DOCUMENT RESUME

ED 334 677 EA 023 158

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TITLE Curriculum Integration: A Critical Analysis of Practical and Conceptual Issues.
PUB DATE Apr 91
NOTE 15p.; Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, April 3-7, 1991).
PUB TYPE Information Analyses (070) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Change Strategies; *Curriculum Design; *Curriculum Development; Educational Improvement; Educational Innovation; Educational Strategies; Elementary Secondary Education; Holistic Approach; Instructional Design; Instructional Development; Integrated Activities; *Integrated Curriculum; *Interdisciplinary Approach; *Relevance (Education); School Restructuring

ABSTRACT

Many educators suggest that deteriorating academic quality in schools can be addressed with the help of an approach to curriculum development called "curriculum integration," which presents a holistic view of knowledge to learners. One reason among many to move from subject-focused curriculum to curriculum integration is that the former fails to provide learners with the intellectual skills needed in a competitive society. Other arguments stem from the ability of curriculum integration to actively involve students in their own education. Traditionally, integrated approaches to curriculum design have been associated with "intermingling" of disciplines such as thinking, reasoning, and problem-solving capabilities. Operational schemes of curriculum integration specify the degree of integration and depend upon the content, processes, and skills involved in learning. Curriculum integration is not a random combination of disciplines and should be approached with a systematic, conscious effort that makes relationships among disciplines explicit. (31 references) (EJS)

Curriculum Integration: A Critical Analysis of Practical and Conceptual Issues

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Paper presented at the Annual Convention of the American Educational Research Association, Chicago, April, 1991

Acknowledgement

The authors would like to thank Nancy Engen-Wedin (Minnesota Center for the Arts) and Raymond Higgins (Minnesota State Department of Education) for providing valuable feedback on earlier drafts of this paper.

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In prevailing curriculum development practices, it is tacitly assumed that all learning must be compartmentalized into specialized macro units, or "disciplines", eg., music, drama, mathematics, art- resulting in what is referred to as a "subject-centered" curriculum. Such an approach was a natural outcome of the necessity for specialization that followed the advent of the industrial revolution (Haas, 1975). Although it has been highly successful in fomenting economic growth, materialistic wealth, scientific and military power- discontentment with such isolated forms of disseminating knowledge has begun to emerge. Thus, "the entire conventional structure of subjects and subdivisions of knowledge...have reflected a grossly outworn, atomistic model of both the universe and the man." (Brameld, 1970, p. 346).

Historically, public education has mirrored societal vicissitudes, which is evident in present times. Declining growth rates in the American economy coupled with a failure to compete internationally has resulted in several criticisms levelled against prevailing educational practices. To enumerate a few, schools are characterized by fragmented schedules and a lack of relevance to real-life issues. Students are patently unmotivated with academics, and have failed to embody a holistic view of the world. The deteriorating situation has led curriculum reformers to believe that problems prevalent in schools today are an outcome of unrealistic, outmoded curriculum structures which have failed to keep pace with rapid advances in society. Many educators suggest that deteriorating academic quality in schools today can be addressed with the help of a different, more relevant and realistic approach to curiculum development; an approach which presents a holistic view of knowledge to learners (Cummings, 1989; Gaff, 1989). This approach, known frequently as "curriculum integration" is the subject of the current paper. We intend to scrutinize the theoretical foundations of the concept of curriculum integration and its various interpretations, explore the models and schemes which operationalize it, and finally, present the reader with issues that are pertinent to the implementation of integrated curricula. The review and synthesis that follows examines the benefits as well as the constraints of a unified approach to curriculum development, with the hope that a clearer

picture of the concept and the issues surrounding it emerges.

Why Curriculum Integration?

In recent times, interest in and need for a unified approach to education has intensified- an outcome of public outcry against the failing educational system in general, and the dissatisfaction experienced by practitioners from the inadequacy of a discipline-based approach in providing solutions to dynamic problems posed in the society. From a historical perspective, it is not surprising that strictures about the inadequacies of a weakening social and economic system are directed at the existing curriculum ideology. Today, the subject-focused curriculum is a target of criticism, in failing to provide learners with desirable intellectual skills needed for a competitive society. It is believed that the world is increasingly acquiring a global, interdependent outlook; provincial, parochial attitudes stultify efforts towards economic and academic progress. (Cummings, 1989; Zverev, 1977). Further, society is experiencing change at a rate unprecedented in human history; there is need for curriculum to keep pace with these changes. A subject-centered curriculum is allegedly far from the realities of life, lacking in "relevance". In the late sixties, Foshay pointed out the inadequacy of a subject-centered curriculum in dealing directly with the relationship between education and life- thus one can be thorough in the study of physics, but be completely ignorant about the problem of racial injustice, poverty.

