AAHE Scholar Presentation

Thinking of a Change: Health Education for the 2020 Generation

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In my March 2011 AAHE Scholar presentation, I suggested several possible innovations in school health education that, if initiated, may better meet the needs and interests of our two youngest generations - Millenials and 2020s. To understand why I could be in a position to make these recommendations you may want to know something about my background. I'm currently a professor at Indiana University (IU) who focuses on health education and health promotion in the school setting. My career has included time as a high school health education teacher and school district health education coordinator followed by several initial years in higher education. I returned to public education as a health coordinator and, eventually, curriculum director for an innovative school district in the late 1980s at the beginning of the current education reform era and worked for a number of years in the early 1990s to 2002 on large scale evaluations of school-based HIV prevention programs and coordinated school health infrastructure before joining the faculty at IU in 2002.

During my career I have witnessed an ebb and flow in the perceived importance of school health education through three major child and adolescent health "crises" - drug abuse in the 1970s, HIV in the 1980s and, today, child and adolescent obesity. As each of these problems emerged, I was involved in developing and implementing responsive new programming. As a curriculum director responsible for all school subjects in grades PK-12, I was very engaged in learning about and planning systemic change. From these experiences I feel that I developed a unique perspective as a health educator.

As I explain to my current health education teacher preparation students my philosophy holds that all teachers, regardless of the subject they teach, and all instructional programs, including health education, must contribute to the educational mission of schools. A related corollary is that to be effective health educators must understand how school systems work along with the pressures and problems school administrators face, and use this information to position health education as a major contributor to solutions. This latter point is often not appreciated by school administrators in the absence of strong advocacy by health educators who make their cases through both words and deeds.

While working on education reform as a curriculum director, I began to read works in the emerging field of "futuring." The first book I remember having an impact on my thinking was John Naisbitt's 1982 book, "Megatrends: Ten New Directions Transforming out Lives."[1] Subsequently, I became a member of the *World Future Society* and a regular reader of its Journal, *The Futurist.* I regularly consult the "Bookstore" feature of this Journal for publications that I might use to glean new insights about developments that could affect my life or work. Sometimes my reading choices are random and sometimes I'll end up reading several books on topics I decide to pursue in more depth.

I routinely use two strategies to inform my thinking about health education. The first, environmental scanning, I learned from the "futuring" literature. Futurists like Naisbitt regularly scan grassroots sources such as local newspapers in an attempt to identify new and emerging trends. My reading of books from eclectic fields is, for me, a type of environmental scanning. The second is a concept I learned from teaching about creativity. That is, in addition to generating completely new ideas, creativity can entail using existing ideas in new and different ways. In combining the two strategies, I scan different fields for information that I can then apply to the practice of health education, asking myself the question, "How can I use these ideas to inform and improve what I do as a health educator?"

HINTS ABOUT THE CURRENT STATUS OF HEALTH EDUCATION IN SCHOOLS

Before suggesting how we might change school health education, I thought it prudent to determine its status today and did this in two ways. I reviewed what we already know about school health education along with gathering information from the public education environment that might provide additional insights. I call this section "hints" because my environmental scanning churned out lots of information, much of it substantiated but

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some also based on my professional impressions and interpretations.

How Should Health Education be Taught?

I first asked if we know how health education should be taught relative to best educational practice and influencing students to behave in healthy ways. As it turns out, we actually know a lot about this. As displayed to in Figure 1, at least eight (some sources list up to 18) characteristics of health education are common to topical curricular units studied in numerous quasi-experimental research projects conducted throughout the 1990s that were shown to positively influence student health behaviors.[2] Also listed are the eight current National Health Education Standards [3] adopted by most state education departments,[4] which have strongly influenced health education PK-12 textbooks and instructional support materials. Perhaps unique among all school subjects, a comparison with the Effectiveness Characteristics clearly shows that the Standards and, by extension, curriculum and instruction designed to be consistent with the Standards, are research-based.

Furthermore, for a recent study published with a colleague,[5] we analyzed select research-based middle and high school curriculum modules and documented five categories of common teaching strategies that ought to be employed in order to teach a standards-based curriculum which provides opportunities for students to both learn health knowledge and mastery of health skills. These strategies are: role play; group cooperation (jigsaw, carousel, think-pair-share, etc.); interactive technology (e.g., video, websites); team games; and small group discussion.[5] These vitally important strategies facilitate student processing of health information and practice of the skills embedded in the National Health Education Standards including, but not limited to: interpersonal communication; conflict resolution; avoidance and refusal; problem solving; planning; advocacy; evaluation and critical analysis; self-management; and personal responsibility. Additionally, use of these types of strategies is seminal to "active learning" which is the hallmark of highly effective teachers of all school subjects.[6] As we point out, without the use of these types of strategies, instruction becomes fact-based, didactic and ineffective.

In regard to the current status of school health education, my cursory review showed that as a profession we have known for over 15 years what constitutes effective health education and how to teach it in ways that insure effectiveness. Nevertheless, knowing how to best teach health education in schools does not guarantee it will be taught in that way.

Is there Support for Health Education in Schools?

