)

Palmer (Palmer, 2010, p. 89) provides:

Aristotle’s ... division of labor within the state was as harsh as Plato’s. A great number of the inhabitants of the state – perhaps the majority – would be slaves. Aristotle provided a tortured argument trying to prove that some individuals are natural slaves.... Even those individuals who are citizens but are artisans or laborers are debarred from full participation in the advantages of citizenship. ... [Aristotle debased] the class of blue-collar ... workers in his republic.

The Romans followed the Greek model, though not quite to the same degree during the Republican period. However, we must consider what conditions allowed both societies to establish such an elitist perspective. Slavery was the vehicle providing the conditions for such a privileged way of life, with slaves doing all the manual work for those who could afford them, leaving citizens the leisure time to pursue intellectual studies, political ambitions, or waste their lives away in the trappings of entertainment and their passions. The ancient institution of slavery is the cause of our present esteem for academia; that is, through academia, we are assured, mistakenly of course, that we will not live amongst the “menial and servant class.”

Greek and Roman classics had been lost to the Western tradition for centuries after the fall of Rome, but when rediscovered, the aristocrats of feudal Europe embraced the Greek idea of work being beneath them since it reinforced and legitimized what they already took to be true: that serfs and peasants were more suited to work with their hands while the nobility were suited to rule over them (with *the divine right of kings*’ belief being the epitome of this theologically grounded view). This perspective remains with us to this day – albeit in a modified way – and is the primary reason academia is held in such high esteem. Most people want to be associated with the “aristocratic” class, while training for a career is considered to be for those of the peasantry or for the common man, though it is not currently expressed by such terms since it is not politically correct to do so. However, make no mistake, this perspective is rooted deeply in our culture.

We need to look to what Quigley (1961) instructs regarding how institutions form, and their affects on civilizations, in order to understand how an institution like education gets trapped with little hope of escape from its confinement of mediocrity. He attributes the transition of civilizations from growth to decay being due to the transformation of *instruments of expansion* – which serve to improve society – into *institutions* which serve only those the institution is composed of. Quigley states that institutions (James Madison referred to as factions) eventually destroy civilizations if they are not reformed or eliminated. Currently, our country accepts factional forces and the erection of institutions as part of the way our system is governed. Quigley explains the process by which this occurs:

Since the levels of culture arise from men's efforts to satisfy their human needs, we can say that every level has a purpose. [Quigley then lists the human needs] ... To satisfy these needs, there come into existence on each level social organizations seeking to achieve these. These organizations, consisting largely of personal relationships, we shall call 'instruments' as long as they achieve the purpose of the level with relative effectiveness. But every such social instrument tends to become an 'institution.' This means that it takes on a life and purpose of its own, distinct from the purpose of the level; in consequence, the purpose of that level is achieved with decreasing effectiveness. In fact, it can be stated as a rule of history that 'all social instruments tend to become institutions.'

... An instrument is a social organization that is fulfilling effectively the purpose for which it arose. An institution is an instrument that has taken on activities and purposes of its own, separate from and different from the purposes for which it was intended. ... Every instrument consists of people organized in relationships to one another. As the instrument becomes an institution, these relationships become ends in themselves to the detriment of the ends of the whole organization. ... Moreover, as a second reason why every instrument becomes an institution, everyone in such an organization is only human and has human weakness and ambitions, or at least has the human proclivity to see things from an egocentric point of view. Thus, in every organization, persons begin to seek their own advancements or to act for their own advantages.... All of this reduces the time and energy devoted to the real goal of the organization and injures the general effectiveness with which an organization achieves its purposes. ... [M]embers of any organization generally resist ... change; they have become 'vested interests.' Having spent long periods learning to do things in a certain way or with certain equipment, they find it difficult to persuade themselves that different ways of doing things ... have become necessary; and, even if they do succeed in persuading themselves, they have considerable difficulty in training themselves to do things in a different way.... (pp. 101-03)

Quigley points out that institutions erect defensive barriers around themselves through government in the form of regulations. As more and more institutions form across the political landscape, government regulations multiply as defenses to protect these competing interests (some States prohibit home schooling or require children to learn what the institution dictates rather than what is needed).

Consider the American Medical Association (AMA), American Bar Association, construction trade associations, etc., with their excessive barriers to entry in their respective fields. The

defense for such barriers is the assertion that they need to maintain high standards of the endeavor, as did the infamous guilds of Europe. Market forces are inhibited in these fields, which is the reason succeeding fewer people can afford such services. They then require government intervention or assistance to address their needs – healthcare being a perfect example. If we were to minimize regulatory barriers to sensible levels so that innovation and competition would not be drastically inhibited, as we now have it, we would see prices plummet, which would allow the average citizen to afford paying health care providers directly for average care and they would be able to afford insurance for catastrophic care. The demand for socialized medicine would dissipate once affordable levels were achieved.

One example is, the Food and Drug Administration (FDA) places cost prohibitive market entry barriers on pharmaceuticals. “It takes on average 12 years and over \$350,000,000.00 to get a new drug from the laboratory onto the pharmacy shelf.” (www.drugs.com/fda-approval-process.html) We can assume that the pharmaceutical companies support this high cost of doing business since it places severe limits on competition, which allows for extreme price gouging. Of course, it is defended as a means to maintain high quality, but we need to compare how effective our system is in minimizing adverse reactions to drugs to other nations’ costs and effectiveness. We must keep in mind that we can never provide a risk-free environment where drugs cause no adverse reactions. There will always be individuals who will react negatively to particular drugs no matter how extensive a testing regimen we put in place. There is a point of diminishing returns that is reached in testing and we must accept a certain percentage of problems. However, FDA and pharmaceutical companies would rather not inform the public of this since it allows for permanent jobs in the FDA and high prices for the drug companies. This is an example of how institutions work.

Our education system is in the same rut. Long ago it became an institution with all its trappings. It places regulatory barriers around citizens’ rights to pursue an education that is suited to individual needs. Universities control the curriculum public schools are obliged to provide regardless of any merit it offers individuals, and local education boards blindly follow the dictated path. Most parents are unaware of alternatives and the institution reinforces their ignorance by providing misleading statistics that assert that the only way to a successful life is through their academic oriented monopoly. Those who have the wherewithal are bestowed the “honor and privilege” of being admitted into one of their **public** institutions of “higher learning.” Those who don’t make the grade are left to their own devices with little to show for 12 years of school.

I stress “public” because it is neither an honor nor a privilege to enter a public institution such as education – it is a right for every individual. The problem is, these public institutions limit what they offer to the public so that only certain talents/abilities are provided an opportunity. This is what gives it the “privileged” appearance.

The public education establishment is not a system that is serving individuals or society, other than a small percentage. It is an institution that serves itself at the expense of others.

Economic Benefits of an Applied Studies Program

1. Provides a broad-based understanding of our economic structure to students.
2. Provides insight into primary economic sectors so students perceive career opportunities.
3. Helps employees be more productive for companies.
4. Increased productivity allows for these individuals to receive higher incomes.
5. Increased productivity allows companies to be more profitable.
6. Increased productivity improves companies' competitive advantage position in the market, which allows for increased international opportunities.
7. Improved international competitive advantage provides more jobs at higher wages due to increased business.
8. Increased business and more jobs mean greater tax revenue for communities and/or the ability to reduce taxes so citizens can keep more of their own money.
9. More jobs at higher wages and greater tax revenue equates to a higher standard of living.

Social Benefits of Program

1. Reaches a larger portion of the student population than is now possible with the current college prep focus or the discriminatory view toward limited vocational programs.
2. Prepares this majority sector for real economic opportunity rather than dead-ends.
3. With real opportunity, citizens will be less likely to live in poverty.
4. With real opportunity, fewer citizens will require government support and will actually contribute resources to, rather than take resources from, society.
5. With fewer citizens living in poverty, society will see fewer people turn to crime, substance abuse, spousal or child abuse, and a host of other social deviant behavior.
6. With citizens less likely to turn to social deviance, the judicial system will be less burdened with caseloads; therefore, incarceration numbers will fall, which reduces law enforcement, judicial, and incarceration costs.
7. Those in poverty would be in a better position to take care of themselves. For example: with familiarity of trades, individuals will be able to repair many of the simpler problems around the home and on vehicles; with exposure to food preparation, individuals will be able to make meals from basic raw materials rather than needing to purchase more expensive prepared foods; with exposure to textiles individuals will be able to make their own clothes by purchasing inexpensive fabrics, should they have the economic need to do so. This has the effect of maintaining a higher standard of living even when income may be low, i.e., a quality life can still be maintained.
8. With a majority of citizens living under a higher standard of living, civility, health, safety and security will improve.
9. Under such an improved civil society, far more people will have the opportunity to reach their highest potential based on individual abilities and initiative (think of Maslow's *hierarchy of needs*), with less government required to manage the system. Fewer police and social services in general will be needed and more money will remain in the possession of citizens to spend as they see fit.
10. Government's job, as it relates to preparation of our youth, then becomes prevention of problems by pursuing their root **cause** rather than dealing with the **symptoms** once the

evil has become manifest. Prevention is both cheaper and more effective than treating or addressing a social ill after it strikes.

11. Preparing youth for adult life will provide far greater economic efficiencies for society. Rather than spending extraordinary amounts of money – in the trillions of dollars – on general education, many can exit high school **very** well prepared for adult life.
12. The personal real estate property of individuals will be of a higher order given the care that will go into it.

Therefore, the focus of this curriculum is to provide real opportunity – based on the requirements of the individual and society – to all interested students so they may grow up to be well-adjusted, productive, contributing, and dedicated citizens to our society. This is possible if they have a stake in the game by finding their place in it. We don't find many professionals turn to social deviance since they have a vested interest in the system; which also holds true for all others who have a vested interest in the system. Contrast this with those who feel the system does not benefit them, which typically begins with a lack of suitable education.

Choice

At every stage of progression in education, choices should be available to students, with parental input and teacher advice, to decide on a direction they want to take. For example, in contrast to a purely academic college prep track:

1. At the beginning of middle school, in 6th grade, they can take a more applied track.
2. At the beginning of high school, in 9th grade, they can choose between an applied track or a pre-vocational track. We can define pre-vocational as a focus on a particular industry or economic sector – such as the trades, agriculture, crafts, etc. – in contrast to a specific vocation such as carpentry for example.
3. In 11th grade they can continue with an applied track or start down the path of a pre-vocational track, or a vocational track. Pre-vocational will still be general in nature as a continuation of the 9th grade prevocational track, with the intention of pursuing a vocational focus once finished with high school such as in a trade school or community college.
4. Throughout the high school years, there needs to be dual-enrollment opportunities at community colleges or universities regardless of which path a student pursues. Unlike Germans, U.S. citizens will not tolerate a rigidly tracked educational system. It must be flexible for those who wish to change direction.

Prior to any one of these choices at the different grades, students can stay focused on a general education or college prep track until they make up their minds which track they wish to pursue. Certainly, students could expend their entire effort on a general applied education track throughout high school. They could then make a decision if they want to pursue a technical career through a polytechnic (STEM) school, or pursue an academic path at a university. Those who had earlier chosen a vocational, pre-vocational, or applied track, but upon graduation decide they wish to pursue an academic degree, could also start at a community college. Any of them could decide that an associate's degree is sufficient to their career choice or go onto a university to pursue a bachelor's degree if it serves them. Unlike some countries, earlier track choices made by students in the U.S. create no roadblock to changes in direction now that we have a well-

established community college system. If anything, it will broaden their horizons and distinguish them from all those who pursued the narrowly tailored college prep track.

By training a vast majority of children for economic opportunity, a shortage of unskilled labor will result since the ranks of skilled individuals will swell. This will cause wages for unskilled laborers to rise due to such a shortage, thereby dramatically improving their standard of living. This, in all likelihood, is what happened during the Italian Renaissance and provides the explanation why even the poor lived comfortably during that period.

Under such conditions, child labor laws and minimum wage laws would need to be seriously amended to provide broad opportunities for teenagers to fill unskilled positions in order to develop good work habits at an early age and to develop an appreciation for work that the academic establishment typically implants prejudices toward.

During periods of economic boom, shortages in unskilled, semiskilled, and skilled labor can be sought through highly tailored immigration policies. Immigration is important, but unregulated policies are detrimental to a society from many angles; not least of which are the interests of the workforce that is most effected by such policies.

Educational Subjects are Currently Designed as Self-Perpetuating

The National Education Association (1918) addressed a problem with curricula that has yet to be resolved:

Many subjects are now so organized as to be of little value unless the pupil studies them for several years. Since a large proportion of pupils leave school in each of the successive years, each subject should be so organized that the first year of work will be of definite value to those who go no further; and this principle should be applied to the work of each year. Courses planned in accordance with this principle will deal with the simpler aspects, or those of more direct application, in the earlier years and will defer the refinements for later years when these can be better appreciated. The course as a whole will then be better adapted to the needs both of those who continue and of those who drop out of school. (p. 17)

Prioritizing is an absolute necessity, not only in picking subjects to teach but also what is to be covered, along with depth and breadth. Since educators who make up each discipline feel that theirs is of the highest value and wish to teach their subject as though every student will pursue the discipline as a vocation, they cannot be allowed to determine what will be covered and for how many months or years, though they should be contributors in designing curriculum once decisions have been made. Only that material which is useful to citizenship and/or economic needs should be covered. For those subjects that are of least importance, testing may be dispensed with since it is irrelevant how much is memorized. In such cases, superficial understanding is all that should be required.

Students Learn More by Doing Than Watching & Listening

Wexler's (2015) article points out the importance of application in the learning process. She reports on the findings of a study, "Learning is not a Spectator Sport: Doing Is Better Than Watching for Learning From a MOOC." The study looked at some of the students who learned by spending "most of their time watching video lectures" and others studied by combining "the MOOC and interactive materials."

... Those in the MOOC-only course scored an average of 57% on the final. ... And when students in the combined course completed an interactive activity, they learned six times as much as those who only read the material or watched a video.

"When one is watching a lecture or reading material, there's an illusion of learning," says Ken Koedinger, a professor of human-computer interaction and psychology at Carnegie Mellon, and an author of a report on the study. "Lessons communicated in a lecture don't stick"

When students listen to a lecture or read text, Mr. Koedinger says, it is easy for them to feel confident that they know the material. But that feeling is deceptive, because sometimes students come away from lectures with misconceptions.

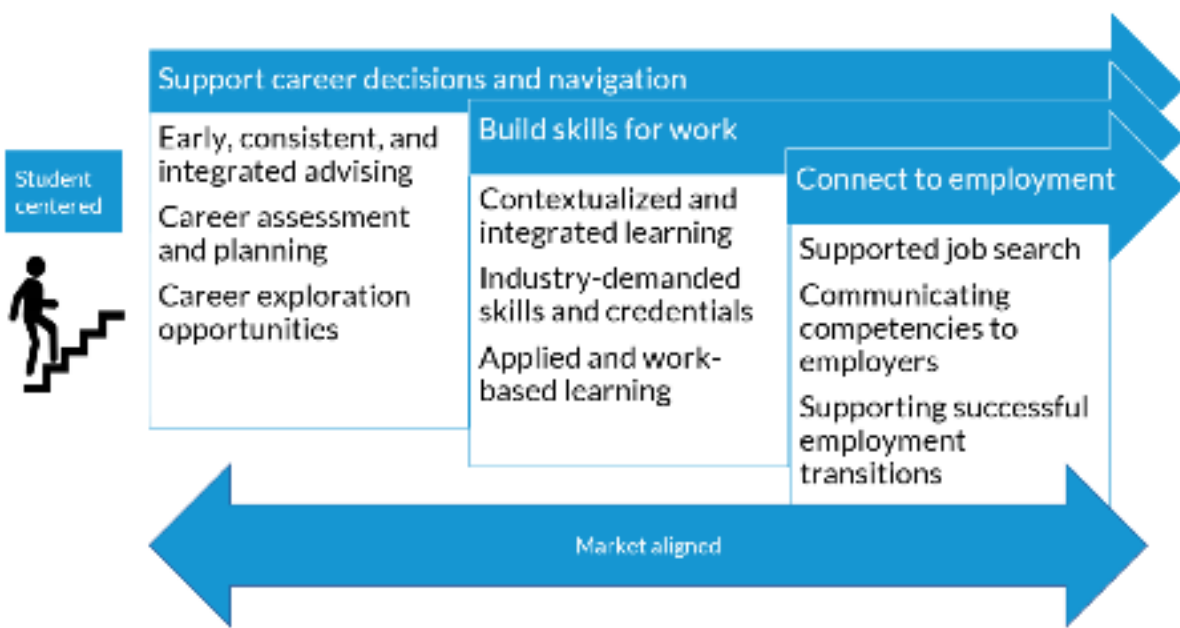
The findings of these researchers apply to the vast majority of cases in our formal educational establishment. Whether it is in secondary schools or universities, the outcome is frequently the same – lectures, textbooks and the testing methodology that accompany them don't cut it and transfer of learning of any significance, simply does not occur. What is learned through lectures and texts must be applied to real world scenarios for understanding of subject matter to sink in to any meaningful depth.

Part II A Proposed Solution

Middle School

To begin this section, let us utilize the Urban Institute's model for career preparation. [Spaulding and Sirois \(2022\)](#) provide a graphic image that is at the foundation of educational goals. Let's keep this image in our minds as we move through the rest of this essay; and yes, this starts in middle school. To help students develop skills and work ethics, labor laws need to be radically altered to get government out of the way.

Workforce Alignment Framework



While there is much that can be done in primary school to broaden our vision of what education means in a free society – that is, prepare *all* our youth for full economic and political participation in it – that will be left for another day. For the current purposes of formulating an applied studies program, we will begin with grades five and six since children are ready to move on from the basics and begin taking the next step. However, without a solid foundation in both applied and abstract concepts, individuals may never reach their full potential. Therefore, we will eventually need to work on developing a better primary education program that blends the two.

The history of technology is a good place to begin discussion for this program since through it, we may be able to achieve the greatest potential for transfer of learning if theory and application are appropriately tied together. After all, this is where the rubber meets the road. Sixth through eighth grades could cover hunting and gathering technologies; then the progression of agriculture and animal husbandry through the millennia; and finally, 18th century cottage industries – i.e., craft oriented – technologies. Understanding a multitude of technologies and their progression as times changed will broaden the minds of individuals and will develop minds shaped for adaptation and innovation, which is what the world requires from all of us.

