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Interdisciplinary teaching at the middle level

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Interdisciplinary teaching at the middle level

Abstract

When the junior high school movement began in the United States around 1910, the junior high school was intended to be a junior version of high school. The junior high school was proposed as a means to offer accelerated programs for the college bound student and vocational courses to better prepare those who dropped out after 8th grade for the world of work. The curriculum was often an adapted version of a high school curriculum (Beane, 1991). When the middle school movement began in the 1960's, the subject-centered curriculum of the junior high continued to dominate. Since the 1960's, educators at the middle level have, however, made efforts to reform schools, making curriculum more relevant to the needs of early adolescents.

Interdisciplinary Teaching at the
Middle Level

A Graduate Project
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by

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Interdisciplinary Teaching at the Middle Level

Introduction

When the junior high school movement began in the United States around 1910, the junior high school was intended to be a junior version of high school. The junior high school was proposed as a means to offer accelerated programs for the college bound student and vocational courses to better prepare those who dropped out after 8th grade for the world of work. The curriculum was often an adapted version of a high school curriculum (Beane, 1991). When the middle school movement began in the 1960's, the subject-centered curriculum of the junior high continued to dominate. Since the 1960's, educators at the middle level have, however, made efforts to reform schools, making curriculum more relevant to the needs of early adolescents.

Success at learning the old curriculum is no longer a guarantee of achievement in the adult world (Capelluti and Brazee, 1992). According to Capelluti and Brazee, the curriculum of most middle schools prepares students for life 40 years ago, not today (Capelluti and Brazee, 1992). The content of the school curriculum only rarely coincides with issues that concern young adolescents (Lounsbury, 1991). Life at school and life outside of school are simply too far apart.

In real life, adolescents encounter problems and situations, gather information from many areas, and look for solutions. The fragmented school day does not reflect the real world (Jacobs, 1989). When confronted with a problem in real life, one doesn't think which part is mathematics, which part is science, and which part is social studies. Yet in our school day, we are asking adolescents to do just that (Beane, 1991). Middle schools need to create learning experiences that demonstrate relationships between the disciplines and make them more relevant to the needs of adolescents. In recent years there

has been a renewed trend toward interdisciplinary teaching as a means of helping students relate what they study in school to their larger world (Jacobs, 1989).

Description of the Study

Is interdisciplinary teaching an appropriate means of organizing instruction for early adolescents? This study will explore what is involved in interdisciplinary teaching. It will identify important organizational strategies involved in interdisciplinary teaching and will explain stages that evolve when teachers are grouped into interdisciplinary teams. It will describe how to plan an interdisciplinary unit. It will identify academic and social benefits for students derived from interdisciplinary teaching and also how interdisciplinary teaching benefits teachers. It will also explore new assessment techniques required to evaluate the progress of students in an interdisciplinary curriculum.

Not all educators agree about the importance of interdisciplinary teaching; nor do they agree about the organizational methods of setting up a unit or team. Some may agree but are hesitant to change, or do not know how to go about making the change. This study will help to guide those who are contemplating a change to interdisciplinary teaching.

Review of Literature

Current Middle School Curriculum

James Beane described the middle school curriculum as a jigsaw puzzle we are asked to put together without seeing the picture the pieces will make. It is the picture which gives meaning to the puzzle and assures us that all the pieces fit together (1991). The typical middle school curriculum with its subject-centered organization appears like the picture-less jigsaw puzzle to the students. There appears to be an endless array of facts and skills that are unconnected and fragmented without the benefit of the whole picture (Beane,

1991). Toepfer notes that many middle school students fail to see how the curriculum helps them deal with the real needs and interest in their lives (1992).

Departmentalization or discipline-based subjects were created for the specialization needed in universities and then this model was extended down to the junior high schools. The subject area approach is only one way of organizing curriculum; and it tends to reflect the interests and needs of scholars and academic specialists, not early adolescents. Beane has determined that "specialization is neither timely nor appropriate for early adolescents" (1990, p. 2).