In assessing its current status, I also wanted to determine if support existed for inclusion of health education in the overall

Figure 1. Characteristics of Effectiveness and National Health Education Standards

Characteristics of Effective Health Education	National Health Education Standards
▪ Research-based and theory driven ▪ Focus on specific behaviors ▪ Accurate, basic, and developmentally and culturally appropriate information ▪ Learning activities engage students in interactive and experiential ways ▪ Students are given opportunities to model and practice skills (communication, avoidance, refusal, negotiation, problem solving, goal setting, stress management, etc.) ▪ Social and media influences on behavior are addressed ▪ Individual values and group norms that support health-enhancing behaviors are strengthened and supported ▪ Of sufficient duration to allow students to gain the needed knowledge and skills (at least 8 lessons) ▪ Include teacher training that enhances effectiveness	▪ Standard 1– Students will comprehend concepts related to health promotion and disease prevention to enhance health. ▪ Standard 2–Students will analyze the influence of family, peers, culture, media, technology and other factors on health behaviors. ▪ Standard 3–Students will demonstrate the ability to access valid information and products and services to enhance health. ▪ Standard 4–Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks. ▪ Standard 5–Students will demonstrate the ability to use decision-making skills to enhance health. ▪ Standard 6–Students will demonstrate the ability to use goal-setting skills to enhance health. ▪ Standard 7—Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks. ▪ Standard 8–Students will demonstrate the ability to advocate for personal, family and community health.

school curriculum. I found that several sources of evidence exist including public opinion polls conducted by American Cancer Society (ACS) in 1995[7] and Alliance for a Healthier Generation in 2009[8] as well as a survey conducted by the Mid-Continent Regional Education Laboratory (MCREL) in 1999.[9] The ACS survey conducted by the Gallup Poll organization found that a majority of U.S. school administrators, students and their families support comprehensive school health education and that a majority of parents and administrators believed that adolescents should be taught more health information and skills in schools. Furthermore, over half of students said schools should spend more time on health than on English, math or science.[7] The much more recent national survey conducted for the Alliance for a Healthier Generation by KRC Research found that an astounding 92% of parents consider physical education and health education as important as English, Math and Science instruction.[8]

The McRel study proved especially instructive. The premise behind this study was that when considered across all 14 generally accepted school subjects, the total number of standards just could not be addressed in a 13 year education and, therefore, standards should be prioritized according to importance. To inform the content of the public school curriculum, a random, nationally representative sample of American adults was asked to rank 142 Standards from across the 14 school subjects including: Language Arts, Mathematics, Science, Foreign Language, History, Civics, Economics, Geography, Social Studies, Health, Physical Education, Technology, and Lifelong Learning. To the utter surprise of many, perhaps most, in the public school "establishment" (i.e., the high national and state public officials, intellectual education writers, and schools of education faculty members who strongly influence curricular policy decisions), all 10 health education standards statements appeared in the top 50 in this order:

- 1 of 142: Understand substance use and abuse
- 3 of 142: Understand family health/individual health
- 4 of 142: Knows essential concepts of disease prevention and control
- 6 of 142: Knows how to maintain mental and emotional health
- 11 of 142: Knows use of health services, products and information
- 12 of 142: Understands nutrition and diet
- 16 of 142: Knows injury prevention and safety
- 19 of 142: Fundamental concepts of growth and development
- 24 of 142: Knows how to maintain and promote personal health
- 50 of 142: Knows environmental health[9]

Suffice it to say that no other subject, including Language Arts, was perceived by American adults to have this level of importance in the overall school curriculum.[9] When I first saw these findings years ago, I thought that the educational world would just have to stop and restructure the entire PK-12 curriculum around health. That's what the results demanded.

To no one's surprise, however, that simply did not happen. The "establishment" prejudices and biases against health were just too great for this kind of evidence to have its intended effect. To this day, health education and physical education are the only areas that are not named as school subjects by the U.S. Department of Education[10] and, as a consequence, do not receive financial support for developing and refining their standards. Not to be denied, both AAHE and NASPE have spearheaded development of content standards with non-governmental funding; the American Cancer Society has supported development of both editions of the National Health Education Standards.[3]

Is Health Education Taught Now?

Satisfied that health education has support, I next wanted to know if it is being taught in schools. For this I turned to the 2006 School Health Policy and Programs Study (SHPPS) [4] conducted by the Division of Adolescent and School Health of U.S. Centers for Disease Control and Prevention which included data collected at the district, school and classroom levels from a random, representative sample of U.S. school districts. This study, indeed, found that 70% of elementary schools required that seven of the fourteen health topics be taught while 83% of middle schools and 90% of high schools did the same. The following topics are reportedly taught in at least two-thirds of elementary, middle and high schools: injury prevention/safety; alcohol and other drug use; emotional and mental health; nutrition; physical active and fitness; tobacco use prevention; and violence prevention. At the elementary level, the median number of hours devoted per year to each topic ranged from .7 hours for "other STD prevention" to 3.4 hours for "nutrition." The number of hours required annually per topic in middle school courses was somewhat greater and in high school courses substantially greater, however, middle and high school health courses are not necessarily required in every grade. High percentages of elementary, middle and high schools indicate that they teach multiple sub-topics under these major health topics during required instruction but one has to wonder how they are able to do this with any level of thoroughness in the amount of time devoted to such instruction. For example, over half of elementary schools report teaching eight of 17 subtopics under emotional and mental health but the median number of hours devoted annually to this topic is only 2.6. Likewise, over half reported covering fourteen of twenty-three tobacco sub-topics in a median of 1.9 hours annually.

These results are both encouraging and discouraging—encouraging because they substantiate that some of the most important health topics are required to be taught in most schools; discouraging because the amount of time devoted to health instruction is minimal compared to other subjects. For example, whereas the hours devoted to each health topic are reported *per year*, the typical elementary school includes two hours of language arts, one hour of mathematics,

one-half hour of social studies and one-half hour of science instruction *every day*.

How is Health Taught?

Also wanting to know how health education is taught, I again turned to the SHPPS,[4] where I found that in elementary schools health was almost uniformly infused into the grade-level curriculum. That is, unlike physical education, art and music, health education was seldom taught by content specialists or during specified times every week. At the middle and high school levels, health education was taught as a separate course in 43% of schools, combined with physical education in 22% of schools, and integrated in other subjects such as science, social studies and English in 35% of schools. With the exception of environmental health and immunization, most health topics received more frequent coverage in identified health courses.[4]

To know how more about approaches to teaching health, I turned to my own students as the data source. My students know and are able to distinguish knowledge acquisition from knowledge application, active learning from passive learning, and information-only from skills-based instruction. Following a semester of early field placement during which each of 28 students spent a minimum of 20 hours serving as active observers in 28 separate and distinct middle and high school health classrooms (approximately 560 total hours), I asked how many had observed: either knowledge acquisition or knowledge application; either passive or active learning; and skills based instruction. All 28 had seen only instruction focused on knowledge acquisition and none had observed any skills-based instruction. About half had observed some type of learning where students were actively engaged in some way.