The evolving society has implications for the changing nature of knowledge. For example, Cohen (1988) proposes that with increasing information, new disciplines emerge due to the combination of old ones, eg., biophysics, biochemistry. She believes that students must know the process of this syntheses. A multitude of recent social and ecological disasters have exemplified that disciplinary boundaries are temporary and penetrable (Haas, 1975). In such instances, when entities or concepts are viewed from one perspective or discipline, grave repercussions are felt in other fields (for example, the use of DDT as a pesticide). Finally, the convenient but artificial compartmentalization of disciplines does not adequately represent the world, which is not made up of such artificial constructs (Cummings, 1989). Thus effort should be expended on fitting specialized viewpoints into the big picture.

Schools are constantly trying to accommodate an exponential growth of knowledge, resulting in a conflict in what should be taught, and what should be eliminated (Jacobs, 1989). Compounded with this is the assimilation of newer subjects, for example, AIDS (Acquired Immune Deficiency Syndrome) and drugs, and chemical education, adding new pressures and constraints on times allocated to subjects. Teachers and students are frustrated with fragmented schedules in schools today. Jacobs suggests that an unified approach would not only resolve these problems, but make curriculum more relevant and useful to the learner regardless of the content being taught. An integrated curriculum helps students understand a complex, interrelated world (Gaff, 1989). Tyler (1949) supports curriculum integration as a "must" to help students gain a unified view of their learning. Associated with this is the belief that problems in today's world can be solved only by whole men, not those who are anything more than a technologist, artist or pure scientist, which a "rational" study of disciplines seems to promote (Foshay, 1970).

An integrated approach is viable from a psychological perspective. Gestalt psychologists believe that entities are considered as wholes rather than individual parts- thus knowledge should be presented

as a whole for easy assimilation. Advocates of the schema theory believe in the activation of links and nodes in memory for effective encoding and retention (Anderson, 1980). From this viewpoint, the greater this spread of activation, the easier it is to anchor new concepts to those existing in memory. A curriculum that is more relevant to the learner will also permit deeper levels of processing.

Integrating higher order *skills* across the curriculum has been gaining popularity. Ackerman and Perkins (1989) state that with such integration, the acquisition of vital learning skills would be enhanced; and content will be more relevant to students, making them independent, proactive learners. Transfer of skills would be encouraged and process and content goals would be unified.

Other arguments for an integrated approach stem from its ability to actively involve students in their own education. Because of the process-oriented approach in many forms of curriculum integration, it is assumed that students are actively involved as decision-makers and problem-solvers. Cooperative learning is fostered and different ability and interest levels are easier to accomodate (North Carolina State Dept. of Public Instruction, 1986).

Thus, hypothetically, a unified approach to curriculum offers several advantages relevant to the needs of contemporary society. At this juncture, however, the concept of an "integrated curriculum" is yet unclear, and we explicate that in the next section.

Concepts and Levels of Integrated Curriculum

What is meant by curriculum integration? Is it the fusion of two or more subjects? Is it studying one content area from the viewpoint of another? Is it content-based at all? Published work on different forms and methods of integrating curricula reveals diverse interpretations of the term, and is characterized by an abundance of alternate terminology (eg., multidiscplinary studies, interdisciplinarity, fused curriculum, correlated curriculum, transdisciplinary studies, unified studies, etc.). The plethora of terms centered around a single concept indicates the significance of certain fundamental questions in aiding an understanding of the exact nature of benefits, conceptualization and implementation of an integrated program.

Traditionally, integrated approaches to curriculum design have been associated with some form of "intermingling" of disciplines which goes beyond the compartmentalized, specialized teaching of each discipline. This form of integration is referred to variously as "multidisciplinary", "interdisciplinary", and "transdisciplinary". The focus in these approaches is on different ways of combining disciplines, so that "integration" of a desirable form is achieved.