Associations, museums, craft schools, publishers, and archives dedicated to antiquated technologies, to lay foundational concepts, will prove useful to instructional resources. Some examples are:

- The Core Historical Literature of Agriculture <http://chla.library.cornell.edu/>
- Early American Industries Association <http://www.earlyamericanindustries.org/>

- The Artist-Blacksmith's Association of North America <https://www.abana.org>
- Deutsches Museum <http://www.deutsches-museum.de/en>
- Corning Museum of Glass <http://www.cmog.org>
- Museum of Glass <http://museumofglass.org/public-programs>
- Colonial Williamsburg <https://www.colonialwilliamsburg.com>
- The Lace Guild Museum <https://www.laceguild.org/museum/>
- The Lace Guild <https://www.laceguild.org>
- Shaker Villages & Museums <http://www.shakerworkshops.com/catalog/directory-of-shaker-villages-and-museums.php>
- Seminole Tribe of Florida Ah-Tah-Thi-Ki Museum <http://www.ahtahthiki.com>
- Society for the History of Technology <http://www.historyoftechnology.org>
- Burke Museum, Tribal Museums & Cultural Centers
<http://www.burkemuseum.org/blog/tribal-governments-museums-and-cultural-centers>
- American Textile History Museum <http://www.athm.org>
- Japan Open-Air Folk House Museum <http://english.nihonminkaen.jp>
- Japan Folk Art Museum http://www.nihon-kogeikan.or.jp/e_about.php
- Japan Folk Crafts Museum (Nihon Mingeikan) <http://www.mingeikan.or.jp/english/>
- Korean Folk Village
http://english.visitkorea.or.kr/enu/ATR/SI_EN_3_1_1_1.jsp?cid=264116
- Welsh National Wool Museum <https://museum.wales/wool/>
- St. Fagans: National History Museum <https://museum.wales/stfagans/>
- Norsk Folkemuseum, Norway <http://www.norskfolke.museum.no/en/>
- Penn Museum: Applied Sciences http://penn.museum/sites/applied_science/index.html
- Galileo Museum <http://catalogue.museogalileo.it>
- The Virtual Museum of Japanese Arts <http://web-japan.org/museum/menu.html>
- The Artisan Museum of Quebec (le Musée des Maîtres et Artisans du Québec)
<https://www.mmaq.qc.ca/en/about>
- Museum of the Middle Ages <http://www.musee-moyenage.fr/visiter/english.html>
- National Railway Museum
<http://www.nrm.org.uk/researchandarchive/archiveandlibrarycollections>
- Museum of Applied Arts & Sciences – Australia <https://maas.museum/about/>
- Austrian Museum of Applied Arts – Vienna <http://www.mak.at/en>
- Mississippi Industrial Heritage Museum (steam equipment)
<http://www.soulelivesteam.com>
- Mystic Seaport <https://www.mysticseaport.org/learn/k-12-programs/>
- The National Wood Carvers Association <https://www.chipchats.org>
- The Glass Art Society <http://www.glassart.org>
- International Guild of Glass Artists <http://www.igga.org>
- Stained Glass Association of America <http://stainedglass.org>
- American Craft Council <https://www.craftcouncil.org/post/about>
- PAST (Preserving Arts and Skills of the Trades) Tool Collectors
<http://www.pasttools.org/#>
- Mid-West Tool Collectors Association <http://www.mwtca.org>
- Museum of Woodworking Tools <http://www.antiquetools.com>
- The Marquetry Society <http://www.marquetry.org>

- Pierre Francois' school of "trait" in Romanèche-Thorins France, stereotomy museum, <http://www.historicalcarpentry.com/pierre-francois-guillon.html>
- Les Compagnons du Devoir et du Tour de France, compagnons museum, <https://www.compagnons-du-devoir.com>
- Musée du Compagnonnage, Museum of Compagnonnage, stereotomy museum, <https://www.museecompagnonnage.fr/en>
- Fondation de Coubertin, French school of crafts, http://www.coubertin.fr/501_p_31238/workshops.html
- Ecole Boulle (French woodworking craft school) <http://www.ecole-boulle.org/page/international>
- National Association of Wheat Weavers <http://nawwstraw.org>
- The Crafts Report Magazine <https://the-crafts-report.com-sub.biz/?&gclid=CImyi4vL7M0CFQgsaQod4NIMmQ>
- Fine Woodworking <http://www.finewoodworking.com>
- Woodworking News <http://www.woodworking-news.com>
- Woodcarver Online Magazine <http://carverscompanion.com/Ezine/WWWEzine.html>
- Wood Carving Illustrated <http://woodcarvingillustrated.com>
- Toolemera Press <http://www.toolemera.com>
- The Bulletin of Primitive Technology <http://www.primitive.org>
- Marc Adams School of Woodworking <https://www.marcadams.com>
- Penland School of Crafts <http://www.oefcc.com/AboutOEFCC.shtml>
- Tillers International <http://tillersinternational.org>
- Great Smoky Arts and Crafts Community <http://www.gatlinburgcrafts.com>
- Evanston Art Center <https://www.evanstonartcenter.org>
- Center for Essential Education <http://www.cfeeschool.com>
- College of the Redwoods <http://crfinefurniture.com>
- Woodworking Schools Directory <http://www.finewoodworking.com/how-to/article/woodworking-schools-directory.aspx>
- Woodworking News <http://www.woodworking-news.com/woodworking-classes/>
- The Connecticut Valley School of Woodworking <http://www.schoolofwoodworking.com>
- Philadelphia Furniture Workshop <http://www.philadelphiafurnitureworkshop.com>
- Rosewood Studio <http://www.rosewoodstudio.com>
- Vermont Woodworking School <http://www.vermontwoodworkingschool.com>
- Dimitrios Klitsas Fine Wood Sculptor <http://www.klitsas.com/classes.html>
- Homestead Woodworking School <http://woodschoolnh.com>
- Fletcher Farm School for the Arts and Crafts <http://www.fletcherfarm.org>
- Sievers School of Fiber Arts <https://sieversschool.com>
- North House Folk School <http://www.northhouse.org>
- The Furniture Institute of Massachusetts <http://www.furnituremakingclasses.com>
- Dun Laoghaire Institute of Art, Design & Technology (Dublin) <http://www.iadt.ie/en/>
- Brook Field Craft Center <http://www.brookfieldcraft.org>
- Art Schools and Art Colleges Directory <http://artschools.com>
- Ox-Bow School of Art <http://www.ox-bow.org>
- Northwest School of Wooden Boat Building <http://www.nwswb.edu>
- The Landing School of Boatbuilding and Design <http://www.landingschool.edu>

- North Bennet St. School <http://www.nbss.edu>
- Oregon College of Art and Craft <https://ocac.edu>
- Center for Furniture Craftsmanship
http://woodschooll.org/?gclid=CMCmoO_X7M0CFRCRaQodQaQJ1w
- Yestermorrow Design/Build School <https://yestermorrow.org>
- Artists in Stained Glass <http://www.aisg.on.ca/index.shtml>
- Diablo Glass School <http://www.diabloglassschool.com>
- Sarasota School of Glass <http://www.sarasotaschoolofglass.com>
- The Washington Glass School <http://washingtonglassschool.com/school>
- Eugene Glass School <http://eugeneglassschool.org>
- The SGAA Stained Glass School <http://stainedglassschool.org>
- Pilchuck Glass School <http://www.pilchuck.com>
- Corning Museum of Glass <http://www.cmog.org/programs/classes>
- NRA Affiliated Gunsmithing Schools <https://gunsmithing.nra.org/find-a-school/>
- John C. Campbell Folk School <https://folkschool.org/index.php>
- TM Technologies (sheet metal) <https://www.tinmantech.com/education/workshops/>
- Davide Bigazzi Studio & Gallery (chasing and repousse)
<http://www.davidebigazzistudio.com/classes-1/>
- Valentin Yotkov Studio (chasing and repousse)
<http://www.valentinyotkov.com/site/studio.htm>
- School of Applied Arts http://schoolofappliedarts.org/wiki/index.php/Main_Page
- Association Ouvriere des Compagnons du Devoir et du Tour de France
<http://www.compagnons-du-devoir.com>
- La Grande Ecole Des Hommes de Metieren Compagnonnage, French carpentry school
- Worker’s University the School of Trait: Romaneche-Thorins
<http://www.historicalcarpentry.com/pierre-francois-guillon.html>
- The Culinary Institute of America, <https://www.ciachef.edu/research/>
- American College of the Building Arts, <https://acba.edu> and
<https://www.pbs.org/newshour/show/this-unusual-charleston-college-produces-educated-artisans>
- The Fabrication Series, <https://thefabricatorseries.com>, metal fabrication
- Ward Museum of Wildfowl Art, Salisbury University <http://www.wardmuseum.org/>
- Edwardian Farm BBC series
<https://www.youtube.com/watch?v=ATUv8b6eH30&list=PLc9JhVp9B6Crpfu7asBwJZAY87d0iCTYw&index=2>
- The 1900 House BBC series <https://www.youtube.com/watch?v=INCMRWTLu8>
- Edwardian Country House BBC series <https://www.youtube.com/watch?v=y98hDxllGy0>

If students are challenged by instruction that asks them to attempt to invent mechanisms and methods to address the various challenges people faced over time and under various environmental conditions, afterward providing them with examples of what actually remedied those challenges, the minds of students will begin to develop reasoning abilities that will allow them to transfer learning in ways our current educational system can only dream of. Tests may be structured that ask students to invent technology that resolve challenges. Whether it is illustrated with written explanations, and/or with an actual physical structure, doesn’t matter.

Even the effectiveness of the invention has less significance than the thought processes that go into the creation. It is not unlike a complex math formula: While the final answer has relevance, it is not as important as the process the student followed to arrive at an answer.

Fifth and sixth grades can be dedicated to the technologies utilized by hunter-gatherers from around the world. This is a long stretch of time with many technologies adapted to regional conditions, e.g., seafaring, versus desert, versus tropical, versus temperate environments. Survival strategies were quite different between them, with each demonstrating brilliant adaptations to their environments. An excellent example is the highly sophisticated and extensive number of instruments developed by the Northwest Coast American Indians for extracting the resources from the sea. (see *Indian Fishing: Early Methods on the Northwest Coast*, Hilary Stewart, Univ. of Washington Press, 1977.)

In addition to developing an innovative mind through technological history, a deeper understanding of the earth sciences will be forthcoming since there was an intimate relationship between hunter-gatherers and the earth. That is, hunter-gatherers shaped raw materials themselves into finished utensils, which is in contrast to contemporary manufacturing systems that have multiple processing steps far removed from one another that alienates individuals from a comprehensive understanding. In a word, hunter-gatherers were masters of material sciences applicable to their needs.

The raw materials used by them – such as flint to shape arrowheads – along with the flora and fauna utilized, offer the perfect means to tie the various educational disciplines together to provide a big-picture approach to the world. Even evolution and psychology could potentially be incorporated into the mix since hunters needed to understand how animals were adapted to their environmental niche and how to “read their minds” when tracking or trapping them. As it relates to the gatherers, a command of ethnobotany was essential to survival, not only for food, clothing, and shelter, but also for medicinal purposes. Contemporary pharmaceutical companies visit surviving hunting-gathering communities in an attempt to find new compounds that offer medicinal qualities. Hunting-gathering technologies are rich in educational lessons that we currently ignore as though they were “primitive” and therefore “beneath us.” This is an arrogant and foolish perspective.

Another benefit to a hunting-gathering program is the development for an appreciation of nature. Nature observation of flora and fauna, hunting, hiking and camping can all be incorporated in the program. This has a subsequent benefit of preparing citizens for war, should the need arise, but without the structure of a military culture. Soldiers are frequently challenged to the limit in the field. Casualties of war are not infrequently caused by the environment. Conditioning individuals to the elements for extended periods, combined with hands-on knowledge of camping, hiking, etc., better prepares them for war should they be called to duty. This was one of the reasons for the founding of The Boy Scouts, which was founded by Lord Baden-Powell, who had been a lieutenant general and learned how wholly unprepared men were for the hardship conditions of war.¹⁵

¹⁵ See [Brilliant](#)'s (the interactive STEM learning platform) *Why 80% of Americans Live East of This Line* to connect applied knowledge with more abstract, theoretical knowledge to gain a deeper insight into the world in order to transfer learning to real life scenarios: <https://www.youtube.com/watch?v=wwJABxjcvUc>

An interesting side note Spencer (1860) offers regarding the manner in which we learn through application. He uses the hunter-gatherer's abilities developed through use, to exemplify how we learn and become proficient at an activity.

Everywhere throughout creation we find faculties developed through the performance of those functions which it is their office to perform; not through the performance of artificial exercises devised to fit them for these functions. The Indian acquires the swiftness and agility which makes him a successful hunter, by the actual pursuit of animals; and by the miscellaneous activities of his life, he gains a better balance of physical powers than gymnastics ever give. That skill in tracking enemies and prey which he has reached by long practice, implies a subtlety of perception far exceeding anything produced by artificial training. ... [W]e find that the highest power of a faculty results from the discharge of those duties which the conditions of life require it to discharge. And we may be certain, *a priori*,¹⁶ that the same law holds throughout education. (pp. 79-80)

Spencer's idea makes clear the need to distinguish between base knowledge that can be transferred to most any task versus knowledge that is more specific to specialized tasks such as career pathways. For example: The memorization of the periodic table is necessary to a chemist but not to the general population; yet high school chemistry classes require its memorization, which wastes time and energy on superfluous knowledge.

Gardner (1983) proposes that there is a *naturalistic intelligence*. Such a program of study I'm proposing here would strengthen and refine this intelligence.

Not part of Gardner's original 7, naturalistic intelligence was proposed by him in 1995. "If I were to rewrite *Frames of Mind* today, I would probably add an eighth intelligence – the intelligence of the naturalist. It seems to me that the individual who is readily able to recognize flora and fauna, to make other consequential distinctions in the natural world, and to use this ability productively (in hunting, in farming, in biological science) is exercising an important intelligence and one that is not adequately encompassed in the current list." Gardner, H. (1995). Reflections on multiple intelligences: Myths and messages. *Phi Delta Kappan*, 77, 200-209. This area has to do with nurturing and relating information to one's natural surroundings. Examples include classifying natural forms such as animal and plant species and rocks and mountain types. This ability was clearly of value in our evolutionary past as hunters, gatherers, and farmers; it continues to be central in such roles as botanist or chef. This sort of ecological receptiveness is deeply rooted in a "sensitive, ethical, and holistic understanding" of the world and its complexities – including the role of humanity within the greater ecosphere.¹⁷

The history of technology in seventh grade might cover the evolution of agriculture and animal husbandry in all of their manifestations.¹⁸ This is where an understanding of meteorology,

¹⁶ "Relating to what can be known through an understanding of how certain things work rather than by observation." <http://www.merriam-webster.com/dictionary/a%20priori>

¹⁷ https://en.wikipedia.org/wiki/Theory_of_multiple_intelligences#Naturalistic

¹⁸ Consider using the series *The Complete Victorian Farm* DVDs for instruction. It is described as follows: "Complete collection of the documentary series following a team of archaeologists and historians as they recreate

chemistry and biology can be enriched through observation due to mankind's discoveries over the millennia. For example: Not only can students learn through processes such as plant photosynthesis and cross-pollination, they can also learn through chemical transformations that man initiates, such as food preservation, fermentation, exposure to heat of the various raw materials used, etc.

The history of technology in eighth grade might cover the evolution of the cottage industries in all of their manifestations.¹⁹ The use of wood, metal, glass, clay, fiber, etc., by craftsmen, provide the raw materials to demonstrate advancing technology throughout history coupled with artistic expression – i.e., the useful or functional arts and crafts. Perhaps one of the greatest periods to analyze is the Italian Renaissance where the great masters – Leonardo de Vinci, Donatello, Rafael, Michelangelo, etc. – blossomed due to the perfect climate and soil of an applied educational structure coupled with an outstanding apprenticeship system. Here we see manifested, examples of Gardner's (1983) kinesthetic and spatial intelligences.

Let us create an analogy from science fiction literature where a space or time traveler finds himself in an unfamiliar world. It's a place where chemistry, physics and math are the same, but their manifestations are foreign to him. If his educational upbringing was the same as the current system, he will, in all likelihood, perish since he has not been taught foundational principles upon which science and math are grounded and has therefore not been taught how to think and reason through challenges in their applied manifestations. In other words, he has been taught close transfer but not far. Now if this individual had been educated in the *applied education* model being proposed, his chances of success are increased exponentially.

As will be the case in the high school curriculum, the foundational courses – language, math and science – should be taught with application to historic, period, real world scenarios in mind. When it comes to history and civics, perhaps we should think outside the box for the middle school years. Few students are motivated by history and civics as it is delivered to them through lectures and in textbooks, and middle school is the stage of development where many individuals are either stimulated or turned off by a subject – frequently with permanent and detrimental results. Therefore, it may be worthwhile to look at alternatives to textbooks at this stage and consider delivering instruction through visual mediums – just like the creators of Sesame Street did with language and math for young children – coupled with supplemental reading materials. Interesting programs through documentaries, movies, and short series – coupled with prerecorded short lectures done by award winning and inspirational teachers – may prove to be highly motivational in stimulating interest in history and civics. Once again comparing such

life down on the farm 100 years ago. Wearing period clothes and using only the tools available at the time, the team takes a year out of their lives to find out what rural life was really like in the 1880s, as they tend pigs and sheep, cultivate the land, and try to survive without modern-day aids.” The book they use as their guide is *The Book of the Farm: Detailing the labors of the Farmer, Steward, Plowman, Hedger, Cattle-Man, Shepherd, Field-Worker, and Dairymaid*, by Henry Stephens, 1860, which is available at https://books.googleusercontent.com/books/content?req=AKW5QacYFeAWTMGibs_n3NGO50bHt71FWEbQM7_wxXwnPprCCvYNGTS9pEu_FwekFQjIRdLZBLFOx5dHt8ZAs3UJ1DO3W2hxM7Syax4BqHmzQz243ThGN4hjoRcNk6lqyVqZe9VZkS7K0IITP0-_12yGepgfY74aAxwkY-xciOtmBZHo5aJEFqPc12VDO1YxLLik-hOcDG0Z8x6IUfiUT0PrCPJnt_SQD6MJG9U0uq4J3NKaROZkUqLy1gODNKi3L943rL1hFC4X

¹⁹ A very nice 2014 British documentary that shows craft and trade skills of the medieval period is *Secrets of the Castle*. It's about a 25 year long archeological experiment to build a castle from scratch using the same tools, techniques and materials available in the 13th century. <https://www.imdb.com/title/tt4388710/>

instruction to Gardner's concepts, history and civics can be related to his *intrapersonal* and *interpersonal intelligences* since history and civics, if appropriate instruction is provided, teach us about our internal selves as well as our external social side.

Individual economic wherewithal and an understanding of oneself and civics are some of the primary considerations in sending our children to school; for without them, our system of government will erode and eventually collapse, or be confiscated by a dictatorship from within, or will be invaded by a conquering army. This is one of the fundamental lessons history reveals.

A plan needs to be developed to address the needs of the middle school age population. This will require a team of specialists to establish an effective program.

The High School Program

An applied studies curriculum would encompass exposure to and provide real career choices in all of the primary economic sectors in our society.²⁰ This program would provide graduating students a much higher probability of success in securing a job as well as advancing in a job due to their extensive preparation combined with a broad understanding of the matrix in which the American economic system operates.²¹ High school programs should mirror college career programs so that a majority of individuals can finish their education far earlier than what is common today. Teenagers are fully capable of such studies and dual enrollment programs (enrolled in high school-college simultaneously) prove it.

All businesses are interrelated and dependent upon one another; therefore, an understanding of these intimate connections is vital to success in the marketplace. It would not be a stretch to suggest that a fundamental understanding of the various economic sectors does indeed enhance an individual's comprehension of the particular sector one will end up working in. That is, by understanding the "connection of dots" (i.e., breadth), a deeper understanding of an individual "dot," becomes possible once immersed in it.

Besides a broad understanding of microeconomic systems and opportunities, this program should offer interested students a solid foundation for supervisory, managerial and entrepreneurial ambitions through a rigorous business management curriculum. This helps alleviate the dispute that raged during the early 20th century against a dual secondary school system (i.e., separate schools for career/vocational oriented education and college prep education) when many academics argued that career education would perpetuate an American under-class while the separate college prep program would perpetuate an American upper-class. Of course, this was a red herring as European nations have proven with their dual systems. However, to the detriment of our society, we've been stuck with the *comprehensive high school* or unified school ever since that time in most locales. Therefore, for those not bound for influential careers that some college credentials provide and which lead to political leadership roles, entrepreneurialism opens doors to influential opportunities from another angle. Therefore, even those who pursue a narrowly

²⁰ For an excellent analysis of this concept, see Dougherty, 2016, in particular, see an example of this concept on page 10, Figure 1 "Example of CTE Course Organization." Of course, this is a CTE organized curriculum, but there is conceptual similarity.

²¹ See *Skill Scales Companion Guide*, National Skill Standards Board, 2000 to get some ideas of designing training.

tailored vocational program can become highly successful and influential if they have the business acumen the marketplace requires. We must be prepared however, since most academics will have nothing but contempt for this concept because they are typically inept at business and hate capitalism.

Like the proposed middle school *history of technology* curricula, the high school program should be a continuation of this effort. Freshman year can be dedicated to the 19th century Industrial Revolution period, while sophomore year can focus on the 20th century. The evolution of technology should be the focus rather than any specific area.