Obviously, these results are based on a very small sample of teachers and are certainly not conclusive in isolation. Nevertheless, in talking with colleagues from across the nation I'm hearing much the same. While we know how to teach health education effectively, substantial anecdotal evidence exists to suggest that many, many teachers of health education ineffectively rely on a "facts-only, read the textbook and learn the bold words" approach based on didactic instruction with little, if any, opportunity for students to practice the skills that will allow them to act in healthy ways throughout life. I'm also hearing that teachers are taking this approach because it is considered "academic" in that it stimulates students to expand their vocabulary and will help them succeed on high-stakes, standardized test. (Thankfully, we also know from evidence such as several of the outstanding presentations from classroom teachers at the AAHPED Convention, the AAHE Blue Apple Awards ceremony and other sources that there still are a lot of conscientious teachers attempting to provide active, skills-based health instruction.)

Where Does Health Fit in (or Not)?

For many years, I have been a premium member of the Association for Supervision and Curriculum Development (ASCD), one of the largest and influential professional education organizations in the U.S. and, incidentally, an organization that in many ways "gets" the importance of the connection between student health and safety and academic achievement. As a premium member I receive the Journal, *Education Leadership* and, annually, four books on topics of current interest to educators, primarily curriculum specialists, principals and superintendents. I regularly peruse both looking for insights regarding health education; recently one *Education Leadership* article and two premium books caught my eye. Jane David,[11(p. 78)] in her article *High-Stakes Testing Narrows the Curriculum,* asks:

> "Are science, social studies, the arts, and physical education really disappearing from elementary schools? Are critical thinking and deep reading of literature fading from the high school curriculum?"

Her answer.[(p. 79)]

> "A study of a large urban district from 2001-2005 found that as worries about adequate yearly progress increased, teachers matched contend and format of what they taught to the state test. These researchers concluded that the content of the tests had effectively become the learning goals for students…More than 80 percent of the studies in the review found changes in curriculum content and increase in teacher-centered instruction."

This answer was not at all surprising and, in fact, was expected. Most telling for me, however, was David's initial question in which it did not even dawn on her to ask if health education is disappearing from the curriculum. What does this question (and the troubling answer) imply about health education and its future in the school curriculum? Given her conclusions regarding the impact of high-stakes testing and annual yearly progress (AYP) anxieties teachers (and school administrators) are currently facing, how might SHPPS results differ in 2011 from those reported in 2006?

I also quickly read through two brand new 2011 copyright ASCD Premium Membership Books: "Wasting Minds Why Our Education System is Failing And What We Can Do About It?"[12] by Ronald A. Wolk and "Focus Evaluating the Essentials to Radically Improve Student Learning" [13] by Mike Schmoker. Given the titles and all the work that has been done over the last 15 years to make the connection, I was intrigued to see what these books might have to say about the link between health and learning as well as the importance of health and health education in schools. What I found was that neither book even mentions child health, teacher health, or physical activity directly with only a very few tangentially health-related issues (e.g., self-control) included in sections entitled "what do employers want," "brain studies point the way," and "the drop-out epidemic." I was especially astounded by these omissions given the recent notoriety given to the impact of physical activity on the brain and learning, most notably summarized by John Ratey's in his book, "Spark the Revolutionary New Science of Exercise and the Brain."[14]

Perhaps one of the best sources of information about future trends in education is the Council of State Chief School Officers (CCSSO); a professional association of all U.S. state superintendents of schools. CCSSO currently provides support services

for and collaborates with the *Partnership for 21st Century Skills,* [15] an independent membership organization comprised of some professional education associations, such as the American Association of School Librarians and ASCD, along with many large for-profit companies including Cisco Systems, Hewlett Packard, Sun Microsystems, Intel Corporation, Houghton Mifflin Harcourt, McGraw-Hill, The Walt Disney Company, and Verizon. The *Partnership's* goal is to identify and enumerate the essential skills students must learn in schools to successfully compete in a global integrated economy. Preliminary information from the Partnership website [15] provides great insight regarding the importance of student health and health education in the collective judgment of the many diverse partners involved in this project, primarily for what it does not say. Below is the list of core subjects for the 21st century this project has identified to date:

- English, Reading or Language Arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics[15]

Note that this list does not include health education (or physical education) and, despite more than a decade of effort by numerous health and health education organizations, has not changed from the original list of subjects that appeared in 1990 under the federal Education Goals 2000 legislation.[10]

While contemplating these hints about the current status of health education in schools, I happened to receive the latest issue of the *American Journal of Health Education* which contained an article by the editor, Robert McDermott, titled *Health Education Circa 2035—A Commentary.*[16(pp. 2-3)] The following lines from that article especially rang true for me:

> "In the next 25 years we will have to leave our comfort zones and take a calculated risk with some radical and creative approaches to health behavior change, for as Einstein is credited as having said: "Insanity is to do the same thing over and over again and expect a different result."…I would like to suggest that our prediction of the future will be made easier if we are among *those who create the future through a conscious set of decisions and actions.*" [16]

Based on impressions generated from the information presented above, one could argue that with regard to health education in schools we're doing the same thing over and over again and achieving no better result (i.e., little influence on the educational system, little regard from within the education establishment, constricted instructional time, uncertain quality of instruction, etc.). The logical questions to explore then become: Should we stop doing the same thing over and over again and try something else? If so, what else could we consider doing?

SCANNING FOR BLIPS ON THE RADAR

So now you know what stimulated my interest and drew me to the theme of my presentation, thinking of a change. But, instead of jumping to immediate answers I was led to an entirely new set of questions. In order to even consider what we might change in school health education, I felt the need to know:

- Who are our learners? What are they like? How do they learn?
- What "blips" are out there to inform what we do?
- What non-traditional delivery systems are available?
- Can a new approach connect to 21st Century Education Reform?

