Educating the Wise Cyborg of the Future

Tom Lombardo, Ph.D.
Director of the Center for Future Consciousness
&
Ray Todd Blackwood, MBA-TM
Director of Technology
University of Advancing Technology

The Challenges and Problems of Contemporary Times

At a global level, humanity faces a number of significant challenges and problems, including the growing divide between the rich and the poor; ethnic and cultural divisiveness, conflict, and war; international crime; ecological deterioration, including deforestation, desertification, and the destruction of natural habitats; mass biological extinction; threats to the exhaustion of non-renewable resources; climate change; and the continued repression and brutalization of women (Glenn, Gordon, and Florescu, 2010; Myers and Kent, 2005).

In particular, modern society and culture also suffers from a variety of negative trends, which are frequently reflected and reinforced in the world of education, including increasing speed and frenzy in the tempo of modern life; a diminished sense of the past and future in favor of presentism; excessive, perhaps even escalating financial and materialistic greed, consumerism, and commercialization; relativism, the loss of strong, universal intellectual and moral standards, and epidemic unethical behavior among students; a decline in the perceived value of intelligence, complex thinking, and wisdom in favor of superficiality, sensationalism, and small, quick bites of information; specifically regarding higher education, an increasing emphasis on high-tech gadgetry, convenience, and speed over depth, hard work, and sustained thinking; a push for vocational, profit motivated, self-serving learning over social responsibility and the love of knowledge; and fragmented, just-in-time learning instead of an integrated curriculum and holistic education (Carr, 2010; DeGraaf, Wann, and Naylor, 2001; Gardner, 1999; Gleick, 1999; Jacoby, 2009; Lombardo and Richter, 2004).

There are innumerable and varied solutions proposed, and to various degrees already in progress, to address these challenges and problems (Glenn, Gordon, and Florescu, 2010; Lombardo, 2006b, Chapter 4). In our approach, however, we propose the pursuit, cultivation, and exercise of wisdom in all human affairs as a general guiding principle and framework for all such solutions and constructive actions, relative to which they should be assessed and implemented. Given the complex and transforming nature of

the world we live in, the development of wisdom provides a holistic, perspicacious, and ethically informed foundation for understanding the world, identifying its critical problems and positive opportunities, and constructively addressing its challenges and problems (Lombardo, 2006b, pp.391-409; Lombardo, 2006c; Lombardo, 2009; Lombardo, 2011; Macdonald, 2004).

Wisdom as the Central Goal of Higher Education in the Future

If the central purpose of education should be to facilitate the development of individuals who will constructively contribute to the further evolution of humanity then wisdom should be the central goal of higher education. Further, the modeling and teaching of wisdom would counter-act many of the negative trends in contemporary education identified above, including fragmented learning, self-serving education, unethical behavior, presentism, and anti-intellectualism (Lombardo, 2006c; Lombardo, 2011).

Drawing upon both classical sources and the contemporary renaissance of thinking and research in wisdom, the authors define wisdom as "the highest expression of self-development and future consciousness. It is the continually evolving understanding of and fascination with the big picture of life, of what is important, ethical, and meaningful, and the desire and creative capacity to apply this understanding to enhance the well being of life, both for oneself and others." Wisdom is a holistic capacity. There are cognitive, motivational-emotional, and ethical dimensions to it. It is a dynamical (every evolving) and open-ended state of mind and pattern of behavior. It structures both thought and perception. It is a complex and broad character trait–in fact, a highly esteemed character virtue (Lombardo, 2010a; Macdonald, 1996; Sternberg, 1990; Sternberg and Jordan, 2005).

