

THE
INTERNATIONALIZATION
OF CURRICULUM STUDIES

Selected Proceedings
from the LSU Conference 2000

EDITED BY

DONNA TRUEIT, WILLIAM E. DOLL, JR.,
HONGYU WANG & WILLIAM F. PINAR

on the internationalization of curriculum studies was held April 27–30, 2000. As a result of this breakthrough meeting, the International Association for the Advancement of Curriculum Studies, the American Association for the Advancement of Curriculum Studies, and the movement within American curriculum studies known as “internationalization” all emerged. This book, which documents the conference proceedings, is an important one for courses in teacher education, foundations of education, and curriculum studies.

DONNA TRUEIT is a doctoral candidate in curriculum and instruction at Louisiana State University.

WILLIAM E. DOLL, JR. is Co-Director of the LSU Curriculum Theory Project and Director of LSU’s Holmes elementary education program. He has written *A Post-modern Perspective on Curriculum* (1993) and (edited with Noel Gough) *Curriculum Visions* (Peter Lang, 2002).

HONGYU WANG is Assistant Professor in Curriculum Studies at Oklahoma State University. She received her Ph.D. in Curriculum Theory from Louisiana State University and has co-authored books in Chinese and published articles in both Chinese and English.

WILLIAM F. PINAR teaches curriculum theory at Louisiana State University, where he serves as the St. Bernard Parish Alumni Endowed Professor. He has also served as the Frank Talbott Professor at the University of Virginia and the A. Lindsay O’Connor Professor of American Institutions at Colgate University. Dr. Pinar is President of the International Association for the Advancement of Curriculum

www.peterlangusa.com

ISBN 0-8204-5590-3



CHAPTER TWO

WES: A Theory and Framework for an International Curriculum

Keith Bookwalter • Colombia

Basic Principles and Components

The Wholistic Educational System (WES) is a comprehensive, systemic, research-based approach to education which can be characterized as being religious in its inspiration,¹ organismic in its philosophic orientation, and scientific in its method. Drawing upon three corresponding bodies of knowledge and human experience—religion, philosophy, and science—a theory of development and learning was derived which posits the interdependence of the actualization of human potentiality and the acquisition of knowledge. From this theory three others were derived: a theory of curriculum, a theory of teaching, and a theory of administration and institution-community relations. From these three theories practical applications were generated. A fifth theory, the theory of evaluation, completes the educational system and assures that inductive knowledge gained from praxis and research will continually renew all of the constituent components of the System. (figure 1 shows the relationship of these various aspects of the Wholistic Educational System.)

The philosophical foundations of WES draw most heavily from the work of Alfred North Whitehead (1917/1967a, 1925/1967b, 1929/1978, 1933/1967, 1938/1966) and Abraham Maslow, and, to a lesser extent, from Henri Bergson and Charles Pierce. However, in the formulation of its theory of curriculum, WES is also informed by two other branches of knowledge—

religion and science. Religion, like philosophy, invariably asks the fundamental questions which are beyond the scope of science: What is the essence of reality? What is the purpose of the universe? What is the destiny of human life on this planet? What are the spiritual truths which can illumine our understanding of human nature? and others.² Historically, religion was the mother of philosophy. And philosophy, in turn, was the mother of science, mathematics, and other branches of knowledge (Conow 1990: 15–16).

Because educational curricula and teaching methods are strengthened by a deeper understanding of the nature of the learner, WES has formulated a theory of development and learning which draws upon the branches of science which directly or indirectly impact human health and well-being and the educational enterprise, e.g., genetics, neurobiology, neurolinguistics, and other branches of brain research; agriculture; nutrition; medicine; ecology; social-economic development; and many others. Unfortunately, it is beyond the scope of this chapter to present the religious notions, philosophical principles, and scientific tenets which undergird the Wholistic Educational System.

The Historical Roots of WES

The Wholistic Educational System represents the author's attempt to recast, elaborate, and refine the ANISA Model of Education which was developed by the late Rhodes scholar, Daniel C. Jordan, his close colleague Donald T. Streets (1973a), and their associates.³

The Theory of Development and Learning

Because the WES theory of curriculum is derived from its theory of development and learning, the basic principles of the latter have been included in this discussion. However, due to the intimate connection between development, learning, and curriculum, it is recommended that the reader refer to the curriculum summary chart (figure 2) during the exposition of the theory of development and learning.

The theory of development and learning of the Wholistic Educational System has drawn on the work of Jordan and Kalinowski (1973), Gardner (1983), Piaget (1972), and others such as Goleman (1995), Werner, Erikson, Gesell, Epstein, Baldwin, Hunt, Havinghurst, Mussen and Langer, Harris, Buhler, Bonner, and Scott. As it stands at this point in time, the theory of development and learning of WES upholds the following principles:⁴

religion and science. Religion, like philosophy, has always helped to answer the fundamental questions which are beyond the scope of science: What is the essence of reality? What is the purpose of the universe? What is the destiny of human life on this planet? What are the spiritual truths which can illumine our understanding of human nature? and others.² Historically, religion was the mother of philosophy. And philosophy, in turn, was the mother of science, mathematics, and other branches of knowledge (Conow 1990: 15-16).

