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The challenge becomes one of transforming an information-rich society into a learning society . . . the question, then, of what are legitimate pathways to knowledge is an important one to higher education pursuits.

Learning Throughout Life: The Information-Knowledge-Wisdom Framework

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Although the idea of lifelong learning dates to antiquity, conceptualization as a movement of worldwide concern is only a little more than a quarter of a century old. While initially construed to mean that adults too should be considered in the learning arena, it evolved into a movement which emphasized the unity and continuity of the learning and educational process throughout life. Indeed, the early years of youth became recognized as playing a vital role in developing self-directing learners.

The latter goal of developing such learners became an integral part of the learning society concept—a vision of a society in which learning opportunities would be available to all ages and stages of growth for all people as catalyzed by a variety of social structures within an economical, political, and social support system. Learning how to learn would supercede learning how to be taught—thus differentiating a learning society from an information society. In an information society the processing, storage, manipulation, retrieval, and transmittal or communication of information are emphasized. A learning society, however, emphasizes know-how and the wisdom of appropriate application of knowledge and sound judgment. How resourceful is the individual in locating, sorting through, and using the bewildering mass of information with which one is beset? Can one recognize, avert, and deal with the potentially debilitating effects of information overload? The question of how much knowledge one possesses is superceded by the question of how well one can continue to learn and such competency includes knowledge, skill, as well as attitude.

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Information does not equal knowledge, and knowledge is not the same thing as wisdom. Understanding the progression and character of learning itself from an information-knowledge-wisdom framework presents a challenge to educators attempting to better operationalize in reality the vision of a learning society. Accordingly, as rooted in the writings of ancient philosophical sources, the article will offer a review also of the modern literature in the following domains as derived from philosophical, psychological, neurological, sociological, anthropological, and other sources:

1. Information processing, retrieval, assimilation, accommodation, and information overload—particularly in the adult learner.
2. Knowledge development, the ways of knowing, and the contribution of both cognitive and contemplative pathways to growth.
3. The emergence of wisdom and the maturing learner.

Given that different societies and cultures often nourish different aspects of thinking and knowing, the imperative seems clear. Lifelong learning is not a luxury, but a necessity, not only for individual and national growth, but also for interacting with and learning from the greater global community. Use of an information-knowledge-wisdom framework as viewed from a larger global context can help those in higher education elucidate the degree to which information, knowledge, and/or wisdom is or should be an aim of educational intervention strategies, aims, programs, or interactions. In general, readers are challenged to consider what they might contribute toward the aim of developing lifelong, self-directing learners and actualizing the vision of a learning society from both a national and global perspective.

The Information-Knowledge-Wisdom Framework

Writers as early as the ancient Greeks recognized that information alone was insufficient for the development of an educated person. Knowledge tends to emerge as a higher order aim in the learning process, and beyond that wisdom. Although not necessarily a purely linear progression, the categories represent domains and are developmental in nature.[1]

As T.S. Elliot wrote about our modern world, however, wisdom gets lost in knowledge and knowledge gets lost in information.

> All our knowledge brings us nearer to our ignorance, All our ignorance brings us nearer to death, But nearness to death, no nearer to God. Where is the life we have lost in living? Where is the wisdom we have lost in knowledge? Where is the Knowledge we have lost in information?
>
> T.S. Elliot, "The Rock"

Given this scenario, what role should institutions of higher education play in nourishing the growth of an "educated being?" An even more fundamental question emerges as to the purpose of higher education within a lifelong learning/learning society theme and an information-knowledge-wisdom framework. The reader is encouraged to consider these challenges in moving through the discussion of each of the following domains: Information, knowledge, wisdom.

Information

The term information age or information society is heard and employed with increased frequency of usage

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among educators in many contexts. A multi-disciplinary host of scholars have likewise offered analyses that echo a common theme: the central project of highly industrialized societies is shifting from industry to information, thus earning the label of "information society" (Boucouvalas, 1981; 1983).