Except for exploratory programs, current middle school curriculum does not differ significantly from high school curriculum. Toepfer observes that as elementary and high school curricula differ from each other, middle level curricula should differ from that of both elementary and high school (1992). That difference should be more than the degree of difficulty and level of study. With the emergence of middle schools it was realized that there is a developmental level between the childhood years in elementary school and the adolescent years of high school. The effectiveness of middle level education depends on the degree to which curricula and programs respond to the needs and characteristics of early adolescents (Toepfer, 1992).

Traditionally educators have tried to meet the needs of students by adding special programs. They have cluttered the school day with pull-out programs for the talented and gifted, special classes for problem solving, Chapter 1 requirements, or advisory periods (Lounsbury, 1991). Each of these programs have added to the fragmentation of the school day. Lounsbury feels that "we need a common curriculum for our common clients in our common schools" (1991, p. 2). It should be resource-based, not text-book based and should

integrate exploratory approaches and affective concerns into all academic and related activities (Lounsbury, 1991).

Integrated Curriculum

Beane (1990) believed that if a middle school is to be based upon the characteristics of early adolescents, then the curriculum ought to be redesigned along developmentally appropriate lines, not just a simplified version of traditional high school curriculum. He proposes that the middle school curriculum should have as its primary purpose education that is concerned with the common needs and interests of young people. Toepfer also states that "young adolescents learn best when they can see the importance of facts, skills, and information from classroom lessons in their young lives" (1992, p.6). Middle school students need to use academic skills, thinking skills, social and ethical skills, and problem solving skills in real life situations, not in isolated subjects (Beane, 1990). Otherwise they fail to see the need for overlapping and connecting these skills, making them relevant to their lives. Skills taught in the isolation of separate programs appear to be ends in themselves, not problem-solving techniques. Furthermore, skills taught in real situations are more likely to be learned and applied.

Toepfer believes that middle level schools should be arranged into teams of teachers who develop programs based on interdisciplinary learning arrangements. The interdisciplinary teams need to include teachers of academic areas as well as the so-called exploratory areas of art, music, health, physical education, and industrial arts (1992). Designation of some subjects as academic and others as exploratory places unnecessary importance on the "academic" subjects and demotes the others to "frills". Beane states that in too many schools, "these subjects may reasonably be described as the place the kids go while the real teachers plan" (1992, p. 35). A student may learn basic

information in an academic class but may not understand that information until it is used in an experiential activity in a non-academic class, such as home economics or industrial arts. Toepfer (1991), Beane (1992), and McDonough (1991) believe that courses should not be designated as exploratory but that exploration should be a part of all experiences at the middle level.

The curriculum must be presented in a manner geared to the students' levels of understanding. Arnold has found that "most young adolescents are in transition from concrete to abstract thinking, but are still most at home with concrete thinking" (1991, p. 11). If educators are to make curriculum developmentally appropriate for young adolescents then they must include experiences which employ manipulative materials, utilize hands-on activities, engage students in simulations, involve most of the students in community service experiences and present students with problem-solving situations (Arnold, 1991). Toepfer (1992) believes that interdisciplinary organization is the best choice to meet the goal of integrated learning in middle schools. It allows the flexibility necessary to provide many group and experiential activities; it plans connections and integrates learning into real-life situations, allowing students to see the relevancy of what is learned in school to their daily lives. In addition the close relationships between teacher and student allows for advising opportunities and social development.

Interdisciplinary Teaching.

The interdisciplinary team plan of organization referred to above is a more fundamental, structural change than the team teaching that was popular in the 1960's (Erb, 1987). Toepfer (1992) refers to teamed learning in the middle school which has a broader application than that given by Merenbloom (1991). Toepfer believes that team organization should include all areas of instruction, not just academic areas. Erb (1987) lists four organizational aspects of team

organization. Two essential elements are common planning time and shared students. Two conditions that are not absolutely essential are a common block-of-time teaching schedule and common team space composed of adjacent classrooms and hallways.