Learners of Tomorrow…Today: Millennials and 2020s

To find out something about the learners, I consulted several works about the various generations present in the U.S. population today with primary focus on the two newest generations, wanting to find out what they're like and how they might be uniquely different from previous generations. Two individuals who have made a study of U.S. generations, William Strauss and Neil Howe, identified four generation-types (Figure 2) which they claim repeat throughout history.[17] Each generation type has a unique description and, generally speaking, is motivated by a distinct set of values.

Of most interest to us are the "Civic" and "Adaptive" generation types which constitute the current Millenials born between 1982 and 1999 and Generation 2020s born in 2000 and later. Interestingly, the Millenials are of the same generation type as the "Greatest Generation" of teens and young adults who fought in World War II and led the U.S. national surge to super-power status during the post-war period. (According to the repeating pattern, the Civic generation type is in its youth when the nation faces a crisis and is called to the rescue by national elders.) This generation type is highly invested in by parents of the previous generation who had to raise themselves because their parents were pre-occupied; many parents of Millenials (highly supervised) are the Gen Xers (raised themselves) who were, in turn, the children of the Boomers (self-absorbed).

Generally speaking, the Millenials are characterized as: [18,19]

- The least white and most racially and ethnically diverse generation in history;
- Thinking of themselves as "global;"
- The busiest people in U.S. with reduced unstructured time and in school longer;
- Having considerable spending power, but with parent's approval;
- Except for BMI, generally healthier and engaging in risk behaviors in lower numbers;
- Never having known a time without computers;
- Wanting to work for an organization that does something they believe in and is supportive, empowering and inspiring;
- Blending home and work life; and
- Wanting to develop new skills and career prospects at work.

Figure 2. Four Generation Types that Repeat throughout U.S. History*

Type	Name	Years	Description	Values
Reactive	Lost	1883-1900	Unprotected and criticized youth; risk-taking, alienated; reclusive elders	Liberty, pragmatism, survival
Civic	GI (Greatest)	1901-1924	Increasingly protected youth; heroic and achieving adults; busy elders	Community, technology, affluence
Adaptive	Silent	1925-1942	Overprotected and suffocated youth; risk-averse, conformist adults; sensitive elders	Pluralism, expertise, social justice
Idealist	Boomers	1943-1960	Increasingly indulged youth during spiritual awakening; visionary elders	Principle, religion, education
Reactive	Gen X	1961-1981	Unprotected and criticized youth; risk-taking, alienated; reclusive elders	Liberty, pragmatism, survival
Civic	Millennium	1982-1999	Increasingly protected youth; heroic and achieving adults; busy elders	Community, technology, affluence
Adaptive	2020	2000-	Overprotected and suffocated youth; risk-averse, conformist adults; sensitive elders	Pluralism, expertise, social justice

* Adapted from Generations The History of America's Future 1584-2069 by Strauss and Howe

Members of Generation 2020 are children of very late Boomers, Gen-Xers and early Millennials and are characterized as:[18]

- Hyper-networked, staying connected by cell and smart phones;
- Knowing how to access information quickly (also TMI);
- Concerned about the environment;
- Wanting freedom to get their education anywhere in the world, even by phone;
- Desiring mobile access in order to organize volunteer opportunities and corporate social responsibilities;
- Spending less free time outdoors;
- Possibly having overweight and obesity as their major health threat (but are generally too young to be assessed for other health risk behaviors); and
- Going to work as adults in jobs and careers that have not yet been invented.

While inappropriate to apply to all individual Millenials and 2020s, in general, members of these generations are or will become the most technological savvy. Estimates are that by the time they reach college-age they will have spent 10,000 hours playing videogames, sent and received over 200,000 emails or text messages, spent over 20,000 hours watching television, and experienced over 500,000 commercials.[20] This level of involvement with technology has led them to be dubbed "digital natives."[20]

Psychology of Learning: Why Bolster Working Memory?

Now that we know quite a lot about our learners, I'm going to turn to some of the different books on diverse topics that I've found to have information and insights which might lead us to some conclusions about designing and implementing health education differently for Millenials and 2020s. I call these books "blips" on my environmental scan, similar to blips that appear on a rotating radar screen.

The initial blip to consider is a book called "Why Don't Students Like School?" by Daniel Willingham,[21] a cognitive psychologist who has studied learning for more than 20 years. Like all the books I will visit, this one is much too complex to summarize here; however, several of many valuable concepts Willingham explains are identified in Figure 3.[21(p. 42)] This depiction represents a relatively new concept called "working memory" and its interaction with long-term memory and the environment. The heading of Figure 3 also contains two related concepts. The first, implied, is that humans do not like to think but, rather, when faced with a new situation draw on past memory and rely on that to decide how to act, assuming that applicable knowledge is stored in long-term memory. The second, overt concept is that the acquisition of meaning requires thinking. Fortunately, humans enjoy thinking if the goal is to solve novel problems. The take away for educators is that they have to stimulate students to think in order for them to create meaning from an experience–to learn.

The depiction in Figure 3 can be interpreted like this. Behavior begins with sensing information in the environment that draws our attention. That information is realized in working memory and, in order to determine whether and how to react, the individual searches for factual information (i.e., what to do) and procedural information (i.e., how to do it) from long-term memory and

uses what is found to guide actions. If the information in long-term memory does not adequately address the situation or if no appropriate information exists, the individual works through a new approach to the environmental cue. If that works, s/he will learn something new and store that in long-term memory for future use. As stated, the more information an individual can hold and manipulate in working memory, the better thinker s/he will be. Additionally, for knowledge to "stick" in long term memory it usually must be recalled and applied repeatedly; information in both working and long-term memory can be forgotten if seldom recalled.