In recent times curriculum integration has assumed an inclusive interpretation, which extends beyond a combination of disciplines. Thus included in this interpretation are the integration of across-the-domain skills such as thinking, reasoning and problem-solving capabilities (for example, Bereiter, 1986; Ackerman & Perkins, 1989), the teaching of learning strategies, and the addition of topics and subjects in the curriculum, which have not been structurally recognized as unique disciplines, for example, AIDS, drug, nutrition, and career education (the "non-disciplinary fields"). Thus unplanned forms of integration, occurring most simply at the level of combining two disciplines, as well as fully integrated programs can be considered examples of "curriculum integration".

One of the more popular forms of integrating curricula are operationalized with the help of problem-oriented approaches, in which no conscious attempt is made to study specialized disciplines. Short and Jennings (1976) advocate a

"multidisciplinary" approach which is "holistic, and makes collective use of the disciplines". (p. 592). In a similar vein, Kersh, Nielson & Subotnik (1987) state that integrative curricula unify subject matter from a wide variety of disciplines around a series of generalizations. Cohen (1978) considers interdiscipilinarity as "an attitude as well as a set of methods for posing problems that transcend subject matter boundaries and in fact be created by them." (p. 125). Jacobs (1989) defines an "interdisciplinary" curriculum as a knowledge view and curriculum approach that consciously applies methodology and language from more than one theme to examine a central theme, issue, problem, topic, or experience. Thus the "multidisciplinary" approach transcends all boundaries of traditional disciplines and is highly interactive, actively combining social and intellectual domains. Jacobs (1989) refers to this as a "transdisciplinary" approach, which is beyond the scope of disciplines.

Other forms of curriculum integration can be seen as reflecting an establishment of ties among different disciplines. Thus Tyler (1949) considers integration as the horizontal relationship of curriculum experiences. Henchey (in Short & Jennings, 1976), looks upon the "multidisciplinary" approach as a process based upon the analysis of "relationships" and establishment of "ties". According to Jacobs (1989), a "multidisciplinary" approach is the juxtaposition of several disciplines focused on one problem, with no direct attempt to integrate. In this definition, linkages between subjects are stressed.

Integrated approaches may occur at relatively "shallow" levels. For example, "crossdisciplinary" approaches view one discipline from the perspective of another. A "pluridisciplinary" approach is the juxtaposition of disciplines assumed to be more or less related (Jacobs, 1989). Finally, integration takes place without conscious attempts at providing linkages. Thus lessons are sequenced to correspond to lessons in the same area in other disciplines, but no connections are made across fields, only sequencing is such that students will find necessary linkages.

From the above interpretations we can conclude that curriculum integration can be considered along a continuum, where different levels on the continuum specify the *degree* or *depth* of integration. It is also dependent on the content, processes and skills involved in learning. Although there is some overlap in these frameworks, differences in comprehensiveness and organization set them apart as individual approaches. For example, Jacobs' (1989) scheme recommends six types of integrative strategies, depending on the depth of integration. Kimpston (1989), examines strategies for an interdisciplinary approach to curriculum as lying on a continuum. One one extreme is the structuring of the plan around each separate discipline, which is not an integrated approach, but has well-known advantages. A second possibility is to focus two or more disciplines on a single area of content (the organizing center). This approach maintains the integrity of each discipline so that each provides a unique contribution and perspective to selected content. Third, it is possible to find common elements, concepts and processes in two or more disciplines (eg., related natural and social sciences), and teach only these to develop an understanding of the perspective common to all the disciplines which have been "fused". Here the unique perspective of each fused discipline is lost in the process, but the power of the broader perspective is gained. This is the "fused" approach. Finally, the fourth approach termed the "eclectic" strategy, does not respect the boundaries of specific disciplines, or restrict itself to knowledge drawn from established disciplines. This is similar to

the problem-oriented approach discussed earlier.

Another comprehensive scheme of curriculum integration is proposed by the North Carolina State Department of Public Instruction (1986). "Integrated learning" refers to the interrelatedness of the subject and skill areas within and across grades of a school program. Several qualitatively different integration strategies have been proposed. Thus integration can occur in the form of *content within a subject or skill area* (for instance, the integration of history and geography within social studies), as *skills within subjects* (for example, writing across the curriculum, thinking skills, communication skills, library/media and computer skills, guidance skills etc.), *subject with subject* (where two subjects are blended together and presented as a unique elective, eg., history and the arts, humanities, technology and history), *skills with skills* (for example, thinking skills and guidance skills). Finally, any combination of skills and subjects is integrated with other skills and subjects, which typically develops around a theme, problem, question or issue.