Just as simply placing children in groups does not create cooperative learning, simply organizing teachers into teams does not create interdisciplinary teaching. Interdisciplinary teaching emphasizes deliberately identifying the relationship between disciplines. Jacobs defines interdisciplinary teaching as a curriculum approach that consciously applies methodology and language from more than one discipline to examine a central theme, problem, or topic (Jacobs, 1989).

Beane (1992) warns about confusing interdisciplinary teaching with multidisciplinary teaching. Jacobs (1989) defines multidisciplinary as several disciplines focused on one problem with no attempt to integrate them. Interdisciplinary teaching requires teams of teachers from all subject areas who jointly plan curriculum with students to create themes or units that create connections among subject areas and bring unity to learning experiences (Beane, 1992).

Beane (1992) states that what many schools claim is interdisciplinary education is really multidisciplinary because it retains the identity and priority of separate subjects. Teaming often involves only the "big four" academic subjects, not all subjects taught at the middle level. But an even bigger problem is the lack of curriculum integration. Most teams use collaborative planning to select a theme then ask how each subject might fit into it. Almost always, teaching is done through the usual round of subject classes.

Capelluti and Brazee (1992) found similar results. Curriculum teams often did not go beyond core subjects and integration of curriculum was lacking.

Each teacher in the team taught something related to the central theme in his or her own subject area. Moreover, most often interdisciplinary education consisted of a once-a-year unit related to a teacher-selected theme.

Beane (1990) proposes a thematic curriculum to replace the present academic and special subject curriculum. Teachers would be repositioned in relation to themes rather than separate subjects. Thematic units would be selected by teachers and students which are drawn from the concerns of early adolescents and issues in the larger world. Activities would be planned within the units to develop and apply various skills emphasized at the middle level while also allowing for exploratory activities. Beane stated that learning is ineffective when it lacks unity and coherence in relation to some large question or issue. Powerful learning occurs when experiences are integrated into our scheme of understanding. "Integration, then, is something we do ourselves; it is not done for us by others" (Beane, 1991, p. 36).

McDonough (1991) feels that traditional subject boundaries inhibit the discovery of relationships. Much of the current interdisciplinary curriculum still assumes a priority of the subjects. An authentic approach to learning cannot assign knowledge to subject areas. Rather, it must involve unified knowledge that transcends subject area boundaries. Moreover, young adolescents must be involved in the planning of this curriculum.

Effects of Teaming on Teachers and Students

Academic Performance

Early research found no difference in student achievement as a result of interdisciplinary team teaching. Rather it was found that conditions which co-exist with team teaching have a greater effect on student achievement than organizational arrangements (Arhar, Johnston, and Markle, 1989).

More recent research has shown that middle school students taught by interdisciplinary teams perform academically as well as, or better than, students in self-contained or disciplined-based classroom organizations (Vars, 1991). George and Oldaker found in their study of one hundred effective middle schools using interdisciplinary team teaching that student achievement increased. Sixty-two percent of the respondents indicated consistent academic improvement. Another twenty-eight percent demonstrated increased scores on state assessment tests, the California Achievement Test, or the Iowa Test of Basic Skills (Arhar, et. al., 1989).

Bradly's study (cited in Arhar, et al, 1989) researched the effect of interdisciplinary teams and departmentalized arrangements on math and reading achievement and found that the team arrangement was more effective for fostering math achievement and equally effective in promoting reading achievement.

Cotton reviewed fifteen research studies that compared achievement results of students taught by a team teaching organization versus students in traditional discipline-based classrooms. Eleven studies found no achievement differences, two favored team teaching, zero favored traditional teaching, and two gave inconclusive data (Cotton, 1982). Scholz also reviewed 66 studies involving team teaching as opposed to traditional methods. In thirty-six studies there appeared to be no significant difference between the achievement of team-taught students and that of traditionally taught students. Nineteen studies found differences favoring team teaching and eleven studies found differences which favored a traditional approach (Cotton, 1982). Self-contained classrooms and an interdisciplinary approach appear to result in at least equal achievement levels for the students. However, as we begin to move toward the middle school concept, self-contained classrooms are being replaced by more

discipline-based approaches. An interdisciplinary organization is suggested as a means of helping students make the transition from self-contained elementary classrooms to a departmentalized high school (Meichtry, 1990).