To me, this says to health educators, "Do not change some of what you are now doing." Why? Because some of what we know to include in health instruction artificially populates long-term memory with crucial factual and procedural knowledge (i.e., skills), especially for children and youth who have not yet experienced some of the risky environmental stimuli they will be exposed to as they get older and, therefore, won't know how to act in ways that are self-protective. By teaching students especially procedural knowledge such as how to refuse, negotiate, plan, make decisions, etc. we prepare them for facing novel situations and having to make a potentially life-changing health related choices. Through multiple in-class activities, especially role play, they will have repeated and stored information in their long term memory that they can call up and use in new situations without having to think. Most inexperienced individuals make unhealthy decisions because of: (1) lack of awareness that they are facing a risky situation, (2) time pressure, and/or (3) peer pressure. Health skills (i.e., procedural knowledge) learned in the classroom can mitigate all three reasons if drawn from long-term memory into working memory and applied, because individuals who have been involved in effective health instruction can identify a risky situation and employ procedures for resisting pressure from peers without needing a lot of time to process.

Language, Media Messages and the Brain: Influences on Behavior

The next book by Drew Westen, an expert in neuro-linguistics, is called "The Political Brain: The Role of Emotion in Deciding the Fate of the Nation." [22] In this book, the author relies on research about the brain and advertising to explain political choices made by U.S. citizens. Two main ideas presented are that humans make decisions based more on emotions (80%) than reason and political advertising is designed to arouse emotions, not reason. Furthermore, brain research on advertising has revealed dual systems of emotional processing as shown in Figure 4, the behavioral approach system activated by positive words, images, sounds, music, backdrop, tone of voice, etc. and the behavioral inhibition system activated by negative words, images, sounds, music, backdrop, tone of voice, etc. Different parts of the brain and different neurotransmitters are involved in each system. Dopamine creates a pleasurable emotional state to be welcomed. Norepinephrine arouses anxiety, fear and the inclination to "fight or flee." Whether individuals are aware or unaware, messages can activate one or the other system and create either a positive or negative emotional association with an object.

These dual systems serve important functions. They provide internal checks and balances, leading to the pursuit of enjoyable activities but putting the brakes on when individuals are about to get themselves into trouble (these brakes may fail for many adolescents whose "executive function" has not yet fully developed or who do not have adequate procedural knowledge in their long-term memory bank). Those individuals who are too high on one system and too low on the other may risk psychological problems, being vulnerable to depression and anxiety on the one hand or to excessive risk taking and antisocial behavior on the other. Given time and repetition, media messages that appeal to emotion can distort reality and create malfunctions of internal regulation and cause individuals to make choices that are against their own best interests. Incidentally, Westen points out that the most effective political ads appeal to the behavioral inhibition system and are used to create a negative perception of an opponent that leads to avoidance.

Our next book, "The End of Overeating Taking Control of the Insatiable American Appetite" by former head of the U.S. Food and Drug Administration, David Kessler,[23] reaffirms many of Westen's points. Kessler contends that the business of the food industry is to encourage consumption by creating highly rewarding stimuli based on the layering of the three most satiable ingredients for humans: sugar, fat and salt (SFS), in many food products. The food industry takes advantage of our brain chemistry by using SFS as a reinforcer which humans will consume even when they don't feel hungry, leading to overeating. The food and beverage industry deliberately utilizes consumption reinforcers such as sight, smell, location and anticipation to get us to want and buy their products. Additionally, neurotransmitters that are involved with positive emotions (comfort, stress relief), including dopamine, are imbedded in cues to eat. Neurons in the brain that are activated by appearance, smell, taste and texture of SFS are part of a circuit that produces endorphins and opioids, which can actually relive pain and stress and produce calming—"comfort foods."

So like political advertising, food advertising capitalizes on the systems of emotional processing shown in Figure 4, but unlike political advertising, relies exclusively on the behavioral approach system and its neurotransmitters to elicit anticipatory pleasurable emotional feelings towards food, especially SFS. Food and beverage, including beer, advertising messages present cues associated with rewards through pictures, words, expressions, location, etc.; effective marketing is itself an emotional reinforcer, driving individuals to consume reinforcing foods and beverages whether aware or not.

Kessler advocates five actions to implement at the national level to counter such food marketing:

- Mandate that calories of foods be displayed on all restaurant menus;

• Prominently identify sugar, fat and salt on food labels;

• Conduct public education campaigns to expose SFS foods as negative and unhealthy;

• Monitor and expose food marketing of SFS foods as harmful; and

• Protect children from food advertising.

He is adamant about this last point because children just do not have the cognitive ability to recognize and avoid the type of emotional manipulation used in food advertising that is intentionally and directly aimed at them in the U.S.[24]

What cues do these two books provide about what we might change in health education? As we have seen, both provide insights into how the advertising industry uses media messages to manipulate behavior and even convince individuals to act against their own best interests through emotional arousal. In regard to food, the advertising, food and beverage industries combine to entice individuals to overeating SFS foods, often unconsciously.

An important action we can take to arm children and youth so that they can protect themselves is to emphasize media literacy, defined as "the ability to communicate competently in all media forms as well as to access, analyze, evaluate, create and participate with the powerful images, words and sounds that make up our contemporary mass media culture.[25(p. 3)] The goal of media literacy is to empower individuals by teaching them to be aware of the multitude of media messages that bombard them daily and that they can be influenced by these messages both consciously and unconsciously. Media literate individuals learn to challenge and question what they see and hear and, thereby, enhance their ability to consciously choose and select. Two overall approaches are involved in teaching medial literacy. First, learners are taught how to interpret media messages and, then, develop insights about how messages are created by designing and producing their own media products. [25]

According to the Center for Media Literacy,[25] media literacy encompasses five key concepts: (1) all media messages are constructed, (2) they are constructed using creative language and made-up rules, (3) messages have embedded values and viewpoints, (4) different people experience media differently, and (5) the media is a profit-driven business. As we have already seen, the advertising, food and beverage industries use various techniques in ways that appeal to the behavioral approach system. Through media literacy, individuals learn important points such as: vital information is left out; visuals, music, camera angles, metaphor, grammar and syntax used in messages are all very purposeful; messages have story lines and character; and individuals experience the same media differently.