This program is not to be taught as a specialized career path, but rather in an introductory, broad-based, and non-specialized manner. In other words, teaching fundamental principles of the various areas of study in order to establish an overarching and foundational view of how these disciplines are connected. Fundamental principles lay the groundwork for all subsequent learning – whether during the educational experience or outside of it – which provides for the transfer of learning.

A caveat must be included here: There are those in high school who will prefer a specific field of study in a career technical education program. Every effort should be given to support this pathway by customizing a program of study that fits an individual's needs rather than the institution's interests. However, an applied studies track compliments CTE *far* more than the standard combination of general education requirements with CTE, which have little in common and are detached from one another.

Unlike most academic oriented courses, these courses are not to be taught as a preparation for a career in the individual discipline being taught (e.g., math and the sciences are currently taught as though the student is to become a mathematician or scientist). Rather, they are meant to expose students to information fundamental to the various economic sectors coupled with the basic skills to succeed in any sector a student might desire. Upon graduation, students are then in a better position to choose a specialized area that fits their talents due to their exposure to real choices. They will be prepared for work and/or further education in a field of their choosing.

In addition, avoidance of the traditional approach of memorizing superfluous data – such as names, dates, and events for history – will be an important strategy.²² Understanding of concepts and principles tied to application is to be the primary focus. For example: the memorization of mathematical formulae (e.g., algebraic formulas) will not be required since such information is readily available in copious industrial, mathematical and scientific resources. Knowing how to access these resources is far more important than memorizing formulae. In addition, the logic of math is far more important than the repetitive clerical computation exercises currently employed. Therefore, students should be required to know which formulae fit a given problem and then to know how to solve the problem, based on a logical approach, with the allowance of access to reference books during tests.²³ Also, for history, students are to be taught principles,

²² Labels are useful if they serve a purpose to further understanding toward application. Memorization of words is not the objective of education. Words are simply verbal symbols; so they must not be placed on a pedestal where the memorization of them determines a student's grades and prospects.

²³ The reader will immediately note this is at odds with preparing for assessment tests, but then education should not be designed for tests. To the contrary, tests should be designed for what education is to achieve for the various

ethics/morality, values, and lessons we can learn from. Choices made by previous generations reveal good or bad results – i.e., the very reason history is valuable. Superfluous data is easily forgotten and therefore of little use in a general education setting.²⁴

However, a lack of understanding of foundational vocabulary of disciplines such as math, English, and science can cause many students tremendous grief since they will have difficulty comprehending concepts and principles while trying to understand the language of the discipline, especially during lectures. The language must be fully comprehended before they can comprehend concepts and principles; otherwise lectures and literature need to use the vernacular forms of communication. If only the formal language will suffice, effort must first be exerted toward teaching the lexicon of that portion of the discipline the curriculum will focus on, prior to teaching concepts and principles. Presently, students are expected to memorize terminology through the process of quick and shallow absorption as they read the text and listen to lectures – an illogical approach since it promotes shallowness of understanding. They are also expected to use glossaries on their own so that teachers can avoid spending time on relevant nomenclature. Instead, teachers should make a concerted effort to help students grasp and memorize relevant nomenclature prior to the concepts and principles being taught.²⁵ Otherwise by the time they’ve come to understand the language, they’ve missed out on much of the instruction.

There is a cascade affect that must be understood in the learning process. A base of information must be understood before a student can move on to learn the next level. Therefore, only that which is necessary to a *general* education should be incorporated in curriculum. Vocabulary development of those words *useful*, but not superfluous, to this entire program will be necessary and should be taught within the individual courses throughout the educational experience. After all, language is the foundation of all learning. A limited daily ration of vocabulary instruction for students to study should prevent too much boredom.

The discernment of what is necessary and useful will be the job of a team of specialists for each discipline for the various levels. However, a group of non-specialists are required to ensure that what the specialists write is comprehensible by one who does not know the subject. It would be best to test it on those who know nothing about a given subject since, after all, this is where texts will be used in educational settings.

Memorization of unessential data is something that serves no purpose since it takes up valuable instruction time. It simply distracts the student’s attention away from important information, which reduces motivation and, further, alienates those who do not possess excellent memory retention abilities. This is one cause of many students leaving high school prematurely and a major reason why many do not pursue further education. What’s more, the amount of

interests and needs students have, and teaching students what reference books are and how to use them is far more important than memorizing data found within them. Such books are a fountain of information useful to the multitude of technical disciplines, but since educators feel such books allow students to “cheat,” they are largely ignored, to the detriment of individuals and society.

²⁴ This requires historical events be judged, not unlike Edward Gibbon and David Hume provided in their Roman and English history classics. Time has revealed the error in complete neutrality as it relates to judging the actions of various cultures. Nazi Germany, Fascist Italy, Socialist China and Socialist Soviet Union proved this point. Of course, this would require that both positive and negative judgments be scrutinized for our own history as well.

²⁵ Linguistics should be incorporated here, where the structure of words is important to discovering their meaning through an understanding of suffixes, prefixes, and roots.

information students are expected to memorize has been steadily increasing over the years without connection between the subjects. It has reached a point where many students can no longer memorize, let alone comprehend, a majority of what they are studying; they can only hope to learn enough to receive a passing grade in order to get through the system, but with no hope of being prepared for the working world. They are sent into the world with no sail, rudder, map or compass and most will be at the mercy of the currents and winds.

The memorization of superfluous data and the overwhelming amount of data expected to be memorized reflects a bias that educators have implanted in our educational system. Since academics typically possess excellent memory retention and recall abilities, they steer the system in this direction and then label “intelligence” in such a way that only those who have similar attributes are classified as intelligent and who are then given the opportunity to receive the education our society has come to believe as necessary for success, i.e. the education attained at a university, from which all social and political power originates, thereby disenfranchising those who are not allowed into the system. Of course, this is a false assumption since there are many other educational choices besides universities with equal, if not superior, results (see *But What If I Don't Want to Go to College*, by Harlow Unger, Checkmark Books, 1998, page 4). But the academic community tends to ignore or downplay alternative choices as paths for “dummies.” This is a prejudice that must be seen as evil as any other prejudice, such as racial or religious bigotry, and perhaps even more so since education, if done right, can provide for opportunities and success, regardless of race or any other social factor. But the academic community holds a tight rein on educational choice since this provides them with the political power and resources, and they will fight hard not to lose control in spite of the needs of our children.

Classes should consist of prerecorded lectures, extensive video instruction,²⁶ labs, literature, and hands-on projects. Like all programs in an applied studies program, every effort should be made to coordinate other disciplines in the program so that teachers work concurrently amongst themselves to join the disciplines chronologically that will facilitate the learning process for students. For example: economic and financial classes will be assisted by math instruction that supports these disciplines. Another example might be: technical writing will be coordinated with such classes as American Government where research papers will be required of students to prepare a convincing argument for their perspective of government.

Carnoy et al. (2003) have this to say about the departmental structures within a high school:

In the complex organization of the comprehensive high school, teachers are likely to identify themselves, not only as subject specialists, but as members of a particular department that provides them with the primary social, political, and intellectual context for their work. These departments, especially in large high schools, can be like different worlds, where English teachers may never have met their science colleagues, and have little or no structured opportunity to see themselves as part of the same collective professional community, to develop shared expectations about student work, or about what teaching should be. The distances between departments and the “two worlds phenomenon” tend to be even more pronounced between teachers in the “core” academic

²⁶ We can pick the best teachers for certain subjects within disciplines to prerecord to ensure the highest quality is being offered – consider The Teaching Company’s lectures.

departments and those in the “special” subjects like vocational education or the arts. (p. 92)

It is no wonder that no effort to combine subjects to support one another has been forthcoming for all these years.

As always, the needs of students will supersede the needs of the educational establishment.

The time frame of instruction for the various classes will depend on what needs to be learned. Some classes require a semester while other classes might be taught in a matter of days or weeks (compare to Marc Adams School of Woodworking in Franklin, Indiana <http://www.marcadams.com>). Some classes might require a full day of studying just one subject if this proves to be an effective means for students to comprehend the subject matter.

Wherever students are experiencing difficulty in a given subject, alternative instruction needs to be presented to them. It’s a form of triangulation, similar to what marine navigators use when determining a ship’s position on the globe. Observing the same subject from different angles will allow students a greater likelihood of understanding the subject.

Potential Structure of the Program

The length of a given course, currently measured in periods of time, should not be determined by the Carnegie unit or credit hour system. The length should be determined by what is to be taught based on what must be known to achieve the predetermined competency. This is dependent on the age, the abilities, and the needs of the students (e.g., talents, shortcomings, and directional choices), and the needs of society in what an education is meant to provide communities through individuals (e.g., professional, economic, and citizenry requirements that allow for society to run efficiently, effectively, harmoniously, and peacefully). Some of these courses could be intense couple/few day seminars, such as bootcamp courses, while others may span the period of a year, or perhaps more.

In this paper, a rough layout of what applied curricula could encompass is offered as a starting point for a dialogue to begin. This is not meant to be the final word on curricula nor a complete program of study – it simply scratches the surface. It is to begin a dialogue on what such a program *might* look like for a portion of the student population. Given the different interests, talents and needs, other educational offerings would need to be analyzed.

As in every subject/discipline related to a general applied education, courses are not to be taught as though students will pursue a career in any of them. They are to be taught as though students **will not** pursue a career in them, with subject matter and teaching methods being used that are relevant to the needs of every citizen – no more, no less. Of course, if students pursue an actual career track in a particular field, this is when subject matter and teaching methods need to be employed for a specific field in order to develop expertise to become a professional in that field.

To that end, in July 2017, Louisiana earned the title of being the number one workforce development program in the U.S. for the eighth consecutive time by Business Facilities magazine. The Louisiana program, FastStart, designs on-demand training modules tailored to a

variety of positions needed by a company. It develops training directly related to an employer's current and future needs at high schools and colleges. Let's look at how FastStart makes this happen in their own words.

How LED FastStart Works

LED FastStart employs a unique four-step process to create customized programs that ensure high-quality, flexible workers are prepared on day one and beyond.

1. ANALYZE

Every aspect of a company's proposed operation is analyzed.

LED FastStart® pairs its world-class team with a company's subject matter experts at any location in the world mirroring the new operations. If the company has a unique process, FastStart will work with the R&D and engineering departments to gather necessary critical data. Final approval of all plans rests solely with the client.

Analysis can include:

- Behavioral Skills
- Business Analysis
- Competencies Review
- Core Skills
- Cultural Analysis
- Needs Analysis
- Process Documentation
- Recruitment and Relocation
- Staffing Plans
- Technical Analysis
- Technology Transfer

2. ATTRACT

FastStart sets forth to find the best potential talent.

After a complete analysis of the company, FastStart determines the competencies and behaviors that match the cultural and technical abilities that will help define the most successful employee.

Tactics can include:

- Alumni Outreach
- Campus Visits
- Company Websites
- Corporate Concierge Services
- Corporate Recruiter Services
- Social Media Campaigns
- Recruitment Videos
- Targeted Career Fairs

3. EVALUATE

Pre-hire evaluations mean the best candidates are selected.

Critical data is collected for each applicant through behavioral interviews, job observations, situational role-playing, pre-employment training and hands-on simulations. Evaluations are scored and sorted, allowing the company to select the best

candidates.

4. TRAIN

Customized and comprehensive training delivers a strong workforce.

Technical, team-based and soft-skills training programs are custom designed, sequenced and delivered to engage new employees. Learning curves are greatly improved and a company's productivity increases, resulting in a faster start and a better bottom line.

Training programs can include:

- Core Skills Training
- Customized Multimedia
- Interactive Training Modules
- Job-Specific Customized Training
- Mobile Learning Devices
- On-the-Job Training Guides
- Organization Development
- Quality Training
- Regulatory Training

Source: https://www.opportunitylouisiana.com/faststart/how-it-works?utm_source=buzjrn1&utm_medium=ative&utm_term=howitworks&utm_content=workforce&utm_campaign=LEDnative

While this is a good example for helping companies and individuals maximize potential for both, we should look to LED FastStart as a template for whole industries where the trade association of that industry develops a comprehensive training program that isn't so targeted, as it is for individual companies, in order to provide industry and individual flexibility and adaptability.

Every State and every school district should analyze how FastStart is accomplishing this noble effort in helping individuals and our economy be all it can be.

Curricular Structural Prospects

Manufacturing Curriculum

Discipline 1 – Tools, jigs & fixtures: their design, production, and use. Anthropologists define man as the tool-making animal and, we are informed, it is this aspect of human attributes that provided the evolutionary mechanism to increase intelligence. It behooves us to have a foundational understanding of this extremely important attribute that helps define man. Whether one pursues the trades, manufacturing, crafts and even art, one must understand tools and their uses. The course will start with tool use based on a text designed by the U.S. Naval Education and Training Program, *Tools and Their Uses*, Dover Publications, 1973. The preface for the text describes areas covered:

Chapter 1 describes hand tools: impact, twisting & turning, woodcutting, metal cutting, holding, miscellaneous, and safety.

Chapter 2 describes pneumatic and electric power tools.

Chapter 3 describes measuring devices and techniques.

Chapter 4 describes fasteners – components and procedures.

Chapter 5 describes abrasive systems.

Chapter 6 further describes metal cutting operations. In addition to this text, other sources will be utilized to cover design and manufacture.

A good example of high-quality hand tools is Lie-Nielsen Toolworks, heirloom quality tools. Lie-Nielsen produces traditional woodworking hand tools, which are beautiful to look at due to the raw materials they use and wonderful designs, but the company also offers innovative designs for artisans that provide new methods to shape wood. Visit their webpage to see what quality tool design and manufacture encompasses: <https://www.lie-nielsen.com/>

Tools offer the opportunity to delve into material sciences – since this is so important to the materials used in making tools as well as for their applications – and physics – since the applications of tools are utterly dependent on physical forces. Much can be learned about these two sciences in an applied setting if the course is designed with this in mind. In fact, the course could be designed as a material science and physics class with tool making and use being the subject matter to demonstrate important principles. Personally, I believe that both, these sciences and tool fundamentals, should be given equal weight since the knowledge of doing is more important than just knowing.

Discipline 2 – Basic machines: This too is a foundational course that can expand upon the incorporation of material sciences and physics. The course will begin by utilizing the U.S. Naval Education and Training Program text *Basic Machines and How They Work*, Dover Publications, 1994. The preface for the text summarizes what is covered.

Beginning with the simplest of machines – the lever – the book proceeds with the discussion of block and tackle, wheel and axle, inclined plane, screw and gears. It explains the concept of work and power, and differentiates between the terms ‘force’ and ‘pressure.’ The fundamentals of hydrostatic and hydraulic mechanisms are discussed in detail. The final chapters include several examples of the combination of simple mechanisms to make complex machines.

Some principles of machine design will be covered as well. Some considerations might be utilizing portions of *Five Hundred and Seven Mechanical Movements*, by Henry Brown, The Astragal Press, 1990; *1800 Mechanical Movements, Devices and Appliances* along with its companion *Mechanical Appliances, Movements and Novelties of Construction*, by Gardner Hiscox, Dover Publications, 2007 and 2008 respectively.

Drafting should be taught in this course. Consider using *Blueprint Reading Basics*, by Warren Hammer, Industrial Press, 2001. Elements of mechanical engineering will be included in order to lay a strong foundation that is useful to so many aspects of the major economic sectors.

Discipline 3 – Manufacturing Processes & Management: Areas covered include: motion studies, charting, measuring machine & human performance, learning curves, standardized data, ergonomics, customization vs. automation, quality assurance, economic considerations in

engineering, facility design & location, purchasing & inventory control, scheduling, capacity, distribution & logistics, information processing, material handling, R&D, and safety. Principles of manufacturing processes that could be covered include: casting, forming, forging, extrusion, injection molding, blow molding, rotational molding, thermoforming, compression & transfer molding, stamping, diecutting, machining, welding, brazing, soldering, adhesives, fasteners, tribology, surface treatments, instrumentation, CAD & CAM, and assembly methods including the use of robotics.

The television series, [*How It's Made*](#), documents how various everyday products are manufactured. This provides excellent overviews of processes involved in manufacturing products. Visual imagery like this offers understanding that helps tie instructional principles together. It is also fascinating for those with inquisitive and inventive minds. Further investigation into manufacturing processes can be found at [*How Products are Made*](#). Do-It-Yourself (DIY) web searches will provide endless sources of projects that can be used for instruction.

Discipline 4 – Designing, machining, and operating: Areas covered include: Fundamentals of machine design as well as the design of jigs and fixtures; machine shop practices in the production of parts (including gears, bearings, shafts, dies, molds, jigs & fixtures, tooling, etc.); operation of manufacturing equipment (such as stamping presses, fourslides, wire-forming equipment, Swiss screw machines, screw & nail making machines, diecutting presses, printing presses, injection molding machines, thermoforming machines, compression molding machines, etc.); and a review of maintenance in the scheme of manufacturing management.

Discipline 5 – Maintenance and Repair: Without an understanding of this discipline, no establishment that utilizes machines and equipment can long survive since wear and tear degrades machines to where they no longer function. This course could have a two-pronged approach: 1) the introduction to principles of maintenance and repair of plant facilities, electrical equipment, mechanical equipment, service equipment, vehicles, welding, instruments, sanitation, lubrication, and corrosion; and 2) an introduction to maintenance management – its organization, preventive, records, training, estimating costs, use of manuals, and the economics of maintenance. See *Maintenance Engineering Handbook*, McGraw-Hill. Here too, a great deal of material science, applied physics, and applied chemistry can be incorporated into the program.

Extraction and Processing Curriculum

Extraction Industry Program: The content of this course will include mining and extraction of raw materials for further processing for the various economic sectors that utilize processed raw materials. This is where everything begins and an understanding of origins provides a far more complete picture of economic issues and the products we all depend on for survival.

Processing Industry Program: The content of this course will include the various raw materials that are processed (food, plants, timber, minerals, chemicals, crude oil, fibers, etc.), types of processing equipment and their components such as valves, piping & vessels, pumps, compressors, turbines & motors, heat exchangers, cooling towers, steam generation (boilers), fired heaters (furnaces), process instrumentation, process diagrams, utility systems, reaction

systems, distillation systems, other separation systems, and plastics systems. See *Process Technology: Equipment & Systems*, by Thomas, Uhai Publishing, 2002.

Agriculture Curriculum

Horticulture: This course instructs students in the use of gardening crops for consumption and ornamental plants for landscapes. There are many career opportunities in this field. “In the eastern U.S., high value horticultural or gardening crops that are very labor intensive are produced on many small farms.” (*Introduction to Agronomy: Food, Crops and Environment*, by Sheaffer & Moncada, Delmar Cengage Learning, 2009. Also, see [Homegrown](https://magnolia.com/watch/show/b50efb26-bf5a-5682-ab46-bbfcee9daee4/homegrown/) on the Magnolia Network, 2021: <https://magnolia.com/watch/show/b50efb26-bf5a-5682-ab46-bbfcee9daee4/homegrown/>)

Ethnobotany: This course will introduce students to the field of botany from a utilitarian perspective. Ethnobotany analyzes plants useful to man and how they are utilized, e.g., medicinal, building materials, clothing, food, tools, etc.

Farming (annuals & perennials – grains, fruits, nuts, vegetables, herbs – both medicinal & herbs for consumption): This course instructs students in good farming practices as well as marketing opportunities that allow farmers to expand their markets and to avoid overly competitive environments as well as the avoidance of dependence on government. Addiction to government has become an unhealthy form of welfare dependence, costing Americans billions of dollars, that steers the grain markets in distorted directions with subsequent indirect higher costs. Many farmers have become welfare dependent and therefore incapable of seeing any other way of doing business than based on government.

The use of nature will also be analyzed to improve farming methods and to provide habitat for wildlife that benefit crops as well as provide opportunities for hunters and nature sightseers during the off season, which can provide additional revenue to farmers’ income through rental or leasing fees. Economic independence is a must for this sector.