Included in the concept of curriculum integration are processes and skills, and those fields which do not currently possess the status of unique, recognized disciplines, for example, thinking and problem-solving skills, global, multicultural studies, the study of hunger, patterns in the world etc. This type of integration is characterized by issues pertaining to the structure of disciplines to some extent, and by others which are indigenous to the process, skill or field being integrated. The integration of thinking skills are used here to illustrate the point.

Ackerman & Perkins (1989), have presented a detailed plan for integrating thinking and learning skills across the curriculum. It consists of a "futuristic alternative concept", in which curriculum throughout the grades has two levels: the curriculum, and the metacurriculum. The curriculum consists of subtantive content and concepts, whereas the metacurriculum consists of learning skills and strategies which help students acquire content being taught in class, and develop the capacity to think and learn independently. It is integrated with the curriculum, so that skills of learning are scheduled and explicitly taught within the context of the content being taught. It is also integrated across subjects. According to these authors, thinking skills should be integrated across the curriculum on a day to day basis, and can be implicitly or explicitly taught, loosely or closely coupled with the content area, before and during the teaching of content areas. Skills and content can be doubly integrated: both within a subject and across the curriculum. As to what should be the focus of attention: skills or content, skills can be on one end of the continuum and content on the other, with numerous points between the spectrum. For example, in one arrangement, there is explicit content focus in content subjects, but skills focus in reading, remedial skills and study skills classes. Another approach is to view skills and content as objects of alternating instructional attention. Finally, skills may be completely integrated within content. Supportive of integrating skills across the curriculum, Bereiter (1984) recommends making thinking skills an already accepted instructional objective, or permeate the instructional program thoroughly with these activities.

The inclusive nature of "integration" from these schemes is easily discernible. Also apparent is the considerable overlap in the strategies of integration represented in the schemes. For a comprehensive understanding of the nature of integration, both aspects of integration, depth and quality must be accounted for. What are the implications of these interpretations of these schemes?

The following sections present a critique of the analysis presented so far, and in doing so, illuminate the considerations involved in transferring the theoretical faramework into applied environments.

Curriculum Integration: A Critique

It clear thus far that references to curriculum integration are made in general terms, without revealing precisely why and how such approaches should work. Since practically no long-term evaluations or studies systematically investigating the effects of any kind of integration exist, one is left to derive conclusions from the success stories recounted in isolated examples of spontaneous integration adopted by willing teachers. While such accounts amply demonstrate the enthusiasm generated among students, and are useful in indicating the feasibility of integrating different disciplines, missing from these accounts is an analysis of the underlying factors which caused a particular amalgamation of disciplines to succeed. It would be a worthwhile attempt to study this rich collection of anecdotal accounts to draw conclusions about the plausibility of fitting integrative practices in the overall scheme of curriculum design and implementation.

Thus, in spite of its speculated advantages, several basic questions about curriculum integration remain equivocal: Which factors are causal to the success of integration, and under which conditions? What is the role of the structure of disciplines in enhancing integration? Given the structure of disciplines, when is it feasible to integrate disciplines? Are some disciplines better than others for integration? To what depth must disciplines be integrated? What is the perspective one must impart to learners regarding the nature of integration? What are the benefits of planned integration versus spontaneous integrative practices followed informally by teachers? What are the effective means of implementing such an approach? Is adopting a problem-oriented approach which does not respect the boundaries of any discipline feasible and desirable?

The questions generated above have implications for conceptualizing the notion of integration and implementing some form of it in applied settings. However, given the intrinsically appealing arguments presented in favor of curriculum integration, it is easy to follow the bandwagon approach, which many practitioners are likely to do (Gibbons, 1979). We now examine integration from the perspective of the structure of disciplines and the constraints in adopting an integrated approach to curriculum. Finally, we offer suggestions on the process involved in implementing an integrated approach.

The structure of disciplines

When integrating disciplines, it is natural that several questions should arise about the integrity of disciplines: How sacrosanct are the boundaries of a discipline with respect to integration? How feasible is it to integrate separate structures, biases, conflicts and language of disciplines? Viewpoints on the subject are varied.