When the central project of society changes (e.g., from agriculture to industry as in the past, or currently from industry to information) so does the underlying structure or order upon which society is based. For example, as a result of the Industrial Revolution a shift to mass production—including mass education—occurred. A concomitant value shift to productivity, particularly in terms of quantification, consumption, and other values ensued. The according of status also shifted from those who possessed land in agricultural society to those who had capital, money, and material possessions in industrial society. As society shifts to information as a central project, the granting of status should also shift to those with information and knowledge. In more specific terms, Masuda (1980) helps us better understand how profoundly the structure on which society is based is changing as we move from an industrial to what has been referred to as an information society (See Table 1).

Table 1
A Comparison of Selected Elements of the Social Order in the Shift from Industrial to Information Society

Industrial Society	Information Society
Technology	
Machine Technology extends Physical Ability	Computer Technology extends Mental Ability
Major Value	
Affluent Material Consumption (Capital)	Knowledge (Information)
Training in Technical Matters Important	Development of Potential Talent of each Individual Important
Social Structure	
Hierarchies and Central Bureaucracies	Multi-centered and Horizontal Networks
Force for Social Change	
Labor Movements	Citizen Movements

[a]Some elements based on information provided by Y. Masuda. **The Information Society as Post Industrial Society,** Washington, D.C.: World Future Society, 1980.

Harman (1977, p. 9) explains the why and how of this occurrence. Essentially, the current structure on which society is premised has now become our weakness:

> The basic system goals that have dominated the industrial era (material progress, individualism, freedom of enterprise, few restraints on capital accumulation, social responsibility mainly the concern of government rather than other institutions, etc.) and that have been approached through a set of fundamental subgoals (efficiency, productivity, continued growth, of production consumption, and technological and manipulative power), have resulted in processes and states (division of labor, specialization, cybernation, stimulated consumption, planned obsolescence, private exploitation of resources held in common), which end up counteracting human ends (enriching work roles, resource conservation, environmental enhancement, equitable sharing of the world's resources). The result is a massive and growing challenge to the basic goals and institutions of the present industrial system.

This "happening" in society today is often misunderstood as a purely technological expansion. In fact, the phrase "high tech" seems to be quite in vogue today. It is critical to understand, however, that technology is merely the catalyst, just as it has been in previous transformations. Reference to Table 2 will reveal that computer and communications technology are catalysts in creating the newly labeled "information society" just as the machine served as catalyst to the development of industrial society, and as the domestication of the plant and animal before that helped transform society from hunting and fishing to agricultural.

Table 2
Technology as Catalyst to Selected Societal Transformations in the History of Humankind

Society	Technology
Information Society	Computer Technology + Communications Technology = Information Technology
Industrial Society	Invention of Machine
Agricultural	Domestication of Plant and Animal
Hunting & Fishing	

Biological	Cultural	Evolution of Consciousness

Societal Transformations

Harman (see Table 3), offers a comparison of selected societal features under an industrial versus a transindustrial[2] society which reveals a striking parallel between the features of transindustrial society and the features of a learning society.

The challenge then, becomes one of transforming an information-rich society into a learning society. As early as the 1970s lifelong education had been proposed and promoted by UNESCO as a "master concept" to guide reconstruction of the entire educational system in both developed and developing countries (Faure, 1972). Movement has been encouraged from the currently dissolving system of "terminal education" to lifelong education "not as an educational system, but as the principle upon which the overall organization of a system is founded and which should underlie the development of each of its component parts" (Faure, 1972, p. 182). Learning not teaching becomes a central feature, thus the name lifelong learning rather than lifelong education movement. Accordingly, both the product and process of education are transformed, as depicted in Table 4. In such a context institutions of higher education

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become pivotal agents of learning which can set the pace in preparing and further developing societal leaders. The University of Minnesota, for example, has already reformulated policy guidelines around the principle of lifelong learning/education.