Because educational curricula and teaching methods are strengthened by a deeper understanding of the nature of the learner, WES has formulated a theory of development and learning which draws upon the branches of science which directly or indirectly impact human health and well-being and the educational enterprise, e.g., genetics, neurobiology, neurolinguistics, and other branches of brain research; agriculture; nutrition; medicine; ecology; social-economic development; and many others. Unfortunately, it is beyond the scope of this chapter to present the religious notions, philosophical principles, and scientific tenets which undergird the Wholistic Educational System.

The Historical Roots of WES

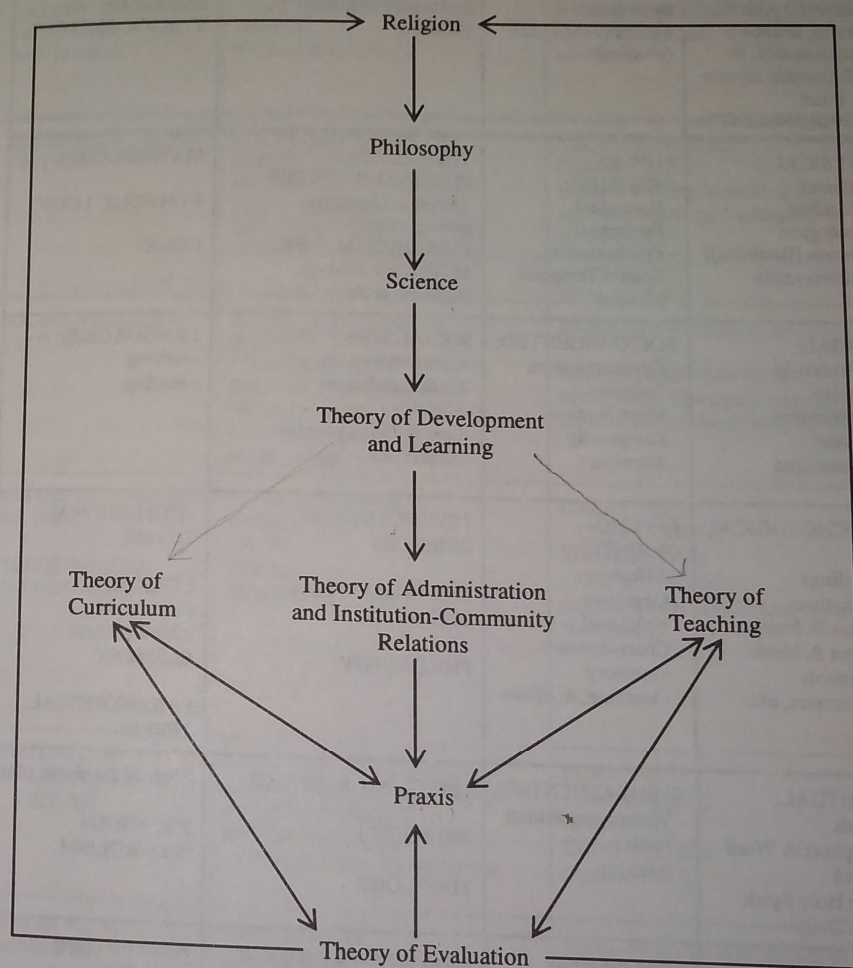
The Wholistic Educational System represents the author's attempt to recast, elaborate, and refine the ANISA Model of Education which was developed by the late Rhodes scholar, Daniel C. Jordan, his close colleague Donald T. Streets (1973a), and their associates.³

The Theory of Development and Learning

Because the WES theory of curriculum is derived from its theory of development and learning, the basic principles of the latter have been included in this discussion. However, due to the intimate connection between development, learning, and curriculum, it is recommended that the reader refer to the curriculum summary chart (figure 2) during the exposition of the theory of development and learning.

The theory of development and learning of the Wholistic Educational System has drawn on the work of Jordan and Kalinowski (1973), Gardner (1983), Piaget (1972), and others such as Goleman (1995), Werner, Erikson, Gesell, Epstein, Baldwin, Hunt, Havinghurst, Mussen and Langer, Harris, Buhler, Bonner, and Scott. As it stands at this point in time, the theory of development and learning of WES upholds the following principles:⁴

Figure 1: Model of the Wholistic Educational System



Note: Top-to-bottom arrows indicate lines of deductive generation of the system components. Bottom-to-top arrows originating from praxis and evaluation indicate lines of inductive development of the system, thereby guaranteeing the perpetual renewal of the System. (Actually, bottom-to-top arrows should be drawn to all components but, for the sake of visual clarity, this was not done.) Also, it should be noted that the evaluation of religion does not mean the assessment of God's Revelations but rather the continual reconsideration of our understanding of the Revealed Word and its implications for education, the results of which will be different from one generation to the next.