A more analytical approach to describing wisdom includes the following specific qualities (Lombardo, 2006c; Lombardo, 2008; Lombardo, 2009a):

- Deep Learning and Understanding
- Synthetic, Big Picture in Space and Time
- Practical Application of Knowledge
- Multi-Faceted Thinking Skills and Modes of Understanding (Intuition and Logic)
- Open-Mindedness
- Self-Stimulating, Dynamical, and Contingent Mode of Knowing
- Reflects Contemporary Knowledge (Social, Humanistic, and Scientific)
- Curiosity, Wonder, and Engagement with the World
- Connected to and Supported by Other Virtues (Courage, Integrity, Fairness, Optimism/Hope, Self-Responsibility, and Humility)
- A Synthesis of Heart and Mind
- Self-Awareness, Self-Actualization, and Self-Transcendence
- Understanding the Connection of Self with the World and Others
- Compassion and Empathy for Others

- Ethical Application Knowledge to Self and Others

As can be seen from the above description, wisdom synthesizes the highest ideals of knowledge, consciousness, ethics, social conscience, self-awareness, and emotional-motivational development. Clearly it is the foundation upon which to create more evolved human beings and valuable citizens and contributors to human society. As various wisdom writers have argued, from a pragmatic point of view, the teaching and cultivation of wisdom would greatly benefit both the ongoing development of modern society and the life significance of our educational practices. If the virtue of wisdom were more deeply engrained and valued in individuals (through education) it would more strongly influence human values, problem solving, and decision making in our modern world and we would make significant progress in solving the social and environmental problems of today and creating a better world for tomorrow. Most of our contemporary problems, identified above, derive from a combination of unethical behavior, lack of sufficient foresight, lack of expansive thinking addressing the inter-relationships of humanity and nature, narrow and shallow value systems, static and/or regressive mindsets, and egocentric concerns and mindsets. Wisdom is the antithesis of all of these psycho-social deficiencies.

A Theory of Wisdom Based Education: Character Virtues and Future Consciousness

Central to our thinking is the idea that wisdom is the highest expression of future consciousness. Wisdom is applying expansive, integrative, and ethically informed knowledge to decision making about the future (Lombardo, 2009a; Lombardo, 2010a).

Specifically, the authors define future consciousness "as the total integrative set of psychological abilities, processes, and experiences humans use in understanding and dealing with the future." Heightened future consciousness involves "an expansive sense of time, of past and future linked together; a progressive, action-oriented optimism about the future; an expansive and informed sense of contemporary trends and challenges; creativity, imagination, and curiosity regarding future possibilities; courage and enthusiasm facing the adventure and uncertainty of the future; a strong sense of ongoing personal growth and purpose involving long-term goal-directed thinking and behavior; a future-oriented self-narrative; and a strong sense of self-efficacy and self-responsibility in determining one's future." All these qualities align with features of wisdom (Lombardo, 2006a, Chapter One; Lombardo, 2007a).

Many of our present global challenges and problems are due to a lack of sufficient future consciousness—for example, global warming, mass species extinction, and environmental deterioration due to industrial and urban growth—both in the sense of not adequately appreciating the long term consequences of our actions and not sufficiently considering the ethical ramifications of our decisions (Myers and Kent, 2005). Within a time of rapid and complex change, heightened future consciousness—that is, wisdom—is critical to thriving and surviving in the years ahead. Not only are we in a period of accelerative change, but this heightened change brings with it increasing uncertainty,

something that we, as a species, need to understand and constructively adapt to. Heightened future consciousness (and hence wisdom) includes the capacity of courage, necessary for dealing with an uncertain future, and the desire to continually develop one's knowledge base, necessary for adapting to and flourishing within rapid evolution. There are multiple and varied teaching approaches to heightening these and other qualities of future consciousness in students (Lombardo, 2009c; Lombardo, 2010b).

Consistent, in fact, supportive of our contention that wisdom should be the central goal of education, we should structure the curriculum of higher education in terms of the cultivation of character virtues. Wisdom, in fact, is a character virtue—as we have contended the highest virtue—and the cultivation of wisdom requires the concomitant development of many other noteworthy virtues, such as honesty and self-responsibility. Other educators have argued for a virtue-centered approach to higher education, including Gardner (1999, 2008) and Weigel (2002). A virtue-centered educational approach is clearly relevant to contemporary times, given the excessive levels of cheating and plagiarism across college campuses. A comprehensive proposal regarding the essential character virtues that need to be modeled and taught, that would maximize both educational success and future success in both the personal and professional spheres of life, would include the following virtues:

- A Practicing Belief in High Standards and Ideals and the Pursuit of Excellence
- Self-Responsibility and Accountability
- The Love of Learning – Curiosity and Wonder
- The Love of Thinking
- Honesty, Integrity, and Authenticity
- Self-Awareness and Understanding
- Humility and Open-Mindedness
- Discipline and Self-Determination
- Justice and Fairness
- Hope and Optimism
- Social Conscience and Responsibility
- Mutual Respect
- Courage
- Wisdom

The authors place wisdom at the end of this list since it subsumes and integrates many, if not most of the above virtues, providing an overall focus to a virtue based approach to education. One of us has developed an extensive educational workshop with multiple learning activities and assessments for teaching this set of character virtues (Lombardo, 2008).

An educational curriculum, with an overall focus on the development of wisdom, incorporating character development and heightened future consciousness (two key dimensions of wisdom), would provide college students with the necessary capacities,

values, and character traits needed to constructively address the central issues of tomorrow. Many of our problems are expansive in space and time, global and ecological, involving long term trends, and accelerative transformations. As noted above, it our contention also that many of our challenges are ethical in nature, and that the key to the "good life" (both for ourselves and the world at large) is the cultivation and application of fundamental character virtues, which of course pivots on wisdom.

One of the authors has developed a comprehensive two-year foundational educational program for incoming college students that synthesizes futures education, character virtue development, and wisdom as its overall goals (Lombardo, 2010c). The program is integrative (interdisciplinary) and holistic (psychologically well-rounded), and incorporates technological awareness and proficiency. The overall educational vision is:

"The development of students possessing a broad and integrated future-focused knowledge base who can ethically apply their knowledge for the betterment of themselves, their community, and humanity as a whole."

The supporting integrative educational goals include:

- Future Consciousness (Personal & General)
- Personal Character Development
- Higher Cognitive Capacities (Deep Learning, Critical Thinking, and Multiple Modes of Understanding)
- Communication, Interpersonal Skills, and Composition
- Humanistic and Artistic Awareness
- Historical Consciousness
- Global and Cultural Consciousness and Social Conscience
- Ecological-Environmental Consciousness
- Scientific, Mathematical, and Technological Awareness
- Information Literacy – Computer Technology Proficiency and Awareness

This curriculum provides a foundational framework for moving to the next level of our argument: educating the wise cyborg.

The Evolution of Humans and Technology: The Concept of the Cyborg

If wisdom, by necessity, has a perspicacious eye on the future, then can we imagine with some degree of wisdom and foresight, what would be the qualities of the wise person of the future? It is part of the very nature of wisdom that it is a self-reflective dynamic capacity in evolution. How might the capacity of wisdom further evolve in the future? There are many different answers one could give to this question; in this paper the authors will focus on what we believe is one of the most interesting. Further, we will also address the question of education: how do we educate the wise person of the future?

When we consider what significant trends and consequent future possibilities loom large in the human condition, rapid and ubiquitous technological evolution is one of the most striking and portentous phenomenon in the last century (Kurzweil, 1999; Kurzweil, 2005). Based on this pervasive and powerful trend of ongoing technological evolution, it stands to reason that the wise person of the future will function and realize his or her best capacities embedded within and supported by increasing technological augmentation and more powerful instrumentalities. It is highly probable, in fact, even necessary, that wise people will increasingly be technologically enhanced as we move further and further into the future.

Two additional critical reasons, undoubtedly among many others, behind this prediction are: The ever increasing complexity, depth, and breadth of knowledge and information needed to get the big picture of things, with a special emphasis on extracting what is important and meaningful, requires technological facilitation and augmentation of human cognitive capacities; and given the global nature of many of our most central problems, supportive social, communicative, and collaborative technologies must be developed and intelligently used to address the challenges of today and tomorrow. Technologies are needed to further empower our individual cognitive capacities and our collective decision making. The wise person of the future will be a wise cyborg. And as a corollary, the wise society of the future will be cyborg-like as well.

