

## **Phasing-in: Exploring Necessary Capacities and Implications for Success in the Next Three Decades**

William G. Huitt

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*A previous paper provided an overview of the forces, trends, and themes that are currently impacting human lifestyles (Huitt, 2017a). The focus of this paper will be on the capacities that children, youth, and adults must develop as a result of a phase change as the sociocultural milieu moves from an orientation of empire building based on agricultural and industry to a planetary phase based on digital, networked technology. Also discussed are the identification of some implications for education and schooling.*

Many parents, educators, and policy makers are becoming increasingly concerned about preparing children and youth for successful adulthood in the coming decades (Sharma, 2017). In a previous paper, Huitt (2017a) discussed forces, trends, and themes that must be considered in a world described by Haass (2017) as in disarray. However, identifying those is only the first step in the process; it is also necessary to identify critical individual capacities as well as strategies and methods that will allow individuals to develop their individual potentials, become valuable members of a community, and contribute to society's progressive development.

Huitt (2017a) identified a digital, global cultural milieu as one of the most important trends in the coming decades. There are three primary factors that will become increasingly important for individuals, as well as communities, to take advantage of opportunities and manage challenges in this timeframe. The first is increased connectivity, both personal (Seligman, 2011) and digital (Khanna, 2016); the second is the development of human capital (Becker, 2008); the third is the development of networked systems that will connect participants in a learning community. One aspect of connectivity is that those living in urban nodes will find it much easier to adapt to the speed of change existing in the digital, networked environment because face-to-face communication will still be important and is easier in large, concentrated populations (Khanna as cited in Swanson, 2016). Consequently, individuals living in communities outside of urban nodes will need to make extraordinary efforts to increase the number and quality of the connections available to them. This is a primary challenge that is finding voice in the recent political upheaval as those not embedded in an environment rich in connections express their displeasure at what they believe to be inequity in income and governmental policies (Priester, 2016; Priester & Mendelson, 2014).

As for the second factor, education is the primary driver for the development of human capital. A common view is that education is equated with schooling, especially at the kindergarten, elementary, and secondary levels (Huitt, 2017a). However, LaBelle (1982) proposed education should be considered in three different categories: formal, non-formal, and informal. From that perspective, higher education would also fall in the category of schooling. Alternatively, much of extra-curricular activities and much of adult education falls in the non-

formal category. However, the informal aspects of teaching and learning, those spontaneous and unplanned teaching moments, are also important.

The third factor is the necessity of building a networked learning community that can provide the opportunity for educators to learn through experience, to share their activities and results, and provide feedback to each other as the profession iteratively transforms to a new set of structures and functions in this new milieu (Lingard, Nixon, & Ransom, 2008). The accelerating nature of change demands that new ways of consulting and collaborating are developed in order for professionals to learn how to guide children and youth into a future the adults have never experienced. While this new knowledge will eventually become standardized enough to be taught traditionally, the immediate future will be fraught with chaos as old concepts and principles and their related structures that worked in relatively nationalized industrial economies gives way to new concepts, principles, and structures more appropriate for a globalized, digitized, networked age.

A focus of this paper will be on proposing alternatives that can be implemented primarily in formal education or schooling, although options for addressing issues in non-formal and informal education will also be discussed where appropriate. A discussion of the desired human capacities for the next several decades will be followed by a discussion of the implications for education and schooling.

### **DESIRED CAPACITIES OF PHASING-IN**

Diamandis and Kotler (2012) discussed a critical issue regarding the current sociocultural milieu – for the first time in human history, human beings have the power to imagine a future and then create societies in which people can live in peace and prosperity. This should have a tremendous impact on the purpose, focus, and desired outcomes of schooling. A foundational principle that must guide the development of a framework for decision making is a vision of a stable, peaceful, sustainable planetary sociocultural milieu (Gilman, 1993, 2014). Martenson (2011) suggested that this framework must integrate the economic, energy, and environmental activities that allow for sustainable lifestyles. The educational system must then empower children, youth, and adults to develop their personal capacities and use them for developing the community that will, in turn, encourage individuals to develop additional capacities and use them for the advancement of the communities in which they live. This positive feedback loop between community progress and individual development is an important feature of a systems approach to a sustainable adaptation process. It recognizes that individuals are embedded in geographic, social, and cultural ecologies that directly impact thoughts, dispositions, and behavior (Huitt, 2012a).

While an analysis of forces, trends, and themes is necessary to establish the context in which education and adulthood will take place, educational policies and practices cannot be readily derived from that examination. First, these will likely impact rural and urban populations differently. Second, local challenges can be impacted by different industries or job possibilities in different localities. Third, there is no guarantee that the trends, even if understood correctly, will unfold smoothly without major disruptions. Predictions made regarding these trends are likely to be flawed as a result of any number of possible scenarios such as a national or global financial meltdown, a national or regional epidemic, various generational or economic cycles, or any number of other possible challenges. Even though the likelihood of any particular challenge is small (ie, it is a Black Swan event; Taleb, 2010), the cumulative probability is non-zero and

the risks for an unforeseen disturbance are quite high. Different scenarios and specific communities must therefore be considered when designing desired outcomes for guided learning experiences with the expressed purpose of facilitating the development of resiliency across a variety of possible alternatives. This is the essence of a glocal perspective--one that simultaneously considers global and local needs and opportunities (Mendis, 2007; Robertson, 1994; Shamsuddoha, 2008). At the same time, there are innate human capacities that will remain relatively stable and these need to be addressed also

### **Capacities Based on an Analysis of Forces, Trends, and Themes**

An analysis of the forces, trends, and themes discussed in Huitt (2017a) led to the identification of a number of capacities that people will need to develop in the phase change from empire to planetary eras discussed by Gilman (1993, 2014). These can be grouped into the following categories: holistic mindset, thinking processes, increased importance of experiential learning, communication strategies and skills, handling tensions among analog/physical and digital/networked activities, and choice. These will be discussed in this section.

#### **Holistic Mindset**

There are a number of issues that deal with understanding that individuals are embedded in a sociocultural milieu that begins with the family and extends to the planet (Bronfenbrenner, 1979, 1989). As interactions increase among the disparate people and institutions, it is important that individuals become increasingly comfortable in successfully adapting to people and cultures alien to themselves.

**Understand holistic view of human beings and their ecosystems.** As mentioned above, a number of researchers have advocated a need to view human potentials in a more holistic manner. This is by no means a recent development, although accumulating empirical data support the need for educational institutions to address more than the development of cognitive intellectual potential (Huitt, 2011). While it is certainly true that cognitive intelligence is an important predictor of life success (Terman & Oden, 1923/1967), more recent research by Gardner, Goleman, and Sternberg (as cited in Huitt, 2011) show that other factors such as emotion, self-regulation, and social skills have twice as much impact on life success. Moreover, aspects of one's developmental ecology, such as family and community, influence these non-cognitive factors as well as the more traditional measures of student academic achievement (Grolnick & Ryan, 1989; Grusec, 2011; Israel, Beaulieu, & Hartless, 2001).

**A glocal mindset.** A related issue is connecting local activities to issues that can potentially have a global or planetary impact (Shamsuddoha, 2008). The foundation for this approach is to think in terms of sustainability for individuals, communities, societies, and the planet. There is a viewpoint that when individuals act in their own benefit it will automatically benefit all, at least economically (Smith, 1776/2014). While this might have been a valid principle when there were relatively few people living on the planet, it is demonstrably incorrect as humanity transitions from its empire to planetary stage (Worldwatch Institute, 2015). While raising several billion people out of absolute poverty in the last two decades is good for those individuals, it increases the demand for resources as well as an increase in waste products. An ecological approach to economics and lifestyles would not only address the needs of

individuals living today, but would also allow future generations to live useful and meaningful lives (Daly & Farley, 2011).

**Comfortable interacting with different ethnicities, religions, cultures, languages, age groups, etc.** The increased opportunity for interaction globally presents a challenge for learning to interact with diversity. Additionally, populations within countries are becoming more diverse (Fearon, 2003; Fisher, 2013) with the public, neighborhood schools in the USA now majority-minority (Carr, 2016; Maxwell, 2014). This is a key indicator that the millennial workforce, the largest segment of the workforce in the next decade, will be more diverse than in previous generations (U. S. Census Bureau, 2015), leading to people of color as the majority in the non-college-educated workforce by 2032 (Wilson, 2016). In fact, the USA is expected to be majority-minority by 2050 (Colby & Ortman, 2015), setting up an opportunity for the millennial and later generations to establish a new course for sociocultural values (Taylor & Pew Research Center, 2014). This increase in diversity bodes well for creativity and innovation as these thrive in a context of diverse viewpoints (Mueller, 2017).

### Thinking Processes

In addition to the more general shift from considering factors in isolation to a more holistic framework, there are a number of specific thinking processes that should be addressed.

**Understanding phase changes and transitions.** As humanity is involved in a phase change (Gilman, 1993, 2014), it is important for people at all levels of society to understand that dynamic at multiple levels, from human development to the cosmological. Rastigue (2013) provided a very simple overview of human development, Beck (2003) did the same for cultural development, while Chow (2011) addressed cosmological development. Investigating how transitions are similar across scales is an important concept that needs attention.

The essence of a phase change is that there is a chaotic process of decay and growth at that point in the functioning of a living system. While some, formerly stable, attributes and processes decline in function, other, newer attributes and processes simultaneously grow and become more prominent. This can be seen in toddlers and adolescents, in the change from one dominant culture to another, and in the process of dying and birthing of stars and the formation of new galaxies. In human history, families as a dominant form of social organization gave way to tribes, tribes gave way to city-states, and then to empires, and nations. In each case, there was a point when social structures functioned less well as new ones were forming. Humanity is now in a transition to a global, digitized, network form of social organization with a corresponding set of new concepts and principles that form the basis of new ways for humanity to organize social, economic, legal, and political institutions. Looking back to a time when conditions were different for solutions to present-day challenges is simply not the way that systems self-organize themselves when conditions change.