Figure 2: WES: Curriculum Summary Chart

The person(s) interact(s) with the known, unknown but knowable, & unknowable aspects of these ENVIRONMENTS:	thereby actualizing these basic POTENTIALITIES (process):	assimilating these bodies of basic KNOWLEDGE (content):	by utilizing these higher-order SYMBOL SYSTEMS
PHYSICAL: -Mineral -Botanical -Zoological -Human (Body[ies]) -Human-made	PHYSIO-ORIENTED: - Biological - Perceptual - Psychomotor - Spatial/Temporal - Musical	THEORETICAL PHYSICAL SCIENCES (physics, chemistry, geology, etc.) THEORETICAL LIFE SCIENCES (biology, anatomy, ecology, etc.)	MATHEMATICS SYMBOLIC LOGIC CODES
SOCIAL: -Partnership -Family -Community -Culture -Humankind	SOCIO-ORIENTED: - Communication - Imitation - Identification - Reciprocity - Altruism	SOCIAL SCIENCES: -Communications -Human Relations -Sociology -Law & Human Rights -History, etc.	LANGUAGE(S): - writing - reading
PSYCHOLOGICAL: - Feelings - Questions - Ideas & Images - Aims & Ideals - Symbols - Memories, etc.	PSYCHO-ORIENTED: - Affective - Cognitive - Volitional - Cross-domain: - memory - learning, & others	PSYCHOLOGICAL SCIENCES THE HUMANITIES THE ARTS PHILOSOPHY	PROFESSIONAL TERMS LITERARY ELEMENT ART FORMS/ ELEMENT PHILOSOPHICAL TERMS
SPIRITUAL: - Souls - Prophets & Word of God - The Holy Spirit - The Deity	SPIRIT-ORIENTED: - Virtues acquisition - Faith - Worship	SPIRITUAL SCIENCES RELIGION THEOLOGY	Most of the above plus RELIGIOUS SYMBOLISM
All of the above combined into the ENVIRONMENT OF THE SELF: -Physical self -Social self -Psychological self -Spiritual self	All of the above oriented to the Self: -Personal health care - Self-percept - Body awareness - Self as companion - Self-esteem - Self-concept - Self-determination -Respect divine in self	All of the above applied to the SCIENCE OF THE SELF: vital information about one's - Biological health, - Social health, - Psychological health, - Spiritual health	All of the above applied to SELF-SYMBOLIZATION: - Self-measurement - Self-definition - Self-dialogue - Self-expression

Figure 2: (Continued horizontally)

thereby forming these VALUING/ VIRTUES (mode of lived with process):	which are "lured" from potentiality into actuality by these IDEALS:	and on which these HIGHER-ORDER COMPETENCES are based:
MATERIAL VALUES/ VIRTUES	TECHNOLOGICAL EFFECTANCE ECOLOGICAL BALANCE SUSTAINABLE DEVELOPMENT HIGH QUALITY SURVIVAL	TECHNOLOGICAL COMPETENCE (applied science: technology, agriculture, animal husbandry, medicine, etc.)
SOCIAL VALUES/ VIRTUES	SOCIAL EFFECTANCE JUSTICE COOPERATION SERVICE TO HUMANITY WORLD UNITY UNIVERSAL PEACE HAPPINESS	MORAL COMPETENCE (applied social sciences: law, social work, education, business & organizational administration, etc.)
ARTISTIC VALUES/ VIRTUES PHILOSOPHICAL VALUES/ VIRTUES	PSYCHOLOGICAL EFFECTANCE UNITY TRUTH BEAUTY	CREATIVE COMPETENCE SPECULATIVE COMPETENCE (applied fields: arts, crafts, think tanks, etc.)
SPIRITUAL & RELIGIOUS VALUES/ VIRTUES	SPIRITUAL EFFECTANCE LOVING & KNOWING GOD PURITY OF HEART KINGDOMS OF GOD: ON EARTH & IN HEAVEN	FIDUCIAL COMPETENCE SPIRITUAL COMPETENCE (applied fields)
All of the above combined into SELF-IDENTITY or CHARACTER	All of the above combined into SELF-EFFECTANCE & the IDEAL SELF: (as a vision of the attributes of God reflected in the Possible Self: the potential "image of God")	All of the above & to the left as they apply to SELF-COMPETENCE which is sustained by: -Learning competence -Self-teaching -Self-actualization (applied in field of self-help practices)