Table 3
Selected Feature of Society Under the Current Industrial Paradigm Versus Under a Transindustrial Paradigm[a]

Industrial	Transindustrial
Emphasis on economic and material growth	Emphasis on human growth and development
Concerned with physical frontiers of geography and technology	Concern shifts to inner frontiers of mind and spirit
People serve institutions	Institutions serve people
Learning viewed as an activity of limited duration in preparation for real "business" of fitting into institutions of industrialized state	Learning a prime source of all phases of life and all social institutions
Emphasizes possession (degree, certificate, credential)	Emphasizes being-stresses both individual and societal self-renewal
Segments learning into subject-centered approach	Attempts to make learning more life-centered and problem-centered and emphasizes integration among subject areas
Serves as a means of directing individuals into career choices both by educational institution and employers and, as a result, enhances only a selected segment of an individual's skills	Frowns upon developing only a specific component of individual's ability and seeks to draw out and develop individual's entire potential as a full being
Embraces linear life pattern model of school (in youth) work (in adulthood) leisure (in old age)	Extends education to cover all of life's roles and goals and seeks integration among learning, work, and leisure
Views Education as provided by only one section of society-educational institutions	Views Education as provided by whole of society in different contexts and at different times

[a]Based on information presented by Willis Harman in **An Incomplete Guide to the Future.** San Francisco, San Francisco Book Co., 1976.

Table 4
Comparative List of Characteristics of Education Under Present "Terminal System" versus under Lifelong Education[a]

Present System "Terminal Education"	System Based on Principle of Lifelong Education
Concentrates primarily on one period of life known as youth	Covers the entire life-span
Concentrates on transmission of knowledge with primary emphasis on intellectual development	Fosters development of inquiry skills and self-direction with emphasis on the total person in intellectual, emotional, social, and spiritual areas and integration among them. Also recognizes a continuum of learning needs from basis survival to more transpersonal.
Definition and source of knowledge narrow in scope; logic emphasized	Recognizes and is based on a view of many sources of knowledge, including the intuitive mode
Based on premise that education is a means by which cultural heritage is handed down	Based on expanded premise than education is a means of development

[a]Based on information presented at the UNESCO Interdisciplinary Symposium on Lifelong Education, Paris, September 25–October 2, 1972.

Given an understanding of the larger context—the reality of an information rich society and the vision of transformation into a learning society—it would seem helpful to ask the question of how people learn, which in the "information" domain focuses on how information is processed. A plethora of literature has emerged on learning styles in this vein; particularly useful references in this regard are Smith (1982)—especially the Appendix which lists assessment instruments and their sources—and Cell (1984). Perhaps the most popularized approach deals with modality use—for example, whether one processes information visually, auditorially, kinesthetically, or some combination thereof.

Information-processing, of course, is influenced by world views, values, environment, emotions, as well as perhaps some innate matters. (Lachman, Lachman, and Butterfield, 1979; Pich and Saltzman, 1978; Spoehr, 1982; Suedfeld, et al., 1971) Although research is far from conclusive with regard to the etiology or rationale as to why one individual processes information differently than another, an understanding of one's own proclivities better equips one for learning throughout life. The individual learner may have a responsibility in this regard, but so do the various agents of learning. How will institutions of higher education respond?

The brain then, through the senses,[3] processes information continually. Implicit in the lifelong learning theme is the notion that it is never too late to learn. From the neurosciences compelling evidence has emerged relevant to the neuroplasticity of the brain and its relevance to learning and memory throughout life. In effect, the brain is apparently a plastic organ which is capable of continually responding and adapting to the functional demands of the environment.

Chemical and anatomical responses in brain structure and function result from both use of the brain and the "ecology" or greater environment in which the brain functions (Milgram, MacLeod and Petit, 1987; Winlow and McCrohan, 1987).

A critical question emerges as to the kinds of environments created, particularly in institutions of higher education which are designed to prepare and cultivate the leaders, decision makers, policy makers—the "movers and shakers" of society. Furthermore, it would seem important to ask what kind of environment is manifest for the further development of faculty, administrators, and other personnel.