Hence, it is critical that we not only understand what is, in fact, a wise cyborg, but that we also infuse into a wisdom based education for the future those principles and learning activities that will facilitate the development of wise cyborgs.

To begin, let us consider the deep significance of technology within the human condition, and in particular, the intimate connection of human intelligence and technology. Technological augmentation is integral to the very nature of what it is to be human. Human capacities and ways of life are almost always realized in the context and support of technology. Our biological cores are interdependent with our technological skins and shells. We are naked and relatively helpless—unformed—without technology. Technologies are part of us and we live in a technologically constructed reality.

This symbiotic connection goes back to our pre-human origins, with *Australopithecus* and *Homo Habilis* developing crude tools to hunt and butcher animals and in other ways modify and manipulate their environment. As Andy Clarke states, we are "natural born cyborgs." Our technologies are both extensions of our bodies and minds and enhancements and modifications of the environment. Technologies are a significant evolutionary advance over being locked into genetically determined anatomical structures and associated capacities. This fluidity and flexibility in our somatic reality and psychological capacities is one of the distinguishing qualities of our species (Clark, 2003, 2008).

For the purposes of the present discussion, the authors define a cyborg as a functional synthesis of the biological and the technological, a living creature that has both biological and technological components. The technological component does not need

to be implanted or permanently attached to the biological; the technologies utilized and involved in the symbiosis can be "detachable." In this sense, we can view tools and instruments as detachable body parts.

Humans have co-evolved with their technologies. Throughout history, there are numerous ways in which technologies have deeply shaped human psychological and social capacities, traits, and values, and as our culture, knowledge base, and values have evolved we have created ever more sophisticated technologies to serve (and even articulate and evolve) our needs and ends (Carr, 2010). Technology is a dramatic demonstration of our ecological nature; our bodies and minds have been interwoven together in highly complex arrangements with a technologically enhanced environment. As a general direction for the future, we should anticipate the continuation and further evolution of this technological-biological mode of existence (Lombardo, 2009b).

Further, throughout our history, humans have pursued purposeful evolution, attempting to enhance and further empower themselves through psycho-social, spiritual-religious, ethical-moral, chemical, and physical-technological means (Lombardo, 2006a; Lombardo, 2009b). We should anticipate that, at the very least (not to discount non-technological methods), we will further augment and attempt to enhance our capacities through the use of new technologies in the future. For many different reasons, the technological evolution of human enhancement appears to be an inevitable and even desirable future trend (Garreau, 2005; Kurzweil, 2005). We will purposefully evolve through technologies. We will strive to further empower the human cyborg.

If solutions to our contemporary problems require the heightening of wisdom and character virtues—if this should be our goals in education—then we should guide further technological enhancements of humans to benefit wisdom and ethics. We should purposefully evolve toward admirable, laudatory ends. In part, the technologically augmented wise person of the future—the wise cyborg—will be purposefully created by us, both through education and technological development. We should create tools to serve this end.

The Wise Cyborg - The Wise Cyborg of the Future

A wise cyborg—as we define it—is a person who utilizes mental technologies to facilitate the pursuit and exercise of wisdom; further, the wise cyborg understands the affordances of wisdom within technology and even participates in the creation of new technologies toward this end.

In this context, we have chosen to define "mental technologies" as all those technologies that support, facilitate, and enhance any and all psychological functions: The storing and collecting information and knowledge; accessing and researching information and knowledge; organizing and synthesizing information and knowledge; displaying information and knowledge; communicating and dialoguing on ideas, information, and knowledge; providing multi-sensory, multi-faceted interactive embodiments and representations of information and knowledge; facilitating problem

solving, thinking, imagination, and creativity; supporting and enhancing sensory-perceptual sensitivity and acumen; supporting and enhancing behavioral intelligence; enhancing or improving emotional health and vitality, motivational capacities, personal well-being, self-awareness, and happiness; and in general, any form of further educational development and support along any of these psychological dimensions.