**Understanding linear vs exponential change.** Linear change, where the rate of change remains constant over time period of interest, is how human beings normally experience the world around them (Kurzweil, 2005). Understanding exponential change, where the rate of change accelerates over that span, is a challenge because it is primarily an abstract concept that is rarely experienced concretely. Therefore, exponential change must be taught through a variety of experiences with learners challenged to see patterns across situations.

One way to demonstrate this is ask students if they would rather have 10 million dollars or to have one penny placed on one square of a chessboard and then doubled for every square

thereafter. Because a chessboard has eight by eight squares (making 64 squares in all), one penny double 64 times would be equal to 18.4 quintillion dollars (18 followed by 18 zeroes. Another way to think about this is to imagine a pond with one lily pad on the first day that doubles each day until it is completely covered in 30 days. The pond is only half covered on day 29, only one-quarter covered on day 28, and one-eighth covered on day 27. Over 370 different lessons on this concept are provided on the Teachers Pay Teachers website (<https://www.teacherspayteachers.com/Browse/Search:exponential%20growth%20and%20decay>).

**Developing curiosity and questioning, as access to information is ubiquitous.**

Currently, the focus of education and schooling is on the acquisition and assessment of knowledge using standardized tests (Wei, Pecheone, & Wilczak, 2015). Essentially, this means learners need to store in long-term memory bits of decontextualized facts that can be used to derive the correct answer from pre-selected options provided by test developers. However, in the current milieu, there is a need to facilitate the development of curiosity and asking questions, especially those that cannot be readily answered via a digital search (Proyer, Ruch, & Buschor, 2013). For example, consider the following questions:

1. Who was the last czar of Russia, when did he live, and how did he die?
2. Capitalism and communism suggest different ways of organizing an economy. How are they alike and how are they different?
3. Karl Marx was a German who lived and wrote in London about the benefits of communism. However, his ideas were rejected in both England and Germany, yet adopted in Russia. Provide a rationale for why this might have occurred.
4. Develop some basic principles for an economy of the twenty-first century and explain how these principles are similar to and different from either capitalism or communism. Why are these more appropriate for the twenty-first century as compared to the nineteenth or twentieth centuries?

Consider how relatively easy it would be to find the answer to question number one and increasingly difficult to create an appropriate answer for the remainder. With the ubiquitous access to information via digital devices (Diamandis & Kotler, 2015), the ability to ask questions, independently investigate those questions, and create and evaluate higher-level organizations of knowledge and accompanying products should be a focus of education.

**Developing imagination, creativity, and innovation versus critical thinking and evaluation.** Critical thinking and evaluation of alternatives is a current focus; however, in the age of rapid change, imagination, creativity, and innovation are even more important (Friedman, 2016; Wagner, 2012). An important distinction exists between being creative and innovative. While creating involves the production of a product or service that is original or different, innovation requires that the new service or product must meet some sort of need. That requires putting the new product or service into the market place and testing its practicality. Answering questions on a multiple-choice test can simply not address the issues of creativity and innovation.

**Experience with multiple symbol systems.** In the information/digital era, production and communication is done primarily through symbol systems. In addition to language and math, young people should engage in learn other languages as research shows improved school success for those who do (Bialystok, Craik, Green, & Gollan, 2009; Genesse, (2000). Children and youth should also learn to read and write music (Schellenberg, 2004) and learn to code, thereby learning how to control digital technology rather than simply use it (Jarrett, 2014).

Learning to use additional symbol systems beyond letters and numbers will be one of the most important issues in the coming decades.

**Learn, change direction, relearn.** General approaches to adaptation will be useful; however, specific knowledge and skills will need to be constantly modified and new ones learned. This will require a process of systematic exploration of new methods and their effectiveness. Hattie and Donoghue (2016), in a meta-analysis of learning strategies, identified 73 learning strategies that were significantly related to student academic achievement and a model of how they were related; 23 of the strategies had an effect size greater than 0.70. [Note; an effect size of 0.70 means that learners using a particular strategy will score about 0.70 standard deviations on a standardized test beyond what learners would score when they do not use that learning strategy]. Teaching these strategies within an action research paradigm (inquire, plan, implement, reflect on results, and repeat; Whitehead, 2016) allows each learner to create an individualized approach to learning specific to different types of learning and conditions. Focusing on this process empowers learners to self-regulate their own learning (Dent & Koenka, 2016).

## Choice

In a time of transition and accelerating change, the freedom to choose one's beliefs, values, and actions is critical. There are at least four factors related to choice identified in Huitt's (2017a) review of the forces, trends, and themes related to the current phase change in the human sociocultural domain.

**Self-regulation and self-determination.** Dent and Koenka (2016) found that goal setting and specific cognitive processes such as planning, monitoring and self-checking performance, and self-evaluation of results were critical features of self-regulation. This is an important skill set as learners must be able to guide their individualized learning processes that result from development as independent learners. Additionally, because of the ambiguity and instability of the present and future sociocultural conditions, self-determination of life goals and self-regulation have become critical factors of life success. Dent and Ryan (2012) proposed that learners who believe they are competent, autonomous, and can relate well with others will be predisposed to set their own goals without undue influence of others.

**Ability to discern reliability and validity of information.** As a result of increased open access to information resources (Huitt & Monetti, 2017; Jhangiani & Biswas-Diener, 2017), learners need to be able to judge the reliability (consistency across resources) and the validity (accuracy or correctness) of information and its sources. Learners need to be provided a wide variety of experiences across most of their elementary and secondary schooling to solidify their competencies in this area. A quote widely attributed to Daniel Patrick Moynihan points to this concern: "Everyone is entitled to his own opinion, but not to his own facts." When people and institutions intentionally create fake information, it is important to be able to separate truth from fiction (Kiely & Roberston, 2016).

**Create and use filters.** An additional competency that must be developed is the ability to create and use filters when collecting information as there is simply too much available in the digital age. Schmidt and Cohen (2013) proposed that in the early twentieth century, knowledge is being created in two days that is equal to all knowledge created from the start of civilization to the beginning of the twenty-first century. Learners must be able to create and modify a cognitive

framework and corresponding value system that can provide for adaptive learning that will be successful (Huitt, 2018).

### Increased Importance of Experiential Learning or Learning by Doing

The well-known phrase, knowledge is power, is not quite correct. While knowledge is a necessary component of good decision making and problem solving, unless it is used to create a product or service that effectively and efficiently meets a need, it is not sufficient (Gilder, 2013). Additionally, when knowledge is standardized, it can be organized and taught in schools. However, when knowledge is changing rapidly, critical knowledge and skills are more likely to be the result of personal experiences (Kolb, 2015).

Moreover, learning to put knowledge into practice is as important as creating or acquiring the knowledge itself. Just as the scientific method can be used to develop an individualized approach to knowledge acquisition, it can be used to put book learning into practice and engage in evaluating effectiveness of social action. A comparison of the steps in problem solving, the scientific method, and social action show a similar logic in moving from identifying a situation that needs more consideration to creating and evaluating the effectiveness of any proposed actions (see Table 1). These steps involve what has been described as good thinking by a number of authors (Lutz & Huitt, 2018).

**Table 1. Comparison of steps in problem solving, the scientific method, and social action.**

Step	Problem Solving	Scientific Method	Social Action
1.	Problem Identification	Make an observation	Identify level of interest
2.	Definition of problem	Ask a question	Complete needs assessment
3.	Construct a strategy	Investigate what is known	Identify knowledgebase
4.	Organize information	Construct a hypothesis	Create alternatives
5.	Allocate resources	Collect data	Develop action plan
6.	Monitor implementation	Organize data	Implement plan
7.	Evaluate results	Draw conclusions	Evaluate results

**DIY – Do It Yourself.** Even though collaboration and working with others is important, it is imperative for individuals be self-starters, prepared to put ideas into action (Diamandis & Kotler, 2012). Sometimes it is the lone individual willing to take a first step that encourages others to start their own initiatives. As someone who has created a lot of materials, I can attest to the joy that results from someone saying “I can make some improvements on that” or “This is how I would do that.” That means that the person has developed a level of self-efficacy required to take initiative and responsibility for one’s actions. In a time of transition, requiring an ability to adapt to fast-changing conditions is a highly valued quality.

**Access to resources/money to facilitate DIY.** While information is ubiquitous, financial and human capital are not; individuals must have experience in how to access these as required to develop their ideas and put them into action. One quickly learns that successful implementation of ideas often requires at least a partner and more often a team to put the idea into practice. Being able to create and tell a story is vital to gaining access to those resources (Godin, 2008).

**Engaging in growth/increase vs destructive/decrease activities.** A lack of strict boundaries for thinking, valuing, and action can be both exhilarating and debilitating (Schwartz,

2009). However, a lack of boundaries for appropriate behavior in a fast-changing society results in some people engaging in destructive behavior in their creative explorations of themselves and their environment. One need only look at statistics on youth engaging in risky behavior (Centers for Disease Control and Prevention, 2016) or the increasing percentage of teens suffering from anxiety or depression (Seligman, 2011) to conclude that youth need assistance in selecting knowledge, attitudes, and skills that will empower them to develop their potentials and use them for the benefit of society.

**Employee vs gigs vs entrepreneurship.** Because of exponential acceleration of change, unless a company has established process of providing training and education for future skills, it is unlikely that long-term employment will be available (Schwab, 2016). And even if it is, more people are opting for establishing themselves as their own brands or developing businesses as entrepreneurs. A study by Intuit (owner of TurboTax) estimated that 34 percent of the US workforce work in the gig economy and that could rise to about 43 percent by 2020 (Gillespie, 2017).

**Use of artificial intelligence.** A variety of futurists such as Diamandis and Kotler (2012), Kelly (2016), Kurzweil (2005) predicted that artificial or machine intelligences will become a major factor in the next several decades. Their reasoning stems from the exponential acceleration of computational power and the need to use that power to discover patterns in the vast amounts of data acquired through digital processing as well as the desire to put that knowledge into practice. Increasingly, companies are making shifts to increased use of artificial intelligence and rewarding people who can work in that type of environment (Dugan & Nelson, 2017).

## Communication Strategies and Skills

In today's highly connected world, there are two areas of communication that are vital: the ability to connect with others to share information and products as well as the ability to work in groups and seek win/win solutions.