Cotton recognized five major strengths of interdisciplinary teaching that can affect student achievement.

1. An interdisciplinary approach capitalizes on the individual strengths and weaknesses of the team teachers.
2. Interdisciplinary teaching engenders creativity because of the close working relationships among teachers.
3. Interdisciplinary teaching facilitates individual instruction.
4. Interdisciplinary teaching provides better sequencing and pacing, because teachers can check their perceptions with others.
5. Interdisciplinary teaching builds program continuity, as the team abides even when individual teachers come and go (Cotton, 1982).

However, middle schools frequently choose interdisciplinary teaching for reasons other than increases in achievement.

Affective and Social Performance

An effective middle level curriculum must be responsive to the needs, interests, and abilities of early adolescents, helping them to make sense of themselves and the world around them (McDonough, 1991). Discipline-based classes inhibit the discovery of relationships in the exploration of relevant meanings. An interdisciplinary approach allows the flexibility necessary to provide hands-on experiences, joint student-teacher planning, advisory activities, and connections among subject areas which make the curriculum relevant to the lives of early adolescents. Rutter states in Fifteen Thousand Hours that two variables which differentiate between successful and unsuccessful middle schools are the academic emphasis of the school and its psychosocial

environment (Arhar, et al., 1989). Metz (Arhar, et al., 1989) and Joyce (Arnold, 1991) found that in schools which used interdisciplinary organization, the students expressed more enthusiasm toward school and their teachers than did students in schools with discipline-based organization. Students participated more and contributed more often, readily accepted the differences of others, and were more appreciative of the strengths and talents of others. Cotton (1982) found that students in interdisciplinary situations exhibited a better self-concept, more happiness with school and more interest in school subject matter. The students had a greater sense of personal freedom and self-reliance; they felt they had more influence on the school environment.

George and Oldaker's study (cited in Arhar, et al., 1989) and Jacobs (1989) reported improved attendance and a decrease in vandalism and discipline problems. Students in team teaching situations exhibited better self-discipline than others in traditional situations.

Haskvitz reports on a social studies program in the Suzanne Middle School in Walnut, California, which used interdisciplinary organization to develop a community service program. The program expects "students to accomplish real goals and to apply to the real world what they have learned in a variety of classes. The results have benefitted the students and the community. The improved test scores are just a fortunate side effect (Haskvitz, 1988, P. 178).

Teaming makes a difference on student outcomes because it allows conditions to exist that are related to instructional effectiveness and student success. It allows teachers to know their students well and to "gang up" on students to affect learning (Arhar, et al., 1989).

Effects on Teachers

Interdisciplinary teaming has important effects on the organizational climate of the school, the satisfaction and professional development of teachers,

and collaboration within the work place (Arhar, et al., 1989). Teachers organized into interdisciplinary teams not only have more frequent discussions with colleagues about instruction, student progress, and curriculum, but they also play more active roles in building-level decision making (Erb, 1987).

Erb (1987) has listed four systems that work together in interdisciplinary team organization to create a positive work environment:

1. **Authority system:** Team teachers make joint decisions about rules of conduct, retention, student progress, discipline, rewards, and grouping of students. Team teachers have better access to principals because the principals regularly meet with teams or team leaders. Team teachers feel they have greater input on school-wide issues.

2. **Decision-making system:** Team teachers work together to solve problems that affected their teams. Also, decisions on school-wide issues are first discussed in team meetings before being brought to the entire faculty.

3. **Reward system:** Team teachers feel less isolated because they have other team members to provide moral support. Support from other teachers is an important part of the team process. Team teachers feel they have more input into decisions that affect their work lives. Team membership also provides opportunities for leadership.