Based on the ANISA Model of Education
Copyright 1999, by Keith Bookwalter

- Development means the translation of potentiality into actuality, the process of which can be equated with creativity in its broadest sense.
- Interaction with the environment is the means by which development is sustained.
- There are five basic categories or aspects of the environment.⁵ (See figure 2.)
- The five aspects of the environment are organized hierarchically. (See figure 3.)
- All environments contain entities which have aspects that are known, unknown but knowable, and ultimately unknowable.
- The perpetual introduction of some novelty⁶ into the environment is a primary means of creating disequilibrium (or disparity) between a person's developmental level and experience, thereby compelling new patterns of interaction, which, in turn, facilitate the actualization of potentialities.
- Environments and interactions are categorized and evaluated in terms of their power to facilitate the maintenance of biological integrity (that is, safety must be paramount), the actualization of all categories of potentiality, the acquisition of knowledge, competence in the corresponding symbol systems, the formation of character, and the enhancement of higher-order competencies, especially the development of learning/self-teaching competence.
- Although the number of human potentialities is infinite and the finitude of their actualization is impossible to establish, they can be categorized into domains, each of which can be analyzed and improved in relative isolation to the others.
- There are five broad categories or domains of potentiality, the actualization of which is oriented toward effectance with a particular environment. (White, 1959)⁷ (See figure 2.)
- There are five subcategories of physio-oriented potentiality. (See figure 2.)
- Proper nutrition is the essential element in the development of biological potentialities. Other important elements include: hygiene (physical health, freedom from illness, cleanliness of physical environment—clean air, clean water, clean food, etc.), exercise (fitness of muscular, cardiovascular, and respiratory systems), leisure (as of muscular, cardiovascular, and respiratory systems), leisure (as a means of re-energizing the system for further service to God and His creation), and rest (especially sleep, but also mind control and other techniques for revitalization).
- There are five subcategories of socio-oriented potentiality. (See figure 2.)

- Communication—body language, social gestures such as gift-giving, listening, and speaking (lower-order symbol systems)—is the key process in the release of socio-oriented potentialities.
 - There are four subcategories of psycho-oriented potentiality. (See figure 2.)
 - Learning is the key cross-domain, psychological process involved in the release of psychological potentialities;
 - There are three subcategories of spirit-oriented potentiality. (See figure 2.)
 - Worship is the primary process for the release of spiritual potentialities. Subprocesses of worship include: prayer, meditation, service and work (as devotion to God via helping others), group worship (the traditional idea of worship), fasting, tithing, and scripture study.
- Note: All of the above potentialities, which are actualized as processes [or powers] are brain-connected. Hence, the argument can be made that they are all processes which are highly mental or psychological in nature. In order to accommodate this truth while maintaining a pentamorous categorization of processes for practical purposes, the term “-oriented” is used to indicate the primary, though not exclusive, realm of utilization of the process in the person's quest for effectance with a particular environment.
- There are eight subcategories of processes oriented to the Self. (See figure 2.)
 - There are five value/virtue subsystems. (See figure 2.)
 - Self-identity (character development) emerges in terms of value/virtue formation. Values are defined as relatively enduring structurings of actualized potentialities (patterned uses of energy available to the organism), and virtues are defined as values, the formation of which is guided by universal ideals which seek the highest good for all things everywhere.
 - The structural and functional reality of self-identity (the Self) is comprised of the four value/virtue systems combined into an integrated totality, on which depends the personal effectance of the self—“self-competence”—analogously defined as the combination of the higher-order competencies.
 - Because of the hierarchical context of development, personality formation cannot be fully understood independently of the culture as transmitted by parents, family, and society.
 - Information about the environments, held as beliefs, whether error free or error ridden, affects the structuring of values and virtues.
 - Psychological processes such as feelings, perceptions, and intentions af-

fect attitudes, which are fused with beliefs in the structuring of values and virtues.

- In correspondence with the five sets of values/virtues there are five supplementary sets of ideals which lure their development forward. (See figure 2.)
- There are five sets of analogous higher-order competencies. (See figure 2.)
- Learning how to learn (learning competence) is the ultimate source of effectance—the ability to bring about intended effects in relation to any targeted entity, whether it be physical, social, psychological, spiritual, or personal in nature.
- Learning competence means the conscious ability to differentiate aspects of experience, integrate them into novel patterns, and generalize them to other situations. Differentiation, integration, and generalization constitute the trio of interrelated processes that define a developmental unit of change—a stage (sequences of stages being the primary means by which increasing complexity of function and structure is built up and integrated through hierarchical organization).
- Early experience is important in the shaping of subsequent developmental phenomena. The concepts of critical or sensitive periods, stages, and sequences within each category or domain of potentiality have heuristic value.
- Developmental universals provide a framework for the planning and implementation of educational programs cross-culturally, provided that cultural and personal uniquenesses are accounted for and encouraged.
- The WES theory of development and learning also provides a general scheme for understanding the nature of pathology and its etiology, sets forth the conditions for the prevention of mental illness, character disorders, delinquency, and criminality, and is generative of testable propositions concerning therapy and rehabilitation.

