Conclusion

Alfred North Whitehead said that those who fail to come to grips with the notion of quantity fail to come to grips with much of the fundamental reality of the universe. In other words, to fail to understand quantity is to be out of touch with reality to some degree. Traditionally taught math, which fails to address the issue of meaning, does not facilitate the understanding of reality in the child. Instead, it mitigates against it.

The relationship established by the following four operations are clear: addition refers to the combination of different and/or same quantities; subtraction refers to ascertaining the difference between two given quantities and represents an inverse relationship to addition; multiplication involves combining the same amounts; and division, the inverse of multiplication, involves the separation of one amount into smaller amounts which are equal.

Although the logical sequence and the order of complexity of the four basic mathematical operations have been reasonably well worked out, the psycho-motor, perceptual, and cognitive structures which collectively provide the individual with prerequisites for comprehending the quantitative relationships with respect to the four operations have yet to be clarified. This is one of the areas of research that the Anisa program proposes to undertake in the near future.

Teaching according to Anisa theory is defined as arranging environments and guiding the child's interactions with them to attain both the process and content goals of the curriclum. Because all environments are not equally rich (i.e., some environments have more objects and substances that can be seriated or classified, etc., than others), and not all interactions are equally powerful in drawing out those potentialities related to the fundamental processes underlying number relations (i.e., some interactions lead to differentiation, integration, and generalization more readily than others), it stands to reason that a carefully designed set of experiences characterized by rich interactions with carefully arranged environments (i.e., attribute blocks, golden beads, pink tower, cuisinaire rods, vessels of various shapes) would increase both the probability and the speed with which youngsters come to understand reality from a quantitative point of view. The development of the mathematics curriculum of the Anisa Model is based on this rationale.

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THE ROLE OF THE ARTS IN THE RELEASE OF HUMAN POTENTIAL: AN ANISA PERSPECTIVE

By DR. DANIEL C. JORDAN

The Anisa theories of development and curriculum recognize three basic symbol systems: mathematics, language, and the arts. A symbol, according to Charles Sanders Peirce, is something that can stand for something else in some way for someone. Man's capacity to symbolize—to make something stand for something else—makes him unique among living creatures; it is the foundation of consciousness and self-awareness. To be conscious requires one to compare what is going on in the immediate present with the past in anticipation of the future. There is no way to make such a comparison unless that past, which is obviously a time gone by, can have some kind of representation in the present. For this, symbols are needed. Without them, memory of things past could not be brought to a level of consciousness in the present and there would be no continuity of self-awareness over time. One function of symbol systems is to sustain consciousness.

Symbolization is an important factor in the attainment of learning competence because as the Model defines it, learning competence depends on the *conscious* ability to differentiate, integrate, and generalize experience. Thus, to the extent that consciousness depends on symbolic activity, so will the attainment of learning competence.

Another important and related function of symbols is mediating the structuring of potentialities as they are actualized. One of the most direct influences in the structuring of actualized potentialities (i.e., forming patterns in the use of energy) is the self-ideal. If the self-ideal could not in some way be symbolized, it could not be present in consciousness and therefore be compared to the actual self. The gap between the ideal-self and the actual self creates much of the pressure for growth; it is the "principle of unrest," as Alfred North Whitehead would say, that impels us forward. Even that gap, if it is to be dealt with consciously, must be capable of symbolic representation. Dealing with anything requires the utilization of energy. Symbols are means of binding energy and assigning purpose to its use at an appropriate time, either in the present or the future. To be able to "reserve" energy for future use is an important factor in taking charge of one's destiny. Symbols are thus indispensable to the formation of values (i.e., the patterned utilization of energy

available to the organism manifested in forms of acting, perceiving, thinking, feeling, and conation—or will).

One of the basic propositions in the theory of development is that the translation of potentiality into actuality is sustained by the organism's interaction with the environment. Based on Whitehead's statement of the various levels of being in creation, we have established three basic classes of environment: (1) the physical environment (which includes the mineral, botanical, and animal levels), (2) the human environment, and (3) the unknown/unknowable environment. Mathematics is seen primarily as the vehicle for guiding interaction with the physical environment and therefore helping to structure material values in the growing personality.

Language is primarily concerned with human interaction and the structuring of social values. The arts help man relate to unknowns and thus assist in the formation of religious and aesthetic values. Since the environments are heirarchically arranged (i.e., the lower levels are included in the upper levels), the functions of the arts, which are concerned with the highest ontological levels in creation, are also implicated in the structuring of material values, social values, as well as religious and aesthetic values.

In the broadest sense, the arts are the means by which man presents to himself visions of possibilities—intimations of what might be. Art may symbolize many things, but from the Anisa theoretical perspective, its chief function is to symbolize potentiality. To produce a work of art is to create. When a work of art is produced something that exists *in potentia* becomes actualized. The art product is the result of a creative process and is itself therefore a symbol of the fundamental creative process: self-actualization. According to the theory of development, the actualization of psychological potentialities depends on learning and learning is defined as the ability to differentiate, integrate, and generalize experience. We would therefore expect to find differentiation, integration, and generalization at the core of any creative process.