4. **Communication system:** Interdisciplinary team organization fosters communication among teachers. Team teachers talk to each other about students, curriculum, and planning. In addition, team teachers communicate more often with administrators, counselors, and parents. Team teachers also spend more time discussing and planning staff development.

Erb concludes that team organization is a promising way to use teachers effectively. Team meetings alter the way teachers relate to each other, and to educators and parents. Teachers are involved in more decision making and

have greater input into building-wide decisions. Team teachers report greater satisfaction with the conditions of teaching (Erb, 1987).

Other research has shown that interdisciplinary teaching reduces teacher isolation, increases collaboration and interdependence, and offers more support for teachers (Meichtry, 1990, Jacobs, 1989).

Choosing a Curriculum Design

The choice of curriculum design is not an either/or situation in which educators must choose between discipline-based specialization and interdisciplinary integration. Interdisciplinary teaching need not be the only type of instruction in the middle school. Time must be provided for basics to be taught separately as well as within interdisciplinary units (Savage, 1991). Jacobs (1989) describes six design options that include discipline-based, parallel disciplines, multidisciplinary, interdisciplinary, integrated day programs, and complete integration programs. A discipline-based design is based on the traditional separate subject area classes without integration among them. Parallel disciplines would include two or more classes teaching the same subject at the same time in their respective classrooms. A multidisciplinary design would have several subject area classes focusing on the same topic at the same time in their individual classrooms. Interdisciplinary units bring together all the subject area classes to focus on one topic, working together as a team or unit. An integrated-day model is a full day program that focuses the curriculum on the child's interests rather than a state syllabus. A complete integration program includes all disciplines working together to meet the curricular needs of the students. Integration in these options ranges from no integration in a discipline-based program to complete integration of all aspects of the student's life in the complete program. Each option has its own advantages and disadvantages.

Schools need not plan their entire curriculum based on a single design option but may choose to combine options and use some options for only a portion of their instructional program. Jacobs (1989) believes that schools that use a combination of curriculum designs exhibit the greatest success and the least fragmentation in their programs. There is no right or wrong choice of options, just the choice that best meets the needs of each school and its students.

A first step is to evaluate the present curriculum content and then consider these three conditions: (a) the flexibility of the schedule, (b) the support of the staff, and (c) the nature of curriculum requirements. Time is an important factor in interdisciplinary teaching. Does the schedule have the flexibility needed to make adjustments and rearrange subjects? Are the teachers enthusiastic and motivated for integration? Teachers may be unwilling to make changes and should not be forced to change. The best team member is a voluntary member. Curriculum flexibility varies from school to school. Choosing subject matter for interdisciplinary teaching should not be an arbitrary decision. Careful consideration should be given to the validity and practicality of combining disciplines (Jacobs, 1989).

Planning Interdisciplinary Units

Interdisciplinary teaching requires planning and coordination. Schools that have flexible schedules, use blocks of time, and give teachers common planning time have a head start according to Jacobs (cited in Brandt, 1991). The biggest obstacle to interdisciplinary curriculum planning is that schools try to do too much at once. She recommends that schools start small by making more sense of existing curriculum. Look for areas that naturally overlap that can be correlated first, then design a unit which puts two disciplines together. Multi-grade collaboration may come next, followed by a school-wide activity.

Jacobs (1991) feels that three years is a reasonable time frame for developing an interdisciplinary curriculum. She breaks this time period down into four phases.

Phase I: Conducting Research

Staff members should spend about six to twelve months doing internal and external research. Research allows the staff to learn more about their present curriculum and also learn about best practices in the field.

Internal research involves teachers studying parallel articulation on a month-by-month basis. With this information teachers can discover topics that occur in more than one subject, align subjects so topics are studied concurrently, eliminate repetition, and identify possible areas for interdisciplinary units.

External research allows staff members to learn of relevant work in education. Through conferences, site visits, inservice courses, and study groups, they study options for integrating curriculum.