We should particularly emphasize that mental technologies utilized to serve wisdom should enhance rather than enfeeble those psychological capacities that are considered the highest expressions of human excellence and achievement. New technologies have often diminished intellectual, wisdom, and social capacities (Postman, 1985; Postman, 1992; Carr, 2010). Technological evolution guides and influences psycho-social evolution and hence our creation and production ideals of new technologies should reflect our highest human ideals.

Given these opening definitions, the wise cyborg is able to access and utilize the great repository of knowledge and knowledge skills provided through information technology. The wise cyborg is able to thoughtfully guide her education, her research, and her utilization of knowledge embodied in the ever-growing global information system through an understanding of what is centrally meaningful, important, and ethically significant. The wise cyborg is attuned and receptive to the cascading flow of new ideas and principles, using them to support further creativity, as well as being able to thoughtfully separate the junk and the trivial from the intelligent and the important. The wise cyborg should be able to live and thrive within an ever shifting, ever evolving, and to some degree, uncertain reality of the information sphere and the technologically enhanced noosphere. The wise cyborg, in fact, should take as a central responsibility, teasing or constructing out of the phantasmagoria of data, deep integrative principles of understanding and ethics. In the future, in particular, the wise cyborg, may spend increasing amounts of time within virtual reality, as a facilitative medium to create, experiment, and expand their consciousness. We should emphasize that all of these capacities involve the guidance of wisdom interfacing and interactive with mental technologies.

These qualities of the wise cyborg serve as a starting point for articulating some of the central goals for educating the wise cyborg of the future. How do we teach such capacities to students? But the above list of technologically facilitated wisdom capacities highlights higher cognitive abilities, and of equal importance, in a comprehensive description of the wise cyborg will be technologically supported capacities revolving around various character virtues, emotional-motivational qualities, social conscience, and self-awareness. The total set of cognitive and personal-emotional capacities, supported through technologies, will serve as a holistic educational framework for the wise cyborg.

At this point, it is important to note that there are two, relatively distinct arenas in which technology will impact humanity in the future, both of which pertain to the issues of wisdom and the wise cyborg. First, information technology as a whole is enriching the environment in which we live and work, providing an ever increasing wealth of

information and knowledge available to us. Further, hardware and software facilitates our informed and guided access and use of this information and knowledge, and offers greater opportunities for communication and social interaction with others. Applications keep evolving. The second arena of technology relevant to wisdom and the wise cyborg is direct technological enhancement and modification of the biological core, either through the infusion of technologies into our bodies or the transformation of our bodies and brains through technologies, such as in biotechnology and genetic engineering. The wise cyborg—the wise society as a whole—as creators of new technologies should continuously consider how purposeful evolutions in the biological core could produce "better human beings" in the broadest sense, including the ethical and emotional.

But having noted this distinction, we should qualify it. Technology is an ecological reality. As we have noted, humans are technologically enhanced and augmented beings; human activities invariably require a synthesized bio-tech entity to realize the activity. But further, the environment of humans is technologically enhanced; a technologically enhanced environment that provides affordances of action for the technologically enhanced humans. Human goals are realized in a synthetic coordination and interaction of the bio-tech entities and the technologically enhanced environment; the system works as a whole. And we would contend that the line between technologies which enhance human capacities and technologies that enhance the affordances of the environment is exceedingly blurred. Is a computer a detachable body part used for heightened thinking and memory, or part of a technologically enhanced environment? Is a cell phone?

Taking a holistic and integrative perspective on the Gestalt of human reality, the wise cyborg of the future will be a technologically enhanced system merging and synthesizing what we would normally think of as components of both the human and the environment into new wholes (Clark, 2008). We will, in the future, purposefully and reciprocally evolve the entire biological-technological-environmental system, attempting to realize higher levels of functioning in the totality as a whole.