**Ability to connect with others and share information and products.** The entire world is trying to learn to adapt to the phase change; the more everyone can learn from others, the more successful everyone will be (Diamandis & Kotler, 2012; Kelly, 2016). While young people are quickly adapting to the speed of internet; there is a concern that skills for working in face-to-face situations is waning (Drago, 2015). There is a need to develop the ability to use a wide variety of media and technology to connect with people and share thoughts and products, but not to the exclusion of skills needed for face-to-face communication.

**Consultative decision making; create win/win rather than win/lose alternatives.** Working in groups is an additional skill that must be developed. Gerli, Bonesso, and Pizzi (2015) found that social skills and their associated emotional competencies were significant contributors to success in the workplace. Additionally, learning to consult with others and create win/win alternatives has been a primary principle of one of the most successful approaches to personal success and leadership for more than two decades (Covey, 1998/2013).

In creating products and services that will actually meet needs, diversity is crucial; having multiple viewpoints available when making decisions increases the likelihood of optimization (Phillips, Liljenquist, & Neale, 2009). Fortunately, as discussed above, diversity is now a significant characteristic of most schools, at least in the USA. The key is to value all viewpoints and seek a win-win solution for challenges.



## Handling Tensions Among Analog/physical and Digital/networked Activities

People are living in two worlds today; the world of analog/physical that operates more according to the laws of linear change and the world of digital/networks that operates exponentially at the speed of the internet. The following is a discussion of four issues that must be addressed.

**High tech versus high touch.** In the early 1980s, Naisbitt (1982) described a megatrend associated with the transition to the information age that he labeled high tech-high touch. He described this megatrend in more detail two decades later (Naisbitt, Naisbitt, & Phillips, 1999). Naisbitt's original conceptualization was that people need to be able to socialize as well as to create and use technology. He recognized that interacting with technology and face-to-face socialization required quite different skills sets.

However, Naisbitt et al. (1999) recognized that technology was becoming so ubiquitous and integrated into user's daily lives, that these were often not separate skills. This has become even more so with the use of smartphones and ready access to the vast knowledge available on the internet. It is not uncommon to have at least one person in a discussion search the internet for a fact in the middle of a face-to-face discussion or a set of friends to interact during a sporting event using a messaging app. Reducing the stress from being "always on" is one reason why no-tech vacations (Kallenbach, 2010) and meditation (Thorpe, 2017) are becoming more common.

**Use of informational and communication technology.** A related challenge is using informational and communication technology as part of the high-touch process. The key is to create purposeful, meaningful connections while using technology. In my personal experience, I have found that technology can contribute to these connections after they have been established through face-to-face connections or they can be the start of more personal connections when followed by face-to-face meetings, but they simply do not replace face-to-face interactions. This is supported by such researchers as Graham (2016). The implication is that educators must create ways for learners to use technology in paired or group activities, not block their use entirely.

**Sensors and digitalization of information.** One of the major drivers of change will be the vast increase in information that will be available because of the use of sensors that translate analog data into a digital format (Diamandis & Kotler, 2012; GE & Accenture, 2014; Kurzweil, 2005). The key for educators will be to identify components of human development that are important enough for collection of digitalized data via sensors or computers. There is already an explosion of devices that collect data on such factors as steps taken, heart rate, and sleep cycles (Prospero, 2017) and even coherence (<https://store.heartmath.com/tech-comparison>). Digitization is revolutionizing business (Iansiti & Lakhani, 2014), but has yet to become commonplace in education.

**Develop digital programs to create and control robots.** The use of robots for work will be an increasingly important activity (Collier, 2017). Unless one has the knowledge and skills to create and/or modify the software that control these robots, the individual is giving control to others as to how these will be used. Along with the increased use of artificial intelligence, this will be one of the most impactful trends for the next several decades.

## Developing Innate Human Capacities

As important as it is to consider what will change in the coming decades, there is also a need to identify what will not. While it is expected that the forces and trends discussed above will impact opportunities and challenges in the foreseeable future, human potentials and needs will remain relatively stable. For example, human beings are innately social (Huitt & Dawson, 2011), curious, (Peterson & Seligman, 2004), with capacities that describe human cognitive intelligence (Neisser, 1996). A large body of research shows these potentials are interrelated. For example, those with positive relationships are more likely to explore their surroundings (Kashdan, Rose, & Fincham, 2004) while those having higher levels of emotional intelligence are more likely to do well academically (Goleman, 1995). Therefore, a holistic view of developing human potentials is prerequisite to developing guided learning opportunities that will facilitate humanity developing its full capacities.

I previously created a framework that presented domains of human development based on research of domains of human potentials (Huitt, 2011) and identified attributes within those domains that should be the focus of education and schooling (Huitt, 2013a). This work drew heavily on researchers such as Costa and Kallick (2000, 2009) and their work on habits of mind; Diener and Biswas-Diener (2008) and Seligman's (2011) work on happiness and well-being; the learner profile developed by the International Baccalaureate Organization (2013); Narvaez and her colleague's (2001) work in integrated ethics education; the Partnership for 21st Century Skills (2009) framework for developing the skills necessary for success in the workforce; the Search Institute's (2017) identification of developmental assets; and Wagner's (2012) work on creating innovators (see Huitt, 2012b, for the specifics of this analysis). An overview of the desired outcomes identified in this framework and a comparison to a selection of these contributing frameworks is shown in Huitt (in progress).

It should be noted that not all domains suggested in the Brilliant Star framework are represented in each of the contributing frameworks. For example, Costa and Kalick (2000) do not provide any suggestions for the domains of self and self-views, moral character, or citizenship; the Partnership for 21st Century Skills (2009) does not provide any suggestions for self and self-views, emotion and affect, physical/kinesthetic, spirituality and purpose, or moral character; and Narvaez and colleagues (2001) do not provide any suggestions for self-views, physical/kinesthetic, and spirituality and purpose. On the other hand, all of these frameworks provide suggestions for cognition and thinking, agency and volition, and social/interpersonal development. And three of the four frameworks shown in Huitt (in progress) include suggestions for emotion and affect as well as citizenship. Therefore, it would appear that any educational institution that truly desires to develop a holistic framework for human development would need to consider a number of different approaches and include at least cognition/thinking, emotion/affect, agency/volition, social/interpersonal, and citizenship.

Another fundamental principle for developing a framework or set of desired processes or outcomes is to include the possibility for its modification as additional research becomes available. For example, as mentioned above, Hattie and Donoghue (2016) identified 73 learning strategies that were significantly related to student academic achievement, 23 of which had an effect size greater than 0.70. It would certainly be prudent to include development of a specific set of learning strategies as part of the cognitive domain.

Farid-Arbab (2016), building on the work of Dewey (1909, 1916, 1938) and others such as Freire (1974/2013), advocated for the centrality of moral empowerment as an essential goal or

objective for developing the capacities of both individuals and communities. From this perspective, facilitating learners of all ages to engage in the purposeful development of personal capacities and engaging in community development would include developing competencies in most of the domains discussed in these different frameworks. In the current schooling system, academic achievement in primary/elementary and secondary/high school is seen as necessary for tertiary education which, in turn, is necessary for a high-paying career. However, a focus on moral empowerment would be more holistic in nature, focusing on personal development of capacities that could be used in the service of society. Obtaining a job or having a career would be an important component of making a social contribution, but would not be considered the primary goal. Moreover, this single concept has elements of the five components discussed above.

Table 2 presents an overview of the desired attributes that are considered more stable and important for human living in a wide variety of cultural milieus and those that are rapidly changing and need to be developed for personal success and contributing to one's community over the next several decades using the analysis presented above. This presentation is meant to be more suggestive than complete as there are many different viewpoints on desired attributes. Notice that the analysis of the phase change provided by Huitt (2017a) or the similar analysis provided above do not show any additional recommendations for the domains of self and self-views, physical and kinesthetic, and spirituality and purpose. This demonstrates the need to consider both orientations when describing desired learner attributes. Children, youth, and adults continue to need to be knowledgeable about themselves, to live balanced and healthy lifestyles, and create meaning and purpose in their lives. While the circumstances may change in which these are developed, the foundational human needs remain relatively stable.

**Table 2. Comparison of desired stable and changing attributes**

<b>Domain</b>	<b>Stable</b>	<b>Changing</b>
Self/Self-Views	<ul style="list-style-type: none"> <li>• Need for balance among domains</li> <li>• Knowledge of various self-views</li> </ul>	
Cognition/Thinking	<ul style="list-style-type: none"> <li>• Academic knowledge</li> <li>• Creative and critical thinkers</li> <li>• Decision makers and problem-solvers</li> <li>• Metacognition</li> </ul>	<ul style="list-style-type: none"> <li>• Understand holistic view of human beings and their ecosystems</li> <li>• Understanding phase changes and transitions</li> <li>• Understanding linear vs exponential change.</li> <li>• Imagination, creativity, and innovation</li> <li>• Critical thinking and evaluation</li> <li>• Ability to discern reliability and validity of information</li> <li>• Create and use filters</li> </ul>
Emotion/Affect	<ul style="list-style-type: none"> <li>• Emotionally developed</li> <li>• Optimistic</li> <li>• Develops gratitude</li> <li>• Caring</li> </ul>	<ul style="list-style-type: none"> <li>• Increase engaging in growth/increase</li> <li>• Reduce engaging in destructive/decrease activities</li> </ul>