The Theory of Curriculum

The theory of curriculum of the Wholistic Educational System, in its present form, has drawn on the work of 'Abdu'l-Bahá⁸ (1922–1925/1982), Jordan and Streets (1973b), Doll (1993), Oliver and Gershman (1989), Taba, McDonald, Goodlad, and Tyler. At the present time, the basic principles as illustrated in figure 2 are as follows. Curriculum is defined in terms of educational goals as determined by society and the learner⁹ and what learners do (with or without the assistance of teachers) to achieve them. The over-

arching goal of the curriculum (and the aim of education in general) is to enable the person, through a personalized approach which accommodates his/her uniqueness, to consciously and continuously:

- 1) discover, actualize, expand, and refine, at an optimum rate and in constructive directions, his/ her potentialities and special, God-given talents, which are physical, social, psychological, and/ or spiritual in nature;
- 2) structure these potentialities into a self-identity or character around universal ideals which seek the highest good for all things everywhere and which perpetually improve their well-being;
- 3) acquire and generate beneficial knowledge;
- 4) know and love the Creator and His/ Her creation;
- 5) actualize the potentiality of society (e.g., families, organizations, nations, and humankind as a whole);
- 6) carry forward an ever-advancing civilization toward ever-wider, ever-more-evolved circles of unity; and
- 7) prepare his/ her soul for the afterlife.

There are six curricular strands or sets of objectives: 1) process, 2) content, 3) higher-order symbol systems, 4) values/ virtues and their related ideals, 5) higher-order competencies, and 6) the Self.

Just as the five environments are related hierarchically (figure 3), so, too, are the six strands of the curriculum. Each higher strand builds upon, fuses, and subsumes the lower strands with the Self being the highest level, the embodiment of the sum total of all other curricular strands. (See figure 4.)

The main goals and sub-goals of all of the curricular strands are differentiated into process goals and content goals.¹⁰

1. The Process Curriculum

There are five categories of process goals aimed at the actualization of potentialities. (See figure 2.)

2. The Content Curriculum

There are five categories of content goals analogous to the process goals. (See figure 2.)

The content curriculum at all levels and the logical thinking portion of the cognitive process curriculum give importance to the acquisition of a continuously deepening understanding of all forms of causality and regulatory systems governing the various aspects of the environment. (There is a supplementary curriculum for these aspects.)