Hence, as two final points on the wise cyborg of the future, not only would the wise cyborg understand and utilize technologies that would help him or her to realize wise ends, the wise cyborg (given increasing technological power and savvy) would be skillful at modifying him or herself through technologies (including biotechnologies) to better achieve such wise ends. Second, such technological knowledge would clearly extend into the arena of creativity. It stands to reason that our future technologies and our future education of such technologies would allow for and support the capacity to create new technologies (based on individual needs and goals). The wise cyborg of the future will know how to creatively re-make themselves in service of the goal of wisdom. But of course, this is what wisdom is all about anyway; the capacities for thoughtful self-assessment and creative self-transcendence.

Educating the Wise Cyborg of the Future

It is the authors' contention that the development of wisdom in students can be facilitated within higher education. In fact, more broadly, all of the fundamental character virtues can be addressed (in fact, should be addressed) in education. We can and we should teach the "good" (Lombardo, 2008; Lombardo, 2010b; Lombardo, 2010c; Sternberg, 2001).

As a critical step toward this end, as presented above, wisdom can be analyzed into a set of component traits, attitudes, and capacities, and each of these components can be developed and assessed through learning activities and assignments. One can create learning modules with appropriate assessments, for example, on critical thinking, critical comparison, deep learning and understanding, application of knowledge to both personal and global problems, hope and optimism, and self-responsibility (Lombardo, 2008; Lombardo, 2010c). In fact, to support and complement this claim, Hall (2010) provides an alternative analysis of the components of wisdom, and not only brings in psychological and educational approaches to enhancing the sub-components of wisdom he identifies, but biological and physiological research that could lead to informed biological enhancements in the human brain for heightening wisdom and character virtue capacities.

Further, the qualities of wisdom and the list of educational character virtues provided above, can be taught and assessed in the context of the set of fundamental educational goals within a wisdom based integrative program outlined above. As one example, facilitating the development of ecological consciousness within various courses would require teaching to big picture and synthetic thinking, ethical implications of decision making, seeing connections between one's own behavior and the world at large, empathy and compassion for life in general, and even self-transformation in beliefs and values. As another example, higher cognitive skills (as a general educational goal) are integral to the development of wisdom and can be taught and assessed in all courses within the educational program.

Within our list of comprehensive educational goals, the authors include: Science and technological awareness, information literacy, and computer technology proficiency and awareness. Education on technologies, and in particular, mental technologies would be an integral part of the educational curriculum of the wise cyborg. But we need to connect the mental technologies with the various general educational goals and the development of different character virtues and components of wisdom. We can use technologies to heighten our ecological or historical awareness, our self-understanding (and hence personal development), our communication skills, and all the varied sub-components of wisdom and ethical character development. We can use technologies to facilitate the development of future consciousness. As stated earlier, since technologies are often used in contemporary modern society to serve shallow and trivial ends and support psychologically questionable (if not damaging) goals and activities, it is important that students learn technologies and their uses that support enlightening, ethically sound, and mentally empowering capacities instead.

To provide some illustrative examples:

For information seeking activities, to support curiosity, and the acquisition of knowledge and integrative and synthetic understanding, the authors incorporate education on search engines, blogs and wikis, discussion boards, library databases, electronic books, and important websites for each topical area of study.

For self-awareness and understanding, and future consciousness, we include online personality assessment tests, such as Personal DNA, Optimism/Pessimism tests, and Zimbardo's Time Perspective Inventory as valuable and enlightening instruments.

For communication proficiency and activities, we include education on video chat technologies, voice technologies, electronic mail and texting, Contact and Outlook, and radio (including Internet radio).

For time and life management, we include electronic calendars and planners embedded within multiple devices and programs.

For thinking, visualization, and mapping, we include Microsoft Visio, Google Sketch it Up Pro, Adobe Illustrator, Power Point, Keynote, multiple and ever-evolving graphics programs, and varied mind mapping software programs.

For thinking and planning, including goal setting, we again include mind-mapping programs, Acoff, Word, Google Docs, Critical Path, and numerous (and again ever-evolving) accounting and financial planning programs.

For Creativity, we include Photoshop, Photosynth, GarageBand, Light Room, digital cameras, IMovie, and other home video software.