The quality of such an environment is integral. While experience seems indeed to cause the brain to grow and enriched environments produce "bigger" brains, it is *active* effort and involvement which creates cortical connections. Watching alone is insufficient—a finding which may have implications for both learners as well as learning facilitators, designers, and administrators. Of course, such an active mode must be balanced with time for reflection and contemplation, for—as echoed throughout the ages—by Plato, Heidegger, and a host of others—the fully developed being is balanced in both active and contemplative modes. Even the current literature on adult development suggests that one tends to grow most during periods of transition and reflection.

Moreover, too much information to process can produce problems. Neurologically, too much stimulation can cause synapses to shut down thus interfering with learning. Klapp (1986), however, speaking from a sociological perspective, argues that it is not just the sheer quantity/amount of information which is problematic, but information that becomes "noiselike" or without meaning. Boredom often results not just from "underload" but from an overload of processing much uninteresting or meaningless information and furthermore, not just from monotony but sometimes from too much variety from which to choose. Distraction, stress, errors, and other costs are often exacted. Meaning formation is slower than information accumulation, stresses Klapp, who also warns of a "meaning gap" in society—referring to the "inability of people in the same society to agree on larger patterns, purposes, and values even when they share the same factual information" (p. 10). The highest meaning—wisdom—is slowest to arrive, a claim which is consistent with the philosophically-derived framework presented herein. These assertions seem in concert with the psychologically oriented findings reported by Cermak and Craik (1979) that meaningful information tends to be processed at a deeper level—thus retrieved and remembered easier.

Separating relevant information out, then, becomes an important competency for a lifelong learner in the information age, an observation corroborated by Waitley and Tucker (1987) in their analysis of innovative thinkers.

Information becomes knowledge via the twin cognitive processes of assimilation and accommodation. Again, however, the greater context of emotional values, culture, etc., play a role in how knowledge is approached and produced. It is to the next domain or category we turn for discussion and elaboration.

Knowledge

In our postpositivist era we are moving from a conception of knowledge as absolute certainty (episteme) to a more probalistic thinking approach. Along with this movement is a clearly growing interest and acceptance of many modes of inquiry and ways of knowing. The balance between cognitive and contemplative dimensions to knowing is likewise considered. As meaning becomes central (as discussed earlier), it becomes increasingly apparent that, as Bernstein (1983) emphasizes, the hermeneutic dimension is being recovered.

As both an art and a science hermeneutics (from the Greek word ermeneuo, to interpret) is part of a larger arena—the interpretive approach—which is different from, yet complementary to the empirical-analytic approach in both foundational assumptions and aims. For example, the empirical-analytic approach seeks to discover "truth" by distancing the researcher from the researched to maintain objectivity and result in accurate reporting. The interpretive approach seeks understanding and creating of meaning via the intertwining of a dialectic between the researcher and researched to result in a skilled version of our understood meaning (Boucouvalas, 1987). Bernstein (1983, p. 36) particularly notes the value of hermeneutics in contributing to an ongoing understanding of the role of culture in influencing our knowledge and knowing. He stresses that "in and through an understanding of alien cultures . . . we can come to a more sensitive and critical understanding of our own culture and of those prejudices that may lie hidden from us." The understanding, however, should not be confined to the content or manner of culture but to the very ways of thinking and knowing being nourished. Cultures abound the globe, but may also be construed in societally created terms such as the "subculture" of women and their way of knowing as portrayed by Belensky, et al., (1986).