A philosophy of art, aesthetic theories, and art criticism all center around the idea of form as a concept basic to the understanding of art, beauty and aesthetics. Form does not refer simply to shape but to relationships among parts. Discussing parts and wholes is just another way of discussing differentiations and their integrations. Integrating or ordering the various parts creates the form. The form is therefore an embodiment of order. Whitehead says that order is the lure of beauty and that the "teleology of the Universe is directed to the production of Beauty."

Thus, the "visions of possibilities" which works of art present to us are intimations of new orderings or new integrations which represent what is to be striven after. These visions are lures which give order and direction to the striving. Order is the primary characteristic of any living organism; when order goes, life is snuffed out. Therefore, the creation of form as an expression of order is a symbolic affirmation of life and the prerequisites for survival.

Of course, any new ordering or new integration exists *in potentia* before it actually takes place. While it is *in potentia,* it is unknown. The production of works of art means to face unknowns in such a way that they become known. It is therefore one important means of rehearsing the self-actualization process—the process of facing what exists in oneself *in potentia* (which is aways unknown) and bringing it into actuality.

To approach an unknown requires faith. To work as an artist is to exercise faith in approaching the unknown, and if this can be done under benevolent circumstances where risk levels are tolerable and the resultant anxiety therefore manageable and even pleasant, so much the better.

When a child places before himself a blank sheet of paper in preparation for finger painting, he is confronting an unknown. To place a stroke on the paper is to introduce an element of differentiation or contrast onto the page. When a second stroke is placed, further differentiation occurs but now a relationship has to be considered between the two marks. As additional patches of color or lines are placed on the paper, form of some kind emerges. If the form is characterized by organic unity, if it is not monotonous or confused, but has variety that is coordinated or unified, we are apt to say that the painting or sketch is beautiful; it has order of a certain kind and that order has the power of a lure. It is attractive.

Thus, the awareness of unknowns and the inner urge to explore them is an expression of the internal principle of unrest which nudges us forward. Participation in art activities feeds this principle of unrest and keeps it alive. Whitehead says:

> Human nature loses its most precious quality when it is robbed of its sense of things beyond, unexplored and yet insistent.

Because the arts taken together (music, movement and dance, poetry, literature, the dramatic arts, the visual and plastic arts)

represent creative activities which draw out potentialities from all five categories—psycho-motor, perceptual, cognitive, affective, and volitional—they are necessarily at the heart of the Anisa curriculum. As Fred R. Schwart writes in *The Structure and Potential of Art Education:*

> The conception of the centrality of art in the curriculum is revolutionary. To accept it would mean the total reorientation of societies, values, goals, aspirations, beliefs, habits, prejudices, and ideas. One implication lies in the valuing of art products as important objects not only for aesthetic contemplation and study but also for seeking man's significance, his possibilities, and his status in the unexplained conglomeration of events and phenomena.

Charles E. Silberman made a salient point in *Crisis in the Classroom:*

> The scientist and the poet do not live at antipodes; on the contrary, the artificial separation of these aspects or modes of knowing—the false dichotomy between the cognitive and the affective domains—can only cripple the development of thought and feeling. If this be so, then poetry, music, painting, dance, and other arts are not frills to be indulged in if time is left over from the real business of education—they *are* the business of education.

It is one thing to have an intuition that art belongs at the heart of the curriculum. It is another to have an explicit philosophical base, and a coherent body of theory that not only says that art should be at the heart of the curriculum, but explains why. The Anisa Model is an expression of such a conviction and its justification.

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FIELDING THE ANISA MODEL

By NANCY MCCORMICK RAMBUSCH

I have engaged in the calculated diffusion of two educational ideologies in the past twenty years. In one attempt, from 1953 to 1963, I acted as a "circuit rider," moving an American formulation of the ideas of Maria Montessori across the United States. In another, in 1973-74, I helped "install" the Anisa model in a single public elementary school in Hampden, Maine. What I report here are some personal reflections on diffusion experience. I do not pretend to scientific, historical or even personal objectivity. Retrospective nostalgia and partisan perception are inevitable in any first-person account of events. The idiosyncratic nature of my information comes from the role I assumed in these enterprises. Judith Meyer has described this role in relationship to the American Montessori movement:

> Rambusch's role in the diffusion process can be described as a change agent role, the helper or person who is trying to affect change, i.e., adoption.

There were many theories of planned change but as yet no theory of "changing," or of how change actually occurs. Warren Bennis suggests that when change agents write of their work they do so as "theoretical orphans." This assessment seems accurate when one considers that the economy of "changing" is not identical to the economy of the idea which invokes the "changing."

In the 1973-74 academic year, the Anisa model went to the field in four different locations: Hampden, Maine; Suffield, Connecticut; Fall River, Massachusetts and Kansas City, Missouri. The diffusion model used by Anisa is characterized by Donald Schon as the center-periphery model.

The center-periphery model rests on three basic elements:

(1) The innovation to be diffused exists, fully realized in its essentials, prior to its diffusion.
(2) Diffusion is the movement of an innovation from a center out to its ultimate users.
(3) Directed diffusion is a centrally managed process of dissemination, training and provision of resources and incentives.

Schon argues that the effectiveness of a center-periphery system depends first upon the level of resources and energy at the center, then upon the number of points on the periphery, the length of radii of the spokes through which the diffusion occurs, and the energy required to facilitate adoption. I do not believe that the election of this diffusion model was conscious at the outset of the Anisa field experience, but that a description of it serves to "fit" the administrative