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The role of the interdisciplinary approach in improving middle school curriculum

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The role of the interdisciplinary approach in improving middle school curriculum

Abstract

In order to survive successfully in our world, children need to be made aware of interrelatedness within their lives and taught strategies to adapt to that interdependence. Benjamin Troutman (1976) asserted, "It is...the hypothesis of many different perspectives which, in its own analytical form, illuminates aspects of man" (p.49).

**The Role of the
Interdisciplinary Approach
in Improving Middle
School Curriculum**

**A Graduate Project
Submitted to the**

**Department of Curriculum and Instruction
in Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Education**

UNIVERSITY OF NORTHERN IOWA

by

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The Role of the Interdisciplinary Approach in Improving Middle School Curriculum

In order to survive successfully in our world, children need to be made aware of interrelatedness within their lives and taught strategies to adapt to that interdependence. Benjamin Troutman (1976) asserted, "It is ... the hypothesis of many different perspectives which, in its own analytical form, illuminates aspects of man" (p.49).

Why, then, do many secondary educators consistently present their particular curriculum in isolation? There are many possibilities, among them: the training of teachers to be subject matter specialists; a lack of awareness of the philosophy of interdisciplinary principles; or educators that choose not to take the time to explore and adapt the enrichment curricula available in other academic areas.

What can be done to improve curriculum so it meets the developmental needs of children while providing an intellectually stimulating environment and high academic standards? One answer may be the implementation of an interdisciplinary curriculum.

This paper explores the role of the interdisciplinary approach and how that approach can be used to improve curricula at the middle school

level. A growing interest in whole language, cooperative learning, and writing-across-the-curriculum shows that educators are searching for better ways of helping children learn. Educators are questioning classroom teaching strategies and are beginning to revise current curriculum. Before considering revisions, it is important to review first how children develop concepts.

Concept Development

To learn is not just to receive information but also to interpret it and relate it to other knowledge. Recent research has provided new insights on how children learn to think and develop concepts (Perkins & Salomon, 1988).

The human mind seeks to make meaning out of what it encounters, and learning must be meaningful to be assimilated and useful (Schwebel & Raph, 1973). Therefore, the more meaningful material is when it is encountered, the more likely it will be comprehended and retained (Mouley, 1968). Children are continually making meaning out of their experiences with their environment (Schiro, 1980; Schwebel & Raph, 1973). True learning is not memorizing or absorbing meaning, it is an internal process created by the child (Schiro, 1980). Children's innate characteristics of wanting to learn and explore stimulate

intellectual growth. This motivates new learning and allows children to create their own meanings of the world around them (Schiro, 1980; Barth, 1972). This approach makes learning meaningful and useful to children.

Intellectual growth takes place within the growth and development of the total child (Hein, 1975). Since children do not categorize information into subject areas like adults, they should be encouraged and given the freedom to integrate and internalize learnings in their own personal ways (Barth, 1972; Schiro, 1980). Isolating disciplines and fragmenting knowledge into bits of information does not allow for integration or sequencing of learning experiences. The isolation of disciplines in education, therefore, may contribute to some children's failure to grasp learning as a whole (Bloom, 1981; Kernigh, 1988; Harter & Gehrke, 1989).

Theory and research from cognitive psychology suggest that knowledge is stored in the learner's head as a network of concepts or constructs; the mind of the learner is like a construction of tinker toys (Peterson, Fennema, & Carpenter 1988). This illustrates the interconnectedness of ideas and concepts. Teaching disciplines in isolation and as fragmented bits of knowledge does not promote transfer

to this interconnected network. Since many discipline boundaries are at best quite fuzzy with much natural overlap, an interdisciplinary curriculum can provide students the opportunity to practice transfer of knowledge and skills from one discipline to another. Common elements and overlap of many disciplines can be easily integrated into a curriculum which better stimulates the learning of transferable skills, and also provides more meaningful educational experiences that deepen knowledge, skill, and understanding. This type of integrated curriculum capitalizes on the interconnectedness of disciplines, allowing students the opportunity to learn meaningful material, which is more easily assimilated and retained than that of a fragmented disciplinary approach. Perhaps most importantly, young adolescents continue to face an array of puzzling issues and problems that are best addressed in a focused, highly structured, and interdisciplinary fashion (Wruga, 1992). It is necessary to take a look at current curricular practices to better understand the need for change.

Current Curricular Practices

It is common practice today to isolate disciplines when developing curriculum (Jacobs, 1989). Many commonly used curricula isolate

knowledge into subject areas and fragment learning into bits and pieces of unrelated information (Harter & Gehrke, 1989). This fragmentation of information tends to impede rather than enhance learning because the fragments lack meaning and are therefore, quickly forgotten (Mouley, 1968). Conventional subject boundaries inhibit the use of transfer and complex thinking skills (Perkins & Salomon, 1988). This undesirable trend does nothing to help the student integrate and interrelate with the real world. Student thinking does not occur in neat, easily identifiable categories (Marzano, Pickering, & Brandt 1990). It stands to reason that the disciplines should not be presented in this manner either.