Learning the tools of the trade is critical to learning the trade, and what we provide above in the way of mental technologies is just scratching the surface of what is available to support human skills and capacities relevant to wisdom, character virtues, and higher educational goals. Given the accelerative evolution of mental technologies, the wise cyborg needs to continually stay abreast of new technological developments and needs to maintain a level of understanding and fascination with technologies to creatively mix and match, synthesize, and extrapolate upon what is available to serve the goals of wisdom. The love of learning is a key dimension of wisdom and this character virtue clearly needs to evince itself within the realm of technological knowledge and proficiency.

Another useful and practical way to conceptualize the education of the wise cyborg, is to think in terms of learning modules, that can be combined together in various ways or embedded within the general wisdom based program outlined above. Each learning module would identify a quality of wisdom or a key character virtue, teaching it conceptually and psychologically. Appropriate technologies supporting the trait or capacity would be introduced either concomitant with or after the initial learning of the concept. As an assessment or assignment, this conceptual/technological knowledge

could then be applied to a future-focused or practical problem-focused challenge, thus connecting wisdom, virtue, and technological knowledge to action.

Summary and Conclusion

As George Santayana stated, "Life is not a spectacle or a feast; it is a predicament." At both the personal and the global levels, we are beset with multiple problems and challenges, and if Jerome Glenn and others of a similar mind are correct, the problems seem to just get progressively more complicated with each passing day.

The future requires the evolution of an individual and collective mindset adequate to successfully meeting these challenges. Some would argue for a "New Enlightenment" (Anderson, 2003; Lombardo, 2006b, pp. 386-391; Lombardo, 2007b). Not discounting this proposal, we have argued here that the key is the cultivation and practice of wisdom. We have presented a theory of wisdom, informed by contemporary research and thinking and have intimately tied it to both enhanced future consciousness and ethical character virtues.

Further, given the ever-evolving technological dimension of human existence, we have proposed that wisdom, now and into the future, needs to be conceptualized as a technologically supported capacity. We argue for the "wise cyborg" as our philosophical and psychological ideal. Given the nature of the challenges we face, we require a higher level of integrative awareness, a more expansive consciousness, heightened ethical conscience and abilities, and a multi-faceted technological system for facilitating these capacities.

If our educational systems are to serve the needs of humanity and foster the continued evolution of our world, then education should pivot on the development of wise cyborgs. We have outlined a theory of a wisdom based, future focused, ethically grounded educational program, and illustrated how technological knowledge and proficiency can be integrated into such a program to support the development of wise cyborgs.

References

Anderson, W. (2003), *The Next Enlightenment: Integrating East and West in a New Vision of Human Evolution*. St. Martin's Press, New York, NY.

Carr, N. (2010), *The Shallows: What the Internet is Doing to Our Brains*. W. W. Norton, New York, NY.

Clark, A. (2003), *Natural-Born Cyborgs: Minds, Technologies, and the Future of Human Intelligence*. Oxford University Press, Oxford, UK.

Clark, A. (2008), *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*. Oxford University Press, Oxford, UK.

DeGraaf, J., Wann, D., and Naylor, T. (2001), *Affluenza: The All-Consuming Epidemic*. Berret-Koehler Publishers, Inc., San Francisco.

Gardner, H. (1999), *The Disciplined Mind: What All Students Should Understand*. Simon and Schuster, New York, NY.

Gardner, H. (2008), *Five Minds for the Future*. Harvard Business Press, Boston, MA.

Garreau, J. (2005), *Radical Evolution: The Promise and Peril of Enhancing Our Minds, Our Bodies – And What it Means to be Human*. Doubleday, New York, NY.

Gleick, J. (1999), *Faster: The Acceleration of Just About Everything.* Pantheon Books, New York, NY.

Glenn, J., Gordon, T., and Florescu, E. (2010), *2010 State of the Future*. The Millennium Project, Washington, D.C.

Hall, S. (2010), *Wisdom: From Philosophy to Neuroscience*. Alfred Knopf, New York, NY.

Jacoby, S. (2009), *The Age of American Unreason*. Vintage Books, New York: NY.