Spreading of risk through the growing of multiple crops is a strategy that takes into account that weather conditions can be beneficial or detrimental to crops. By growing a variety of crops – some that thrive under one set of weather conditions and others that thrive under other sets of conditions – losses are taken into account from the start, but successes are almost guaranteed.

Animal Husbandry: The use of cattle in its most generic sense (e.g., dairy, leather, wool, eggs, meat, etc.). A video on comparisons of the effectiveness of egg preservation provides an example of a venue for scientific analysis on why one method is more effective than another: “The Top 6 Historical Egg Preservation Techniques!” <https://www.youtube.com/watch?v=yUYgguMz1qI>. Another video worth watching relating to eggs is Hens Lay Eggs Blunt End First! (<https://www.youtube.com/watch?v=sUimZlidmxE>) which provides scientific explanations for the reason eggs are shaped the way they are.

Utilize books on agri-business as well as horticulture business as supportive information for reinforcing business understanding and opening students’ eyes to possibilities.

Case studies of famines must be an important contribution to this discipline. The 1845-52 Irish Potato Famine and the 1992 and 2010-11 Somali famines are examples. We need to address every significant famine we know of and their causes in order to show how we can avoid them. The American “dust bowl” catastrophe must also be analyzed for causes and effects.

Trades Curriculum

Cuisine: Raw foods, processing raw products into meal components, combine ingredients to produce meals (such as cooking), sanitation, storage considerations, preservation, proper display, and markets for the food industry will be covered. See University of Nebraska’s Food Science & Technology (<https://foodsci.unl.edu/bachelor-science-food-science-technology>) and The Culinary Institute of America (https://learn.ciachef.edu/cia-branch/?utm_source=bing&utm_medium=cpc&utm_term=the%20culinary%20institute%20of%20america%20napa&utm_campaign=cia_national_baking&vsrefdom=CIA_google&msclkid=4f9f635dac3117b3eb1a023e933780ad) programs as examples of the science of food.

Textiles: Raw materials, processing thread, weaving cloth, design of textile products, the manufacture of products, and markets for textiles will be covered. See Cornell University’s Fiber Science & Apparel Design (<https://www.human.cornell.edu/fsad/academics/undergraduate/home>) program as an example of the science of textiles.

Trades: Plumbing, Electrical, Carpentry, Masonry, Heating & Air-conditioning, Surveying, Interior Decorating, Electronics Technology, Auto Technology, Small Machines, Manufacturing Machines & Equipment, Welding, Sheet Metal Fabrication, Machining, Casting, Printing, etc.

Firefighting and First Aid: All students need instruction in the fundamentals so they are prepared for such emergencies as well as understand prevention. This is a good example for a short course, perhaps lasting only a couple/few days or weeks. The U.S. Navy teaches this in bootcamp to prepare for emergencies and damage control aboard ships during battles.

Service Industries Curriculum

This discipline will inform students of the various business opportunities in the service industries. Examples might be law, medicine, accounting, investments, insurance, banking, interior design, tailoring, fashion design, hair styling, retail & wholesale businesses, hospitality & recreation, etc.

In addition, an analysis of these various services as they relate to economic costs and benefits in the way in which they’re regulated will be analyzed so that students may better understand such issues when they participate in the democratic process during election cycles.

Sources for Curricula Development

Industry associations are some of the best sources of training for specific careers. There are also a variety of other sources available for development of various programs. Some examples are:

- Manufacturing Skill Standards Council <http://www.msccusa.org>
- National Association of Manufactures <http://www.nam.org>
- The Manufacturing Institute <http://www.themanufacturinginstitute.org/Research/Skills-and-Training-Study/Skills-and-Training-Study.aspx>
- Society of Manufacturing Engineers <http://www.sme.org/>
- Plastics Industry Association <https://www.plasticsindustry.org/resources/educational-programs>
- Society of Plastics Engineering <http://www.plasticsengineering.org>
- Paulson Training Programs <https://www.paulsontraining.com>
- Society of Mining, Metallurgy & Exploration <http://www.smenet.org>
- National Institute for Metalworking Skills <https://www.nims-skills.org/web/nims/home>
- The American Iron and Steel Institute <http://www.steel.org/about-aisi/mission.aspx>
- American Foundry Society, <https://www.afsinc.org>
- Steel Founders Society of America, <https://www.sfsa.org>
- North American Die Casting Association, <https://www.diecasting.org/wcm/Education/wcm/Education/Education.aspx?hkey=6f756dae-10d4-4103-829a-1af44f3403a8>
- Non-Ferrous Founders Society
- American Institute of Steel Construction <https://www.aisc.org>
- American Welding Society <http://www.aws.org>
- Lincoln Arc Welding Foundation http://www.jflf.org/Default.asp?inf_contact_key=ea9779b0a862e3821099221fa3aaad60d14fd9992df3729d68d88687127cfc80
- Copper Development Association <http://www.copper.org>
- Project Management Institute <https://www.pmi.org>
- International Masonry Institute <http://imiweb.org>
- International Union of Bricklayers & Allied Craftworkers <http://www.bacweb.org>
- Portland Cement Association <http://www.cement.org/about-pca>
- The International Brotherhood of Boilermakers <http://www.boilermakers.org>
- American Culinary Federation <http://www.acfcchefs.org>
- Operative Plasterers' and Cement Masons' International Association http://www.opcmia.org/index.php?option=com_content&task=view&id=23&Itemid=52
- United Union of Roofers, Waterproofers & Allied Workers <http://www.unionroofers.com>
- Sheet Metal & Air Conditioning Contractors' National Association <https://www.smacna.org>
- Plumbing-Heating-Cooling Contractors Association <http://www.phccweb.org/index.cfm?ewebToken=%7Btoken%7D&Site=PHCC>
- United Association: Union of Plumbers, Fitters, Welders, & Service Techs <http://www.ua.org>
- Plumbing Contractors of America <http://www.mcaa.org/pca/>

- American Society of Plumbing Engineers <https://www.aspe.org>
- National Auto Body Council <http://www.autobodycouncil.org>
- Automotive Maintenance & Repair Association <http://amra.org>
- Autocare Association <http://www.autocare.org/Default.aspx?gmsopoc=1>
- United Brotherhood of Carpenters <https://www.carpenters.org/Home.aspx>
- The Cabinet Makers Association <http://www.cabinetmakers.org>
- The American Society of Mechanical Engineers <https://www.asme.org>
- Small Business Majority <https://www.smallbusinessmajority.org/about-us>
- Idaho Business for Education <http://www.idahobe.org/about/>
- The Massachusetts Business Alliance for Education <https://www.mbae.org/about-us/>
- Buffalo Niagara Manufacturing Alliance (BNMA) <http://www.bnmalliance.com/about/>
- National Center for Manufacturing Sciences <https://www.ncms.org/about/>
- U.S. Chamber of Commerce Foundation trains for trade association professionals. <https://www.uschamberfoundation.org/about-us-chamber-commerce-foundation>
- The Business Roundtable <http://businessroundtable.org/about>
- National Skills Coalition <http://www.nationalskillscoalition.org/about>
- Jobs for the Future <http://www.jff.org/about-us>
- Credential Engine <https://www.credentialengine.org>
- TAPPI <https://www.tappi.org/Events/Event-Calendar/2018-International-Flexible-Packaging-and-Extrusion-Division-Conference/>
- American Coatings Association <https://www.paint.org/about-aca/who-we-are/>
- Riggers – Machinery Movers – Machinery Erectors <http://www.riggerslocal136.com>
- National Commission for the Certification of Crane Operators <http://www.nccco.org/nccco/certification-programs/rigger>
- Graphic Arts Education and Research Foundation, directed by the Association for Print Technologies, <https://www.printtechnologies.org/education/gaerf/>
- Printing Industries of America, <https://www.printing.org/education>
- Specialty Graphics Imaging Association (SGIA), <https://www.sgia.org/education>
- International Sign Association, <https://www.signs.org/training>
- Associated Equipment Distributors, <http://aednet.org/about-aed/>, Read <https://www.ksl.com/article/46638985/high-school-students-get-a-look-at-high-paying-technical-jobs> to understand their involvement in education.
- Dakota Rural Action <http://www.dakotarural.org>
- North American Agricultural Marketing Officials <http://www.naamo.org>
- Penn State Extension, Farm and Food Business Marketing <http://extension.psu.edu/business/farm/marketing>
- Fibershed <http://www.fibershed.com/education/>
- Ag Classroom http://www.agclassroom.org/gan/pdf/inst_unit.pdf
- Energy Providers Coalition for Education (EPCE), <https://epceonline.org>, Online Energy Education – Designed by industry for industry
- CAEL, <https://www.cael.org> Aligning learning and work

To get an idea about a particular career, companies and industry associations create videos that quickly summarize relevant information. An example for the plastics thermoforming industry

can be seen at: <https://www.youtube.com/watch?v=LYfzl8eciG8>, How the Thermoforming Process Works? – Factories, July 2020.

Entrepreneurial Curriculum

Discipline 1 – Introduction to economics. Consider using *Basic Economics*, 2nd ed., by Clarence Carson, American Textbook Committee, 2003.

Discipline 2 – Study abridged version of Adam Smith’s *Wealth of Nations* (this will also contribute to the student’s understanding of history since Smith references a great deal of Western economic history). This will lay the foundation of a free-market economy and will contribute to our understanding of why too much government intervention based on the Statist approach we labor under does more harm to the economy, and the vast majority of citizens, than with the free-market approach.²⁷

Discipline 3 – Microeconomics: This course will have less focus on academic concepts and more on what citizens and businessmen really need to know. As with all other subjects, this is not to be taught as though the student will pursue an economic career. It is to be for utilitarian purposes, as though the student will someday become the owner or manager of a company in need of an understanding of economic principles; and the student is to be prepared for full citizenship in a free republic that demands a command of the contemporaneous issues so that politicians will have difficulty in misleading constituents with promises and bribes – i.e., “Vote for me and I’ll take from others and give to you.”

Subjects that will be covered are: the usefulness of economic graphs, political policies and their effects on the economy, supply and demand, specialization and comparative advantage, price formation, the market process, economic role of government in a free society, taxation in a free society, economics of crime, economics of education, ceilings and price floors, the failure of regulation in the health care industry as it relates to exponential rising costs, economic systems (capitalism, statism, socialism, communism, and comparison of these systems), elasticity, the effects of trade unions under various political philosophy perspectives (e.g. collectivist protectionism versus free association and the effects immigration has on wages), efficiencies, the cost of production and profits, competition, monopoly & oligopoly, structure of industries, regulations, labor markets, investment in human capital, productivity, rent & interest, income distribution, market or government failure, the welfare state, and international trade. See *Principles of Microeconomics*, by Amacher & Ulbrich, South-Western Publishing, 1989 as an example.

²⁷ Regulation based on the free-market approach is designed strictly as a means to prevent property and liberty from being used irresponsibly which might cause a public nuisance or injury of some sort, such as public health and safety concerns for example. The Court case *Commonwealth v Alger*, Supreme Judicial Court of Massachusetts, 61 Mass. 53 (1851), expressed perfectly the purpose of regulations in a free society. The court stated “We think it is a settled principle, growing out of the nature of well-ordered civil society, that every holder of property, however absolute and unqualified may be his title, holds it under the implied liability that his use of it may be so regulated, that it shall not be injurious to the equal enjoyment of others having an equal right to the enjoyment of their property, nor injurious to the rights of the community.” This is the fundamental position of Adam Smith in his *Wealth of Nations* treatise. *Laissez faire* was never a political philosophy of anarchy as the collectivists have very effectively, but incorrectly, asserted.

Case studies of consequences of war, plagues, natural catastrophes, and famines must be an important contribution to this discipline. The bubonic plagues, catastrophic volcanic eruptions, and 1845-52 Irish Potato Famine are examples. We need to address their causes and consequences in order to show how we can avoid them or mitigate their effects.

Discipline 4 – Austrian School of Economics (utilize the Van Mises Institute course developed by Professor Murphy of Hillsdale College).

Discipline 5 – Introduction to Business: Content will include goods & services producing firms, the role of profit, private vs. government enterprises, brief history of American business (colonial, Industrial Revolution, and modern industry), ownership types (sole proprietorship, partnership, franchises, and joint venture), business combinations (acquisition, merger, amalgamation or consolidation), corporation, nonprofits, management functions (planning, organizing, staffing, directing, and controlling), starting a business, creating an organization, human resource management, compensation, safety regulations, business law and regulation, managing people, labor relations, producing the product or service, marketing, distribution & pricing strategy, financial & accounting management, risk & insurance, gathering & processing data, international business, business cycles, and business ethics. See *Introduction to Business*, by Straub & Attner, PWS-Kent Publishing, 1988 as an example.

Discipline 6 – Marketing Management: Course content will include marketing role in society, marketing planning (forecasting, development, and information systems), buyer behavior & market segmentation, product & service strategy (product mix decisions & new-product development), pricing strategy, distribution strategy, and promotional strategy. See *Contemporary Marketing*, by Boone & Kurtz, The Dryden Press, 1989 as an example.

Discipline 7 – Financial Management: Americans are extremely weak in this area, yet it is critical to understand financial structures in order to achieve some measure of success. Once again, this is to be taught for citizenship or an entrepreneur or manager, not for a financial manager. In other words, rather than knowing how to prepare financial documents, individuals must know how to interpret and use such information. Course content will include scope of financial management, goals of firm, framework for financial management, financial statements & their analysis, financial planning & forecasting, the role of accounting, taxation, the banking system & how to use it, time value of money, valuation, risk & the rate of return, working capital management, cash & marketable securities, accounts receivable management, inventory management, short term financing, the cost of capital, financial structure decisions, stocks, long term debt, and bankruptcy. See *Fundamentals of Financial Management: 5th Concise Edition*, Brigham & Houston, Thomson South-Western, 2007 as an example. In their preface, the authors provide a perspective that expresses our intent of what should be taught and how much should be taught. It is the proper philosophical approach that educational systems should pursue for all education not designed for a particular career. In it the authors begin with stating “*Fundamentals* ... became the leading undergraduate finance text, and it has maintained that position ever since.” Perhaps the reason for this is due to their philosophical approach to what and how to teach. They provide: “Students sometimes find finance relatively abstract [*which is true of most academic subjects*], and they don’t see its relevance to them [*also true of how many high school students feel toward academic subject matter*]. This makes it difficult for professors to get

students to do the work necessary to see just how interesting and relevant it really is.” The authors “took a number of steps to alleviate this problem:

- “Increased Student interest. Students learn a subject best if they find it interesting, so we need to get them excited about finance....
- Provided clear explanations. Students justifiably become frustrated and lose interest if a subject is not explained clearly.... [T]hese changes will help students learn more in less time, which will reduce their stress and thus increase their interest and comprehension.
- Provided timely within-chapter self-tests [*“self-tests,” rather than graded tests, make more sense in most cases*]. Much of finance involves numerical problems, so students must learn a concept, then become familiar with formulas, and then learn how to apply the formulas to solve specific problems.... [*This must be coupled with math instruction. However, the authors might be entering financial career preparation here, which would be inappropriate for a general education at the secondary level.*]
- Improved the Test Bank. ... They will then see that if they work hard and learn how to solve the various types of problems, they will have a good grasp of finance and, consequently, should do well on exams that consist primarily of straightforward (easy and intermediate) problems. Most instructors also use a few ‘challenging’ exam problems.... [*Our approach to exams may be at odds with what the authors are addressing. This will require critical analysis.*]
- Coordinated the text, problems, and Test Bank. Students should be rewarded for their efforts, and they become frustrated if they study hard, learn how to answer most of the problems in the text, and then face an exam where the problems are different from what they have been studying....” [*This is a serious problem in much of academia. It marginalizes many for the mistakes of curriculum designers and exam writers. It is a dichotomy that these designers and writers are given a pass while students are penalized given the fact that these academics are theoretically supposed to be assessing students’ abilities when the academics’ abilities are insufficient for assessment purposes. This is why a portfolio of students’ applied work makes more sense to determine abilities than utilizing assessment tests that have no relation to the real world yet do tremendous harm to a majority of people. A portfolio can be reviewed by anyone who may have a need for it. While one person may give a “failing grade” to a student’s work, another person may see real genius there. Assessment exams are incapable of offering this real-world analysis.*]

Under the section *Relationship to Fundamentals*, in the preface the authors provide: “When we first created *Concise*, we debated streamlining the book by covering all the topics in less depth versus covering fewer topics but maintaining the depth and rigor of *Fundamentals*. We chose to retain the depth and level while eliminating some less essential topics. **While the omitted topics are interesting and important, they are not critical for students who do not plan to major in finance, and finance majors will study them anyway in subsequent courses.**” (Emphasis added.) This last sentence is critical to all courses the applied studies program will entail. This must be understood as a first principle in development of all middle and high school curriculum!

Brigham & Houston point out why studying financial management is important: “A good working knowledge of finance is essential for success in business, regardless of one’s specific job, because everything from marketing to human services is related to financial issues. This

makes it important for anyone who plans to work in business to learn the fundamentals of finance.” In addition, if, through natural forces, we hope to achieve greater economic equity in our society, financial management and investment is critical to this end. Therefore, this subject needs to be elevated to one of the top priorities in secondary schooling. See *The Ascent of Money: A Financial History of the World*, Niall Ferguson, The Penguin Press, 2008, pp. 10-12 which describes the lack of financial education in the Western hemisphere and the resultant negative effect on the undereducated. If we are to elevate the lower income earners into the middle classes or higher, students must have a grounding in financial management. This requires that various curriculum be designed for the various learning abilities of people.

Ferguson provides: “Back in 1970 only around 5% of the men graduating from Harvard, where I teach, went into finance. By 1990 that figure had risen to 15%. Last year the proportion was even higher. According to the *Harvard Crimson*, more than 20% of the men in the class of 2007, and 10% of the women, expected their first jobs to be at banks. And who could blame them? In recent years, the pay packages in finance have been nearly three times the salaries earned by Ivy League graduates in other sectors of the economy.” (p. 5)

Ferguson also offers insight into the level of financial ignorance Western cultures experience:

It is a well-established fact ... that a substantial proportion of the general public in the English-speaking world is ignorant of finance. [In a] 2007 survey ... [m]ore than half of the respondents said they had learned ‘not too much’ or ‘nothing at all’ about financial issues at school. A 2008 survey revealed that two thirds of Americans did not understand how compound interest worked. In one survey conducted by researchers at the University of Buffalo’s School of Management, a typical group of high school seniors scored just 52% in response to a set of questions about personal finance and economics. Only 14% understood that stocks would tend to generate a higher return over eighteen years than a U.S. government bond. Less than 23% knew that income tax is charged on the interest earned from a savings account if the account holder’s income is high enough. Fully 59% did not know the difference between a company pension, Social Security and a 401(k) plan. ... Politicians, central bankers and businessmen regularly lament the extent of public ignorance about money, and with good reason. A society that expects most individuals to take responsibility for the management of their own expenditure and income after tax, that expects most adults to own their own homes and that leaves it to the individual to determine how much to save for retirement and whether or not to take out health insurance, is surely storing up trouble for the future by leaving its citizens so ill-equipped to make wise financial decisions. (pp. 10-12)

Financial studies should take place the last two years of high school since it is more complicated than other study areas, and previous studies will add to a knowledge base that will provide greater comprehension of finance. In addition, the closer the time between studying finance and applying it in one’s life in the working world, the easier it will be for individuals to transfer it.

The U.S. expends a tremendous amount of resources on the “pure” sciences and academic math. However, only a small percentage of the population pursues a career in science or math. On the other hand, everyone is faced with financial decisions throughout their adult life. We appear to have our priorities reversed. This needs to be addressed in the applied studies program.

Science, Technology, and Engineering Curriculum

This curriculum should avoid the contemporary mistake of separating science and technology as if there is little to no relationship, which is due to much of academia's disdain for application.