**Table 2. Comparison of desired stable and changing attributes (continued)**

<b>Domain</b>	<b>Stable</b>	<b>Changing</b>
Agency/ Volition	<ul style="list-style-type: none"> <li>• Planners</li> <li>• Inquirers</li> <li>• Risk-takers</li> </ul>	<ul style="list-style-type: none"> <li>• Curiosity and questioning</li> <li>• Learn, unlearn, relearn</li> <li>• Self-determination and self-regulation</li> <li>• Engage in problem-solving and use of scientific method</li> <li>• Do It Yourself skillset including accessing resources</li> <li>• Learning strategies</li> </ul>
Physical/ Kinesthetic	<ul style="list-style-type: none"> <li>• Healthy lifestyle</li> <li>• Kinesthetic competence</li> </ul>	
Spirituality/ Purpose	<ul style="list-style-type: none"> <li>• Creates individual meaning and purpose</li> <li>• Develops deep, personal relationships</li> </ul>	
Social/ Interpersonal	<ul style="list-style-type: none"> <li>• Open-minded</li> <li>• Communicators</li> <li>• Interpersonally skilled</li> </ul>	<ul style="list-style-type: none"> <li>• Comfortable interacting with different ethnicities, religions, cultures, languages, age groups, etc</li> <li>• Ability to connect with others and share information and products</li> <li>• Consultative decision making. create win/win rather than win/lose alternatives</li> </ul>
Moral Character	<ul style="list-style-type: none"> <li>• Ethical sensitivity</li> <li>• Ethical judgment</li> <li>• Ethical motivation</li> <li>• Ethical action</li> </ul>	<ul style="list-style-type: none"> <li>• Moral empowerment</li> </ul>
Citizenship	<ul style="list-style-type: none"> <li>• Sociocultural awareness</li> <li>• Value social structures</li> <li>• Competence in adult roles</li> <li>• Active community involvement</li> </ul>	<ul style="list-style-type: none"> <li>• Glocal mindset</li> <li>• Engage in social action</li> <li>• Skill-set to work as employee, contractor, or entrepreneur</li> <li>• Skill-set to augment work using artificial intelligence</li> <li>• Ability to use current technology, especially related to information and communication</li> <li>• Ability to use data collected from sensors and other forms of digital information</li> <li>• Create digital programs to create and control robots</li> </ul>

### IMPLICATIONS FOR EDUCATION AND SCHOOLING

Based on the above discussion, it can be stated emphatically that the requisites for personal and community success in the age of empire (the pre-digital/pre-networked age of

agriculture and industry) are radically different from those necessary for the current transition to a global, digital, networked age (Gilman, 1993, 2014). This phase change is analogous to the performance of water as a solid (ice), as a liquid, or a gas; though the chemical composition is the same, the substance functions differently at different phases. This is why there is a need to carefully analyze forces, trends, and themes likely to occur in the next several decades as well as the capacities and needs of human beings and consider changes that need to be made in the goals and objectives of educational systems. Even a cursory review of how current schooling is organized, as well as curricula and assessment methodologies, shows that the preparation of children and youth in many schools appears to be more suited for the industrial age of 1950s than the deeply transformed societies of the 2030s (Wagner, 2008; Zhao, 2012).

There are a variety of implications of this analysis of stable and changing attributes for the structure and functioning of education and schooling. First, some general issues related to needed changes in schooling will be discussed, followed by more specific issues related to openness, issues related to the structure and functioning of classrooms, and some issues related to curriculum and classroom practice.

### **General Issues Related to Needed Changes in Schooling**

As the type of changes described in Huitt (2017a) come at an increasingly faster pace, schools, as well as the federal, state, and district organizations supporting them, must become learning institutions (Senge, Cambron-McCabe, Lucas, Smith, Dutton, & Kleiner (2000). Senge et al. discussed many excellent concepts such as a shared vision including corresponding mental models and the use of systems thinking that contribute to this endeavor. However, there are two additional concepts not mentioned by Senge et al. that are important to consider as a result of changes in the past two decades: decentralization and openness.

Using a systems approach to describe schooling, developing a shared vision and corresponding mental models as discussed by Senge et al. (2000), when combined with the digitalization of data and the ability to rapidly collect data and share results, leads to the need for decentralization of schools as institutions (Huitt, 2006) and the need for federal, state, and districts to develop the means to support this decentralization. This does not mean that common goals such as high levels of academic achievement should be abandoned, but rather that schools should be required to clearly state their missions and orientations and then share the processes they have created or selected to achieve those as well as the associated results. Also, it means that the processes and activities designed to address all of these goals are decided upon and implemented at the building level. Magnet schools and charter schools, as well as private schools, are leading the way in this decentralized approach; the technology changes discussed by Huitt (2017a) make it much easier to address the accountability issues associated with a decentralized approach.

A second issue that must be addressed is the movement to openness (Jhangiani & Biswas-Diener, 2017). As the world moves to a sociocultural climate that is global, digitalized, and changing at an exponential rate, the amount of knowledge generated makes it very difficult to organize and present a particular viewpoint as “truth.” The idea that there is a finite set of knowledge that all Americans or any other nationality needs to know (e.g., Kirsch, Kett, and Trefil, 2002; see <https://www.coreknowledge.org/>) is completely obsolete. With ubiquitous access to knowledge, it is more important to be able to access knowledge and have the cognitive processes to use that knowledge to solve problems or create new products and services. This

does not mean that a set of foundational skills such as reading, mathematics, or engaging in science are not necessary. Rather it means that a different set of processes and skills are even more critical in today's global society (National Education Association, 2012). As such, it is important to be more open with respect to different aspects of education and schooling.

There are many different ways of thinking about the concept of openness. Huitt and Monetti (2017) identified ten dimensions that differentiate approaches to schooling and education that are more traditional (ie, oriented towards a national, industrial economy) and those that are more open (ie, oriented towards a global, digitized, information economy) (see Table 3).

**Table 3: Analysis of Traditional and Open Education**

	<b>Traditional</b>	<b>Open</b>
<b>Transparency</b>	Opaque or hidden data and decision-making processes	Transparent data and decision-making processes
<b>Purpose</b>	Socializing for factory work	Socializing for global democracy
<b>Focus</b>	Curriculum-centered	Person-centered
<b>Desired Outcomes</b>	Cognitive	Holistic
<b>Assessment</b>	Discrete cognitive knowledge	Authentic, holistic profile
<b>Teaching Processes</b>	Standardized, directed learning	Varied, as appropriate, with more self-regulated learning
<b>Learning Tasks</b>	Curriculum-directed	Problem- and project-based
<b>Resources</b>	Private enterprise controlled	Free or inexpensive
<b>Work environment</b>	Compartmentalized	Connected
<b>Organizational structure</b>	Centralized	Decentralized

### **Structural Changes Related to Openness**

Three of these dimensions—transparency, the work environment, and organizational structure—relate to the structure of schooling institutions. Most state, district, and school structures are relatively centralized and compartmentalized, reflecting the industrial model created in the late nineteenth and early twentieth centuries (Marshak, 2003). A more appropriate structure would have these institutions be more transparent, decentralized, and connected. This approach would require the creation of a platform where educators could access the frameworks used by different organizations and any materials related to specific items in the framework as well as allowing educators to post relevant materials and share ideas about the activities of their classrooms and schools. The processes of sharing and accessing materials would be completely transparent to anyone using the platform. Building this platform using blockchain technology (see <https://www.ibm.com/blockchain/what-is-blockchain.html>) could make this secure from undesirable manipulation. That is because when using blockchain technology the record of transactions is decentralized; any attempt to manipulate the data would need to be done simultaneously across all users of the system. This becomes an impossible task when the users number in the thousands or even millions.

### **Goals and Accountability**

Four of the dimensions discussed by Huitt and Monetti (2017) relate more to the goals and accountability of schooling—purpose, focus, desired outcomes, and assessment. These issues are not new; they have been discussed for millennia. The challenge now is that humanity is involved in a phase change that requires these issues be discussed in this new context. The movement to a more holistic, person-centered curriculum that has as its primary purpose the socialization of children and youth to participate in a global democracy requires a more open approach to assessment in order to determine whether educational institutions are actually addressing the requirements presented by the phase change. This should be a major focus during the coming decades.

Federal, state, and local districts must provide leadership in consensual collaboration decision making rather than the hierarchical, command-and-control currently used and provide all stakeholders opportunities to contribute to that process. As stated above this requires the development of a platform that all stakeholders can use to access critical information and share their thoughts and materials related to a wider range of desired outcomes.

They must also provide leadership in creating sustainable approaches to running schools. Climate change is one of the existential threats to humanity (Tollefson, 2017) and schools have an obligation to teach children and youth about how local actions have implications for life on this planet. There are many ideas and working programs on how to address this issue and schooling institutions at all levels need to make this a priority (see [https://19january2017snapshot.epa.gov/climatechange/what-you-can-do-school\\_.html](https://19january2017snapshot.epa.gov/climatechange/what-you-can-do-school_.html)).

Because humanity is in the early stages of the phase change, most people have not acquired the general knowledge and personal experiences that will allow them to adapt to this enormous change. It is therefore important that local districts and schools engage the community and parents in learning and connecting to vision and desired outcomes of k-12 learners (Israel et al., 2001; Spoth, Randall, & Shin, 2008). One example of a successful program is the Parent University (see <http://internet.savannah.chatham.k12.ga.us/schools/parentuniv/Pages/AboutUs.aspx>) and Early Learning College (<http://www.savannahecf.org/>) initiatives in Savannah, GA. These twin programs enlist community resources to support families as they fulfill their important roles in raising children. This school-family-community connection must play an increasingly vital role in the development of children and youth.

### **The Importance of Accountability**

Across the globe, the focus is on standardized measures of academic achievement with little or no regard for other attributes that are likely to be more important in the near future. However, without specific, standardized methods and materials to assess change in the more holistic attributes mentioned above, there will be little incentive for educational institutions to make the necessary changes (Hummel & Huitt, 1994). Creating new and appropriate systems of assessment deserves an extensive R&D effort at both the federal and state levels if educational institutions are going to make the necessary changes to educate children and youth for success in the coming decades. Moreover, reported research showed that external accountability systems were the wrong drivers of successful systemic change (Fullan, 2011). Rather emphasis needs to be placed equally on developing professional capacity building and the development of internal,

personal forms of accountability. When human beings are threatened externally they function less well than when they are encouraged to actualize their potentials.

### **Tensions Among Stakeholders**

There is a tension between the increased acceleration and integration of the various forces and trends and the stability of the current sociocultural context in which humanity currently lives. Likewise, there is a tension between the stable potentials and needs of individuals and the attributes that individuals need to learn because of the changing conditions. There is also a tension between the current knowledge, skills, and expectations of parents, educators, and policy makers and those required for successful adaptation to the fast-paced changes occurring in a given community or society. Moreover, because human beings resist change (Mueller, 2017), it is likely that formal, non-formal, and informal aspects of education will stagnate or even regress unless dramatic steps are taken to change the various systems at the local, national, and even global levels.