The sanctity of disciplines is valued by several writers. That individual disciplines have their own modes of inquiry, jargon, biases and language has been elegantly and extensively documented by Schwab (1964). According to Hughes (1978),".....the disciplines of knowledge, as we know them, are not arbitrary divisions. They are divisions which are permitted by the reality of the exixtential situation.....They have been tried and tested, and their value as vehicles for teaching cannot be ignored." (p. 166). Gozzer (1982) believes there can be no concept of the "international" without that of "national"; thus there can be no learning without a disciplinary framework. Heikkenin and Armstrong (1978) share

Gozzer's belief, stating that the process of interdisciplinary learning is an increasingly complex sequence of relationships, which consists of learning about individual disciplines, learning to coordinate one discipline with another, and superordinating disciplines by integration. These authors affirm that unless students have a foundation of individual concepts, it is impossible for them to see relationships, or use inquiry, analysis and synthesis to explore a particular perspective. In Foshay's words (1970), "We must recognize that the integrity of the fields of inquiry- the disciplines- must be preserved, if they are to be learned. But this immediately makes it impossible in theory to combine disciplines into multidisciplines for instruction. The subjects must be taught separately, each in its own way, according to its own logic". (p. 125).

Integration is also based on certain assumptions which may be questionable. For example, Kindler (1987) questions the inclusion of art into the general curriculum. Integration assumes that there is similarity across the arts. However, sometimes focusing on one kind of art without interference from others allows more profound involvement in that art form. Arts are expressive in nature, but the expression takes very different forms in each art area, eg., the concept of rhythm in music and visual arts is very different, the meaning is different in each art medium. Kindler feels that long term integration should present numerous problems- the focus may become narrow in one or both the media. Further, each discipline has its own logical sequence, thus coordination may be difficult in both. Kindler is also concerned with transfer of artistic skills- creativity in one medium does not guarantee it in another, there may not be any transfer.

Integration of knowledge is subject-specific, that is, it depends on the nature of disciplines being integrated (Gibbons 1979). Using an analytical approach to integrating physics and math, the author demonstrates that knowledge has coherence or synthesis within certain broad fields of experience. A different set of hypotheses is arrived at using integration of content from history and sociology, implying that one cannot make generalizations about integration, it is unique to all domains. According to Gibbons, integration of knowledge from different domains is not only possible but a normal feature of the pursuit of knowledge. However, teachers and students pursuing integrated studies must find out the nature of the domain of enquiry and the instrumental domain, as well as the nature of concepts and propositions in the two domains.

Ackerman (1989) looks at the question of integration from a more applied emphasis, enumerating the intellectual and practical criteria which should be considered in curriculum integration. Speaking for the integration of higher order thinking skills, the author believes that integration must actually enhance the learning of disciplines- students should grasp the subjects better than if they were taught separately; students must derive benefit beyond the disciplines; and finally, students may acquire flexible thinking processes in different situations, understand their limitations better, which will assist in the development personal attributes.

There are grounds for conflict in the two outcomes being considered: keeping the integrity, the indigenous logic and structure of a discipline, versus "integrating" disciplines so that the boundaries among subjects no longer exist. Brameld (1970) theorizes that the structure of the curriculum may be symbolized in the form of a moving "wheel", in which the rim is the unifying theme of mankind- its predicaments and aspirations, the hub is the central question of any given period of learning, and spokes

are the supporting areas of concentrated attention that bear most directly upon each respective question. In this framework, within a problem-oriented approach, individuals are allowed to develop their areas of interest and concentration. Presenting a similar viewpoint, Jacobs (1989) reiterates that one can accomplish both- teach via an interdisciplinary approach and retain the unique flavor of each discipline. However, such schemes are conjectures at this points, how effectively they can be accomplished can be ascertained only after systematic research and evaluation.

What conclusion then, is one left with regarding the structures of disciplines and their effects on integration? The answer lies in the nature of integration one is trying to accomplish. Some schemes or strategies of integration described earlier illuminate the issue. For example, Kimpston's strategies of integrating curricula considers different types of integration- those in which it is not necessary to lose the thread of inquiry found in each discipline, as well as a problem-oriented approach, in which no reference is made to the disciplines. An insightful approach for the practitioner of integration would be to study these schemes, analyze the structure of the disciplines being pooled, and select a strategy which would best enhance what is being synthesized. Failure to do so can result in what Jacobs terms the "potpourri problem", which leads to a lack of "staying power" of interdisciplinary approaches in schools; such units posses no general structure, resulting in a sampling of each of the subjects which are combined.

Curriculum Integration: Some practical considerations

In making decisions about integrating curricula, the practical criteria must not be underestimated. Of utmost importance are the attitudes and academic preparation of teachers, reactions of students, parents and community, equipment needs and new expertise (eg., Salt, 1969).