Thus the questions of how people learn when asked within the "knowledge" domain, moves from a discussion of processing information (emphasized in the "information" domain) to a treatise on the use of faculties of inquiry and ways of knowing. The standard philosophical treatment of the subject makes its own contribution to an understanding of the ways of knowing (ways by which knowledge is attained and interpreted). Monatgue (1925) offers a discussion of the manner of knowing (ground) and its origin(s) which can be encapsulated as follows:

Method of Knowing (ground)	Origin
Authority	Testimony of others
Mysticism	Intuition (instinct, feelings, desires)
Rationalism	Abstract reasoning from universal principles
Empiricism	Sensory experience
Pragmatism	Practical activity having successful consequences and concrete results
Skepticism	Can neither be proved nor disproved

Each "method" has a domain of experience for which it is fitted. One might expand upon the mystical mode as enunciated by Montague to include spiritual and theological ways of knowing. All modes have had their "heyday" of value in the history of humankind. Objectivism, subjectivism, and dualism have reigned as "methods" of interpreting the knowledge. Of course, with the rise of postpositivism, method itself has come into question as the only or best way of addressing or interpreting knowledge, since it may prestructure an individual's way of thinking. Individuals, however, who have attained increased cognitive power in adulthood and reached "higher stages" of development may be in a position to understand and perceive the potential constraints on one's thinking. Although beyond the scope and space constraints of this paper, an impressive array of

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research is being generated in the realm of adult cognitive growth beyond the Piagetian level of "formal operations" or problem solving. The interested reader is referred to Commons, et al., (1984) and to papers and results of more recent symposia.[4]

The question, then, of what are legitimate pathways to knowledge is an important one to higher education pursuits, particularly in our post-postivist era which is beginning to recognize multi-modal epistemological pathways. Even the critiques of brain lateralization (i.e., right brain/left brain) on the basis of oversimplification of assigned dichotomous function to right or left brain, however, have nevertheless recognized the qualitatively different functions of: a) understanding the pieces and b) forming or creating the whole. Dichotomies abound: Intuition and intellect (Arnheim, 1985), logico-scientific and narrative thinking modes (Bruner, 1985) to mention a few. Suffice to say, as summarized by Noddings (1985, p. 130), "to know requires informal activity in intuitive, scientific, and aesthetic modes as well as skilled operation in the formal domain."

Even more critical, it seems, is the issue of tacit learning and its importance to knowledge acquisition in the adult (Polanyi, 1974, 1976; Sternberg and Caruso, 1985). Its form is unspoken—it is not directly taught. Sternberg and Caruso (1985) argue that "most of the practical knowledge adults acquire is tacit." (p. 147). One learns by doing and from mistakes made. Noteworthy is the claim by Wagner and Sternberg (1985) cited in Sternberg and Caruso that tacit knowledge was reported as the most important kind of knowledge for professional success. What implications or challenges might this discussion have for the manner and mode of learning in higher education institutions?

Whether tacit or more formal, one can know much and still be very foolish. The antonym of foolish, of course, is wise. Thus it is to the final domain we turn for an understanding of wisdom and its importance to higher education pursuits within a lifelong learning/learning society frame.

Wisdom

The Oxford English dictionary defines **wisdom** as the opposite of foolishness "capable of judging rightly in matters pertaining to life and conduct" and to be **wise** is "having or exercising sound judgment or discernment; capable of judging truly, concerning what is right or fitting, and disposed to act accordingly; having the ability to perceive and adopt the best means for accomplishing an end; characterized by good sense and prudence."

The wise individual may not have any more information than the foolish, but the information is used differently. Thus, the question of how people learn when asked within the "wisdom" domain moves once again not only away from a discussion on information-processing but also away from a treatise on the use of faculties of inquiry and ways of knowing to a discussion of appropriate application of information and knowledge and sound judgment. Implicit is the underlying attitude. William Cowper in "Winter Walk at Noon" seems to express it well: "Knowledge is proud that he has learned so much; wisdom is humble that he knows no more." This humbling process results from the knowledge of how much one does not know but, according to Meacham (1982), a balance is managed between such a recognition and the ability to acquire new information and develop knowledge. One might also recognize the ultimate Socratic position of "the only thing I know is that I don't know anything."

According to Erikson's theory of human development, wisdom is the last ego strength or virtue to emerge. Building upon Erikson, Clayton (1975, 1977, 1982) conceptualizes wisdom as an ability to grasp human nature and its contradictions, paradoxes, and changes—an understanding of self and of others as manifested in both judgments and actions and their effect on both self and others.