Figure 3: Hierarchical Ordering of the Environments

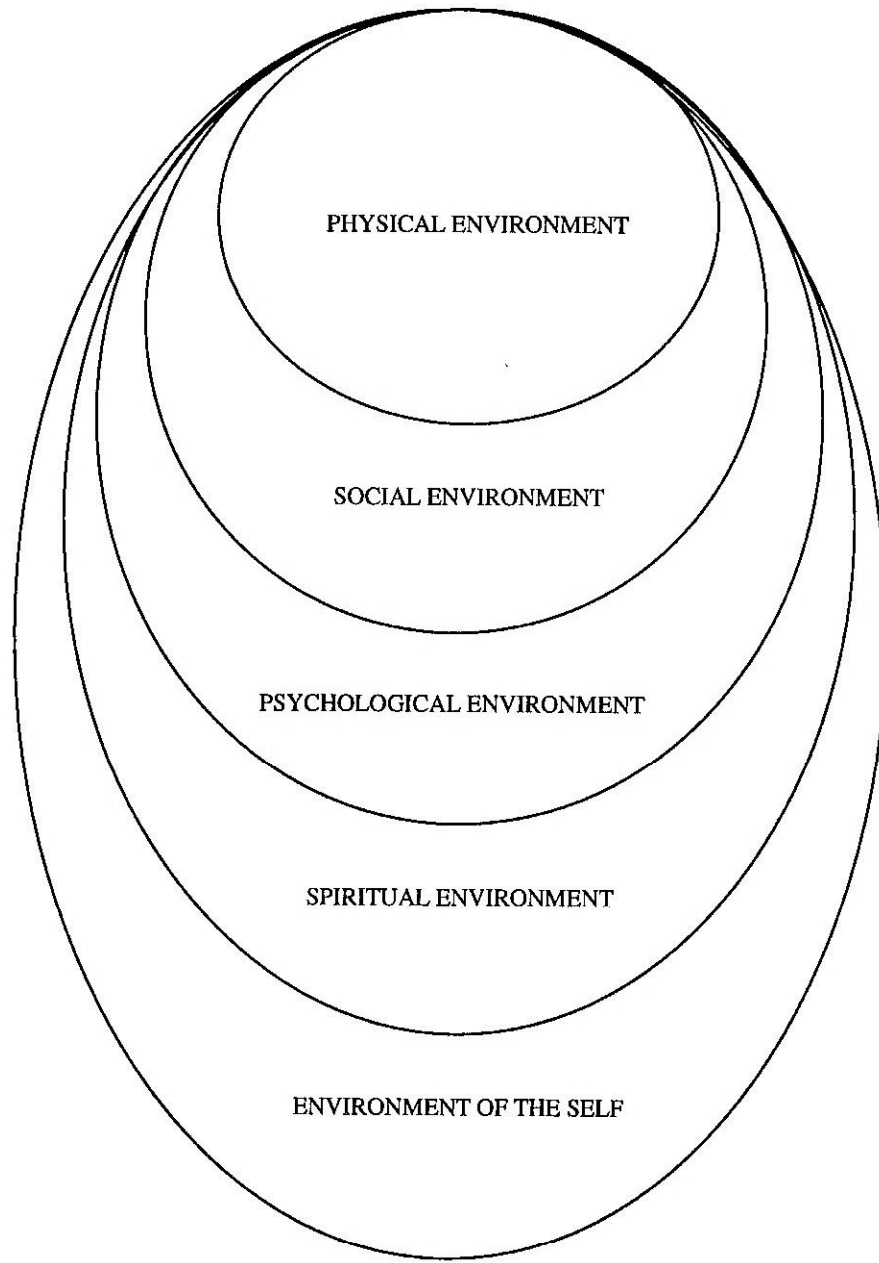
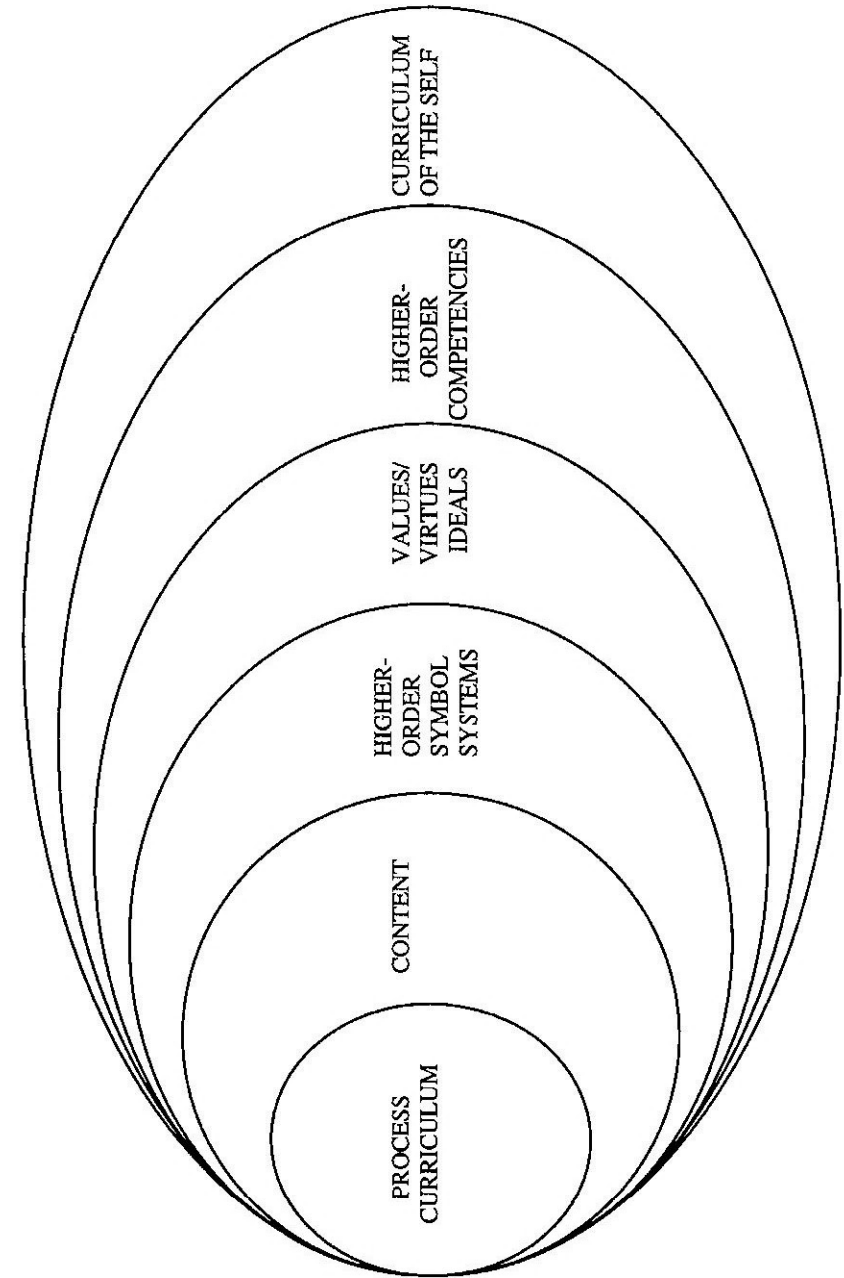


Figure 4: Hierarchical Ordering of the Curricular Strands



Cognitive processes (especially logical and critical thinking) should be as the means for reducing error in the knowledge (content) assimilated, and accumulated content should be applied to render cognitive processes more efficient.

Content knowledge is viewed as consisting of hierarchically organized bodies of concepts, information, and facts.

3. The Higher-Order Symbol Systems Curriculum

There are five categories of higher-order symbol systems¹¹ which help to mediate or facilitate interaction with the five basic environments, give direction to the structuring of the actualization of potentiality, and heighten consciousness of the entities for which the symbols stand. (See figure 2.)

4. The Curriculum of Values/Virtues and Related Ideals

There are five categories of values/ virtues and related ideals. (See figure 2.) Supplementing the value-virtues-ideals strand of the curriculum are five sets of role models, heroes/heroines, and leaders who serve as exemplars and "embodied lures."