Kurzweil, R. (1999), *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*. Penguin Books, New York, NY.

Kurzweil, R. (2005), *The Singularity is Near: When Humans Transcend Biology*. Viking Press, New York, NY.

Lombardo, T. and Richter, J. (2004), "Evolving future consciousness through the pursuit of virtue", in Didsbury, H. (Ed.), *Thinking Creatively in Turbulent Times*. World Future Society, Bethesda, MD.

Lombardo, T. (2006a), *The Evolution of Future Consciousness: The Nature and Historical Development of the Human Capacity to Think about the Future*. AuthorHouse, Bloomington, IN.

Lombardo, T. (2006b), *Contemporary Futurist Thought: Science Fiction, Future Studies, and Theories and Visions of the Future in the Last Century*. AuthorHouse, Bloomington, IN.

Lombardo, T. (2006c), "The pursuit of wisdom and the future of education", in Mack, T. (Ed.), *Creating Global Strategies for Humanity's Future.* World Future Society, Bethesda, MD.

Lombardo, T. (2007a), "The evolution and psychology of future consciousness" *Journal of Future Studies*, Vol. 12 No. 1.

Lombardo, T. (2007b), "Wisdom and the Second Enlightenment" in World Futures Study Federation *Futures Bulletin*, Volume 32, No. 3.

Lombardo, T. (2008) "Ethical character development and personal and academic excellence" *The Wisdom Page*, www.wisdompage.com.

Lombardo, T. (2009a), "The wisdom of future consciousness", in Wagner, C. (Ed.), *Innovation and Creativity in a Complex World*. World Future Society, Bethesda, MD.

Lombardo, T. (2009b), "The future evolution of the ecology of mind" *World Future Review*, Vol.1 No. 1.

Lombardo, T. (2009c), "Understanding and Teaching Future Consciousness" *On the Horizon*, Vol.17, No.2.

Lombardo, T. (2010), "Wisdom facing forward: what it means to have heightened future consciousness" *The Futurist*, Vol. 44 No. 5, September-October.

Lombardo, T. (2010b), "Multidisciplinary and Interdisciplinary Approaches to Futures Education" *Journal of Future Studies*, Volume 14, No. 4.

Lombardo, T. (2010c), "Integrative and Holistic Futures Education" *Center for Future Consciousness*, http://www.centerforfutureconsciousness.com/pdf_files/2010_Preso/IntegratHolistFutEd.pdf .

Lombardo, T. (2011), "Wisdom in the 21st century: a theory of psycho-social development" *World Affairs Journal*, (Forthcoming).

Macdonald, C. (1996), *Toward Wisdom: Finding Our Way Toward Inner Peace, Love, and Happiness*. Hampton Roads Publishing Company, Charlottesville, VA.

Macdonald, C. (2004), *Matters of Consequence: Creating a Meaningful Life and a World that Works.* Big Ideas Press, Charlottetown, Prince Edward Island, Canada.

Myers, N. and Kent, J. (Ed.) (2005), *The New Atlas of Planet Management*. University of California Press, Berkeley, CA.

Postman, N. (1985), *Amusing Ourselves to Death: Public Discourse in the Age of Show Business*. Penguin Books, New York, NY.

Postman, N. (1992), *Technopoly: The Surrender of Culture to Technology*. Vintage Books, New York, NY.

Sternberg, R. (Ed.) (1990), *Wisdom: Its Nature, Origins, and Development*. Cambridge University Press, New York, NY.

Sternberg, R. (2001), "Why Schools Should Teach for Wisdom: The Balance Theory of Wisdom in Educational Settings" *Educational Psychologist*, Vol. 36, No. 4.

Sternberg, R. and Jordan, J. (Ed.) (2005), *A Handbook of Wisdom: Psychological Perspectives*. Cambridge University Press, New York, NY.

Weigel, V. (2002), *Deep Learning for a Digital Age: Technology's Untapped Potential to Enrich Higher Education*. Jossey-Bass, San Francisco, CA.