Cognitive knowledge and wisdom are differentiated as two different domains. For example, while cognitive knowledge is time bound, wise judgment and action are timeless. The wisdom of Solomon would still be considered wise today. Although not articulated as such, this assertion is in consent with the ancient Greek knowledge categories framing the present discussion as is the purported developmental nature of wisdom offered by other authors. Characteristics of highly developed individuals a la adult development theory are consistent with descriptions people have given of wise people in at least one study (Johnson, 1981). The importance of meaning alluded to earlier, again arises as Hedlund (1977) stresses the importance of the creation of meaning to the development of wisdom.

The literature is replete with discussions as to whether wisdom is independent from or a domain of intelligence. Arguments abound, but the literature is still unclear on this topic. Expertise in the pragmatics of life situations may be construed as a type of social intelligence acquired via living and through learning from one's own mistakes and the mistakes of others and would resonate with predecessors such as:

Pubilius Syrus (c. 42 B.C.) "He is truly wise who gains wisdom from another's mishap."

and Plutarch (c. 42-120 A.D.) "Cato used to assert that wise men profited more by fools, than fools by wise men; for that wise men avoided the faults of fools, but that fools would not imitate the good examples of wise men."

The renditions of wisdom emerging from the theologically oriented literature, however, speak of a wisdom emanating from spiritual maturity which results from contemplation. Harkening to the ancient Greek knowledge categories of techne (instrumental rationality and knowledge/skill) phronesis (practical wisdom), and theoria (spiritually oriented wisdom deriving from contemplation) the complementarity of all modes becomes apparent.

An understanding of how wisdom develops or is acquired, however, is still absent. It seems that attention to a balanced development of action and contemplation may provide a groundwork; learning from one's mistakes and those of others, and meaning formation derived from a project transcending one's own self-interest all provide direction. The definitions provided at the outset likewise imply a moral and ethical development.

Nurturing wisdom, then, appears to be a complex process aimed at development of the total person. A monumental challenge, therefore, faces institutions of higher education in providing an environment (in policy and practice) which attends to the development of wisdom as something worth working toward. Conversely, how will higher education recognize and respect the wisdom of the myriad of adult and older learners abounding within a lifelong learning framework.

Those few authors who allude to the development of wisdom as part of the purpose of higher education (Goode, 1968; Honigan, 1984; O'Brien, 1972; Vaccaro, 1975), decry what they perceive as the exclusively or primarily utilitarian notion as to the purpose of higher education. Is a balance possible? The question/issue now becomes the reader's to consider: What considerations if any could or should be given to wisdom (and its development or modeling) in higher education when viewed within a lifelong/learning so-

ciety context? Ultimately one returns to the age old philosophical question of what is the purpose of higher education. The question is renewed, however, within an information-knowledge-wisdom framework and within the context of lifelong learning where many other institutional forms and agents of learning are contributing to the information and knowledge domains.

Toward Dialogue

Each of these domains—information, knowledge, wisdom is much deeper and more multi-faceted than a few words on paper can portray. It is hoped that this modest discussion, however, will encourage further exploration of each realm and the progression and development of an "educated" being as considered here. Most important, it is hoped that this discussion will stimulate thought and dialogue about the present and future role(s) of higher education institutions and personnel in nurturing learning as a lifelong process and contributing to the creation of a learning society.