The National Academies of Science (2012), Chapter 8, Disciplinary Core Ideas – Engineering, Technology, and Applications of Science (pp. 201-14) provides a good analysis of what a proper science curriculum should entail. Keep in mind, their analyses should also be used for political, legal and regulatory considerations. For example, they state: “Engineering design: The engineering design process begins with the identification of a problem to solve and the specification of clear goals, or criteria, that the final product or system must meet.” Whereas in politics, law, and regulation, a great deal of energy is expended on emotions, fear and opinion grounded in ignorance. STEM provides the template that may help guide social decision-making processes which will improve society and minimize the destruction by factions.

In his Conclusion, White (2003) discusses the interconnectedness of science and technology:

It is very easy for the modern citizen of a technologically dependent society to assume that the social structure and human interactions are being driven by the unfettered, and often unintentional, consequences of a spiral of accelerating technological developments. Likewise, it has become fashionable for warnings of the potential evils of technology to be screamed from the pages of prophetic socio-political novels and science fiction films. However, on the contrary, a careful study of the history of technology shows that, rather than it being the driver of society, indeed society's values, motivations, beliefs, and worldview drive and shape the evolution of technology.²⁸ Also, it is common to find abstract science standing on the shoulders of historical techniques and technological innovation.²⁹ This has been the case since the earliest of recorded history.

Though one might argue for the theoretical neutrality of science as pure abstract knowledge, it is clear that technology or technique, upon which science is built, is never neutral. From its earliest uses in the advanced civilizations of Mesopotamia, Egypt, India, China, Greece, Rome, and Mesoamerica, through its applications by Medieval Arabs and Europeans, through its acceleration from scientific developments of the Renaissance, Industrial Age, and the modern Information Age, technology has been the servant of human needs, desires, intents, and actions. Technology's potential to address human needs and motivations is a function of the state of earlier technologies accelerated by the sum of a civilization's social values, which are in turn functions of society's worldview.

²⁸ However, as of 2021, one may argue that the internet allows social media and platforms like Google, to purposefully and in some cases maliciously, influence culture quite dramatically. It is probably reasonable to conclude that, as it relates to these forces, it is a two-way street.

²⁹ White's footnote provides, “There are intimate relationships between science and technology; yet science is not technology and technology is not science. Technology relies very heavily upon basic scientific knowledge in addition to existing technologies. There is also a strong influence in the reverse direction. Modern science relies to a large extent upon current technology as well as prior scientific knowledge. Science and technology reinforce each other by complex interactions. Each one, science or technology, can build upon itself or upon a linkage from one to the other. Indeed, science is not technology and technology is not science, but they are firmly interrelated. One could not exist in modern society without the other.”

What we know, i.e., scientific knowledge, and what we don't know but try to explain, i.e., belief systems, form the worldview.

As ancient Egypt shows us, the technology of monumental construction, calculation, record keeping, and organization, and especially what society does with these techniques, is a matter of cultural values and societal choice. In the Egyptians' case, the cultural values centered on religion and the societal choice was one of maintaining an idealized world.

Traditionally, technology as a trial-and-error art is thought to have developed separately from science as an abstract discipline throughout most of recorded history. As seen in Egypt, the practical techniques of arithmetic can be used for organizing labor and trade, geometry can be used for construction, and astronomical observation can be used to produce calendars and the determination of ideal planting cycles. In this sense, it can be sometimes viewed as applied science. Yet, from the ancient Egyptians until modern times, much of technique continues to be developed with little or no basic scientific knowledge. As McClellan and Dorn cite, "...in many instances technology directed the development of science, rather than the other way around" (McClellan 2). One can certainly see the links in the case of Egypt, where accounting techniques led to a mathematical system, which when combined with the observational impetus provided by religion, led to documentation of general rules that were precursors to engineering as a profession.

If one accepts this as true, then by extrapolation, modern society's technological prowess owes its birth to the religious motivations that drove ancient Egyptian engineering and science, and the subsequent abstract thinking that its culture fostered.

Due to the negative influence of the relativistic Postmodern movement – currently in vogue amongst academics whose philosophy can only be explained as one rooted in irrationality – it is useful to point out how such views manifest themselves. Pierre Simon Marquis de Laplace (Laplace is considered one of the great mathematicians of history, and is identified as the French Isaac Newton) starts off the second chapter of his *A Philosophical Essay on Probabilities* with words of wisdom that reveal man's shortcomings in regards to knowledge. However, if we take it one step further and see the arrogance of some people when they assert that because *something* is not known (by them), then it means there is an absence of that *something*.³⁰

ALL events, even those which on account of their insignificance do not seem to follow the great laws of nature, are a result of It just as necessarily as the revolutions of the sun. In ignorance of the ties which unite such events to the entire system of the universe, they have been made to depend upon final causes or upon hazard, according as they occur and

³⁰ I remember when I had a fascination with acupuncture in the 1970s, Western doctors frequently referred to it as voodoo. Their attitude was: "Since I didn't learn this in medical school and since there is no proof of how it works, it must therefore perform by placebo effect." This has since been demonstrated to be untrue. Perhaps this is an example of White's conclusion that technology comes first through trial and error, and the underlying abstract science that attempts to explain the technology follows thereafter. However, we have not yet fully arrived at an explanation of how acupuncture works; that is, we see a correlation between treatments and responses (but that do not fall within placebo calculations) without understanding causation.

are repeated with regularity, or appear without regard to order; but these imaginary causes have gradually receded with the widening bounds of knowledge and disappear entirely before sound philosophy, which sees in them only the expression of our ignorance of the true causes.

Present events are connected with preceding ones by a tie based upon the evident principle that a thing cannot occur without a cause which produces it. (p. 3)

This is useful in starting this section since his statement is the foundation in man's pursuit of knowledge – in both the physical and social sciences.

Discipline 1 – Applied Physics (Laboratory Science): course content might cover: measurement & graphic methods, mechanics, mechanical properties of matter, heat & thermodynamics, wave motion & sound, light & optics, and electricity & magnetism. See *Introductory Applied Physics* by Harris & Hemmerling, McGraw-Hill, 1980 as a model text. Another example of a useful program of physics is *Physics of the Household*³¹, by Carleton J. Lynde, The MacMillian Co., 1917 to be used in conjunction with *A Laboratory Course in Physics of the Household*³², 1922. This pair of books is based on teaching physics from an applied education perspective.

In his prefaces, Lynde explains his strategy for using household appliances to teach physics:

This is an elementary textbook of physics....

The writer believes that we teach physics to young students for these reasons: first, that they may obtain knowledge of the physical world about them; and second, that they may gain, through this knowledge, the power to control the forces of nature for their own benefit, and for the benefit of others. In other words, we wish them to acquire knowledge which they will use in everyday life.

The reason for using illustrations taken from household appliances known to the students is obvious. It is good pedagogy to lead from the known to the unknown, and to illustrate the unknown by means of the known. This is the method followed in this book.

In his *Laboratory* preface, Lynde explains:

There are three reasons why familiar apparatus ... is used. If the student uses apparatus with which he is familiar, he finds that he can make experiments at home and he learns that an experiment may be made when and where information is desired; whereas, if he uses only the apparatus commonly found in a school, he is likely to get the impression that an experiment is something to be made only in the school laboratory. ... Also the familiar apparatus is cheap and easy to obtain.

³¹ <https://ia802708.us.archive.org/32/items/physicshousehol00lyndgoog/physicshousehol00lyndgoog.pdf>

³² <https://ia801405.us.archive.org/17/items/laboratoryphysic00lyndrich/laboratoryphysic00lyndrich.pdf>

The reason for encouraging the student to set up a laboratory at home is obvious. If he plans his own experiments on a given subject and then makes these experiments, he gets a firmer grasp of the subject than if he makes only the experiments in school.

Discipline 2 – Applied Chemistry (Laboratory Science): course content might cover: sources of energy, solid fuels, crude oil, liquid fuels, gaseous fuels, nuclear energy, lubrication & lubricants, electrochemistry, corrosion, polymers & plastics, adhesives & adhesion, paint & coatings, water, cement, ceramics, composites, viscosity, and surface chemistry. See *Applied Chemistry: A Textbook for Engineers & Technologists* by H.D. Gesser, Kluwer Academic/Plenum Publishers, 2002.

Discipline 3 – Applied Life & Earth Sciences (Laboratory Science): health & medicine,³³ wildlife biology (look to wildlife management programs that promote sustainable harvest as a template), ethnobotany, geology,³⁴ topography, astronomy (for navigation and agriculture) and meteorology.

Discipline 4 – Introduction to Engineering Fields: e.g., aerospace, marine, mechanical, manufacturing/industrial/production, electronic, electrical, chemical, extraction & processing, materials science, civil, architectural, etc.

Discipline 5 – The History & Evolution of Science and Technology: This course is designed to introduce students to the challenges man has faced and how he has dealt with them – both in his failures and successes. This course is to provide a multitude of examples in troubleshooting, reasoning and innovation. Man is always faced with challenges; how he deals with them determines his future prospects. Experimental archeology provides research that could prove very useful in incorporating lessons that were learned in history.

When teaching principles of science, use a variety of circumstances or conditions as the bases of teaching principles and theories. In this way, students see how the various principles and theories affect each circumstance from a different perspective. For example, the conditions within a combustion chamber of an engine has various circumstances occurring simultaneously: chemical reactions; thermodynamics; motion; transfer of forces; tribology; metallurgical behavior; etc. Teaching principles of each area in this given circumstance will broaden students understanding as it relates to breadth and depth of the subject – the basis of transfer.

A human condition that is part of our nature that requires attention in all aspects of education, can be emphasized in the history of technological innovation. The condition is called *groupthink* (a subcategory under *unnecessary constraints*). Wikipedia (in its explanation of *Problem Solving*) describes it as follows:

Groupthink, or taking on the mindset of the rest of the group members, can act as an unnecessary constraint while trying to solve problems. This is due to the fact that with everybody thinking the same thing, stopping on the same conclusions, and inhibiting themselves to think beyond this. This is very common, but the most well-known example

³³ Consider [Functional Medicine](#) with its wholistic approach to instruct in interconnectedness of systems.

³⁴ See Ries, H., *Economic Geology*, John Wiley & Sons, 1942 for a good template.

of this barrier making itself present is in the famous example of the dot problem. In this example, there are nine dots lying on a grid three dots across and three dots running up and down. The solver is then asked to draw no more than four lines, without lifting their pen or pencil from the paper. This series of lines should connect all of the dots on the paper. Then, what typically happens is the subject creates an assumption in their mind that they must connect the dots without letting his pen or pencil go outside of the square of dots. Standardized procedures like this can often bring mentally invented constraints of this kind, and researchers have found a 0% correct solution rate in the time allotted for the task to be completed. The imposed constraint inhibits the solver to think beyond the bounds of the dots. It is from this phenomenon that the expression “think outside the box” is derived.

Since our educational system demands compliance and obedience from students and to follow orders/instructions explicitly, bordering on a militaristic culture, thinking outside the box is downright prohibited. When exposed to this culture for 12 or more years, the human mind becomes conditioned to thinking only within the box that has been created by others. This must end in a free society such as ours.

In Wikipedia’s explanation of *Problem Solving*, they also cover *mental set* and *functional fixedness*, which are two other negative conditions that our educational system contributes to, or does not teach how to overcome. Go to their website to see these descriptions:
https://en.wikipedia.org/wiki/Problem_solving

History & Civics Curriculum

Spencer (1860) discusses choosing what should be included in history instruction. He argues against the all-pervasive “names, dates, and events” data that wastes students’ time, but which, it is argued by some, is interesting. He points out there are many interesting things available for study but this does not warrant the inclusion of such information if it has no bearing on usefulness in the lives of individuals as citizens in a civil society. He states that if it is not useful, “then it must be admitted that the liking felt for certain classes of historical facts is no proof of their worth; and that we must test their worth as we test the worth of other facts, by asking to what uses they are applicable.” (p. 58) He asserts that historical, unorganizable “facts from which no conclusions can be drawn ... can be of no service in establishing principles of conduct, which is the chief use of facts. Read them, if you like, for amusement; but do not flatter yourself they are instructive.” (p. 59) This section of Spencer’s work provides good explanations of what history should cover.

As it relates to civics instruction, Spencer has this to say:

It may ... be argued with much reason, that as in a nation so in a family, the kind of government is ... about as good as the general state of human nature permits it to be. It may be said that ... the average character of the people determines the quality of the control exercised. It may be inferred that in both cases amelioration of the average character leads to an amelioration of system; and further, that **were it possible to**

ameliorate the system without the average character being first ameliorated, evil, rather than good, would follow. (pp. 178-79, Emphasis added.)

We see the truth of this statement in the current state of affairs whereby government authority is used in attempt to force society to be good, in some abstract, theological, Statist fantasy, while ignoring the role citizens play in improving society. The result of which are evil effects; where tribal type of brutality dominates rather than civility through union.

Without virtuous citizens, we cannot have a virtuous society, but this understanding has been lost by the Statists who believe utopia is right around the corner, if only we would listen to them.

Spencer continues:

[T]hough pure rectitude may be at present impracticable, it is requisite to know where the right lies, so that the changes we make may be *toward* the right instead of *away* from it... We need fear no evil consequences from the maintenance of such an ideal. On the average the constitutional conservatism of mankind is always strong enough to prevent a too rapid a change. So admirable are the arrangements of things that until men have grown up to the level of a higher belief, they cannot receive it: nominally, they may hold it, but not virtually. And even when the truth gets recognized, the obstacles to conformity with it are so persistent as to outlive the patience of philanthropists and even philosophers. (p. 181, emphasis added)

In addressing the subject of history, Montaigne (1580) discussed what we currently refer to as *the great conversation* where, as he puts it, we “converse with the great and heroic souls of the best ages.” Of course, this was when they read primary sources as opposed to interpretations provided for in modern-day textbooks.

Montaigne states:

[L]et my [teacher] remember to what end his instructions are principally directed, and that he do not so much imprint in his pupil’s memory the date of the ruin of Carthage, as the manners of Hannibal and Scipio; nor so much where Marcellus died, as why it was unworthy of his duty that he died there. Let him not teach him so much the narrative parts of history as to judge them.... Plutarch had rather we should applaud his judgment than commend his knowledge.

Contemporary historians have flipped this on its head. We teach the narrative exclusively but with no judgment, no discernment to grow and learn from. The very purpose of learning history is extinguished. If we are unable to rectify what history instruction has degraded into, it would be wise to simply dispose of it since it no longer serves any purpose but to provide jobs to historians.

Herodotus (c. 484-425 BC) – the father of history as we currently understand it – used history as a context in which to understand human behavior and human character and to provide examples of what attains the best results in human actions. He did this by analyzing the combination of historical events with mythical/religious contemporaneous perspectives. He looked for cause and

effect and used the tools of his day to find them. While we do not subscribe to Greek mythological perspectives, both mythology and theology need to be understood as systems used to explain the causes of inadequately understood circumstances and events. And by analyzing them, we may better know how to judge historical events and players and learn by them in our effort to achieve harmony in the world as best we can.

Since man cannot answer vexing questions, such as one's destiny for example, due to a lack of empirical evidence being at his disposal, it has typically proven convenient to attempt to correlate questions and answers to mythological contexts. Consequently, such perspectives eventually lead to questions of morality. Through an analysis of history, Herodotus was seeking an understanding of cause and effect as it relates to morality. That is, human actions lead to consequences and from these, we can better understand virtue in contrast to vice grounded in intent – intent being central since it was understood by ancient Greeks, best articulated by Aristotle, that a bad man cannot do good things other than by accident.

Myths are symbolic in what they are attempting to identify. For example: Noah and the Ark may be better understood if we place Noah in the time of the great glacial melt off, where there were glacial dams holding back huge glacial lakes. When such dams broke – perhaps due to heavy precipitation – epic floods occurred of cataclysmic proportions. Whether the person we currently identify as Noah – if he was an actual person – understood these forces, cannot be known, but we know that later interpretations of this event are couched in mythological stories beginning with the *Epic of Gilgamesh*. Did Noah actually exist? We cannot know, but we do know that such floods occurred when glacial dams gave way; therefore, myths of cataclysmic floods are, in all likelihood, grounded in some truth.

Another approach to better understanding mythological and factual combinations used by Herodotus can be found in Wikipedia's explanation of him:

Herodotus attributes cause to both divine and human agents. These are not perceived as mutually exclusive, but rather mutually interconnected. ... Gould notes that invoking the supernatural in order to explain an event does not answer the question "why did this happen?" but rather "why did this happen to me?" By way of example, faulty craftsmanship is the human cause for a house collapsing. However, divine will is the reason that the house collapses at the particular moment when I am inside. It was the will of the gods that the house collapsed while a particular individual was within it, whereas it was the cause of man that the house had a weak structure and was prone to falling.

This is certainly a very interesting perspective. Taken to its logical conclusion, it would have applied to reasons why some people have it easy while others have more challenges in life. In other words, the gods would have willed it for various reasons, whether it was for rewards or punishments, or for lessons needing to be learned. Such a perspective argues for taking responsibility for one's own life and for the lives under one's care, such as children, and to look less to others to pay for our own foolish choices.

... As James Romm has written, Herodotus worked under a common ancient Greek cultural assumption that the way events are remembered and retold (e.g., in myths or legends) produces a valid kind of understanding, even when this retelling is not entirely

factual. For Herodotus, then, it takes both myth and history to produce truthful understanding.³⁵

We find this in so many ancient cultures. Perhaps we should look at myths as analogies – the most useful method of instruction when empirical evidence or experience is unavailable – that help get a point across rather than as an alleged explanation of actual events. With such a perspective, contemporary prejudices that condemn myths and thereby completely ignore them, can be discarded due to the ignorance displayed by such closed-minded perspectives. We can then look for meaning through analogous understanding; and there is much wisdom in myths that are currently ignored to our detriment.

Jordon Peterson delves deep into myths and the archetypical subjects addressed in meta-stories. There is no one source of Peterson's to cite; his lectures are jam packed with historical analysis and wisdom. Peterson's lectures need to be combed through and incorporated in a historical program of study.

* * *

Quick (1894) makes an astute observation on the interpretation, or should I say, misinterpretation of history by many:

[W]e are too apt to read into words, meanings derived from controversies unknown at the time when the words were uttered. This is a well-known fact in the history of religious thought. We must always consider not merely the words used but the time when they were used. What a man might say quite naturally and orthodoxly at one period would be sufficient to convict him of sympathizing with some terrible heresy if uttered half a century later.³⁶ We find something like this in the history of education. If anyone nowadays speaks of the pleasure with which as a young man he read Tacitus, he is understood to mean that he is opposed to the introduction of "modern studies" into the school-room. If on the other hand he extols botany, or regrets that he never learned chemistry, this is taken for an assault on classical instruction. But, of course, no such inference could be drawn if we went back to a time when the antithesis between classics and natural science had not been accentuated. In many other instances we have to be on our guard against forcing into language meaning which belongs rather to a later date. (pp. 232-33)

This is something almost absent from the minds of many contemporary academics. They load the past with all kinds of contemporary political baggage that is totally out of place.

Regarding the utilization of judgment when analyzing history: There is a place for judging the past, such as Edward Gibbon exemplifies in his *The Decline and Fall of the Roman Empire* where he condemns the actions of Roman tyrants, but it also needs to be tempered with an understanding of the times. While some of the Roman tyrants were bloodthirsty maniacs with no room for our respect of their actions, people like Charlemagne and Mohammed executed

³⁵ <https://en.wikipedia.org/wiki/Herodotus>

³⁶ Compare this to the hypersensitive issues of today. If one criticizes a feminist or racial political position, heresy is the appropriate word that describes what the individual will be accused of regardless of the truth the position reveals.

innumerable people – who would not follow the State dictated religion they asserted – in order to bring law and order to a depraved populace. While we contemporaries might condemn the actions of these two men, we might have thought differently had we lived in their times when cruel barbarism was rampant throughout the masses. Christianity and Islam pursued the taming of the beast within men, and once barbarism was marginalized as an unacceptable cultural perspective, such extreme tactics practiced by these two men could be abandoned.