The fifth and, perhaps most important concept is that media producers (i.e., film distributors, television networks, websites, magazines, etc.) make money by using entertainment to capture audiences and then sell access to these audiences to advertiser. For example, the NFL and FOX use the Super Bowl to capture an audience made up of a high percentage of beer drinkers. They then sell access to this audience to Budweiser for millions of dollars so that "Bud" can send highly creative "approach system" messages that market their product. The same is true for school principals who sign pouring rights to soft drink companies like Coca Cola™. The principal actually has a captive audience of students and sells exclusive access to these students during the school day so that Coke (or Pepsi) can sell them its products. Coke does this for little profit to gain long-term brand loyalty and future sales.[24] (That's the dirty little secret that few school stakeholders really understand—it's really only and all about the money.)

Through media literacy programs, students learn to answer five essential questions related to the concepts listed above:

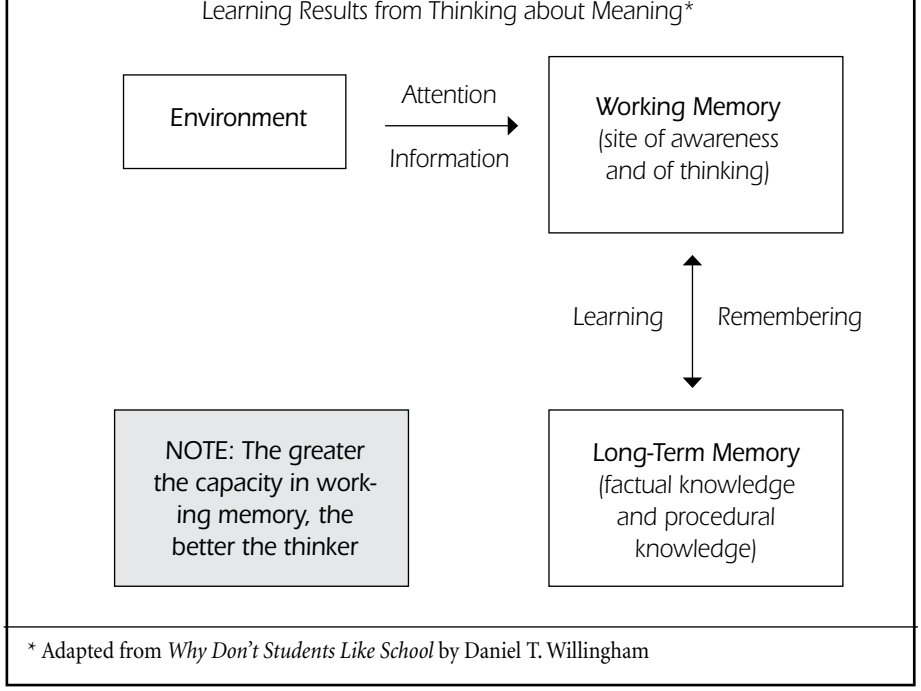
• "Who created this message?

• What creative techniques are being used to attract my attention?

• How might different people understand this message differently?

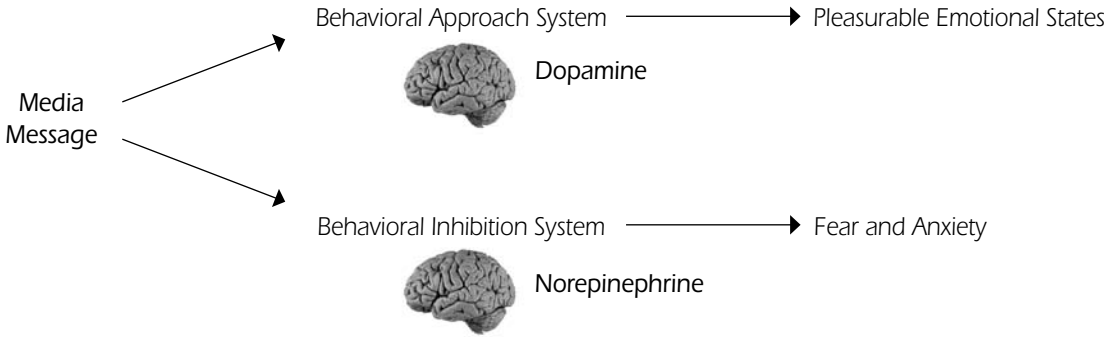
• What lifestyles, values, and points of view are represented in or omitted from this message?

Figure 3. Interaction between Working Memory, Long-term Memory and Environment



* Adapted from *Why Don't Students Like School* by Daniel T. Willingham

Figure 4. Brain Research and Advertising and the Dual Systems of Emotional Processing Activated in Response to Media Messages



- Why is this message being sent?"[25(p. 18)]

Digital Natives: Functioning in the Future Workplace

Jeanne Meister and Karie Willyard are human resource specialists in the business field who conducted an international survey to learn about the five generations that will be in the workplace by the year 2020. They also wanted to find out how these generations will relate and interact and wrote about their findings in "2020 Workplace: How Innovative Companies Attract, Develop and Keep Tomorrow's Employees Today."[19] This book was the source of information about the 2020 generation presented above.