Phase II: Developing a Proposal

Proposal development usually takes two to four months of planning during the first year. The staff will begin by assessing potential areas for interdisciplinary units. Most schools decide to improve an existing unit through collaboration between disciplines. An interdisciplinary proposal should not be viewed as enrichment but as a better way to teach the unit. A pilot unit usually lasts from two to six weeks. After the proposal is written and reviewed it is time to try it in the classroom.

Phase III: Implementing and Monitoring the Pilot

During the second year the pilot unit should be implemented and monitored. The teachers evaluate decision-making procedures, relationships between team members, time allotted, adequacy of resource materials, and

political considerations. They also assess the impact of the pilot on the students. From this information the staff plans revisions to the unit.

Phase IV: Adopting the Program

During the third year the planned revisions are made and the unit is adopted as a permanent part of the curriculum. Since there is not time in a school year to add new curriculum, the unit must replace what was previously offered.

The Interdisciplinary Unit

Planning the Unit

Although many interdisciplinary models exist, the models themselves do not provide guidance for individual teachers who wish to write units and carry them out. Interdisciplinary units should be flexible, easily-adapted resource plans, not rigid lesson plans. Capelluti and Brazee (1992) describe the components of a flexible interdisciplinary curriculum resource unit.

1. State a title or theme. Topics should be based on the concerns of young adolescents and common issues they face in society. Students can and should be involved in the planning.

2. Provide a short description of the unit. It provides information to allow readers to understand what the learning experience will look like.

3. Describe the problem focus. All units should be experiences in inquiry and problem solving. The problem focus should be stated clearly so it is understood by all.

4. List student generated questions and their influence on the unit. The experiences of students and their current areas of interest serve as primary focus for the unit.

5. List goals and major objectives in terms of student outcomes and curriculum compatibility. Each objective should relate to the problem focus and student generated questions.

6. List skills, knowledge, and content that will be taught and how it relates to the existing curriculum.

7. Give a detailed description of activities. Categorize the activities according to type: initial, on-going, culminating, and evaluative. Evaluative activities will be used to assess the impact of the unit in regard to student learning and the success of the unit.

8. Construct an action-plan and time-line. It will serve as the lesson plan for teachers. Describe, in detail, the activities, when and where they will occur, deadlines, responsibilities, and other crucial information.

9. Include an annotated list of resources and materials. Also include resources from the community.

10. List responsibilities of the team and individuals. Tell what needs to be done and who will do it. Include responsibilities of the students.

An on-going journal of thoughts, comments, and suggestions is not a part of unit development, but it can be valuable during assessment and in future unit development.

Criteria for Selecting a Unit

A unit may be planned around a topic that repeats in more than one subject area. Sometimes units are developed from scratch. Teachers and students are free to develop any unit that is meaningful to them. Yet certain criteria should be considered when choosing a theme to be sure that it is worthy of the time, resources, and energy involved. Among these criteria are a theme that should:

1. involve questions from the young adolescents who will carry out the unit,

2. involve a concern that is commonly shared by young adolescents and involves larger world concerns of social significance,

3. engage a wide range of knowledge and resources and pose opportunities for in-depth work, and

4. present possibilities for a wide range of activities and for action, including action outside the school (Beane, 1992).

Assessment and Evaluation.

The effectiveness of a new curriculum can not be measured by old yardsticks. Assessment must go beyond simple recall and right and wrong answers in relation to facts (Capelluti and Brazee, 1992). Evaluation needs to be creative and take many forms. Interdisciplinary teaching is concerned more with young adolescents' ability to integrate and connect knowledge than their ability to display content information on a paper and pencil test (McDonough, 1991). What activities were involved in the students' search for relationships? These activities can become the basis for assessment. Portfolios, journals, project displays, reports, research papers and reflective self-evaluation are all important assessment tools (Beane, 1992). Just as students should help plan the interdisciplinary unit, students should also participate in the development of the assessment plan. Assessment can then lead to further curriculum development (McDonough, 1991).

The Interdisciplinary Team.