Formal education, including K-12 schooling and higher education, is historically conservative; there is a tendency to look backward to see what worked and bring those forward as sociocultural truths (Smargorinsky, 2010). This is not viable in a period of fast-paced change. Rather, schooling should be guided by the expectations of changes that will likely occur in the next several decades as well as a vision of the type of society in which humanity would like their great-grandchildren to live.

At present, elementary and secondary schooling is heavily influenced by entrance standards of institutions of higher education and expectations for the demands placed on learners once they are there. This places a tremendous burden on institutions of higher education to provide leadership in clarifying and promoting the knowledge, attitudes, and skills that will be important over the next several decades. Universities, especially, need to be much more open about what it means to create and disseminate knowledge (Biswas-Diener & Jhangiani, 2017). For example, universities must actively work with faculty to address expectations and modify incentives from publish-or-perish at prestigious research universities to sharing results of research and suggested applications in ways that can be accessed by the general public. It also means increasing the importance of working with non-university colleagues to implement that knowledge throughout the society. Without reducing the standards of academic scholarship, the general public has every right to expect that time and monies are spent on assisting in their preparation for the accelerating changes at hand.

However, elementary and secondary schools cannot wait for institutions of higher education to make dramatic changes. They must create curricula and learning activities that allow for transition from present demands to a desired future. Most importantly, they must transition from a past-present to a past-present-future orientation as they work to prepare learners to develop their own knowledge and skills and contribute to creating a desired future. As explained above, exponential change means that change is happening not only at a quicker pace, but the rate of change is also increasing. While it is possible to identify forces and trends as they develop (Huitt, 2017a), it is not possible to predict exactly what is going to occur over the adult lifespan for those who are now in elementary or even secondary school.



### **School-level Issues**

The remaining three dimensions of open education—teaching processes, learning tasks, and resources—relate more to the functioning of schools and classrooms. Any changes addressing the levels discussed above must support the activities of educators and learners in schools and classrooms. While specific details will be discussed in a later section, at this point it should be emphasized that a standardized academic curriculum presented in a strictly teacher-centered manner and using primarily instructional materials owned by private corporations simply does not address the purpose, focus, and desired attributes for the changing cultural milieu. However, enticing educators to create and share their own materials and learning activities must be preceded by a different accountability system. Educators will simply not make these changes if the accountability system remains focused on a competition to create academic achievement as measured by standardized assessments.

At the school level, it is necessary to prepare learners for expectations of multiple career shifts throughout one's work life and retirement. Therefore, there should be a focus on developing potentials and meeting needs rather than selecting a career. At the same time, children and youth need to be provided opportunities to engage in a wide variety of activities that might be used in different careers. This is one reason why exploring the arts is so important. Invariably, there is a product that is produced and shared, providing learners with increasingly more complex experiences that are similar to adult practices. Another way to do this is to engage learners in using problem solving, the scientific method (especially action research), and social action described in Table 2 to address authentic school and community challenges. These activities combine both creative and critical thinking that are important now and will become increasingly important in the future.

An additional issue at the school level is to provide a platform where learners can share the created products that demonstrate what they have learned. The platform should provide not only opportunities to demonstrate speaking and writing skills, but also the use of multi-media for communicating ideas. Sharing products and using what others have produced should become standard practice in the schooling system.

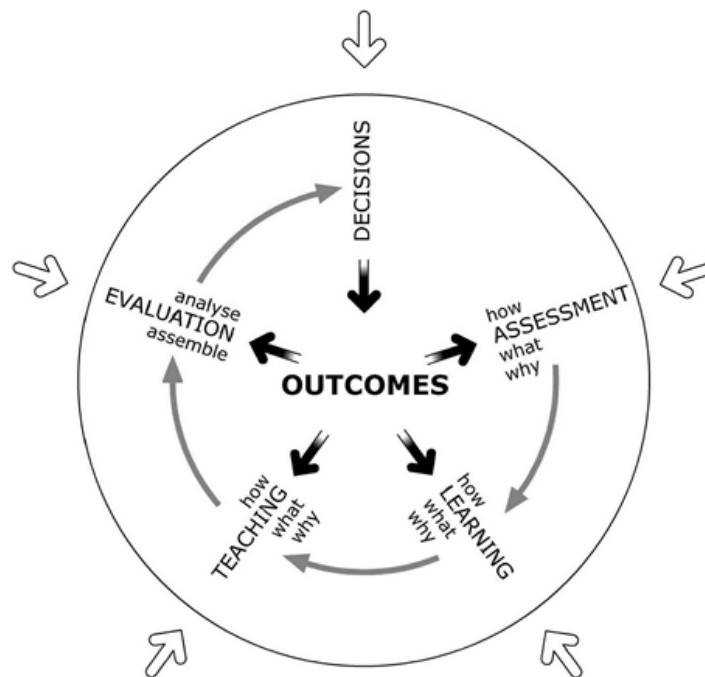
### **Curriculum and Instructional Alternatives**

Stefani (2004/2005) described a model of curriculum development that begins by defining the desired outcomes and possible assessments before identifying the theories of learning and methods of teaching (see Figure 1). While the previous discussion focused on desired outcomes, it is beyond the scope of this paper to adequately address associated assessment methodologies. Creating these and developing a platform where results can be easily organized and presented to various stakeholders must be a priority in any attempts to change traditional practices. While there is some progress in regard to assessment of more holistic objectives (eg., Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011), there is still much work to be done. More importantly, a platform where these types of results can be organized and reported for individuals is yet to be developed and accepted as common practice.

As for theories of learning, Huitt (2013b) outlined eight learning theories that provide support for curriculum and instruction. These range from behavioral and information processing theories to social cognitive and connectionistic theories. Each theory has a set of basic assumptions, a view of the learner, a set of principles of learning, and an optimum method for

instruction. For example, a behavioral/operant conditioning view of the learner would be that of a reactive adaptor and the task of the teacher would be to categorize the goals and objectives into manageable units, arrange an environment whereby learners could successfully address those units, and provide the correct reinforcers and punishers during the learning process. On the other hand, a humanistic theory would have a view of the learner as an autonomous agent, make sure the learner felt comfortable during the learning process, and would connect learning to personal interests and goals. Alternatively, a social cognitive theory would view the learner as an embedded agent, would assist the learner to work towards both personal and socially prescribed goals, and would have learners engage with others during the learning process. The differences among learning theories and prescriptions for instruction demonstrate the importance of one's mental representation of reality (Huitt, 2018). Once one has created a map of learning and teaching, education and schooling are then defined by that map, regardless of whether it fits the day-to-day occurrences facing teachers and learners.

**Figure 1. Model of Curriculum Development**



### Teaching Strategies and Methods

There is currently an important discussion among educators as to the best strategies and methods to use for instruction. In general, these strategies have been labeled pedagogy, andragogy, and heutagogy (Hase & Kenyon, 2007). Historically, pedagogy has referred to methods of instruction appropriate for children and adolescents, andragogy has referred to methods appropriate for adults, and heutagogy has referred to methods associated with self-determined, experiential learning, regardless of the age of the learner. However, modern approaches to curriculum and instruction, supported by various learning theories, demonstrate how approaches to curriculum and instruction can be used at all ages (ie, age is not the determining factor of appropriate curriculum development and instructional methods). I suggest

that more appropriate labels for the categories of instructional methods would be teacher-directed, self-directed or self-regulated, and self-determined. Table 4 provides an overview comparison of these three approaches to instruction.

**Table 4. Comparisons of pedagogy, andragogy, and heutagogy**

Dimensions	Pedagogy	Andragogy	Heutagogy
	Teacher-directed	Learner-directed or Self-regulated	Learner-determined
Desired Outcomes	Assessed competence in a classroom setting	Personally-meaningful competence	Capability to use in novel contexts, especially those outside the classroom
Knowledge & Skills	Well identified and organized	Somewhat identified and organized	Often less well-defined and relatively less organized
Who Determines	Society or other authoritative source	Outcome – Society or profession Process -- Individual	Individual for both outcome and process
Focus	Assessed product	Assessed project	Personal capacities
Curricular Orientation	Established topics and standards	Problem- and project-based learning	Experiential
Teacher Role	Instructor	Facilitator or Activator	Create learning environment where mistakes are welcomed
Learning Theory	Behavioral (Operant Conditioning); Cognitive Information Processing; Social Learning Theory	Cognitive and Social Constructivism; Social Cognitive Theory	Humanistic; Cognitive and Social Constructivism; Social Cognitive Theory; Connectivism
Learning Time Orientation	Limited time demands efficiency	Expandable because of learner effort	Expandable because of learner interest
Background Required	Little prior knowledge	Adequate for self-regulated learning	Adequate for self-determined inquiry
Cognitive Load	Relatively simple	Challenging to learner	Relatively complex in a novel environment
Use Orientation	Future use emphasized	Knowledge/skills— immediate and future; processes/capacities— present	Present interests and needs emphasized
Format	Face-to-face	Face-to-face, online, or hybrid	Learner community -- Online and social network
Motivation	Other / External	External and Internal	Personal / Internal

**Teacher-directed instruction.** As mentioned previously, identifying the desired outcomes or target for instruction is the first step in developing curriculum and selecting methods

of assessment and instruction. For teacher-directed instruction the desired outcome is assessed competence on a previously determined set of standards. This implies that the knowledge and skills to be developed are readily identifiable and organized, that society or some other source of authority has determined these are important and has established methods of assessment, and that established topics and standards are readily available to educators.

Using scores on standardized tests as the measure of learning, Hattie (as cited in Huitt, Huitt, Monetti, & Hummel, 2009) completed a meta-analysis of 800 meta-analyses of studies related to improving student academic achievement. The methods identified were primarily used in a teacher-directed approach, although some would be placed in the learner-directed or self-regulated category. Two summary variables, teaching strategies and quality of teaching, had effect sizes of 0.60 and 0.44, respectively. [Note: the effect-size statistic is an estimate of the amount of change in achievement that learners would demonstrate if they were in classrooms where this factor was implemented.] Some of the specific strategies identified as important include reciprocal teaching ( $d=0.74$ ), the use of meta-cognitive strategies ( $d=0.69$ ), the use of teaching strategies related to problem-solving ( $d=0.61$ ), the teaching of study skills (0.59).