At this point, you may be wondering why we would be interested in a book about the workplace. For me, anyway, the reason is simple. The business community has, since the late 1990s, been the driving force behind education reform in the U.S.[26] An organization introduced to you earlier, *Partnership for 21st Century Skills,*[15] primarily exists to identify the skills students need to be successful future workers. For both individuals and the organizations where they will work, this is all about economic competitiveness. Our ongoing challenge is to demonstrate to businesses like those who belong to the *Partnership* and many others, that command of health literacy skills is essential since health and economic competitiveness are inextricably linked.[27]

Additionally, we can use books like these to identify trends that we need to understand and capitalize on in order to make health education relevant to an obviously major US education system stakeholder group - business leaders. Through their survey and other work, these authors describe the many ways that the workplace is rapidly changing today, let alone by 2020. As we learned previously, Millennials and 2020s already use electronic modalities to play, learn and work via new technologies, including smart phones. These practices will persist and probably expand with smart phones becoming the preferred electronic platform. Today, Millenials and 2020s can apply and interview for jobs via social networks and use social networks on the job to conduct collaborative projects. Professional development is already being delivered via mentoring from senior leaders using blogs and through digital games that are customized for a specific workplace.[19]

This leads us at last to our final blip, a book called "Reality is Broken: Why Games Make Us Better and How They Can Change the World" by Jane McGonigal,[28] a games researcher and unabashed proponent of playing smart games for work and learning. In fact, she contends that "playing" electronic games often provides more meaningful work and rewards in the virtual world than many players experience in the temporal world.

McGonagall traces the history of games from ancient Mediterranean culture and then describes games of all types as coming in many forms, platforms and genres from single-player, to multi-player, to massively multiplayer. She contends that, to be considered a game, the activity must have four defining traits: a goal, rules, and a feedback system, and playing must be voluntary. She points out that modern video games are mounted on a variety of platforms including personal computers, game consoles, hand-held devices and mobile phones, and can last in time from as little as five seconds to endlessly, via continuing web-based role-play games. She also concedes that almost all of us, including gamers, are biased against games as unproductive uses of time and that our culture even has pejorative language such as "gaming the system" to support this impression.

Nevertheless, demographics indicate that many today are video gamers including 69% of all heads of households; 97% of youth (who we have seen may play up to 10,000 hours of games by college age,[20] putting them in the "expert" category;[21] 40% of women; and 25% of those over age 50. The average player is 35 years old (Gen Xers), having played games for 12 years and intending to play throughout life. The U.S. is the biggest gaming market in the world.

So why play games for so long? Based on her and others' research, McGonigal insists that these people play because doing so makes them happy, which she identifies as the emotion that is the opposite of depression. Games create happiness by offering meaningful work on hard activities that provide their own reward; high-stakes, busy, mental work, physical work, discovery, teamwork and creative work. Games also

provide what she calls Fiero, what we feel after triumphing over adversity and the most powerful "rush" humans can achieve, as well as "flow," a satisfying, exhilarating feeling of creative accomplishment and heightened functioning. At this point, we should not be surprised to find that, physiologically, fiero is experienced through the release of the neurotransmitters nor-epinephrine, epinephrine and dopamine. Perhaps that is why gamers spend less time watching television than anyone else on the planet.[28]

Additionally, playing video games has intrinsic benefits such as satisfying work every day; experiencing success at some time (although gamers fail 80% of the time); social connection through multi-player and massively multi-player forms, chat rooms, and gaming mentors; plus acquisition of a sense of meaning by being part of something larger than themselves. Conversely, gaming also has risks. Too much flow can lead to exhaustion. Too much Fiero can lead to addiction.

While some may see the video game industry as sinister, McGonigal defends the industry as having the goal of involving lifelong gamers who balance favorite games with full and active lives. As indicated in the title, she also envisions video games as having the potential to change the real world, citing research which shows that children who play games that require them to help others are more likely to help others in real life.[28]

One type of game that caught my attention is called Alternate Reality Games (ARG) which combined a video game with real life activities. ARG are compelling because, compared to games, reality is hard to get into and ARG motivate fuller participation in real life activities. [28]

Additionally, some ARG involve players in quests that correspond to real world actions. Animated electronic characters that represent a player, called avatars, can become more powerful as skill levels increase and individual success with ARG increases when involving multi-player. McGonigal provides examples, including an entire game-based charter school in New York City, to substantiate many claims in her book. Her vision for the role of virtual games in the real world related to health and well-being is:

> "If we take everything game developers have learned about optimizing human experience and organizing collaborative communication and apply it to real life, I foresee games that make us wake up in the morning and feel thrilled to start our day…that reduce stress at work and dramatically increase our career satisfaction…that fix our educational system… that treat depression, obesity, anxiety and attention deficit disorder…that tackle global-scale problems like climate change and poverty…that augment our most essential human capabilities and empower us to change the world in meaningful ways."[28(p.14)]

THINKING ABOUT SOME CHANGES FOR THE 2020 GENERATION

Now that we have assessed the status of health education in schools, enumerated the characteristics of the youngest generations of learners, and explored ideas scanned from eclectic fields such as the cognitive psychology; neuro-linguistics, brain chemistry and advertising; media literacy; business human resources; and video gaming, we certainly have plenty to think about. Undoubtedly, all this should help us to consider some possibilities for changing school health education in order to better meet the needs of the 2020 generation.

Video Games for Skill Development and Social Networks

One of the first points we might want to think about is the six active learning instructional strategies that were found in effective health education curricula and recall that one of those was team games.[5] The point being that the idea of games, though not video games, is already verified in the school health education literature. Another of the six identified strategies was interactive technology in the form of videos and websites. One of the curriculum modules reviewed in the cited study, [5] Project Alert, actually has students doing role play in response to video characters, a mini-step away from interacting with avatars? We also might want to think about the interaction between working memory and long-term memory and the importance of "loading" long-term memory, especially with procedural health knowledge/skills through classroom experiences, including role play.

Combined with what we learned about video games, could lead to speculation about incorporating video games focused on health skills in school health education. This could possibly be done through a multi-step approach in which single-player games are used to learn, practice and master skills, develop confidence and self-efficacy, and experience success followed by use of multi-player and alternate reality games through which students use avatars to practice social skills and then connect to the real world of the classroom, school and/or community and, as a byproduct, build or enhance social connections. As McGonigal envisioned, students could engage in virtual massively multiplayer health games that can change the real world, assuming implementation of appropriate internet safeguards.