Good teams do not just happen, they gradually evolve through work and planning. Team members need to explore their commitment to interdisciplinary teaching, how they will share responsibilities, and how they will work to support each other before beginning a team effort (Merenbloom, 1991). Working as a team may be a difficult experience for some teachers. Teams will not become cohesive automatically. Team members must get to know one another, discuss

expectations of other team members and the team leader, develop team goals, and determine how team decisions will be made. All of these things take time and work (Merenbloom, 1991).

Teams typically go through a progression of stages on their way to becoming an effective team. Pickler (1987) has identified five stages of developmental progression based on the observation of actual teams in different settings at different levels of implementation. Those who are in the process of establishing teams may be comforted to know that some initial floundering is actually one step toward effective teaming. Pickler's stages of team development are:

1. We don't know each others' first names, but that is okay because we don't meet together anyway. In fact, we don't see any benefits to teaming.
2. We meet occasionally but our meetings are not very productive. Some of us would like to do more but others are less enthusiastic about the idea.
3. We meet pretty often and we get along pretty well with each other. We have agreed on a uniform set of team rules and procedures. We try to coordinate tests, homework, and projects.
4. We meet on a regular basis with structured, purposeful meetings. We get along well together and like and respect each other. We have a team calendar so we can coordinate tests and projects. Sometimes we correlate instruction when our content areas overlap. We have established a team identity for our students. We share information and look for strategies to deal with problems.
5. We are truly a team. We cooperate with and support each other. We regularly schedule meetings and follow an agenda. We have established team goals for the year. We have a team identity for our students and occasionally bring all of our students together for activities. We have a team calendar to coordinate tests, projects, and homework. We plan one or two thematic units

each year and occasional "off the wall" activities for our students. We share student information and concerns and look for team solutions to problems. We meet with students as a team to discuss problems or provide reinforcement.

Effective team work requires time and training. A good staff development program is an essential element in the successful implementation of the team process (Merenbloom, 1991). Teaming alters not only the roles of the teachers but the environment in which they are expected to work (Pickler, 1987).

Summary and Conclusions

Summary

The recent reform movement in the middle school level has embraced interdisciplinary teaching as a means of making school more relevant for students (Jacobs, 1989). The effectiveness of middle schools depends on how well they meet the needs of early adolescents (Toepfer, 1991). Interdisciplinary teaching mirrors life in that applications from all disciplines support and enhance one another (Lamb, 1991). Interdisciplinary teaching teams should include teachers of all subjects at the middle level (Toepfer, 1992). As early adolescents are still in transition from concrete to abstract thinking, curriculum must include hands-on activities, manipulatives, simulations, and problem-solving situations (Arnold, 1991).

Interdisciplinary teaching can be defined as a curriculum approach that combines methods from more than one discipline to examine a central theme (Jacobs, 1989). It is different from multidisciplinary teaching in that multidisciplinary teaching makes no effort to integrate disciplines and to show connections among them (Beane, 1992). Beane (1990) proposes an interdisciplinary curriculum that focuses on thematic units, not disciplines. Activities within the units develop skills emphasized at the middle level.

Research shows that middle level students in interdisciplinary programs perform academically as well as or better than students in discipline-based programs (Arhar, et al., 1989). Other studies show that students taught by a team teaching organization show equal achievement levels as those taught in self-contained classrooms (Cotton, 1982).

Middle schools frequently choose interdisciplinary teaching for reasons other than academic. Improvements have been seen in social performance. In schools that use interdisciplinary organization students are happier with school, more enthusiastic toward school; they accept others and their differences more readily (Arnold, 1991). They contribute more and feel they have more influence on school life (Cotton, 1982). Teachers reported improved attendance, a decrease in vandalism and fewer discipline problems (Jacobs, 1989).

Teaming improves the school environment for teachers, too. Team teachers have more input on school-wide decisions; they have more authority when making joint decisions. They feel less isolated and have more support from fellow teachers. They communicate more often with other teachers, administrators, and parents (Erb, 1987).

Educators need not choose between interdisciplinary teaching and discipline-based organization. The basics should be taught separately as well as in interdisciplinary units (Savage, 1991). Schools that use a variety of curriculum design options are the most successful and exhibit the least fragmentation (Jacobs, 1989).