Discipline 1 – History of Civilization: from the Fertile Crescent to the institutionalization of statism in Europe and America; ending with a note on how statism led to the terror of the 20th century (see *Utopia & Terror in the 20th Century*, lectures by V. G. Liulevicius, The Teaching Co., 2003).

Discipline 2 – Greek & Roman Political Thought. See *The Political Ideas of the Greeks*, by John L. Myres, Greenwood Press, New York, 1968 as an example.

Discipline 3 – Abridged version of *The Decline & Fall of the Roman Empire* by Gibbon (some contemporary advances in our understanding of Roman history could be incorporated where needed).

Discipline 4 – Abridged version of *The History of England* by David Hume, accompanied by historical information post Hume up to early 20th century when the voting franchise was finally established for all. The Teaching Company has several excellent lecture series on the subject.

Discipline 5 – U.S. History utilizing Clarence Carson’s U.S. History series published by American Textbook Committee.

Discipline 6 – American government and constitution course. Use *Basic American Government* by Clarence Carson, published by American Textbook Committee. (Note: The use of Carson’s works is to make corrections to the dominant revisionist history books presently used in the public educational system.)

Discipline 7 – Compendium of Natural Law philosophers’ works: Grotius, Pufendorf, Lock, Montesquieu, Cumberland, Burlamaqui, Kames, Carmichael, Hutcheson, Vattel, De Lolme, Millar, Paine, and Tocqueville. See Liberty Fund for access to these books. Spencer (1860, pp.182-87) gives an excellent account of the foundation of Natural Law concepts.

Discipline 8 – Political Philosophy will teach the different forms of government and their level of success. The standard of living will be a bench mark, but in addition, the directional flow of immigration and the effects massive levels of immigration has on the standard of living for those who must compete with the immigrants; the level of philanthropy and what influences philanthropy; availability and level of consumption of consumer goods; the quality of a nation’s infrastructure; innovation of technology, including medical technology; extent of a regulatory police state; opportunity to advance economically and politically (i.e. elimination of class barriers); freedom of movement; freedom of choice; protection of property rights; security from government interference when there is no disturbance of the peace, health, safety, or security issues at stake (i.e. public welfare issues); the use and consequences of child labor laws; availability of education; level of hunger and starvation; consequence of political dissent; level of corruption; support for the arts from the private sector; freedom of speech and religion; right

to bear arms; freedom of contract and association; etc. Discuss how the U.S. has adopted different aspects of different forms of government that have substantially deviated from our Founding principles; where these have come from and their effects on particular segments of society.

Turnbull (1742) provided the following reasons and approach to teaching history:

But the tutors of youth in those days did not satisfy themselves with making general panegyrics³⁷ upon this or the other form of free government, but taught their pupils to attend carefully to the various changes different forms of government had passed through, and to distinguish the internal and the external causes of such revolutions. From such masters had Polybius learned to do more than pass right judgments upon the past, that is, to foresee changes and revolutions yet hid in their causes, and to foretell them as ... he did with respect to Rome, at a very considerable distance of time before ... the fatal change of government sprung, began to develop themselves, and shew [sic] their direful prognostics.... This foresight into distant times has nature granted to us, i.e. put within our power to acquire, if we will apply ourselves to get it by looking carefully into history. For perhaps the moon and planets are not more regular in their motions, to the eyes of an astronomer, than human affairs are to those, who being conversant in ancient history, know how to discern futurity [from] the past, in consequence of the likeness of man to man, and of the sameness of human nature in all ages, i.e. the sameness or likeness of causes in moral productions and events. This is true political wisdom. And this wisdom were youth early taught how to learn from history, and the comparison of times and events – “Such circumstances happened at a certain period, and such was the successful expedient or cure, or such was the fatal mistake and misapplication, and such were its direful consequences; and when these or the like circumstances shall again concur, the effects will be nearly the same.” This was a lesson duly inculcated by ancient preceptors upon their pupils from history and experience, so soon as they had imbibed just notions of the end of government, the design of magistracy and laws, and of the true grandeur and happiness of man, and of society ... ; and by this means a clear idea of internal security in a civil constitution against mal-administration, by a just division and balance of power. (pp. 87-88)

A word of caution in taking the interpretation of history by historians too seriously:

The history of education is particularly susceptible to influence from wider intellectual, philosophical and political movements; scholars have been tempted to justify their own intellectual formation by applauding or condemning the educational attitudes and assumptions of previous epochs. Historians have normally been university teachers and involvement in present-day educational issues has encouraged a tendency to see their own situation and ideals in past structures of learning. Justifications and critiques, derived from contemporary educational preoccupations, have frequently been imposed onto the remote past. (Black, 2001)

³⁷ A public speech or published text in praise of someone or something.

Government policies, such as those that provided for the Commercial, Financial, Agricultural, and Industrial Revolutions in England, need to be analyzed extensively to demonstrate good and bad policies and their repercussions. The policies of the Tudor monarchs Henry VII and Henry VIII – where they tamed the military oriented nobility of Britain, thereby turning the nobility’s energies to intellectual pursuits which helped influence the Age of Reason/Enlightenment – provides an excellent example of social progress, even when done under less than perfect intentions.

To close this section, I would like to cite Levine and Ginsberg’s (2017) essay on civics. The title provides insight into the social problems the essay addresses: *The Republic is (Still) at Risk – and Civics is Part of the Solution*. They reveal the degradation of civic engagement in the U.S. and the dire consequences this is having on the United States’ republican system of government.

Civic learning is an essential part of the solution. In a society characterized by weak civic institutions, balkanized public discourse, and profoundly unequal civic engagement³⁸, schools can offer all young people opportunities to learn fundamental facts and skills, engage with each other and with their communities, and develop dispositions and values supportive of a republican form of government. (p. 3)

The term “civic desert” is used by the authors to describe the condition many in contemporary society find themselves – a continuing trend not likely to subside unless the American community invests in the effort to reverse it. This is not a matter to be taken lightly. The unwillingness of many to accept the Trump election as legitimate is a harbinger of the end of a peaceful transfer of executive power. The consequence is likely to result in the disunion of the country through violent conflict. The American “experiment” of individual liberty and self-government is about to experience its third major test of a constitutional republic’s ability to long endure – the first being the division between the Federalists and Republicans shortly after the Founding; the second being the Civil War. If we do nothing, disunion appears to be inevitable given the hatred observed between political parties. The photos below, which have been circulating in social media, is an attempt to demonstrate this.

Peterson (interview on April 2019, published on Feb. 2, 2020, at 1 hour, 12 minutes, 30 seconds into the interview) explains what the “higher” in “higher education” means. Amongst various very important issues that are addressed throughout the interview, Peterson speaks to the importance of history in discovering “who you are, and you’re a historical creature. You are a socially constructed being in many ways. You’re a product of history and so you need to understand history because history is about you! The great corpus of civilized works is your autobiography. And so if you’re ignorant of it, you don’t know who you are or where you are and so how can you orient yourself in the world without that knowledge. You have a map but you have no idea where you are located on it and so you’re disoriented. And so I always tell my students when we talk about anything that’s of historical import is, why study history is that history is you. The Nazis ... they were you; the Jews in Auschwitz ... they were you. This is about you, and the less you know about you, the less armored you are for the world, and you better be armored for the world because the world is a very rough place. It’s a place of sorrow

³⁸ The inequities are due in large part to academia’s monopolistic power and control over credentials – the gateway to opportunity and positions of authority – without which, marginalization is mandated.

and suffering and malevolence. And the less prepared you are for that, the worse for you and for everyone else, so you better wake up. People understand that when put it that way.”



History demonstrates that what these photos symbolize is a fairly good, though simplistic, account of the evolution of civilizations (granted, over a much longer period of time) as Carroll Quigley explains in his book by the same name.³⁹

Math Curriculum

Rather than instructing students in predominately disconnected abstract concepts and principles (in contrast to applied axioms), this program should apply math in a utilitarian manner first and supported by theory where necessary.⁴⁰

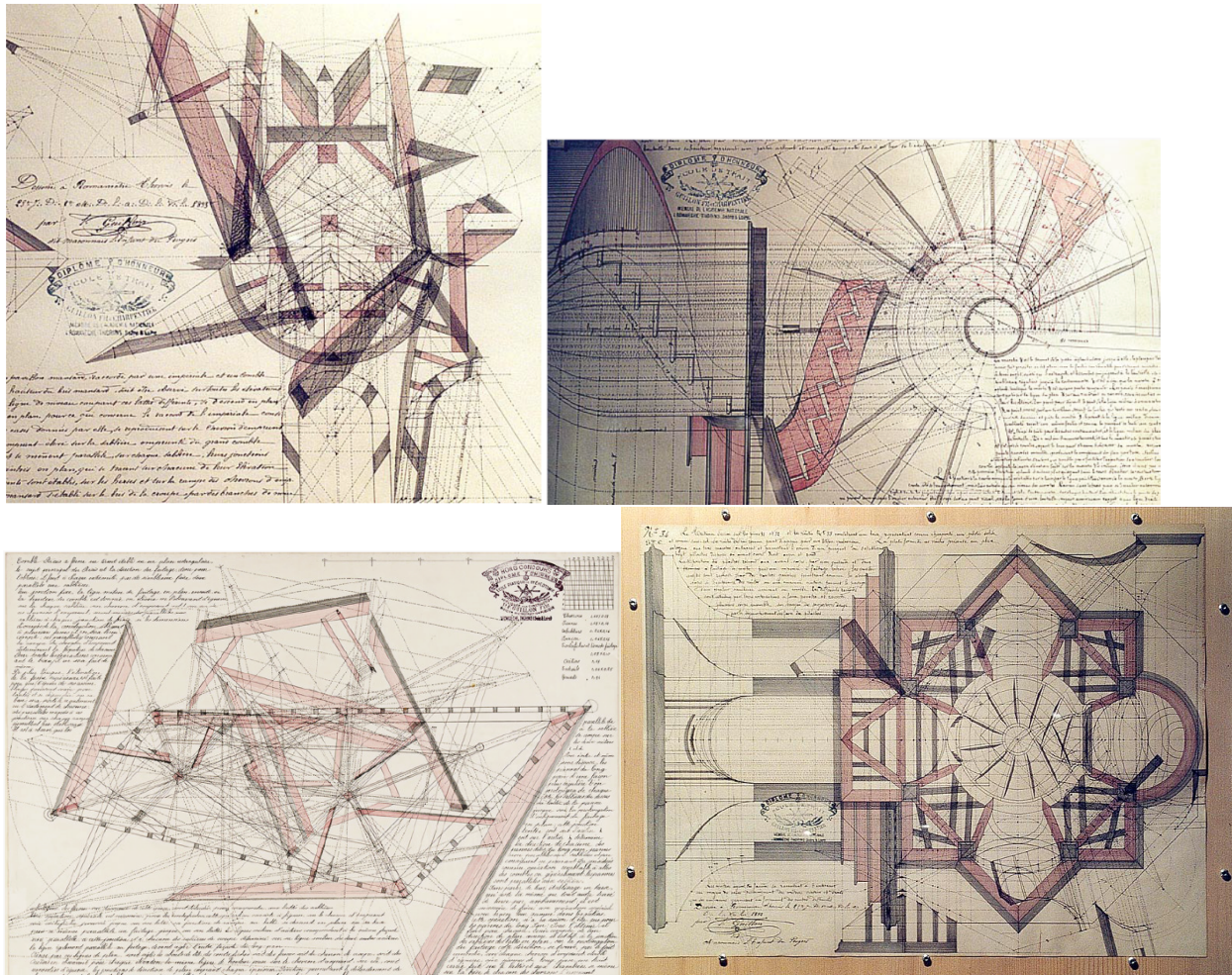
Students should not be overloaded with superfluous abstract information that most Americans will never utilize (for those students talented in math, advanced self-paced instruction can be provided if curriculum is written in a comprehensible manner – which is currently not common). If the foundation is strong, then more abstract concepts will not be difficult to learn at a later date when individuals require more specific knowledge related to a given field. The current

³⁹ <https://www.libertyfund.org/books/the-evolution-of-civilizations>

⁴⁰ Some utilitarian examples are: *Construction Estimating*, Toenjes, Brown Technical Bookshop; *Math for Horticulture*, Boor, Ohio Agricultural Education Curriculum Materials Service, 1994; *Practical Problems in Math for Sheet Metal Technicians*, Schumacher, Delmar Publishers, 1973; *Textile Mathematics*, Booth, The Textile Institute, 1977; *Math for Welders*, Marion, Goodheart-Willcox, 2006; *Math for Machinists*, Burnham, Lindsay Pub., 1995; etc. Trade and industrial associations need to be canvassed to determine real-world math requirements.

educational methodology benefits only those with a natural talent in math, while those without this talent are made to suffer – and indeed, most do suffer due to the power mathematicians wield. In addition, math is taught primarily as a computational subject (just like a computer operates); not at all for the power of logic and reasoning it offers, as Plato argued.

The documentary, *Stereotomy: The Alchemy of Solids*, provides an excellent expression of this highest of craft knowledge: “Their construction drawings [such as the ones shown below] represent a folding of 3D geometry into two dimensions. Being able to imagine of this unfolding and coordination of information requires an ability to conceptualize form in space with clarity. ... To sum up the situation, one might say that stereotomy is to descriptive geometry what perspective is to projective geometry. ... Stereotomy makes anyone who has mastered it a visionary in spatial depth. ... Being able to conceptualize complex geometry in space, in this precise way, extends one’s ability to conceive of and realize any form one can imagine. It enriches the mind and adds value to the lives of these artisans.”



Stereotomy (related to descriptive and projective geometry) is applied math at its zenith. The great cathedrals of Europe were built using the geometric design techniques of stereotomy developed by craftsmen rather than by academics. (See link to watch *Stereotomy: The Alchemy of Solids* <https://www.youtube.com/watch?v=veECjU6edQg>)

* * *

Subject specialists, contrary to what most people might think, should not decide what is to be taught since they don't know what the real world requires of people. However, they must be involved in how their disciplines are to be taught, but with oversight by cognitive psychologists who are more concerned with seeing everyone succeed (an objective perspective) rather than only those who have particular talents, which subject specialists tend to be drawn to (a subjective perspective).

We need to look to some of the fundamental economic sectors to learn what is required for math. Math for business, agriculture, manufacturing, trades, services and extraction industries will need to be analyzed to determine what will be taught as well as how it will be taught. Of course, finance is foundational for the needs of every single citizen. In addition, surveying, navigation, sheet metal work, cooking, molding, etc., all have need of applied math and they are excellent subjects that offer application of what one learns.

If students need remedial work, utilize *Arithmetic*, by Novak, D.C. Heath & Co., 1983. It starts with simple addition and advances through introductory geometry and introductory algebra. This text is so clear and concise, it can be used as a self-paced course for those who have the wherewithal. However, it can be used in the classroom as well.

To better understand the meaning and purpose behind the principles of an applied education program, Grant Sanderson provides a very nice analysis on principles behind teaching math and how to engage students in motivational reasons for learning the subject. See his TEDx video at https://www.youtube.com/watch?v=s_L-fp8gDzY.

Marrou's (1956) analysis of Plato's influence on math's incorporation into school curriculum sheds some light on its place in educational efforts. He points out how

the ancient tradition rejected Plato's great idea of making mathematics the centre of all education. No doubt mathematics was entirely a matter of reason, and reason was common to all men, and so mathematics must seem a suitable subject for everyone to learn; but as soon as it rose above the most elementary stage most minds found the barren, abstract climate in which mathematics really existed quite unbearable. (p. 223)

Lang's (1891) reference to Basedow (a renowned 18th century educational reformer) on what should be covered in a math curriculum is short and sweet: "In Arithmetic the child must gain an idea of the value of numbers, and learn to compute with them so as to satisfy the demands of practical life in this direction."

Besides it being designed for math specialists, math is believed to develop reasoning abilities in the average person, but since form is currently central to math curriculum, with function being of marginal concern, there is little to gain from it beyond an elementary knowledge. Therefore, the development of logic is a highly elusive proposition for any other than those who are born with excellent mathematical talents. However, a general education offered by a public system cannot legally be designed to the exclusive interests of a small talented population. A public system demands that it be designed for all interests and abilities to be addressed in order to be equitable.

Griffin (1922) argued for changing the way in which advanced mathematics was, and still is, taught. A *birds-eye view* of math is needed in order to acquire an understanding of it rather than mere memorization of data and formulae, which causes a majority of students to permanently turn away from education.

Under the traditional plan of studying trigonometry, college algebra, analytic geometry, and calculus separately, a student can form no conception of the character and possibilities of modern mathematics, nor of the relations of its several branches as parts of a unified whole, until he has taken several successive courses. Nor can he, early enough, get the elementary working knowledge of mathematical analysis.... Moreover, he must deal with complicated technique in each introductory course; and must study many topics apart from their uses in other subjects, thus missing their full significance and gaining little facility in drawing upon one subject for help in another.

To avoid these disadvantages of the separate-subject plan the unified course presented here has been evolved. This enables even those students who can take only one semester's work to get some idea of differential and integral calculus, trigonometry, and logarithms. And specialist students, as experience has shown, acquire an excellent command of mathematical tools by first getting a birds-eye view of the field, and then proceeding to perfect their technique.

The mathematics community needs to be held to account for stubbornly sticking with a program that appears to maliciously marginalize most people.

In the prologue of Thompson's renowned book on calculus, he states:

Some calculus-tricks are quite easy. Some are enormously difficult. The fools who write the text-books of advanced mathematics – and they are mostly clever fools – seldom take the trouble to show you how easy the easy calculations are. On the contrary, they seem to desire to impress you with their tremendous cleverness by going about it in the most difficult way. (p. 38)

In the preface of Thompson's book, 1998 edition, Martin Gardner laments the state of calculus instruction. His lamentations are applicable to the way math is taught in general – as evidenced by the poor performance of American students compared to many other countries – and therefore it is useful and appropriate to include his analysis of the state of things when analyzing math curricular changes:

Studies show that almost half of college freshmen who take a course in calculus fail to pass.⁴¹ ... One reason for such a high dropout rate is that introductory calculus is so

⁴¹ Of course, many believe this is a good thing since it separates the wheat from the chaff. However, when winnowing wheat in winds that are too strong, one will lose a great deal of kernel along with the chaff. Much of the problem has to do with the academic community in general and the math culture in particular. Since it has been optimized for certain talents expressed in **very** particular ways. Any who do not fit this culture are purposefully and maliciously barred from their community (not unlike the Catholic Church that prohibited the average man from reading the Bible, which is what led to the Reformation). The current curriculum design is justified by claiming “quality” of mathematicians can only be maintained by such destructive tactics. This is reminiscent of the past when

poorly taught. Classes tend to be so boring that students sometimes fall asleep. ... You look through [calculus textbooks] in vain for simple, clear exposition and for problems that will hook a student's interest. Their exercises have, as one mathematician recently put it, "the dignity of solving crossword puzzles." Modern calculus textbooks often contain more than a thousand pages – heavy enough to make excellent doorstops....

"Why do calculus books weigh so much?" Lyn Arthur Steen asked in a paper.... Because, he answers, "the economics of publishing compels authors ... to add every topic that anyone might want so that no one can reject the book just because some particular item is omitted. The result is an encyclopaedic compendium of techniques, examples, exercises and problems that more resemble an overgrown workbook than an intellectually stimulating introduction to a magnificent subject."

"The teaching of calculus is a national disgrace,"⁴² Steen ... declared. "Too often calculus is taught by inexperienced instructors to ill-prepared students in an environment with insufficient feedback."

Leonard Gillman, writing on "The College Teaching Scandal" ... said: "The calculus scene has been execrable for many years, and given the inertia of our profession is quite capable of continuing that way for many more."

... Leaders of calculus reform ... recommend a shift of emphasis from problem solving, which computers can do so much faster and more accurately, to an emphasis on understanding what computers are doing when they answer calculus questions.⁴³ A knowledge of calculus is even essential just to know what to ask a computer to do. Above all, calculus courses should instill in students an awareness of the great richness and elegance of calculus.