To secure greater instructional time for health education in a crowded school day and generate more excitement about health, student learning could take place individually in the virtual environment only (i.e., outside of the regular school day); individually in the classroom combined with the virtual environment (i.e., homework); individually or in groups virtually but in the classroom (i.e., computer labs or stations); and/or through a combination of blogs, chat-rooms, student-run helpdesks, etc. A variety of individual or networked platforms could be used for these types of games including laptops and game consoles, smartphones or other handhelds, notepad/notebook, or other not-yet-invented devices. Certainly platform access for all students outside of the classroom is a concern but one that conceivable will be well addressed in the not-too-distant future as even highly sophisticated platforms become less expensive.

Despite their reputation as promoters of violence and mayhem, digital games have

in fact been shown to help children learn vital foundational knowledge along with 21st Century skills. [29] And, well-designed digital games have demonstrated substantial potential for promoting children's growth and healthy development. Examples exist of engaging video games for students in the form of exer-games such as Dance, Dance Revolution (DDR); games that help develop healthy long-term habits and those that assist them with self-management of chronic disease.[29]

Several months after giving this presentation I attended the annual Games for Health conference in Boston supported by the Robert Wood Johnson Foundation as a literal novice to this field. There I learned that many health professionals and experienced serious game designers are working on several types of simulations and games for improving safety, health and medicine in some way, including design of games intended to influence adolescent health behaviors. I also learned that there is an entire science of avatars. My two main "take-a way's" from the conference were that: (1) health games, except for exer-games like DDR, are still a fledgling enterprise, and (2) video games have the real promise of serving as a new tool for health education. I also came to my own conclusion that setting the hard-to-achieve standard "must demonstrate change of health behavior to be successful" is exceedingly ambitious and could very well impede development of health games.

Interconnections of 21st Century Skills and Themes

I next want to turn to thinking about the public education establishment and the question of whether health education fits (or not) because a number of important considerations are bound up in this dilemma. As you may recall, health education was not named as one of the core subjects by the *Partnership for 21st Century Skills* [15] Unlike *Education Goals 2000*,[10] the 21st Century Skills project recognizes many more aspects of learning beyond subjects in the form of different types of skills including:

- Learning and innovation skills such as creativity and innovation; critical thinking and problem solving; communication and collaboration;
- Information, media and technology skills such as information literacy, media literacy, IC technology literacy; and
- Life and career skills: flexibility and adaptability; initiative and self-direction; social and cross-cultural skills; productivity and accountability; leadership and responsibility. [15]

Anyone even remotely familiar with the National Health Education Standards will recognize that many of these skill including critical thinking and problem solving, communication and collaboration are subsumed within them [3,27] thought this is seldom recognized by the education establishment.

As recommended by the Center for Media Literacy, [25] the 21st Century Skills divide medial literacy into analyzing media and creating media products and incorporate the five key concepts and five essential questions underlying media literacy. [15] Likewise, 21st Century Skills include information and communication technology skills focused on use of technology as a tool for research plus organizing, evaluating and communicating information; using digital technologies for communication and networking through social networks to function in a knowledge economy and comprehending ethical and legal issues involved in accessing and using information technology. [15] In other words, incorporation of medial literacy and serious video games plus other technologies will position health education as contributing to the overall mission of education in an even greater way. Regardless, what we learned about the influence of advertising should be more than sufficient to justify a much greater emphasis on media literacy in health education. The same can be said for incorporation within health education of video games and other digital technologies.

In addition to subjects and skills, the *21st Century Skills Project* includes cross-cutting interdisciplinary themes not recognized at the level of a skill set. A section of the website reads:

- "…we believe schools must move beyond a focus on basic competency in core subjects to promoting understanding of academic content at much higher levels by weaving 21st century interdisciplinary themes into core subjects: Global Awareness, Financial, Economic, Business and Entrepreneurial Literacy, Civic Literacy, Health Literacy and Environmental Literacy."[15]

So finally, health literacy, defined much as it was in the first edition of the National Health Education Standards [27] has made it to the "big time" through being recognized by the education establishment, albeit as one of several strands of yarn woven in the vast tapestry of education.

A Goal to Consider

After contemplating all that has been covered here, those devoted to health education in schools may wish to consider the following goal: to help children and youth of the Millennial and 2020 generations become health literate through participation in cutting-edge, high-quality, fulfilling and rewarding health education provided in ways that are consistent with how they play, learn and work. To accomplish this goal, strive toward incorporating digital technology including games, consciously and overtly connect to other 21st Century Skills, and strongly embrace and teach media-literacy skills through instructional health education experiences in school, out-of-school, or in combination; recognizing that doing so will require an extraordinary collaborative effort among behavioral and cognitive psychologists, serious game designers, instructional designers, computer engineers and programmers, graphic artists, funders, evaluators and, most importantly, kids and teachers.

Toward 2020

In concluding, two quotes seem appropriate. One is from Jane McGonigal:

> "Extraordinary collaborators…practice possibility scanning: always remaining open and alert to unplanned opportunities and surprising insights-especially at bigger scales. They are willing to bypass or throw out old goals if a more achievable or a more epic goal presents itself. And they are constantly zooming out to construct a much bigger picture..."[28(p. 278)]

The other from the Americana iconic philosopher Will Rogers:

> "Even if you're on the right track, you'll get run over if you just sit there."[30]

Without belaboring, the point seems clear. Even if everything were perfect, school health educators would still be compelled to re-invent what they do and how they do it or risk obsolescence, most especially in this day and age of monumental, continuous change. And like futurists, all health educators, regardless of work setting, will find the path to change by scanning for and thinking about new opportunities. One of those new opportunities for the field, in general, might be a name change from the old stale and static "Health Education" to a new fresh and dynamic "**Health Activation.**" Wouldn't you be invigorated by changing your title to Certified **Health Activation** Specialists? Think about it.

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