5. The Curriculum for Higher-Order Competencies

There are five categories of higher-order competencies. (See figure 2.)

6. The Curriculum of the Self

The curriculum of the Self is based on the microcosm of the four main environments enfolded within the individual, and includes five sub-strands. (See figure 2.) Particular types of interactions are identified which a person must have with the different environments in order to achieve the process and content goals. As a result, an integrated Self can emerge, characterized by values/virtues (actualized potentialities of a mid-range order) and related higher-order competencies that not only guarantee the continual release of potentialities but also improve the quality of survival.

The Theories of Teaching, Administration and Institution-Community Relations, and Evaluation

It is beyond the scope of this chapter to present all of the principles included in the theories of teaching, administration and institution-community relations, and evaluation. Suffice it to say that the theory of teaching has drawn on the work of Bruner, Broudy, B. Othanel Smith, Woodruff, Gage, Glaser, and Moore, and it is derived from and is coherent with the theory of development and learning. The theory defines teaching as the arranging of environments and the guiding of the learner's interaction with them to attain the goals of the curriculum.

The theory of administration and institution-community relations has been influenced by the work of Barnard, Follett, Argyris, Hershey and Blanchard, and Jordan and Streets. It places administrators in the role of "ministers," whose services include the management of the school's accumulated resources (as an expression of immanence) and leading the actualization of the potentiality of students, teachers, parents, and the school as a whole (as an expression of transcendence). Consultation is utilized as the principal decision-making process, which seeks to draw input from those persons with expertise in the topic at hand and from those persons who will be most affected by the decision. The theory also specifies the need for administrators to lead the process of working with parents to lessen the disparity between the student's experience at school and the home environment.

The theory of evaluation was developed from the work of Cronbach, Humbelton, and Swaminathan. The role of evaluation in relation to the curriculum and teaching is to relate the degree of goal achievement to particular interactions prescribed, encouraged, or permitted. The theory of evaluation emphasizes the importance of not only assessing the students' attainment of both the process and content goals of the curriculum but also the assessment of each component of WES, the related programs which support the components, and the system as a whole. (See figure 1.)

Conclusion

This chapter has briefly discussed the religious, philosophical, scientific, and theoretical foundations of the Wholistic Educational System and has emphasized the theories of development, learning, and curriculum and how they were generated. Unfortunately, due to limitations of scope, it was not possible to include a more detailed history of the development of the ANISA Model and WES, to present an example of a curricular unit based on this theory, nor to convey the sheer excitement of learners when such a system (even just a few components of it) are implemented.

Notes

1. By disregarding the components of WES which refer to religion and spirituality, users who are atheistic or who are working in a country which separates church and state, thereby making it difficult to incorporate the spiritual aspect of reality into educational practices, will still find that this is a very powerful and useful system.
2. WES has drawn upon all of the major religious traditions—the common heritage of the entire human race—such as Hinduism, Judaism, Taoism, Zoroastrianism, Native American religious traditions, Buddhism, Christianity, Islam, and the Bahá'í faith. WES views

the Great Revealed Religions as being hierarchically organized according to the chronological order of their appearance, each one embracing those which have come before while adding to their richness and complexity—like the cardinal nature of numbers in which each successive number contains the previous numbers while adding one to their value. Hence, the greatest source of inspiration for WES has been the Bahá'í faith—the most recent of the Great Revealed Religions.

The relevance of Bahá'í concepts for the post-modern age was attested to by Ervin Laszlo (1989), the foremost exponent of systems philosophy and member of the Club of Rome, who credited Bahá'u'lláh, the Prophet-Founder of the Bahá'í faith with having anticipated the current theory of non-linear evolutionary development in human history (122).

3. The interested reader is referred to the summary statement of the ANISA Model available via the ERIC system (Document Reproduction Service No. ED 110387).
4. Some of these principles are the same as those of the ANISA Model, some are extrapolations of ANISA principles and others are new (see note 3). It is beyond the purpose of this chapter to document and explain exactly where ANISA leaves off and the WES upgrade begins. However, this author wants to give due credit to the original work of the founders of the ANISA Model of Education.
5. The "environment" is one, single and seamless; that is, reality is one. However, for conceptual and practical purposes, its various aspects are differentiated (see figures 2 and 3). This aspect of WES then represents a fundamental ontological analysis of reality—the backbone of the System—from which all other major categories have been generated or organized.
6. Novelty can be physical, social, psychological, or spiritual in nature. For example, asking intriguing questions or using a familiar object in a new way can be considered as the introduction of novelty.
7. Robert White's concept of effectance motivation has been applied in WES to all categories of higher-order competence; the idea being that one of the strongest intrinsic motivators to be harnessed by educators is the learner's desire to achieve intended outcomes in his/her interactions with all aspects of the environment.
8. Abdu'l-Bahá was the eldest son of Bahá'u'lláh (see note 2) and is one of the three Central Figures of the Bahá'í faith.
9. WES seeks to strike a balance between self-chosen goals and society-chosen goals. It is assumed that the accumulated experience of a culture knows better than the child what knowledge and skills are needed for high-quality survival. Yet, within the broad expectations of society, there needs to be room for individuals to pursue their own interests which often reflect their latent talents and future area of contribution to society.
10. Every curriculum topic in any of the six strands (process, content, symbol systems, values/virtues, higher-order competencies, and the Self) will always contain a process and a content aspect. It is impossible to teach process without content, and even the dull-est content lesson contains some process, for even rote memorization and recall require certain cognitive processes (Ginsburg and Oppen 1988).
11. The higher-order symbol systems (Gardner 1983) are closely related to the content areas and are nearly impossible to separate from them. Their assimilation appears to require di-