An overview of the NAEP results, published in 1989 by the Educational Testing Service, describe one aspect of the problem of curriculum integration as the "layer cake" phenomenon. In many cases the report states:

The curriculum is treated as a collection of discrete content areas in which teachers move from one topic to another in lockstep fashion. As a result, lessons are often developed in isolation from one another and fail to help students relate their new

learnings to what they already know.

(Applebee, Langer, & Mullis, p. 33)

Use of Time

Another component of the isolated subject curriculum to consider is the issue of time constraints. In many traditional schools the day is broken into numerous segments for each discipline area. This practice is to help maintain accountability, and to meet state requirements (Jacobs, 1989). When the bell rings, especially in middle and secondary schools, students stop math and move on to science with a different teacher, in a different room, with a different set of students, books, and expectations. When students go from math to science they close their books and minds to mathematics and expect to change gears. This fragmented pattern continues throughout the school day. Each time students change classes so does their thinking. Children's intellectual development does not follow the arbitrary timetables established for the convenience of adults (Barth, 1972; Bredekamp, 1988). Dividing their day into various time slots does not promote the integration of ideas, materials, and information. Time allocations must be driven by students' needs, not Carnegie units or the school curriculum (Kelly, 1991). An interdisciplinary curriculum uses time in an integrated way, therefore

establishing very few fixed time periods throughout the school day (Walberg & Thomas, 1971). This flexibility allows students to keep their minds open and see how disciplines interrelate rather than forcing students to close their minds between each subject simply because a bell rings. The teacher is able to determine when transitions are needed, not the clock.

Historical Perspective

Organizing the curriculum in an interdisciplinary way is not a new idea. While the interdisciplinary educational philosophy in its unpolished early stages is probably older, the first practical application of an interdisciplinary CORE program began in laboratory schools in the 1930s. Interdisciplinary education was expanded, implemented, and refined throughout the 1940s and 1950s; lost steam in the 1960s; and regained momentum in the 1970s. Clark, Klein, and Burks (1972), in their book American Secondary School Curriculum, report that in the late 1960's and early 1970's, the emphasis turned toward humanizing the curriculum and making it relevant to the lives of the pupils and the problems of society" (p. 19). Also, they state that trends could be seen in the development of broad interdisciplinary courses - especially courses concerning the real problems of youth and society. These data support

the implementation of interdisciplinary curricula.

John Goodlad (1986-87) defined the core curriculum, mentioned above, as "modes of learning that involve students as participants rather than mere observers, and gives equal access to the whole for all students" (p.11). While the core program is no longer widely used, perhaps because of logistic difficulties such as time, space, scheduling, and dedicated staff, the interdisciplinary philosophy itself continues to be embraced by many educators.

Evidence of the continued support of interdisciplinary philosophy is apparent from the popularity of the writing-across-the-curriculum movement of recent years which has stimulated interest in an integrated curriculum (White, 1986). White states that indirect learning, the non-linear curriculum, teaching for process, and cooperative learning have also led the way by implementing a variety of integrative approaches to education. Educators are joining the movement to develop curricula which help students make meaningful connections between personal experiences and the academic disciplines (White, 1986). Harter and Gehrke (1989) also state that humans seek integration and an understanding of things on higher and higher levels of interrelationship. Interdisciplinary curriculum can help provide this connectedness.

Support for Interdisciplinary Philosophy

The difference between the philosophies of interdisciplinary and disciplinary approaches to educating students are fairly well defined. Mary Futrell described the typical disciplinary secondary curriculum as being packed with separate and unrelated classes, each one about fifty minutes long, and each one separated from the next by a bell, subject matter never overlapping (Futrell 1985). Professor Allen Ornstein of Loyola University viewed it as an arrangement wherein each subject is a specialized and largely autonomous body of verified knowledge (Ornstein 1982). O.W. Markley, director of Studies of the Future at the University of Houston, asserts that this approach leads to processes of "reductionism" in which students are encouraged to specialize, to learn more and more about less and less (Markley 1983). While this may be desirable at the college level, it does students a disservice at the elementary and secondary levels. He further maintains that a primary objective of education is to prepare students to meet the future, and the interdisciplinary approach is essential to that task (Markley 1983).

Others support this point of view of the interdisciplinary approach.