Perhaps the most important among these is the academic and psychological preparation of teachers: Are teachers equipped to implement integrated approaches? In elementary grades, teachers often practice integration spontaneously. However, beyond elementary grades, as teachers' knowledge about disciplines becomes more specialized, instruction increasingly acquires a more subject-centered approach. It is not clear how well teachers who have been a part of subject-centered education, and have never experimented with unified approaches would react to integrated courses. As Cadenhead (1970) states, connections between disciplines can be made at several educational levels, however, the degree to which it is applied will be determined by the teacher's knowledge, attitude and expertise in various subjects and the application of the principle. Using transdisciplinary approaches requires a major shift in teaching strategies. For example, Romey (1975) acknowledges that, "A basic change in level of consciousness is required to accomplish [transdisciplinary studies]. My role as a facilitator of learning changes dramatically when I, too, enter the area of the unknown, the new problem, rather than resting comfortably back in the zone of familiar methods and concepts." (p. 33). Heikkenin and Armstrong (1976) present evidence that only teachers functioning at a highly developed conceptual understanding of science can deal adequately with the idea of a unified approach to science.

Bollen (1977) argues that teachers are specialists, and may be enthusiastic for their own subjects, not others'. Second, teaching certain subjects, eg., sciences requires a number of equipment and safety considerations, thus it would need considerable inservice training to

make teachers experts in fulfilling the safety requirements. The importance of teachers in the learning process is stressed by Hughes (1978), who believes that it is the quality of teachers which makes a difference in learning, not the curriculum per se.

Second, curriculum integration, like any aspect of curriculum, is a social process, involving parents, students, teachers, the community and administrators. The success of integrated programs would depend on the participation, consensus and understanding by all of what is to be accomplished. The decision to adopt an integrated approach would result in a different set of physical and intellectual needs, and require a restructuring of personnel; all such changes must be accounted for before launching an integrated program.

Conclusion

Curriculum integration must not be considered as a random combination of disciplines, as the term may imply. Nor should it be practiced without a systematic, methodical analysis of goals, the underlying philosophy, the structure of disciplines being considered for integration, practical constraints and schemes of implementation. In this paper, we have attempted to highlight those issues involved in curriculum integration which are often overlooked in the design of such curricula. Examples can be seen in how hastily subjects pertaining to contemporary social issues are "integrated" into school curricula, without adequate foresight into their effects on already overburdened teachers, and their overall impact on students intellectually and socially. As Haas (1975) states, "In this century American education has had numerous flirtations with schemes of integrating knowledge- core curriculum, fusion, broad fields..Due primarily to the power of tradition, weak formulations of rationales, and little concern for a philosophy of knowledge, these schemes have led struggling and short existences." (p. 9).

We advocate a systematic, *conscious* effort towards integration, which is not only practiced by individual teachers themselves, but is supported by the school and district administration, as well as students and parents. We believe that in the existing curriculum development practices, acceptance for integrated dissemination of knowledge must penetrate more than one level of administration to have an impact- in making a difference in the learners' holistic conception of knowledge. In this less radical approach towards curriculum reform, we believe that a subject-based curriculum ought not to be eliminated altogether, however, relationships among disciplines must be made explicit. Disciplines which share unifying structures, eg., sciences, should be disseminated with an integrated emphasis (Adenyi, 1987; Chapman, 1976; Showalter, 1975).

Models of integrated curricula delineated recently by Jacobs, and Ackerman and Perkins (1989) indicate a trend in which ambiguity about the nature of integration is beginning to lessen- these models outline clear conceptions and designs for curriculum integration. In spite of existing models, discretion is required before decisions regarding integration are made. Of ultimate importance are the clarity of goals for implementation- what will be accomplished through a certain type of integration? Unlesss there is consensus by all who will be affected by the project, at some level the attempt at integration may lose momentum and focus.

A more radical approach would be to adopt an entirely holistic approach to learning, in which students feel free to study unifying themes, problems and concepts, without being confined to any discipline. Such a philosopy, which is

advocated by many theorists, would require a major restructuring of the school system at all levels. A major concern here is related to expectations of teachers- subconsciously, it would be natural to expect teachers to be subject specialists as well as effective facilitators of integrated learning. This ought to be avoided, with clear expectations delineated for teachers (Hamilton, 1973). Consensus among everyone involved in the restructuring at a philosophical and psychological level would be a major issue.

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