**Learner-directed or self-regulated approaches.** On the other hand, learner-directed or self-regulated approaches deem that any competencies that are developed should be personally meaningful even if the precise knowledge and skills to be developed are not completely identified. There is then a tension between what society or other authoritative sources deem important and what the learner believes is important. This often results in an agreement that the educator will select the desired end result while allowing the learner to select the learning methods and the means of demonstrating competence.

There is also considerable empirical evidence to support self-directed or self-regulated learning. In a meta-analysis of the relationship of self-regulated learning and academic achievement, Dent and Koenka (2016) identified two primary factors that are critical when learners take control of their own learning while advancing towards specific goals: 1) the use of cognitive strategies, in general, and 2) more specifically, the use of metacognitive processes. Some of the cognitive strategies that were identified included paying attention to the main idea when learning new material, using signals such as headings to identify main ideas, and the use of study aids when learning new material. Some of the metacognitive processes identified included goal setting, planning, and self-checking.

An important distinction for teaching methods for self-regulated learning is provided by Hattie (2012) who added to his previous work and identified specific factors that he associated with teacher as facilitator and teacher as activator. He identified seven specific factors of a “teacher as facilitator” instructional method (often associated with humanistic or open education; Huitt, 2009) that had a combined effect size of 0.17 (individualized instruction, inductive teaching, inquiry-based learning, problem-based learning, simulations and games, smaller class sizes, and web-based learning). This relatively low effect size supports the Kirschner, Sweller, and Clark (2006) critique of this approach as it relates to positively impacting scores on standardized assessments of academic knowledge and skills. On the other hand, Hattie identified six factors associated with “teacher as activator” that had a combined effect size of 0.60 (providing feedback, frequent assessments of effects of teaching, supporting challenging goals, developing meta-cognition, using reciprocal teaching, and teacher-student self-verbalization). Of course, this does not mean that humanistically-oriented methods should never be used; rather it points to the need to use these cautiously because of the need to be efficient with the use of school time.

**Learner-determined approaches.** An important distinction between heutagogy and the other two approaches is the expectation that knowledge and skills be developed to such a deep level that they can be demonstrated in novel contexts, especially those outside the classroom. Exactly what is to be learned and how it is to be demonstrated is not as clearly defined and the individual is responsible for establishing desired outcomes as well as the process for how the competencies will be demonstrated.

Hattie and Donaghue (2016) completed a meta-analysis of learning strategies and then developed a model of how these were related and could be used systematically. While these are relevant to self-regulated learning, they are even more important for self-directed learning. Appendix A shows the components of the model with 23 of the strategies that had an effect size greater than 0.70. Notice that there are five categories of strategies (skill, will, thrill, success criteria, and environment) that are used either generally or for surface learning, deep learning, or for transfer. Two of the most important general strategies are the development of a strong sense of self-efficacy ( $d = 0.90$ ) and understanding the criteria by which success will be identified ( $d = 1.13$ ). Two of the strategies most effective for surface learning include having a strategy for integrating new knowledge into prior knowledge ( $d = 0.93$ ) and outlining and transforming new knowledge as it is being learned ( $d = 0.85$ ). Two of the most effective strategies for deep learning include seeking help from others ( $d = 0.83$ ) and involvement in classroom discussions ( $d = 0.82$ ). Finally, two of the most important strategies in the transfer of learnings to new situations includes identifying similarities and differences ( $d = 1.32$ ) and seeing patterns in new situations ( $d = 1.14$ ). All of these can be taught using teacher-directed instruction and then practiced in self-regulated and self-determined learning activities.

**Comparison among approaches.** It is important to notice that the teacher role and supporting learning theories are different for each different instructional approach (see Table 4). Therefore, attempts to define “the best” theory of learning or “the best” set of teaching strategies or methods are unwarranted. Different methods are appropriate for different goals, different parts of a lesson, or even different learners based on age or other characteristics.

In teacher-directed instruction, the teacher is directly guiding the teaching-learning activities using principles of learning derived from operant conditioning, cognitive information processing, and social learning theory. There is a context of limited time available for engaging in teaching and learning which requires a focus on efficient use of that time, there are limited expectations of prior knowledge beyond what the teacher has explicitly taught previously, and the cognitive load is relatively simple in that only small steps above current learning is expected.

On the other hand, the teacher role for learner-directed or self-regulated learning is that of facilitator or activator supported by humanistic and social cognitive theories, respectively. The time available for learning is expandable because of the level of effort the learner is willing to expend, and the background required is adequate for the self-regulated learning on challenging tasks. Likewise, the role of the teacher in learner-determined learning is to create a learning environment where mistakes are not only tolerated but welcomed and the learning methods are supported by cognitive and social constructivism and connectivism. The time for learning is expanded even more because of learner interest and the background required is adequate for self-determined inquiry on rather complex tasks in a novel environment.

There are also differences in expectations on when the new knowledge and tasks will be used, the format for teaching and learning, and the motivation expected for the learners. For teacher-directed instruction, there is a future emphasis with instruction more likely taking place in face-to-face environments, with the teacher responsible for creating a motivation to learn. For

both learner-directed and learner-determined methods there is an increasing expectation that knowledge and skills will relate to rather immediate interests and needs, taking place in a wider variety of contexts, and with the learner providing the motivation to learn.

The most important issue in redefining approaches to instruction as non-age related is that methods associated with all three can be used by teachers of all ages by combining different learning theories and instructional methods in units of instruction. For example, there may be a short teacher-directed component of a lesson related to a specific knowledge or skill that is determined important in a standardized curriculum. This could then be followed by problem-based or project-based instruction, completed either individually or in groups, with a focus on self-regulated learning. Finally, this could be followed by providing learners with opportunities to create a context they determine to be personally important and to develop a product that demonstrates their capabilities to use their knowledge and skills in that novel context.

**Providing effective feedback.** In all three approaches to instruction, one of the most important factors in successful learning is that the teacher, instructional materials, or even other learners provides effective feedback (Wiggins, 2012). He identified seven characteristics to effective feedback, three of which are most relevant to feedback on process. First, the feedback must be tangible and transparent. By that he means that the feedback must be seen understood by the learner. Having a feedback system where it is difficult to receive the results or not concrete enough to provide meaningful next steps is not effective. Second, the feedback must be actionable. That is, it must provide the learner with explicit next steps based on the feedback. Third, the feedback must be timely; it must be provided in a way that the learner has time to make any necessary corrections before the next step is taken.

Baumeister, Vohs, DeWall, and Zhang (2007) identified an additional component of effective feedback. Because emotion has the potential to impact behavior, the feedback must provide opportunities to fail that do not generate excessive negative emotional responses. The climate in which feedback is given can be important in this regard. One suggestion is to have a weekly class discussion where learners discuss their biggest failures with someone receiving a “biggest failure” award of the week. The idea is that when one is creative and innovative, it is expected that most ideas will not work out as expected. Promoting those as learning experiences reduces the negative impact that might result from those failures.

Educators need to make significant progress in providing effective feedback, especially in self-regulated and self-determined learning. One way to do this is through the use of technology. In a teacher-directed activity, teachers could use Google Forms (<https://www.google.com/forms/about/>) to create short quizzes based on reading assignments that are reviewed in class. In a self-regulated activity, learners could submit a learning plan and then submit materials online for formative feedback from fellow learners ([https://edu.google.com/k-12-solutions/classroom/?modal\\_active=none](https://edu.google.com/k-12-solutions/classroom/?modal_active=none)). The same could be done for self-determined learning with learners submitting products for summative review by an authentic audience.

### **Teacher Competencies for Global Education**

Because globalization is such an important factor in modern education, Cain, Glazier, Parkhouse, and Tichnor-Wagner (2014) proposed that one of the most important set of teacher strategies relates to the development of a set of competencies related to global mindedness that teachers must have in order to develop global mindedness in learners (see Appendix B). These

are categorized in three domains: dispositions, teacher knowledge, and teacher skills. The two dispositions include the development of empathy and a commitment to equity on a global level. The teacher knowledge competencies relate to developing an understanding of global issues, especially through personal experiences. Finally, the teacher skills relate to facilitating communication across cultures and languages and creating an environment that encourages inquiry and exploration. Because children and youth are living in an age of relatively unlimited opportunities to live and work anywhere on the planet, these competencies should be a focus in teacher education programs and emphasized in all aspects of professional development activities.

### **Concept-based Teaching**

A method that teachers can use to impact creative and critical thinking, as well as metacognition, is concept-based teaching (Erickson, Lanning, & French, 2017). The focus is on developing conceptual understanding (rather than the memorization of facts) as the foundation for decision making and problem solving. There is also a focus on asking good questions and evaluating the sources of evidence to address those questions. Finally, there is an emphasis on the transferability of knowledge and understanding to a wide variety of situations. These are exactly some of the skills needed in a fast-changing environment.

### **Phenomenon- or Theme-based Instruction**

The essence of phenomenon- or theme-based is to integrate knowledge across different academic areas and apply that to authentic, real-world challenges facing today's young people. For younger children, that might include everyday experiences (Bobrowsky, Korhonen, & Kohtamaki, 2014), while for older children it might focus on local and/or global issues (Springer, 1994, 2006). This approach to instruction has been under development for several decades (Fredericks, Meinbach, & Rothlein, 1993); Roberts & Kellough, 2008), but has gained prominence in recent years. EduRef.org provides links to a variety of theme-based lessons (<https://eduref.org/lessons/interdisciplinary>), while Huitt (2015) provides links to interdisciplinary units based on children's literature. These are excellent starting points for teachers interesting in incorporating theme-based instruction into their current lesson plans.