Benjamin Troutman (1976) wrote:

One way to prepare for the future is to

educate, to develop the capacity to think, and search for "new knowledge." What becomes important is the development of "process," not "product". (p.50)

The more powerful and insightful picture of man evolves from the mixture of collective insights and understandings of disciplines, and not merely from the knowledge of isolated social studies and English programs. It is through the synthesis of many different perspectives that man is illuminated. (p. 49)

Arthur Greenberg (1976) wrote: "experiencing the interrelationships of the disciplines is not without its values to students as we attempt to aid them in their process of becoming whole adults"(p. 60). Information provided in a particular course may not be of benefit to the student several years down the line, but fitting new experiences into his/her daily life using the processes learned and practiced for gathering data, analyzing it, and applying it to new situations, will always be valuable.

On the whole, educators appear to agree that because we live in an interdependent world and the future is always an unknown, students need to be taught within a framework that encourages them to cross subject field boundaries. They need experiences which bring several subject parts together to develop an integrated conceptual framework.

The current trend of memorization of isolated subject matter has long been questioned. Jean Piaget and his followers have argued for over 50 years that knowledge acquired by memorizing is not real knowledge that can be used (Piaget 1948/1974). Piaget gave us a picture of the "natural" child as a scientist trying to make sense of the world, and of true learning as constructing ideas, not memorizing information in the forms given by teachers or texts. A similar critique was offered by the Gestalt psychologist Max Wertheimer. Wertheimer (1945/1959) reported that practiced performance in school often masked the failure of students to understand why procedures worked. This was reflected in an inability of students to adapt to modifications in problems which were presented differently.

Project 2061 of the American Association for the Advancement of Science (AAAS) emphasizes connections across the sciences. It also stresses ideas and thinking over the rote learning of a specialized

vocabulary and the memorization of isolated facts (Lewis, 1990).

Language and thinking are developed through the content of the curriculum in a "whole" experience, not one broken into parts and taught separately. Items of language taught in isolation become unrelated and abstract to the learner (Johnson, 1990). Real, usable knowledge cannot be constructed from brief exposures to information (Resnick & Klopfer, 1989).

Educators assert that the tools of inquiry by which one discovers and validates knowledge are the transferable results of schooling. Consequently, emphasis should be given to developing these skills, using disciplinary and cultural knowledge as a means, not an end, for educating a literate citizenry (Resnick & Klopfer, 1989). Brandt (1988) offers a quote shared by Lauren Resnick: "Just as knowledge is not a collection of separate facts, so learning competence is not a collection of separate skills" (Brandt 1988, p. 14). These educators and their information strongly support the implementation of interdisciplinary curricula in our schools as a desirable trend which considers the students' need to receive and process material in whole interrelated conceptual frameworks rather than in isolated disciplinary fragments.

Advantages

Interdisciplinary units provide several advantages over the traditional disciplinary approach to education. They allow unparalleled opportunities to involve students directly in the learning process (Vars, 1987). Interdisciplinary instruction creates opportunities to demonstrate the importance of skills that students too often view as meaningless. The functional application of all kinds of skills is a major value of the interdisciplinary approach (Vars, 1987). Interdisciplinary units stress thinking and interpersonal skills that are too often overlooked in conventional instruction (Vars, 1987). Since life itself is "interdisciplinary," at least some portion of the school curriculum should also be interdisciplinary if it is to help young people relate to life.

Interdisciplinary teaching is no easy task, but its rewards for both students and teachers are impressive. These rewards may take the form of flexibility, interesting topics of study, and increased responsibility for learning. It also creates connections among subject areas and thus brings a degree of unity to learning experiences (Beane, 1992). Middle level students need ample opportunities to experience the connectedness of things through the study of well-planned and executed interdisciplinary units (Vars, 1987).

It is the primary task of educators to prepare our youth for the future. It would seem, therefore, inappropriate to teach them self-contained segments of life, when life itself does not operate that way. Futrell (1985), a former NEA president, asserted:

To succeed--to thrive--in this world,
our students need to be able to think
across traditional academic boundaries.

They need holistic vision. They need,
very simply, to be able to integrate
knowledge. (p. 2)

Middle School Level

No single educational idea has come to characterize the middle school concept as much as has the interdisciplinary approach. An understanding of, and a commitment to interdisciplinary curriculum, must be established. Then decisions need to be made regarding what type of design should be used, the extent of integration, and scheduling for implementation. William T. Brown (1981) stated: "middle schools should provide a gradual transition from the self-contained classrooms of the elementary school to the departmentalized programs of the high school" (p.19). He also suggested that instructional leaders and

administrators in middle schools allow team planning for the teachers.