... Many reformers want to replace the artificial problems in traditional textbooks with problems about applications of calculus.⁴⁴ ...

More radical reformers believe that calculus should no longer be taught in high school, and not even to college freshmen unless they have decided on a career for which a knowledge of calculus is required.⁴⁵

Quoting a colleague of Thompson's, Gardner provides: "One of the great merits of the book is that it dispels the mysteries with which professional mathematicians envelope the subject."

guilds guarded the secrets of crafts, in the name of quality, in order to exclude all others, which led to their eventual downfall.

⁴² One can certainly say with confidence, this is true of the way math is taught in the U.S. in general.

⁴³ Of course, those who pursue advanced mathematics should delve deep into problem solving since they may be the ones who will design calculus software. But the average person certainly has no need of it, and perhaps engineers and many scientists may have no need of it. For the latter, perhaps a good calculator will suffice.

⁴⁴ This, of course, is the very principle upon which an applied studies program rests.

⁴⁵ To practical minded people who do not see academia as a way of life, this makes the most sense in so many ways. However, understanding what calculus is and how it is applied is useful to all.

Once we dispel the mysteries and identify necessity, perhaps we might want to think about changing the order of mathematical education. That is, maintain the current position of arithmetic in primary school, but then change the subsequent order of math courses. We can start with geometry, then to trigonometry, then calculus, and finally algebra since algebra, at least at the more practical level, is primarily a tool of math. Symbols used in algebra are empty without an understanding of what they symbolize, and many individuals do not buy the academic assertion that “We know what’s best for you, so just study what we tell you to.”

Papert of MIT provides an insightful Foreword in Michael Smith’s 1994 book *Humble Pi: The Role Mathematics Should Play in American Education*.

Accepting a fraction ... of Michael Smith’s arguments will be enough to leave you asking how such a large-scale business as math ed. could be based on such flimsy reason to believe in the value of any possible return. The costs of math ed. are serious: in dollar terms, several hundred billion a year across the world; in psychological terms, tens of millions of egos damaged by a sense of failure; and much more as well. You would think that nobody would incur this kind of cost without the most solid reasons to believe in the benefits – and indeed such hardnosed cost-benefit analysis is demanded in support of proposals for new educational plans. But this bias in burden of proof is a major factor making for conservatism in education (and not only in math ed.): to adopt something new requires more expensive proof than responsible innovators can afford; in the meantime we continue doing what we always did just because it is there even in the absence of any proof whatsoever of its value. In business this would be a formula for rapid bankruptcy. In education it appears that nations can continue mindless policies for longer periods before hitting disaster. It remains to be seen how long.

M. Gardner quotes an economist and Statistician, Julian Simon:

Question: why don’t high school and college kids get to learn calculus the Thompson way? Answer: Thompson’s system has an unremediable fatal flaw: It is ugly in the eyes of the world-class mathematicians who set the standards for the way mathematics is taught all down the line; the run-of-the-mill college and high school teachers, and ultimately their students, are subject to this hegemony of the aesthetic tastes of the great. Thompson simply avoids the deductive devices that enthrall mathematicians with their beauty and elegance.

Gardner concludes with:

Calculus is the mathematics of change. If you are not a mathematician or scientist, or don’t intend to become one, there is no need for you to master the techniques for solving calculus problems by hand. But if you avoid acquiring some insight into the essentials of calculus, into what James called its philosophy, you will miss a great intellectual adventure. You will miss an exhilarating glimpse into one of the most marvelous, most useful creations of those small and mysterious computers inside our heads.

Gardner sums up the problems with mathematics in general, and his analysis must be considered when math curriculum is rewritten for a more practical and realistic education program that

individuals require. Perhaps calculus can continue to be utilized in high school for many, but it needs to be taught as though the student will have no use for it, but simply needs to know where it fits into the scheme of things that make the human experience so interesting.

Finally, Hacker provides a great analysis of the current state of affairs regarding math education:

The Math Myth starts with a simple question: why? As if a child asked you, “why do girls have longer hair?” You’d have to stretch your mind to come up with a convincing answer. In much the same vein, *The Math Myth* asks: why are we making every young American endure a full menu of mathematics, with no alternatives or exceptions?

After analyzing an array of responses, the book concludes there are no convincing reasons for maintaining the prevailing regimen. Even worse, it has become a harsh and senseless barrier to diplomas and careers, suppressing opportunities, stifling creativity, and preventing millions of young people and adults from developing their true talents.

The book scrutinizes widely held beliefs. Like the notion that mathematics sharpens the mind; that mastery of azimuths and asymptotes will be needed for most jobs; that the entire Common Core structure should be required of every student. *The Math Myth* warns that a frenzied emphasis on STEM diverts attention from crucial pursuits and is subverting the strengths and spirit of this country.

The book proposes other options, including greater facility with figures, quantitative reasoning, and deciphering statistics. *The Math Myth* has already sparked a national conversation, not just about mathematics, but about the kind of people and society we want to be. <http://themathmyth.net>

A potential source for developing a math program is Professor Wildberger’s system. It can be accessed at https://www.youtube.com/channel/UCX10Zbk8_rvjyLwAR-Xh9pQ. In particular, review his Math Foundations programs, the purpose of which is “to set up mathematics properly.” He points out that no one else has been willing to address this very, very important issue.

Kahn Academy is another useful source from which much can be learned:

<https://www.khanacademy.org/math>

We need to make sure there is a great deal of real-world scenarios included in math problems for students to practice so they can perceive the application rather than require them simply to memorize disconnected abstract concepts. In his preface, Singh (2003) provides

The heart of the book is the wealth of [applied] examples drawn from a wide range of disciplines such as aerospace, building services, civil, control, electrical, manufacturing, mechanical, etc. In this respect the book is unique. The inclusion of these ... disciplines will show from the outset the many applications of the mathematics you are studying. Understanding why you need to learn the mathematics and using it in real examples is a real motivating factor.

... Recent news articles have stated that there are fewer and fewer students applying for engineering courses ... which is a serious problem for industry. One of the reasons is that the mathematical nature of engineering is perceived as difficult. This book addresses this problem by using an everyday language step-by-step guide through each example.

We know, from our own experience and from what we read in the news and in professional papers that students are starting out on degree and pre-degree courses with an increasingly low level of mathematics. What is worse is that **students feel that mathematics is hard and abstract, unrelated to what they are doing elsewhere....** Although many textbooks add occasional examples or indeed occasional chapters showing mathematics in [applied] contexts, none does this in every chapter right through the book. ... I have included a wide range of applications in as realistic an array of examples as possible. (Emphasis added)

Business Math should cover the following – Applying basic math to business transactions, banking, solving business equations, percents & their applications, discounts, markups, markdowns, breakeven analysis, payroll, interest, promissory notes, annuities installment buying, mortgages, interpreting financial reports, depreciation, inventory & overhead, taxation, insurance, investments, and business statistics. See *Practical Business Math Procedures*, by Jeffrey Slater, McGraw-Hill Irwin, 2008.

Advanced mathematics requires extensive use of formulae. These formulae are frequently required to be memorized by college prep students and then they are required to understand where to use them and how to solve those problems. Applied studies should not require the memorization of formulae; however, students must be able to understand how to apply them to real world applications, as opposed to purely disconnected abstract concepts, and then to solve those problems. For testing purposes, the applicable formulae will be available to students to use through professional pocket references. Teaching students how to use such references should be a high priority. (Use *Pocket Ref*, by Thomas Glover, Sequoia Publishing, Littleton, CO; plus *Applied Mathematical & Physical Formulas: Pocket Reference*, by Vukota Boljanovic, Industrial Press, 2007; *Oxford Concise Dictionary of Mathematics*, Clapham and Nicholson, Oxford Univ. Press, 2009 as examples.) These references make memorization of such data irrelevant. Memorization of formulae does not develop reasoning attributes, and it takes up valuable time that can be spent on more productive ends (think of Spencer's (1860) *relative worth* principle). Also, it provides little to no return on the investment. That which will be necessary in a person's career will be memorized by repetition of use when it is needed. This principle is not applicable to elementary education where information must be memorized, e.g., multiplication tables.

It may be surmised that with the volume of data our educational system keeps accumulating in what children are expected to learn, elementary children are not given enough time to memorize that which is most fundamental and most important. This, then, inhibits future learning, which contributes to the poor international standing of U.S. students.

To conclude this section on math, let us look at some good work by those who are seeking to achieve equity in education in contrast to exclusivity and selectivity. Purnell and Burdman (2020) consider the healthier perspective on the purpose of education.

The traditional architecture of math opportunity often treats math as a gatekeeper that can stop students – particularly low-income students, students of color, and women – in their educational paths. Even in the absence of explicit bias, this architecture is undergirded by faulty assumptions about math ability that ration access to college opportunity in inequitable ways.

... [Current] reforms are expected to improve equity in outcomes by eliminating barriers that arbitrarily prevent students from successfully completing college and disproportionately impact low-income students and students of color. ... For the reforms to disrupt patterns of inequity, they need to reinforce the role of math in preparing students for their futures as opposed to sorting or filtering them.

Communications Curriculum

Since language is the foundation of all learning, and therefore is the most important part of primary education (career education, closely followed by civics, being the most important part of secondary education), I will provide an analysis of what needs to be considered in the development of a language arts program.

Lang's (1891) work on Basedow offers excellent advice on grammar:

Teaching the Branches. – Language lessons must be lessons *in, not on*, language. “I am of the opinion that one can become a masterly writer in a language without ever knowing anything of its grammar. Reason and a wealth of knowledge and words teaches us to write *intelligently*, and through the exercise of taste for good authors we learn to write *well*” (that is, have a good style). But “I do not intend to banish grammar from the number of studies; I only want to assign to it the right place, - which is after the end of the exercises in fluency.” (p. 26)

Marrou (1956), when speaking of education in antiquity, states:

[G]rammar was not in the first place intended to help with teaching, it was not supposed to help children to grasp the mechanics of their mother tongue; it was an advanced science, on the level of our general linguistics, and, as befitted a Greek science, it was purely speculative and theoretical.

Permacharts⁴⁶ has an excellent chart for English grammar that is succinct in what individuals should know about grammar. It is 4 pages of basic grammar that will serve most people well. The use of tools such as this should be a priority in educational instruction rather than attempting to force individuals to memorize encyclopedic volumes of works that they will never use.

Wilhelm von Humboldt (1767-1835) provides an excellent reference point for an understanding of one's native language and language generally speaking.⁴⁷ His research led him to study a

⁴⁶ <http://permacharts.com/collections/all>

⁴⁷ Humboldt “is especially remembered as a linguist who made important contributions to the philosophy of language and to the theory and practice of education. In particular, he is widely recognized as having been the

number of languages which directed him to lay out foundational linguistic principles that are still influential to this day.

Wertz (1996) said of Humboldt, he had an understanding

of the universal role of language in the development of the human mind.

... Humboldt wrote, in a letter ..., “It is only through the study of language that there comes into the soul, out of the source of all thoughts and feelings, the entire expanse of ideas, everything that concerns man, above all and beyond everything else, even beauty and art.”

He held that “Language is deeply entwined in the intellectual development of humanity itself, it accompanies the latter upon every step of its localized progression or regression; moreover, the pertinent cultural level in each case is recognizable in it.... Language is, as it were, the external manifestation of the minds of peoples. Their language is their soul, and their soul is their language.... The creation of language is an innate necessity of humanity. It is not a mere external vehicle, designed to sustain social intercourse, but an indispensable factor for the development of human intellectual powers, culminating in the formulation of philosophical doctrine.”

No wonder today’s students, taught by the disciples of the Modern Language Association that the word “woman” should be written “womyn” to eliminate sexual bias, are losing their [sanity]!

In commenting on the importance of studying classical Greek for the Prussia of his day, Humboldt’s words are equally appropriate for our own time: “The study of the characteristics of Greek culture is especially beneficial in an epoch when, for countless reasons, attention is more focused on masses of men than on individuals,⁴⁸ more on external values and uses than on inner worth and enjoyment, and when a high and variegated culture has deviated very far from the earlier simplicity.... When the Greek nation had not yet entirely raised itself out of primitive circumstances, it already possessed an uncommonly subtle feeling for everything beautiful in nature and art....”

Wertz quotes an article of LaRouche’s (1981):

“... The clear historical significance of classical Greek – from Homer through Plato – is that this represents the development of a language ... which ... assimilated into its best usage the sum of all of the essential knowledge gathered from the world of that time. It was a language which reflected in its best usages, necessarily, the evolution of the capacity to assimilate and develop such acquired knowledge.

architect of the Humboldtian education ideal, which was used from the beginning in Prussia as a model for its system of education and eventually in countries such as the U.S. and Japan.”

https://en.wikipedia.org/wiki/Wilhelm_von_Humboldt

⁴⁸ Of course, this is the foundation of German statism which led into American Progressivism.

“Classical philology, combined with ... poetic compositional knowledge, applied to the mastery of one’s own language, impart critical consciousness of one’s own thought, impart a sense of the causal connectedness of large spans of history, and help the young individual to locate himself efficiently within history as a process of development. This can be accomplished only with aid of a classical language, not one’s own, in which the highest level of moral culture ... is provided. This must be a real language of the past, in respect to which one can situate the development of one’s own language and the civilization of which one is part.”

This represents the historic understanding of the usefulness of studying the classical languages and literature as the vehicle to a highly refined understanding and expression of human thought and expression, which leads to the development of a higher mental capacity in reason and intuition. Highly developed words and phrases can be used to express ideas on subjects such as art, literature, science, law, philosophy, etc. – all of which can and should be used as templates for advancing the command of language. A highly evolved language provides a rich, diverse, and accurate medium through which deep concepts and principles can be expressed by the transmitter and understood by the receiver, which is, more often than not, extremely difficult to accomplish in less developed languages except by linguistically talented individuals.

Having said all of this, a course of study in classical languages may be appropriate for those talented in language arts or those who have a tremendous amount of leisure time (such as aristocrats of old), but it does not stand to reason that such an extensive program of study used in the past is appropriate for most people, then or now. And, for that matter, the same can be said of studying the modern foreign languages as a means to advance the intellectual abilities of individuals. However, the study of linguistics does provide tremendous benefits to all due to the development of highly sophisticated forms of expression associated with highly developed cultures.⁴⁹ But even simpler cultures have unique words and phrases that express concepts unknown to other cultures (consider the Eskimo’s lexicon for the numerous types of snow). However, the need for linguistics to be integrated into a general education program does not imply that linguistics should be taught to the general public as though each were to become a subject specialist in linguistics. It needs to be taught in general terms to benefit the average person – that is, the non-linguist major.

Given the need for a program of study that develops effective communication for the average person in contrast to a mastery of language by linguists, grammar should not be at the forefront of instruction nor a high priority for assessing students’ competency. Like mathematics formulae, grammar needn’t be memorized for testing purposes but, rather, should be readily accessible to students as it is needed through pocket references – the use of which needs to be mastered as tools rather than the memorization of the data contained in them – at any and all times, including during assessment tests. After all, language varies across peoples and across time. To assert that there is one fixed way to define grammar is to have a shallow understanding of language.

⁴⁹ The reader is advised not to read too much into this. Quigley describes the reasons for the rise of civilizations and for their fall. The loss of a moral compass is the primary reason for a fall and the Greeks and Romans provide ample evidence of this truth. So, while these two civilizations have much to admire during their zenith, there is much to condemn as their leisure, their self-indulgence, their overconfidence, and their arrogance undermined the virtues they had previously acquired and refined – this being the perfect subject matter to analyze for lessons in history.

Lerer (2008, lecture 24) looks at the relationship between style and grammar. He states, “Where do we draw the line between grammatical correctness and stylistic choice?” Lerer then considers “The relationship between description and prescription: What is the goal of linguistic study – to describe [language] behavior or to prescribe [language] standards?” I would offer it is a combination that is simultaneously flexible in an elastic sense, while firm in order to provide integrity in meaning so that what the transmitter is broadcasting, the receiver is properly deciphering. Lerer (2008, lecture 35) quotes the linguist Noam Chomsky that supports this principle: “A ‘well-formed’ sentence is something that communicates to another in a meaningful way, and the other understands it.”

Language is both an art and science, but not a science that is easily reduced to definitions for the ease of teaching and assessment. Language evolves over time, so attempts to take a snapshot of it at any given point and to then claim *that* as the definitive way (referred to as *prescriptivism*), is a rather arrogant proposition. Lerer (2008, lecture 26) quotes Noah Webster in his first 1828 edition of *An American Dictionary of the English Language*: “It is quite impossible to stop the progress of language – it’s like the course of the Mississippi, the motion of which, at times is scarcely perceptible; yet even then it possesses a moment quite irresistible.”

Priestley (1772) considered grammar not an essential quality of language but “a collection of observations on the structure of it, and a system of rules for the proper use of it.” For the average individual this should encompass a sufficient understanding of grammar that is useful in an average way in contrast to the needs of an educational subject specialist.

Spencer (1860) offers the following analysis regarding grammar:

From the substitution of principles for rules, and the necessarily co-ordinate practice of leaving abstractions untaught until the mind has been familiarized with the facts from which they are abstracted, has resulted the postponement of some once early studies to a late period. This is exemplified in the abandonment of that intensely stupid custom, the teaching of grammar to children. As M. Marcel says: – “It may without hesitation be affirmed that grammar is not the stepping-stone, but the finishing instrument.” As Mr. Wyse argues: – “Grammar and Syntax are a collection of laws and rules. Rules are gathered from practice: they are the results of induction to which we come by long observation and comparison of facts. It is, in fine, the science, the philosophy of language. In following the process of nature, neither individuals nor nations ever arrive at the science *first*. A language is spoken, and poetry written, many years before either a grammar or prosody⁵⁰ is even thought of. Men did not wait till Aristotle had constructed his logic, to reason. In short, as grammar was made after language, so ought it to be taught after language.... (p. 104)

* * *

Let us consider a proposed English language curriculum simply as a starting point.

⁵⁰ 1. The patterns of rhythm and sound used in poetry. 2. The patterns of stress and intonation in a language.
<https://en.oxforddictionaries.com/definition/prosody>

Discipline 1 – Fundamentals of Communications: This course will cover – Communication processes; Foundations of verbal language; Nonverbal communication; Listening; Intrapersonal communication; Interpersonal communications; Communicating in public. See *Communicating: A Social and Career Focus*, by Berko, Wolvin, & Wolvin, Houghton Mifflin Co., 2007.

Discipline 2 – Technical Writing: This course will cover the following –

- 1) Basics: How important is technical communication and what is it?; Researching for your document; Who is the audience?; Structure of the document (vocabulary, sentence & paragraph structure, orderliness of entire document, design or layout of document including visual aids); Summarizing; Planning, drafting and finishing your document.
- 2) Technical communication applications: Instructions; Memorandums & informal reports; Formal reports; Developing websites; Recommendation & feasibility reports; Proposals; User manuals.
- 3) Professional Communication: Oral presentations; Letters; Job application materials; Documenting sources.
- 4) Design of resumes.

See *Technical Report Writing Today*, by Daniel Riordan, Houghton Mifflin Co., 2005.

After Technical Writing is complete, further development of writing skills could be incorporated in many of the other classes such as civics, history, etc. where essays will be used as the medium of communications and the method of evaluating students' progress. Professor Jordan Peterson provides the proper instruction for essay writing. Please see his instructions, Essay Writing Guide, at https://docs.google.com/viewer?url=http://jordanbpeterson.com/wp-content/uploads/2018/02/Essay_Writing_Guide.docx

Communications teachers will assist their colleagues of the various other disciplines in ensuring that students are progressing in their writing and communication skills since this is so vital to individual success socially, politically, and economically.