Footnotes

1. For a deeper understanding of the philosophical and theoretical foundations upon which the derived framework is based, the reader is referred to Aristotle **(Metaphysics, Nicomachean Ethics)** and Plato **(Laws, Republic, Phaedo).**
2. Although the term postindustrial has been used to describe the newly transformed society, the term transindustrial, coined by Willis Harman of Stanford University, seems preferable since it better connotes the transformative character of going beyond industrial society, rather than merely occurring after (post).
3. Increasing attention in recent years has also been focused on the role of intuition as an alternate, even if little understood, paradigm for accessing information. Since an understanding of the role of intuition in learning is still in its infancy, lack of conceptual clarity is to be expected. For example, Quick (1981) aligns it with wisdom (the third domain in the framework offered herein). Morris (1987), however, has mounted a comprehensive review of the literature on intuition in order to better understand its relation to problem-solving. Preliminary findings suggest that intuition, like a rose, has a myriad of varieties and forms. The author's continuing inquiry should offer some avenues for better clarification and understanding.
4. Commons, et al. (1984) is a book based on the first symposium on post-formal operations, held at Harvard University by the Graduate School of Education during 1981. Subsequent symposia (a second and third) were held during 1985 and 1987 respectively. Publications will be forthcoming.

References

Arnheim, R. (1985). The double-edged mind: Intuition and intellect. In E. Eisner (Ed.). **Learning and teaching the ways of knowing.** 84th Yearbook, Part II. Chicago, IL: University of Chicago Press.

Belensky, M.F., Clinchy, B.M., Goldberger, N.R., and Tarule, J.M. (1986). **Women's way of knowing: The development of self, voice, and mind.** New York: Basic Books.

Bernstein, R.J. (1983). **Beyond objectivism and relativism: Science, hermeneutics, and praxis.** Philadelphia: University of Pennsylvania Press.

Boucouvalas, M. (1981). **Lifelong learning as a worldwide movement reflecting and contributing to social transformation.** (Summary) In G.C. Whaples and D.M. Ewart (Eds.). **Proceedings of the Third Lifelong Learning Research Conference,** pp. 5-6. College Park, Md.: University of Maryland.

Boucouvalas, M. (1983, May). **Lifelong learning and the information society.** Presented to Education in the Information Age Conference, University of Virginia. (ERIC Document Reproduction Service No. ED 244 144.)

Boucouvalas, M. (1987, February). The scope and evolution of hermeneutics and its challenge to lifelong learning professionals. In W. Rivera and S. Walker (Eds.). **Proceedings of the Eighth Lifelong Learning Research Conference,** pp. 133-137. College Park, Md.: University of Maryland.

Bruner, J. (1985). Narrative and paradigmatic modes of thought. In E. Eisner (Ed.). **Learning and teaching the ways of knowing.** 84th Yearbook, Part II. Chicago: University of Chicago Press.

Cell, E. (1984). **Learning to learn from experience.** Albany: SUNY Press.

Cermak, L.S., and Craik, F.I. (Eds.). (1979). **Levels of processing in human memory.** Hillsdale, NJ: T. Erlbaum Associates.

Clayton, V. (1975). Erikson's theory of human development as it applies to the aged: Wisdom as contradictive cognition. **Human Development, 18**(1-2), 119-128.

Clayton, V.P. (1977, October). A multidimensional scaling analysis of the concept of wisdom. (Doctoral dissertation, University of Southern California), **Dissertation Abstracts International, 38**(4-B), 1857.

Clayton, V.P. (1982). Wisdom and intelligence: The nature and function of knowledge in the later years. **International Journal of Aging and Human Development, 15**(4), 315-320.

Commons, M.L. et al., (Eds.). **Beyond formal operations: Late adolescent and adult cognitive development.** New York: Praeger.

Cropley, A.J. (Ed.). (1979). **Lifelong education: A stocktaking.** Mongraph 8). Hamburg: UNESCO Institute for Education.

Eisner, E. (1985). **Learning and teaching the ways of knowing, 84th Yearbook Part II.** Chicago, IL: University of Chicago Press.

Faure, E. et al. (1972). **Learning to be: The world of education today and tomorrow.** Paris: UNESCO.

Goode, D.M. (1968). Will of wisdom. **Improving College and University Teaching. 16**, 219.

Harman, W.W. (1976). **An incomplete guide to the future.** San Francisco: San Francisco Book Company.

Harman, W.W. (1977). The coming transformation, Part 2. **The Futurist, 11**(2), 106-112.