Radnor Middle School in Radnor, Pennsylvania, provides just one example of how a school can focus on a global issue through a focus on local conditions (Springer, 1994, 2006; see Crossroads Project: <http://www.rtsd.org/Domain/419>; Watershed Project: <http://www.rtsd.org/Domain/418>; Soundings Project: <http://www.rtsd.org/Domain/416>). The school's approach was to develop a set of theme-based curricula that addressed important global issues through investigation of local conditions. Results from this project-based approach show that the middle-grade learners do just as well on standardized assessments of academic achievement as learners who enroll in a more traditional approach to schooling.

At a city-wide level, Helsinki, Finland has initiated a movement towards phenomenon- or theme-based learning for all learners (Brown, 2017; Garner, 2015). This is a remarkable initiative as Finland learners score at the very top of comparisons for international academic assessments. It follows the maxim stated by Christensen (1997) and repeated by Diamindis and Kotler (2012): Disrupt yourself or be disrupted.

Two international organizations that include phenomenon- or theme-based curricula are Fieldwork Education, which provides three related programs (International Early Years

Curriculum, International Primary Years Curriculum, and International Middle Years Curriculum) (see <http://fieldworkeducation.com/curriculums/>) and the International Baccalaureate Organization, which provides four programs (Primary Years Programme, Middle Years Programme, Diploma Programme, and Career-related Programme) (see <http://www.ibo.org/en/programmes/>). What sets these approaches apart is their focus on integrating knowledge to prepare learners as global citizens.

### **Arts-based Instruction**

A teaching strategy that has become widely used among those who promote a more holistic approach to teaching and learning is arts-based instruction (Huitt & Huitt, 2008; Pool, Dittrich, & Pool, 2011; Rooney, 2004). A central concept is that by using arts-based instruction, learners are able to use a wider variety of their potentials across multiple domains identified in Appendix A, especially in creative and critical thinking and the domains of emotional, social, and character development. The Leonard Bernstein Artful Learning Model has provided leadership in the development of this strategy (Brothman, 2013). Another excellent resource for units and lessons is the ArtsNow organization (<http://artsnowlearning.org/resources/>).

### **Group-based Decision making and Problem Solving**

Although individual decision making and problem solving are valuable competencies, it is even more important to become skilled in group-based decision making and problem solving. This involves the development of competencies in multiple domains including cognitive, affective, and social. Huitt (1992) described a process of group-based problem solving that demonstrated how a diversity of personalities could be used to include multiple perspectives in the activity. He showed how individuals with different personality types and temperaments would be more naturally included to demonstrate competence in techniques used in creative and critical thinking. By making sure that these differences are provided sufficient time at different phases of the process, more effective win-win alternatives will be developed.

Harley and Harley (2017) described a process they labeled as compassionate consultation that provides a method for making values-based, mindful decisions at the individual, group, community, and even national and global levels. A major component of the method is that decisions makers must be aware of the perspective or worldview that is used to identify the values that will be central to the decision-making process. Facilitating the awareness and development of one's worldview would therefore be an important attribute of schooling and education.

### **The Flipped Classroom**

While some would advocate use of a single learning theory, Huitt and Vernon (2015) demonstrated how all theories could be used at different points in a flipped classroom lesson. Central to the concept of the flipped classroom is that individual learning is done at home while the classroom work is focused on group activities. Huitt and Vernon showed how behavioral and information processing theories provide the foundation for the construction of materials used by learners at home and then humanistic, cognitive and social constructivism, and social and cognitive learning theories are used in the classroom as learners engage in problem- and project-



based learning. Using a connectionistic learning theory guides teachers and learners to display products in as widely a connected environment as possible. For example, they could be displayed within the classroom or somewhere else in the school, could be placed on the classroom or school website for wider viewing, or could even be placed on a public website available to the general public.

A flipped classroom method is an excellent way to be able to spend more classroom time on problem- and project-based learning which, in turn, are excellent learning activities that promote critical and creative thinking (Bergmann & Sams, 2014; Reidssema, Kavanagh, Hadgraft, & Smith, 2017). These are two foundational desired outcomes described above.

### **Maker Spaces**

The creation of maker spaces is a teaching strategy that is gaining prominence, both at the K-12 (Graves & Graves, 2016; Lofton, 2017) and the university levels (Barrett, Pizzico, Levy, & Nagel, 2015; see <https://spaces.makerspace.com/> and <http://oedb.org/ilibrarian/a-librarians-guide-to-makerspaces/>). The basic concept supporting the creation of maker spaces is that learners need the opportunity to put ideas into practice and evaluate results. This supports the concepts of DIY, fail fast, and the use of self-regulation and self-determination learning strategies discussed above. While there is little consensus about exactly how maker spaces should be configured or the tools and materials that should be made available, there is a recognition that learners of all ages need the opportunity to imagine a new product and experience the joys and frustrations of bringing an idea to fruition.

### **Academic Service Learning**

Academic service learning (ASL) might be considered as one of the most important approaches to learning that can be implemented by schools. While academic service learning has been shown to positively impact academic success (Simonet, 2008), it is only one benefit. That is because ASL allows learners to put into practice the separate skills related to cognitive, affective, self-regulation, and social competencies that often are developed separately in other schooling experiences. It also provides an opportunity to gain practical experience through experiential learning.

The RMC Research Corporation (2009) provided some excellent resources for implementing academic service learning projects. During the early years, when working with children who have less experience in academic service learning, adults can make decisions about the types and locations of the service learning project. However, as children and youth develop more experience with the process, they can be asked to develop their own projects based on their personal interests and skills. It is important to consider individual learners capacities to do work independently, but not require it. Some learners will develop the self-regulation skills quite early while others may have challenges in this area. Participating in academic service learning should never be considered a competitive activity, but rather seen as an opportunity to demonstrate and develop new knowledge and skills (Spring, Grimm, Jr., & Dietz, 2008).

### **Sociocultural Evolution Must Consider Religion as Source of Knowledge**

Because decision making and problem solving always involve a value system and a majority of people on the planet connect their values to a religion, Wilson (2006) proposed that the central core of all religions should be taught in schools. In this vein, Friedman (2016) suggested that teaching the essence of all religions could be done by teaching the Golden Rule as it summarizes much of the religious contribution to creating positive human relationships. Additionally, Peterson and Seligman (2004) identified a set of character strengths and virtues through an exploration of resources from science, religion, and philosophy. It seems reasonable to use these same resources to develop win-win alternatives for character development and then investigate these scientifically as to their effectiveness in specific circumstances.

There is ample evidence to support the proposition that all religions have overlapping claims relating to the meaning and purpose of human lives (Metz, 2013), as all of humanity has a common biological heritage (Olson, 2003). Even though the different major religions originated in separate geographical locations at various times in human history, a careful reading shows considerable overlap among essential principles as to how human beings can lead meaningful lives (Smith, 1976/1992). However, any such claims that relate to human practice must be validated using scientific methods. By combining the investigation of religious scriptures with investigations using scientific methods, the major sociocultural challenge of tension among the secular worldviews of elites and the more common religious worldviews of the vast majority of the world's population can be reduced, if not eliminated, in the pursuit of developing effective educational curricula and methods that will meet the needs of children and youth in this challenging transition period (Huitt, 2018).

### **Putting Concepts, Principles, and Methods into Practice**

A quote widely attributed to Abraham Lincoln and Peter Drucker summarizes a foundational perspective of this paper: "The best way to predict the future is to create it" (Peterson, 2013). A second quote by William Gibson (1999) supports a theme as to what is important and what strategies and methods to implement: "The future is already here — it's just not very evenly distributed." The first quote suggests that those interested in schooling and education must imagine a future in which they would like their grandchildren and great-grandchildren to live, investigate the forces, trends, and themes that will likely prevail in the next several decades, determine how those might connect to the desired future global society, and identify the competencies and capabilities that will allow children and youth to progress towards that future. Of course, it is then necessary for adults to acquire those same competencies themselves. After all, one cannot share what one does not have.

The second quote suggests that many of the concepts and principles discussed in this paper have already been implemented, though not widely. Therefore, one should investigate globally-oriented projects that are leading the way to educational re-visioning and reform. While there are a number of these that could be discussed, two will be highlighted here: The International Baccalaureate program developed by the International Baccalaureate Organization and the New Pedagogies for Deep Learning (NPDL) project developed by Michael Fullan and his colleagues.

## The International Baccalaureate Programs

The four International Baccalaureate programs (<http://www.ibo.org/en/programmes/>) for learners ranging in age from four to nineteen have much to offer parents and educators who seek to prepare children and youth to be personally successful and make a contribution to their communities. All programs address the more holistic elements of the learner profile—Balanced and Reflective mindsets, Principled in moral character, Knowledgeable Thinkers who are Open-minded, Caring, Inquiring Risk-takers, and Communicators (Bryant, Walker, & Lee, 2016)—and work to “develop inquiring, knowledgeable, and caring young people who will help to create a better and more peaceful world through intercultural understanding and respect” (International Baccalaureate Organization, 2015, p. i). There are currently 4,000 schools around the world, employing over 70,000 educators (<http://www.ibo.org/benefits/>).

For the most part, the programs offer a framework for designing lessons and units rather than specific curricular standards and objectives (Bunnell, 2011) and educators are encouraged to share and use materials developed by others and published on the organization’s password-protected website. Teaching methods include a combination of instructional methods as described in Table 2 (teacher-directed, learner-directed or self-regulated, and self-determined). There are standardized assessments for the IB Diploma program for high school juniors and seniors. Most importantly, the assessments are graded by highly-qualified experts who are not employed by the school whose learners take the exams; this allows a high level of integrity to be established. Graduating with an IB Diploma allows learners to gain admittance to institutions of higher education in more than 90 countries (Burnell, 2008; Hill & Saxton, 2014).

There are a wide variety of opportunities for professional development, ranging from online courses, to face-to-face workshops and conferences. Educators are encouraged to continually upgrade their knowledge and skills as well as to contribute to the professional development of their colleagues (<http://www.ibo.org/professional-development/which-type-of-training-is-right-for-me/>).