rect teaching. That is, they do not develop naturally by themselves (given a normal environment minus a teacher). Hence, mathematical logic, which is possessed by people in cultures that have no math symbol system or who have not learned the system, must be differentiated from the mathematical symbol systems which have a written form. Also, speaking and understanding the spoken word (lower-order symbol systems), which develop in all cultures (some cultures' knowledge has been passed on exclusively by oral tradition), must be distinguished from reading and writing. (For example, the parents on the American frontier sent their children to school to be taught only how to read and write because this knowledge could not be transmitted under normal living conditions in the home). Natural musical creativity, too, must be differentiated from the ability to read and write music. The former can develop naturally but the latter requires a specially arranged learning environment. (In WES, development and learning are viewed as two, interactive aspects of a whole. Each can constrain and/or facilitate the other.)

References

- Abdu'l-Bahá (1922–25/1982). *Promulgation of universal peace*. 2nd edition. Compiled by Howard MacNutt. Wilmette, IL: Bahá'í Publishing Trust.
- Conow, B. (1990). *The Bahá'í teachings: A resurgent model of the universe*. Oxford: George Ronald.
- Doll, Jr., W. (1993). *A post-modern perspective on curriculum*. New York: Teachers College Press.
- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.
- (1993). *Multiple intelligences: The theory in practice*. New York, Basic Books.
- Ginsburg, H. P., and S. Oppen (1988). *Piaget's theory of intellectual development*. 3rd edition. Englewood Cliffs, NJ: Prentice Hall.
- Goleman, D. (1995). *Emotional intelligence*. New York: Bantam Books.
- Jordan, D. C., and M. F. Kalinowski (1973). Being and becoming: The ANISA theory of development. *World Order* 7 (4): 17–26.
- Jordan, D. C., and D. T. Streets (1973a). The ANISA model: A new basis for educational planning. *Young Children* 28 (5): 289–307.
- Jordan, D. C., and D. T. Streets (1973b). Guiding the process of becoming: The ANISA theories of curriculum and teaching. *World Order* 7 (4): 29–40.
- Laszlo, E. (1987). *Evolution: The grand synthesis*. Boston: New Science Library.
- (1989). *The inner limits of mankind*. London: Oneworld.
- Oliver, D., and K. Gershman (1989). *Education, modernity, and fractured meaning*. Albany, NY: SUNY Press.
- Piaget, J. (1972). *The principles of genetic epistemology*. London: Routledge.
- White, R. W. (1959). Motivation reconsidered: the concept of competence. *Psychological Review* 66 (5): 297–333.
- Whitehead, A. N. (1967a). *The aims of education*. New York: Free Press (original work published chapter 2, 1922; remainder, 1917).
- (1967b). *Science and the modern world*. New York: Free Press (original work published 1925).

- (1978). *Process and reality. An essay in cosmology* (Corrected edition). Edited by David R. Griffin and Donald W. Sherburne. New York: Free Press (original work published 1929).
- (1967). *Adventures of ideas*. New York: Macmillan (original work published 1933).
- (1966). *Modes of thought*. New York: Free Press (original work published 1938).

CHAPTER THREE

Technology Unmasked?

Kevan Brewer • Canada

Information pours in on us, instantaneously and continuously. As soon as information is acquired, it is very rapidly replaced by still newer information. Our electrically configured world has forced us to move from the habit of data classification to the mode of pattern recognition. We can no longer build serially, block-by-block, step-by-step, because instant communication insures that all factors of the environment and of experience co-exist in a state of active interplay. (McLuhan and Fiore 1967: 63)

I would like to open some questions regarding technology in education. In particular, I am interested in the ways in which computer-related technology masks its own essence—how it covers at the same time as it reveals—and the danger of this masking.

I run up the stairs two at a time, and weave my way through a maze of bodies until I reach my office. I practically leap into my seat at the computer terminal, and with a couple of clicks of the mouse, I finally fix the printer problem that has been plaguing me all morning. My head is buzzing with caffeine—I've had six cups of coffee so far—and it's only ten o'clock. I look up from the terminal as a student enters the room to tell me that her computer is not working. I follow her into the main computer lab and spend the next ten minutes or so trying to track down the reason that her computer won't log on to the local network. Unsuccessful and frustrated, I move on to help a student who has been waiting with an algebra problem.¹

This is part of my reality as a technology teacher. I spend more time in service to the machines than I do serving the needs of my students. My