As schools begin planning interdisciplinary units it is important to start small and expand over a period of time (Brandt, 1991). Jacobs (1991) recommends a three-year time period to complete four steps. Those steps are (a) conduct research, (b) develop a proposal, (c) implement and revise, and (d) adopt the program.

While model interdisciplinary units can be found, many teachers will wish to write their own. Capelluti and Brazee (1992) list ten steps to help teachers write their unit. A unit may be planned around any theme meaningful to teachers and students, but it helps assure that the unit is worthwhile if four criteria are considered when planning.

Teachers will also need to plan a new means of assessment to be used with the unit. Assessment should be creative and take many forms. Portfolios, projects, journals, and self-evaluation are some of the suggestions made by Beane (1991) and McDonough (1991).

Good interdisciplinary teams require work and planning. Teams typically go through progressive stages as they become effective. Pickler (1987) described these five stages to aid new teams in their progress. A good staff development program is essential to developing successful teams (Merenbloom, 1991).

Conclusions

The school day is the largest single occupier of a young adolescent's time except for sleep (Lounsbury, 1991). Schooling is seen primarily as preparation for life. What young adolescents study must relate to their lives and take on meaning from that perspective (Savage, 1991). An interdisciplinary curriculum can organize learning activities that will involve students in learning about aspects of real life issues, help them see connections among the disciplines, and relate pieces to their daily lives (Toepfer, 1992).

While the school day has stayed about the same, knowledge has grown. Knowledge no longer consists only of facts gleaned from textbooks. Lounsbury (1991) states that the 3 R's alone do not constitute an education. We need an education that helps people think critically. When hiring new employees, Champion International Corporation looks for individuals who can communicate effectively, work as a contributing member of a team, use technology or be

trainable, and use problem-solving and critical thinking skills (Capelluti and Brazee, 1992). Our present curriculum often does not nurture the skills and attitudes most often sought by business and industry.

A discipline-based organization may not be providing the kind of education needed in today's world. Interdisciplinary teaching combined with time for the basics to be learned separately, provides the necessary flexibility to meet the needs of young adolescents today. Integration of subject matter more closely resembles life outside the classroom where subjects are not found in isolation. In interdisciplinary teaching, like life, we begin with a problem or puzzling situation and imagine ways to address it (Beane, 1992). Interdisciplinary teaching increases the student's feeling of control over his or her education, more adequately relates the subject areas studied to the needs of the student in real life, and provides hands-on experiences that enhance learning and demonstrate the need for learning to the student. Interdisciplinary teaching can build school spirit, improve interpersonal relations, and enhance overall school morale. As students begin to see the need for learning, motivation and discipline problems decrease.

Ultimately, the measure of any curriculum organization must be whether it benefits the students that the school serves. Problems of the future cannot be solved with solutions that worked in the past. The needs and interests of young adolescents are changing along with the changes in the world in which they live. What students need to know stems from concerns they have about themselves and the world around them. The search for answers to these concerns cannot be conducted through traditional subject area boundaries. The study of single subjects in isolation runs counter to what we know about the level of maturation, needs, and interests of middle level students. If our schools really want a curriculum that meets the needs of middle level students, they must

work together as teams of teachers to integrate learning within and among subject areas. Integration of learning is best achieved through the use of interdisciplinary team teaching. It is a method of learning which mirrors life in that applications from all disciplines support and enhance one another.

Implementing change is never easy. It requires time, flexibility, and commitment. Often teachers are cautious because change means they will have to alter their beliefs, behaviors, and practices. They may need to give up activities that are familiar, for new and untried ones. But change is necessary if schools are to meet the needs of students in a changing society. It is becoming obvious that one's ability to learn outweighs in importance any particular body of knowledge one has learned. Middle schools need to instill within their students a love for learning. This joy of learning is more likely to be achieved through the use of interdisciplinary team teaching than isolated discipline based subjects.

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