Discipline 3 – Rhetoric & Ethics: Hillsdale College offered a seminar in rhetoric. In their invitation they quoted Cicero from *De Oratore*, “if we hand over the full resources of speech to those who lack [integrity and the highest prudence], we will certainly not make orators of them, but will put weapons into the hands of madmen.” Therefore, it is imperative that students develop an understanding of this art and science so they may know deceit when confronted with it. This course is not meant to make great orators of students; it is meant to develop an understanding so they may be better communicators grounded in ethics rather than from relativism emanating from postmodernists that have tremendous influence in education. In addition, it is meant to provide familiarity with rhetoric so they will not be overawed by gifted orators, but rather will be able to discriminate between sophistry and real content based on ethical standards. Understanding how sophists argue and use tactics to deceive, such as logical fallacies, arms citizens with weapons of defense against the “madmen” alluded to by Cicero.

Lerer (2008, Lecture 27) points out the place of primacy the teaching of rhetoric had in the U.S. in the 19th and early 20th centuries making the point that rhetoric was considered education – period! – for the American student.

A word of warning on the way in which rhetoric has been taught in the past: While rhetoricians may have admired Cicero's incredible rhetorical abilities, his stress on ethics being integrally tied to rhetoric seems largely to have eluded them. This is probably due to relativism dominating rhetorical educational culture with sophistry impregnating all things rhetorical. In other words, it is not the soundness of an argument nor the truth a rhetorician reveals; it is how well the rhetorician is able to sway the audience that wins the day – even if what he advances is an utter falsehood. If this is what rhetoric is to encompass, it would be best that we completely abandon this science of deception since it can only promote immorality – the curse of a free people as the ancient Greeks discovered. Better that it goes extinct than continue such unethical teachings.

However, rhetoric has much to offer but only if we embrace Cicero's view that morality must be part and parcel in its teaching. I think one of the best examples we have is Thomas Jefferson's writings and in particular The Declaration of Independence, which links rhetoric with virtuous principles in a poetic style.⁵¹

Discipline 4 – Linguistics: see *Understanding Linguistics: The Science of Language* lectures provided by the Teaching Company, 2008, for a model course. Professor John McWhorter of the Manhattan Institute provided the perfect content for these lectures. In a linguistics curriculum, Latin and Greek word origins should be included so individuals can understand the meaning of words by breaking down their roots, suffixes, and prefixes.

Discipline 5 – Debate & Speech: see *Argumentation: The Study of Effective Reasoning*, 2nd edition provided by the Teaching Company, 2005, for one aspect of this course. However, Bowen (1972) refers to a warning Plato offered regarding debate: "...in *The Republic* Plato said that it is dangerous to teach the skills of dialectic argument to young men for they will simply misuse them and get lost in mere verbal quarrelling" (p. 98) How true this is!

A final thought on language: Lerer (2008, lecture 25) points to our indebtedness to the two great linguists, Samuel Johnson (1709-1784) and Noah Webster (1758-1843) for the momentous dictionaries they compiled. Lerer quotes Johnson: "Difference of thought will produce difference of language." Lerer points out how this influenced Webster in his Preface to his 1828 edition of *An American Dictionary of the English Language*. Webster stated in his Preface, "Language is the expression of ideas; and if the people of our country cannot preserve an identity of ideas, they cannot retain an identity of language." While inflexibly following dogmatism as it relates to ideas and language is a form of blindness, so too is it blind to reject what the past has to offer simply because it had a contemporaneous existence with historic iniquities. Language and ideas are part of an evolutionary progression that is wonderfully expressed in the *Great Conversation*.⁵² From this conversation, truths and falsehoods are discovered through trial and

⁵¹ I would ask the reader to disregard the current fad of attempting to marginalize Jefferson because he owned slaves. No one hated slavery more than Jefferson, but it was an ancient worldwide institution that he did not invent, but, rather, inherited much to his dismay. His economic obligations to his family restricted his choices. Though not a perfect analogy, consider our current dependency on fossil fuels for energy even though it pollutes our environment. Will future generations be justified in condemning us for not completely and instantly abandoning its use, which would lead to economic ruin? If they did, they would be fools! It is easy to condemn that which does not affect an individual; it is quite another thing to have to surrender something that would cause economic ruin without an alternative to fall back on. This would require everyone have an equal alternative, otherwise some would have an unfair advantage which would not be acceptable to the potential losers.

⁵² See https://en.wikipedia.org/wiki/Great_Conversation

error, which has the tendency to lead us to a more just and harmonious existence, albeit strewn with periodic dead ends and casualties – but it cannot be otherwise, due to the nature of this world, no matter how distasteful this may be.

Natural Resource Management Curriculum

A program of study should be prepared so that students can learn about natural resource management. However, it is to be based on *the right* to natural resource access, but grounded in sustainable use and harvest. Mankind cannot survive without natural resources, which includes wildlife. However, we have a duty and obligation to pass on to posterity, intact, an equal, if not better, world than what we inherited.

Thomas Jefferson addressed the concept of usufruct⁵³ as an intergenerational issue; that is, the current generation is obligated to pass on to posterity the fruits it currently enjoys. When communicating with James Madison during the formulation of the Bill of Rights, Jefferson's Sept. 6, 1789 letter, addressed the intergenerational issue of usufruct. The Constitutional Law Foundation summarizes Jefferson's principle as follows:

The legal concept of usufruct can be traced back at least as far as ancient Roman law and has changed little over the centuries. In Jefferson's time, as now, "usufruct" referred to "the right to make all the use and profit of a thing that can be made without injuring the substance of the thing itself." It was a term used to describe the rights and responsibilities of tenants, trustees, or other parties temporarily entrusted with the use of an asset – usually land.

Under the common law, the doctrine of usufruct is closely conjoined with the doctrine prohibiting waste, defined by Blackstone as "a spoil or destruction in houses, gardens, trees, or other corporeal hereditaments, to the disheison⁵⁴ of him that hath the remainder or reversion." Taken together, these two doctrines provide that a tenant (or other caretaker/interest holder) is entitled to the beneficial use of the land and its fruits, but is prohibited from prejudicing future interest bearers by using the land in a way that destroys or impairs its essential character or long term productivity.

<http://www.conlaw.org/Intergenerational-II-2-3.htm>

This helps us understand the purpose of natural resource laws and regulations. While the living have the right to full access of all natural resources under a equitably designed management scheme, this right does not include wasteful and destructive practices that impair the rights of current or future generations; nor does it include the use of these laws and regulations to assert religious intolerance of such access to natural resources that is asserted by extreme environmentalists – and yes, extreme environmentalism is a full blown religion. Something that may help students develop an appreciation for animals in general is to provide documentaries on domestic animals that have special qualities that require human interaction with the species being presented. An example of this might be something like horses. A good

⁵³ "The legal right of using and enjoying the fruits or profits of something belonging to another."

<http://www.merriam-webster.com/dictionary/usufruct>

⁵⁴ The act of disinheritting.

example of their use is at the Spanish Riding School of Vienna where Lipizzaners are used for dressage.⁵⁵ See <https://www.youtube.com/watch?v=Z2DPh9zvSb4> for an example of the high art of dressage. Of course, other animals, such as dogs, can also be incorporated into such a curriculum. Much can be learned through animals: research papers can be written, health and medical care can be covered, math problems can offer challenges, etc.

Physical Education Curriculum

Martial arts, gymnastics, modern dance, ballet and yoga are suggested for physical disciplines in high school. Competitive sports are highly useful in earlier years in order to teach how to work as a team and what sportsmanship means – i.e., fair-play and how one plays the game as a coherent whole rather than just for winning. However, sometime in the middle school years, the transition needs to be made to self-development through intense disciplines. In other words, it's time to get serious about physically developing oneself to a significant degree, since this might be the only time available to do so in one's life, and with sports being dominated by popularity contests as well as by the revenue generated from competitive games, they have become the arena of "elites," thereby marginalizing the majority. It creates *prima donnas* rather than well-adjusted and compassionate individuals. This is not in the best interest of citizens in a free society grounded in principles of equity when using public resources; but it is a sign of the deterioration of these principles.

For those who believe that life is a battlefield and that sports prepares one for battle and therefore ignore the higher purposes that sports should engender, let them pursue such barbarous interests in the private realm where their egos can be stroked or crushed, depending on the performance of their teams.

Martial Arts & gymnastics (1.5 hours per day).

Students should be encouraged to continue their training after school and on Saturdays in order to master their bodies to the fullest extent possible within the given years available to them.

Schools should provide firearms and archery instruction and a shooting range. This would be regulated very strictly. Though within some circles this may be controversial, such views are based on fears grounded in ignorance. Adults who have not handled firearms to a proficient level are naturally frightened of them since they don't know anything about the safety regulations of the firearms community and which should be shared with absolutely every citizen of this nation while they are young and still impressionable, i.e., before they are set in their ways due to age and therefore less capable of adapting. The use of BB and pellet guns would be a safer and less expensive way to introduce individuals to firearms. Perhaps .22 caliber rifles could be used at a later stage of training since they do not carry much firepower.

Instruction in the use of firearms is imperative in a society that recognizes the right to bear arms as inalienable for law-abiding sane citizens. With this right, as in all rights, come significant responsibilities. These responsibilities are not instinctive; they must be taught. If we are to minimize accidents with firearms throughout our society, we must instruct our youth in their

⁵⁵ <https://en.wikipedia.org/wiki/Dressage>

proper use. The argument that we could potentially be molding criminals by such training is an empty one. After all, we currently have no public education programs teaching the use of firearms, yet we can look at a city like Chicago which is more like a warzone than a peaceful community.

Another important aspect of this requirement is the preparation for war and/or self-defense. Statistics from the Vietnam War demonstrate that those who were the highest trained (the Special Forces) versus those who were the least trained (the common infantryman), had a significantly higher rate of survival. If and when our young men are called to fight for our country, they had best be well prepared prior to their enlistment so that their odds of returning home alive and whole are increased exponentially. This will not happen if we rely solely on basic training to accomplish this. "Basic" defines the level of preparation this training provides. The basics through advanced training should be offered incrementally throughout their middle and high school experience so that it is deeply ingrained. This training should not be of a military nature, such as marching and knowledge of military codes, nor of glorified battles in history that promotes a warrior spirit as the Greeks and Romans of old encouraged. Rather, it should incorporate experience in the outdoors such as camping, outdoor lore, hiking, repelling, canoeing, shooting, and hunting, as well as martial arts and first aid.

This would allow training after military enlistment to be at an advanced level so that our forces would be formidable, thereby requiring little time to adapt to a war environment. Individuals trained in such a manner would be approaching Special Forces capabilities, which would improve the likelihood of their returning home in one piece. In addition, a citizenry prepared in such a manner would be a major deterrent to any nation that would wish to challenge us.

This program must be tempered with Natural Law philosophy (which is grounded in respect for fellow human beings as individuals rather than as numbers in a collective) in the civics program in order to prevent the creation of brutes who seek the way of the warrior for the sake of glory, as the Spartans are infamous for.

There are many in our current society who are terrified of guns and desire the original intent of the Second Amendment (i.e., the right to bear arms by citizens shall not be infringed) be eliminated. Their fear is due to ignorance and unfamiliarity with guns. This is no different than the fear of automobiles many had when automobiles were coming into their own as they replaced horses. Those who were not exposed to cars at a young age typically retained a fear of them due to how dangerous they can be. I had an aunt born in 1918 who did not learn how to drive until she was in her 40s and she was always scared of driving – she was not unusual in this regard. Also, those who were not trained in pugilism at a young age always remain terrified of the idea of having to fight to defend themselves, hence one of the reasons they look to a police state to protect them and deny others the right to bear arms. Those who practiced pugilism to a sufficient degree do not fear having to defend themselves. If the world were a perfectly peaceful place, neither guns nor the study of pugilism would be necessary. But alas, this is not a peaceful world and until the day it becomes **perfectly** peaceful, the need for individual self-defense, as well as the defense of the country, will be a requirement of the first order. A high level of preparation for battle is the surest, and perhaps the only, means to minimize the need for it.

A last point to make in defense of the firearm program is the possible need to feed oneself. Should our economy collapse due to a depression or a pandemic, individuals will need to feed themselves and possibly defend themselves. Those who are ignorant of firearm use will, in all likelihood, perish.

Misc. Courses

Consumer Economics – This course could be designed to help students make important personal financial and economic domestic decisions. Students will learn basic economic concepts related to their role as consumers. Subjects covered could be: budgeting, comparison shopping (food, clothing, vehicles, durable goods, restaurants, etc.), installment purchases, taxes, accounting services, saving, investing, insurance, medical care, general banking services, loans, mortgages, legal services, etc.

In addition, products consumed by households can be tied to science and therefore possible career opportunities. Knowledge of domestic consumable products can be a launching pad for a large variety of careers. Food science is a well-established discipline, as is nutrition, so no elaboration of their career opportunities is necessary here. But a simple, but easily overlooked, product-line in the consumables market are cleansers. Dow Chemical provides an example of the science that goes into developing cleansers. Such development is typically achieved by research chemists – i.e., Ph.Ds. Dow’s description of the attributes of their Acusol 588 dispersant demonstrates just how complex chemical research goes into something as simple as detergents:

“A detergent polymer shows exceptional calcium polyphosphate dispersing properties in detergent formulations and Gypsum Components.

“Features & Benefits

- Safe and easy-to-handle liquid and easy to formulate (wide range of alkalinity level, bleach stable, excellent surfactant compatibility)
- Effective dispersant for a wide choice of formulations
- Very good filming inhibition on glasses and dishes
- Excellent inhibition of crystal growth and dispersion of precipitates in the cleaning bath
- Prevents the redeposition of soil onto the fabric or hard surface, lime soap encrustation in liquid laundry products containing fatty acid soaps
- Highly effective in maintaining whiteness and providing lime soap dispersion for liquid laundry detergents
- Reduced fabric harshness/fabric encrustation.”

As can be seen, practical application of “the simple things in life” can lead to real and substantial opportunities.

Drivers Education (include an understanding of heavy equipment operation for those with a need or desire to learn)

Marriage & the Family – Upon this subject, Spencer (1860) has this to say about it:

Seriously, is it not an astonishing fact, that though on the treatment of offspring depend their lives or deaths, and their moral welfare or ruin; yet not one word of instruction on the treatment of offspring is ever given to those who will hereafter be parents? Is it not monstrous that the fate of a new generation should be left to the chances of unreasoning custom, impulse, fancy – joined with the suggestions of ignorant nurses and the prejudiced counsel of grandmothers? If a merchant commenced business without any knowledge of arithmetic and bookkeeping, we should exclaim at his folly, and look for disastrous consequences. ... But that parents should begin the difficult task of rearing children without ever having given a thought to the principles – physical, moral, or intellectual – which ought to guide them, excites neither surprise at the actors nor pity for their victims. (pp. 45-46)

Is it that this responsibility is but a remote contingency? On the contrary, it is certain to devolve on nine out of ten. Is it that the discharge of it is easy? Certainly not; of all functions which the adult has to fulfill this is the most difficult. Is it that each may be trusted by self-instruction to fit himself, or herself, for the office of parent? No: not only is the need for such self-instruction unrecognized, but the complexity of the subject renders it the one of all others in which self-instruction is least likely to succeed. ... [W]e must admit that a knowledge of the right methods of juvenile culture, physical, intellectual, and moral, is a knowledge second to none in importance. This topic should occupy the highest and last place in the course of instruction passed through by each man and woman. As physical maturity is marked by the ability to produce offspring, so mental maturity is marked by the ability to train those offspring. (pp. 170-71)

Graphic Arts/Design, Drafting, Illustrating & Design

Computer training in spreadsheets, word processing, and CAD/CAM programs.

Summer classes and/or Saturday classes can be set up for 4-hour intensive training in bootcamp type education settings for both morning and afternoon studies, with students being able to attend both classes each day if they so choose. This would provide a real career advantage to those who take advantage of such a program. Enrollment in the different classes would be encouraged since this correlates with the purpose of the applied studies program, which is to learn by doing.

R&R classes: Spencer (1860, p. 64) address pleasures, amusements, and relaxation during leisure hours. He is referring to “enjoyments of Nature, of Literature, and of the Fine Arts, in all their forms.” He believed that by cultivating an attraction of refinement, it would steer individuals away from vulgar outlets of entertainment that lead to negative outcomes.

Foreign language: As it relates to the study of foreign languages, Spencer said,

However fully we may admit that extensive acquaintance with modern languages is a valuable accomplishment, which, through reading, conversation, and travel, aids in giving a certain finish; it by no means follows that this result is rightly purchased at the cost of that vitally important knowledge sacrificed to it. Supposing it true that classical education conduces to elegance and correctness of style; it cannot be said that elegance and correctness of style are comparable in importance to a familiarity with the principles

that should guide the rearing of children ... [nor would it be] equivalent in value to an acquaintance with the laws of health. (pp.67-68)

When designing curricula for an individual, group or school, Wirt's (1915, p. 20) thoughts on flexibility should always be kept front and center:

I do not wish to urge the adoption of any set form or design of program. The variety of ways in which greater opportunities for children may be secured ... is one of its chief recommendations. We need elasticity and adaptability in our school program and curriculum, not rigidity. The great problem is to learn what kind of a school our children should have, and we should always be learning.

Dual Enrollment

Partnerships need to be set up between all high schools and community colleges, technical schools, and universities whereby students can take courses that will supplement their high school education. Some may even focus on college courses and receive their high school and associate's degrees simultaneously.

The fact that dual enrollment is gaining traction in many States with great results, demonstrates that the high school college prep curriculum, as currently designed, is an antiquated program. This is due to the redundancy between general education classes in high school and in college. Such redundancy is extremely inefficient in both the life of individuals and social costs.

Edmunds et al. (2020), perhaps unknowingly, resurrect the effectiveness and efficiencies of our pre-Progressive, pre-bureaucratic education system. The paper, *How Early Colleges Can Make Us Rethink the Separation of High School and Postsecondary Systems*, reflects on an era that saw education as a part of the social puzzle but not as the puzzle itself.

The authors justifiably ask the question "If we want more people to have postsecondary education, why don't we just combine high school and college together?" The authors conducted a 14-year rigorous study of an early-college model. They found that those who attended early college outperformed the control group in every way. The public education Leviathan must make way for a healthier model of preparing citizens for full participation in society.

Cruzvergara (2021) discusses the advantages community colleges offer as it relates to labor market forces from employers' perspectives during labor shortages. First, she points out, "They are workforce-aligned." Then she states, "They are hyper-responsive to the needs of local labor markets, often collaborating with policymakers and employers to design more direct pathways between the classroom and the workplace. Indeed, this is increasingly a primary function of community colleges."

She then cites, as just a few examples, the efforts of IBM, The Walmart Foundation, and The Ford Foundation to collaborate with community colleges to better align education with the needs of the market. Next, she points out how community colleges are more affordable and provide greater flexibility for a highly diverse student population. The diversity of age common to

community colleges, exposes teenage students to interact with adults, rather than in a stagnant, adolescent, academic type culture universities are notorious for. In the 1980s, Northwestern University sought adult students in order to diversify the classroom experience for their young students. Given community colleges' typical age diversity, they are at an advantage in this regard compared to universities generally speaking.

One thing Americans really need to get past is their attitude toward skill levels. Our culture – in particular, the academic culture – has been obsessed with the “status and prestige” type of credentials and prejudicial toward all other skill levels they deem as “low skills.” These prejudices divert resources away from the needs of the *many* and funnel them toward the needs of the *few*. If Americans could stop their worship of university credentials and come to respect all skills, community colleges – as well as all other educational opportunities – could take their rightful place as major contributors to community participation and economic prosperity for all. After all, All Skills Matter!

Applied Studies Team

A team of specialists will be required to make this applied studies proposal a reality. First, there is the need to define what individuals and society require from education. Educational sociology, educational economics, and cognitive psychology are the three social sciences I propose would make up the first team of experts. A journalist will also be very helpful here in order to publish the findings of this team.

The second team should be made up of specialists in the given disciplines needing to be taught who will need to work closely with curriculum developers and cognitive psychologists. Three fundamental “markets” will need to be considered: 1) public schools, 2) private schools, and 3) home schooling. All three must be given due consideration and respect.

The third team will need to take the developed curricula and publish it in the various forms decided upon, such as print and video media.

The fourth team will need to promote the published media and provide guidance in their use.

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