## The New Pedagogies for Deep Learning Project

The New Pedagogies for Deep Learning project (NPDL; <http://npdl.global/>) was created by Michael Fullan and his colleagues (Fullan & Langworthy, 2013). The project was based on Fullan’s successful school system reform work in the United Kingdom and Ontario, Canada (Fullan, & Rincon-Gallardo, 2016), but is now used by over 1000 schools in seven countries (Fullan, 2017a). The project identified six competencies they believe should be the focus of children and youth—character, citizenship, collaboration, communication, creativity, and critical thinking. There is a great deal of overlap between the 6C’s of NPDL and the IB Learner profile. Character is labeled principled in the IB while communication and critical thinkers are virtually identical. Creativity is incorporated in the IB profile as inquirers and risk-takers, and collaboration is incorporated in the IB programs through group projects and service learning.

The essence of the NPDL project is to create coherence among four components—focusing direction, cultivating collaborative cultures, deepening learning, and securing accountability (Fullan & Quinn, 2016). Focusing direction means to determine starting points for change efforts and to concentrate on just a few indicators for success. Cultivating collaborative structures means to acknowledge that competent individuals are embedded in social and cultural settings and everyone must work together to develop both individual and

social capital. Deepening learning means to focus more on self-regulated and self-determined learning outcomes using technology as an accelerator when appropriate. Securing accountability means to focus on both internal and external accountability—individuals holding themselves accountable for their own behavior as well as individuals and system units holding themselves accountable to external expectations. Coherence, and the capacity to build coherence, is actually created through leadership at multiple levels as leaders discover the right combination of the four components to meet the demands at a particular level.

### Summary

Both the IB programs and the NPDL project state a moral purpose of preparing young people for both individual success and developing a community that will foster further development. This is a central principle of the focus on moral empowerment as a primary focus of elementary and secondary schooling (Farid-Arab, 2016). There are three explicit principles that guide the two approaches:

1. the holistic process of defining the focus of schooling as exemplified by the learner profile (International Baccalaureate Organization, 2013) and the 6C's (Fullan, 2017b);
2. a collaborative approach to developing lessons and units of instruction and school processes that result in deep learning, and
3. a focus on both internal and external accountability systems.

This overlap demonstrates a congruence between the two approaches that separate them from traditional strategies with a focus merely on individual academic achievement. Moreover, both approaches hold that teachers and learners are embedded in a culture that has an impact on both that can reduce the impact of even the most capable among them.

However, while both programs focus on the relatively stable desired outcomes shown in Table 2, they do not address all or even most of the desired outcomes listed in the column describing changing desired outcomes. While these can certainly be addressed by individual educators and schools, especially when included in extra-curricular activities, special attention will need to be provided to be certain that all learners have a variety of experiences that address these issues.

A primary difference between these two approaches is that, while the IB program focuses on individual schools, the NPDL project focuses on connecting state, district, and school systems. Fullan and his colleagues (Fullan & Hargreaves, 2017; Fullan, Quinn, & McEachen, 2017) argued that while developing the human capital of professional educators is important, it is not enough to meet the needs of a rapidly-changing sociocultural context. There must also be the development of social capital among the tri-levels of states, districts, and schools in which educators are embedded and the development of decisional capital that allows educators to adapt to the rapidly changing circumstances.

Again, while there are many programs that might serve as exemplars of the future of schooling and education, these two programs deserve to be high on a list of where to start an investigation of what schooling will look like in the next several decades.

## CONCLUSIONS

It is evident humanity is in the midst of one of the most influential changes in human history. This means that the future is not only unknown, but in many respects, unknowable. One element of successful adaptation is to seek out diversity of knowledge and experiences as individuals and communities grapple with change that at times seems overwhelming. Seeking advice from a narrow range of views is a recipe for disaster in a fast-changing environment. It is likely to lead to a perception bias that influences decision makers to fit new data into established mental representations rather than construct new ones that better match reality (Huitt, 2018). At the same time, it is necessary to develop unity of purpose if diversity of viewpoints does not lead to inactivity or destructive action.

In this context it is just as important for adults to develop the capabilities of communication and collaboration as it is for children and youth. Being able to communicate through non-traditional methods made available by technology such as using social media or creating videos must be developed in addition to the traditional methods of speaking and writing. Additionally, the ability to engage in consultative decision making (Saracco, 2016) or what Harley and Harley (2017) described as compassionate consultation are vital. This stage of transition demands seeking out and understanding multiple viewpoints and perspectives if unity is to be developed without denigrating and crushing diversity.

One implication is that schools must engage adults in these consultation activities, both parents and other members of the community. This is vital to building the support for the non-traditional approaches to schooling required today. Educators need to communicate to parents, community members, and policy makers that they do not know everything; there are no established best practices that inform all decision making. They need to explain that the action research method is a way to explore and verify specific methods and curriculum that work for learners in specific situations. They then need to share the results in a transparent manner and adjust accordingly (Babineaux & Krumboltz, 2013).

A critical component of an action research approach is that educators, parents, community members, and policy makers must accept the principle that failure to achieve a goal or objective is an event, not a destination. The processes involved in learning, identifying knowledge and practices that no longer work, relearning more appropriate knowledge and skills, and reorganizing what is known, are foundational to successful adaptation to fast-paced changes. As Babineaux and Krumboltz (2013) stated, everyone must become comfortable with failing often and quickly and using methods associated with science and social activism to ascertain reliability and validity of best guesses in a specific context at a specific time. Everyone must recognize that individuals and institutions that can change quickly in response to changes in technology and sociocultural contexts are more likely to be personally successful and contribute to an ever-advancing civilization.

In conclusion, there is a flaw in the basic assumption produced by linear thinking that the future will look very similar to the past. Exponential change is difficult to understand and requires specific guided learning experiences in order to develop a minimal competence to use it when thinking about current social and cultural conditions. While human potentials and cultures change relatively slowly, technology and social conditions can, and do, change rapidly. All of humanity can benefit if adults acquire important knowledge, dispositions, and skills that will enable them to then develop environments in which children and youth can develop their full

potentials. There is an abundant future awaiting humanity (Diamandis & Kotler, 2012).; we simply need to develop the vision and corresponding capacities necessary to create it.

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**Appendix A**  
**Learning Strategies**  
 Hattie & Donoghue \*

Effect size &gt; 0.70

Category	General	Surface Learning		Deep Learning		Transfer
		Acquiring	Consolidation	Acquiring	Consolidation	
<b>Skill</b>	Prior knowledge (0.77)	Strategy to integrate with prior knowledge (0.93) Outlining & transforming (0.85) Mnemonics (0.76) Working memory training (0.72)	Deliberate practice (0.77) Effort (0.77) Rehearsal & memorization (0.72) Giving & receiving feedback (0.71)	Elaborating & organization (0.75) Strategy monitoring (0.75)	Seeking help from peers (0.83) Classroom discussion (0.82) Evaluation & reflection (0.75) Self-consequences (0.70)	Similarities & differences (1.32) Seeing patterns in new situations (1.14) Far transfer (0.80)
<b>Will</b>	Self-efficacy (0.90)					
<b>Thrill</b>	Deep motivation (0.75)					
<b>Success Criteria</b>	Success criteria (1.13) Planning & prediction (0.76)					
<b>Environment</b>						

\* Hattie, J., & Donoghue, G. (2016, August 10). Learning strategies: A synthesis and conceptual model. *Science of Learning*, 1(16013). doi:10.1038/npscilearn.2016.13 Retrieved December 2017, from <http://www.nature.com/articles/npscilearn201613.pdf>

**Appendix B**  
**Teacher Competencies for Global Education**  
 Cain, Glazier, Parkhouse, & Tichnor-Wagner\*\*

<b>Domain</b>	<b>Competency</b>	<b>Proficiency Level</b>
<b>Dispositions</b>	1. Empathy and valuing multiple perspectives	I recognize biases and limitations of my own perspective and those of others' perspectives. I recognize how my personal beliefs influence my decisions as a teacher. I empathize by seeking to understand the perspectives of others.
	2. Commitment to promoting equity worldwide	I engage in opportunities that address particular issues of local and/or global inequity (e.g., poverty and discrimination). I take responsibility for helping my students and others in my school to recognize inequities.
<b>Teacher Knowledge</b>	3. Understanding of global conditions and current events	I seek out multiple sources to understand contrasting perspectives on an issue. I stay informed on current local and global issues.
	4. Understanding of the ways that the world is interconnected	I can explain ways that global issues impact my local context and individuals in other nations. I can explain global influences on local issues and local influences on global issues.
	5. Experiential understanding of multiple cultures	I demonstrate knowledge of various cultures through cultural immersion experiences (e.g., study abroad and local immersion). I reflect upon the immersion experience in relation to my own cultural constructs, perspectives, and educational practices.
	6. Understanding of intercultural communication	I can use strategies to effectively navigate intercultural interactions. I understand that learning languages has social, emotional, and cognitive aspects.

**Appendix B**  
(continued)

Domain	Competency	Proficiency Level
<b>Teacher Skills</b>	7. Communicate in multiple languages	I am proficient in at least two languages (including my own). I can effectively communicate with students and families in at least two languages.
	8. Create a classroom environment that values diversity and global engagement	I teach my students to respect and learn from diverse perspectives and cultures. I provide opportunities for students to collaboratively discuss global issues. I consistently encourage students to use resources in my classroom for global learning.
	9. Integrate learning experiences for students that promote content-aligned explorations of the world	I regularly integrate real-world and challenging global learning experiences aligned with my students' interests and content standards.
	10. Facilitate intercultural and international conversations that promote active listening, critical thinking, and perspective recognition	I provide ongoing opportunities for students to converse with individuals from other cultures or nations, in which students demonstrate active listening, critical thinking, and perspective recognition.
	11. Develop local, national, or international partnerships that provide real world contexts for global learning opportunities	I develop local, national, and/or international long-term partnerships that allow my students to learn about the world with diverse communities.
	12. Develop and use appropriate methods of inquiry to assess students' global competence development	I develop and use frequent, authentic, and differentiated assessments of students' global competence development. I can provide students with constructive feedback and analyze students' performance to inform subsequent instruction.

\*\* Cain, J., Glazier, J., Parkhouse, H., & Tichnor-Wagner, A. (2014). *The globally competent learning continuum: The competencies*. Alexandria, VA: ASCD. Retrieved December 2017, from <http://globallearning.ascd.org/lp/editions/global-continuum/contents.html>