Harman, W.W. (1978, July). Education for a transforming society. **Association for Humanistic Psychology Newsletter,** 19-22.

Hedlund, D.E. (1977). Personal meaning: The problem of education for wisdom. **Personnel and Guidance Journal, 55**(10), 602-604.

Honigman, R.D. (1984). Choosing between wisdom and knowledge. **Chronicle of Higher Education, 29**(90), 50.

Johnson, R.E. (1981, August). A study of wisdom as reported by older adults in America. (Doctoral dissertation, Wright Institute.) **Dissertation Abstracts international, 42**(2-B), 748.

Klapp, O.E. (1986). **Overload and boredom: Essays on the quality of life in the information age.** New York: Greenwood Press. Contributions in Sociology, (No. 5-7).

Lachman, R., Lachman J., and Butterfield, E.C. (1979). **Cognitive psychology and information processing: An in-**

https://newprairiepress.org/edconsiderations/vol14/iss2/10
DOI: 10.4148/0146-9282.1667

troduction. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Masuda, Y. (1980). **The information society as post-industrial society.** Bethesda, MD: World Future Society.

Meacham, J.A. (1982). Wisdom and the context of knowledge: Knowing that one doesn't know. In D. Kuhn and J.A. Meacham (Eds.). **On the development of developmental psychology.** Basel: Karger.

Milgram, N.W., MacLeod, C.M., and Petit, T.C. (1987). **Neuroplasticity, learning and memory.** Proceedings of a symposium held at the University of Toronto, Scarborough, Ontario. March 25, 1986.

Montague, W.P. (1925). **The ways of knowing or the methods of philosophy.** New York: MacMillan. London: George Allen and Unwin, LTD.

Morris, L. (1987). **Intuition and problem-solving.** Presented at the 3rd symposium on post-formal operations, June 25-27, 1987. Cambridge, Mass.: Harvard University.

Noddings, N. (1985). Formal modes of knowing. In E. Eisner (Ed.). **Learning and teaching the ways of knowing.** 84th Yearbook, Part II. Chicago, Ill.: University of Chicago Press.

O'Brien, J.C. (1972). A plea for wisdom. **Improving College and University Teaching, 20**(3), 115-118.

Pich, H.L., and Saltzman, E. (Ed.). (1978). **Modes of perceiving and processing information.** Chicago, Ill.: University of Chicago Press.

Polanyi, M. (1974). **Personal knowledge: Towards a post-critical philosophy.** Chicago, Ill.: University of Chicago Press.

Polanyi, M. (1976). Tacit knowing. In M. Marx and F. Goodson (Eds.). **Theories of contemporary psychology.** New York: Macmillan.

Quick, S. (1981). The need for recognizing and developing intuitive wisdom. **College Student Journal, 15,** 378-383.

Rasmussen, J. (1986). **Information processing and human machine interaction: An approach to cognitive engineering,** (Series Volume 12). N.Y.: North-Holland.

Smith, R.M. (1982). **Learning how to learn: Applied learning theory for adults.** Chicago: Follett.

Sternberg, R.J., and Caruso, D. (1985). Practical modes of knowing. In E. Eisner (Ed.). **Learning and teaching the ways of knowing.** 84th Yearbook, Part II. Chicago: University of Chicago Press.

Suedfeld, P., et al. (Ed.). (1971). **Personality theory and information processing.** Ann Arbor, Mich.: Bks Demand, University of Michigan.

Vaccaro, L.C. (1975). In search of wisdom. **Improving College and University Teaching, 23**(1), 152-153.

Wagner, R.K., and Sternberg. (1985). Practical intelligence in real-world pursuits: The role of tacit knowledge. **Journal of Personality and Social Psychology, 49**(2), 436-458.

Waitley, D.E., and Tucker, R.E. (1987). How to think like an innovator? **The Futurist, 21**)3), 9-15.

Winlow, W., and McCrohan, C. (Eds.). (1987). **Growth and plasticity of neural connections.** Wolfeboro, N.H.: Manchester University Press.