Educator Walter Bibb (1976) looked at the practical side of

interdisciplinary instruction. He concluded that

language arts, science, social studies, reading, and math form the major focus of the middle school curriculum. Along with these basic academic subjects, there is also great emphasis placed on the teaching of art, music, health, and physical education. If each of the above areas is to be dealt with as an isolated entity, the actual time allotment for the subject would be competitive at best. Feeling the importance of each of these areas and the need for the children to be actively involved in the curriculum, many educators are implementing an interdisciplinary approach. This approach allows for more time in the various subject areas and for children to interrelate and understand the connections between reading,

social studies, art and music. (p. 30)

Teaching early adolescents is much more than merely instructing. It is presiding over human growth and development. The interdisciplinary team structure is effective in creating an environment which is conducive to students and staff working together at the middle school level (Walsh & Shay, 1993). Teachers often find themselves and their students in highly motivational units in one subject area. It is appropriate to capitalize on this student interest by dealing with the same material in a different subject area. Interdisciplinary units allow this flexibility. Interdisciplinary units bring out the usefulness of subject areas to each other and to the students' outside world.

Accountability

In these days of strict accountability it is reassuring to know that forty years of research and more than 80 studies reveal that students in interdisciplinary programs do as well, and often better, on standardized tests when compared with those in the usual separate-subjects programs (Vars, 1984).

Accountability in the state of Iowa is undergoing many changes at this time. In a recent conversation with S. Donielson (personal communication, March 16, 1993) many aspects of the state's plan for

outcomes based education were explained. A committee was formed to develop a rough draft of exit outcomes. This draft was field tested in November and December, 1992. At present state officials are redefining the outcomes. They would like to see a move from an old factory model of schooling to models directed to school transformation. The local and state role is one of trying to provide a framework from which school districts can work. At this time outcome based education is not mandatory. One of the goals is that educators in each school district will determine their own outcomes and assessment, and will then report annually to the state. Donielson also mentioned that it is important to use a wide variety of testing materials. Districts in Iowa have the flexibility to structure curriculum to meet exit outcomes. Interdisciplinary teaching could play an important role in this restructuring since the state outcomes are broad and span all aspects of learning. Donielson stated that since no state has a true interdisciplinary school system the cornerstone would be in teacher planning and training. The federal and state perspective is a process movement to a results-driven school system. Schools meet the needs of children better when they integrate the knowledge of the many disciplines within the curriculum rather than present them separately (Schiro, 1980).

Recommendations and Conclusions

Summary

This review of the related literature and opinions of respected authorities in the field of education confirms this writer's judgment that an interdisciplinary approach to teaching best suits the needs of students. These needs as described by Benjamin Troutman (1976), include a person's understanding him/herself and his/her relationship to the environment and to society. "The search is for personal wholeness, unity, and self-actualization"(p. 200). John Lounsbury (cited in Vars, 1987) editor of National Middle School Association Publications states, "The ultimate success of the middle school movement is heavily dependent on the implementation of interdisciplinary teaching." It would seem then that the education process should also be treated as a whole, rather than as fragmented bits of learning.

Recommendations

As a result of this study, the writer has developed several recommendations concerning education at the middle school level.

They are as follows:

1. Current literature regarding interdisciplinary education should be made readily available to staff in the faculty lounge, staff library, or

through handouts in school mailboxes.

2. Inservice sessions in interdisciplinary techniques should be offered to staff.

3. Middle school administrators and school boards need to be made aware of, or reminded of, the benefits of an interdisciplinary approach to education.

4. Teachers should increase communication across the disciplines.

5. Periodic planning time should be set aside for grade-level staff to meet together to discuss mutual curriculum needs and plans.

6. Teachers should evaluate their existing curriculum for interdisciplinary possibilities.

Conclusions

At the secondary level, where students travel from room to room, subject to subject, the separate disciplines tend to be largely autonomous. It, therefore, becomes more important for these teachers to work at emphasizing the interrelatedness of the disciplines, and the relationship of the curriculum to life in general. This can be facilitated by the team process; teachers of different disciplines talking to each other, formally or informally, exchanging ideas and information. In many instances the curricula overlap easily. This is the way life operates in

reality and, consequently, by experiencing an integrated curriculum, students are better prepared to meet the world beyond the classroom.

Educational philosophy is in a constant state of flux. There are both positive and negative aspects involved. One of the negatives is that some excellent basic philosophies, such as the interdisciplinary philosophy, get temporarily set aside. However, as Futrell (1985) reminded us, students need to be able to think across academic boundaries in order to survive. "They need wholistic vision. They need, very simply, to be able to integrate knowledge" (p. 2). In his book Schools of the Future, Martin Cetron (1985) agreed:

Although the information provided by many courses may be irrelevant to many students' lives five years later, they will retain the abilities learned in these courses to gather facts, analyze them, and apply them to problems. For this reason our traditional secondary school courses should become interdisciplinary. (p. 135)

The concept of interdisciplinary education is not new. However, it has occasionally become misplaced. An educational philosophy with this much merit, springing from common sense, having a sound research base, and a logical and insightful view of students' needs, should be consistently renewed.

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