

The Concept of Curriculum Integration: Its Meaning, Scope and Modalities

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Introduction

An integrated curriculum is generally defined as an educational approach that cuts across and draws on multiple subject areas for learning and instruction. Its purpose is to realistically link various disciplines in the study and exploration of certain aspects of the world. There are three paradigms that sum up curriculum integration. The most traditional paradigm is *multidisciplinary* in which content is drawn from multiple disciplines in order to increase relevance and applicability [though] primary learning goals remain rooted in the individual discipline. A second paradigm, *interdisciplinary*, begins to dissolve discipline boundaries by looking for common themes across disciplines that can serve higher order learning objectives. The final category, *transdisciplinary*, dissolves all boundaries between the disciplines and poses higher order learning objectives to address broad questions of shaping curriculum to address issues of productive citizenry and construction of meaning through real-world problems/themes. James Beane (1995), a noted proponent of integrated curriculum, explains that:

Curriculum integration is not simply an organizational device requiring cosmetic changes or realignments in lesson plans across various subject areas. Rather, it is a way of thinking about what schools are for, about the sources of curriculum, and about the uses of knowledge. Curriculum integration begins with the idea that the sources of curriculum ought to be problems, issues, and concerns posed by life itself (p. 616).

Thus an integration is a philosophy of teaching in which content is drawn from several subject areas to focus on a particular topic or theme. Rather than studying math or social studies in isolation, for example, a class might study a unit called The Sea, using math to calculate pressure at certain depths and social studies to understand why coastal and inland populations have different livelihoods.

Effective interdisciplinary studies include the following elements:

- A topic that lends itself to study from several points of view.
- Two to five valuable themes (or essential questions) the teacher wants the students to explore.
- An approach and activities to further students' understanding more than is possible in a traditional, single-discipline unit.

Definitions

Integrated curriculum, interdisciplinary teaching, thematic teaching, synergistic teaching... When attempting to define integrated curriculum, it is also necessary to look at related terms. Several definitions are offered here. There are many different ideas about what constitutes curriculum integration. For example, Brazee and Capelluti (1995) write that curriculum integration is

based on a holistic view of learning and recognizes the necessity for learners to see the big picture rather than to require learning to be divided into small pieces. Integrative curriculum ignore traditional subject lines while exploring questions that are most relevant to students.

Similarly, a basic definition is offered by Humphreys, Post, and Ellis 1981 when they state, “An integrated study is one in which children broadly explore knowledge in various subjects related to certain aspects of their environment” (p. 11). They see *links* among the humanities, communication arts, natural sciences, mathematics, social studies, music, and art. Skills and knowledge are developed and applied in more than one area of study. In keeping with this *thematic* definition, Shoemaker defines an integrated curriculum as

...education that is organized in such a way that it cuts across subject-matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study. It views learning and teaching in a holistic way and reflects the real world, which is interactive. (1989, p. 5)

Further description is provided by Dressel's definition which goes beyond the linking of subject areas to the creation of *new* models for understanding the world:

In the integrative curriculum, the planned learning experiences not only provide the learners with a unified view of commonly held knowledge (by learning the models, systems, and structures of the culture) but also motivate and develop learners' power to perceive new relationships and thus to create new models, systems, and structures. (1958, pp. 3-25).

Within this framework there are varied levels of integration, as illustrated by Palmer (1991, p. 59), who describes the following practices:

- Developing *cross-curriculum* sub objectives within a given curriculum guide
- Developing model lessons that include *cross-curricular* activities and assessments
- Developing enrichment or enhancement activities with a *cross-curricular* focus including suggestions for cross-curricular “contacts” following each objective
- Developing assessment activities that are *cross-curricular* in nature
- Including sample planning modules in *all curriculum* guides.

For the advocates of curriculum integration, the word *integrated* implies all of these following elements at once:

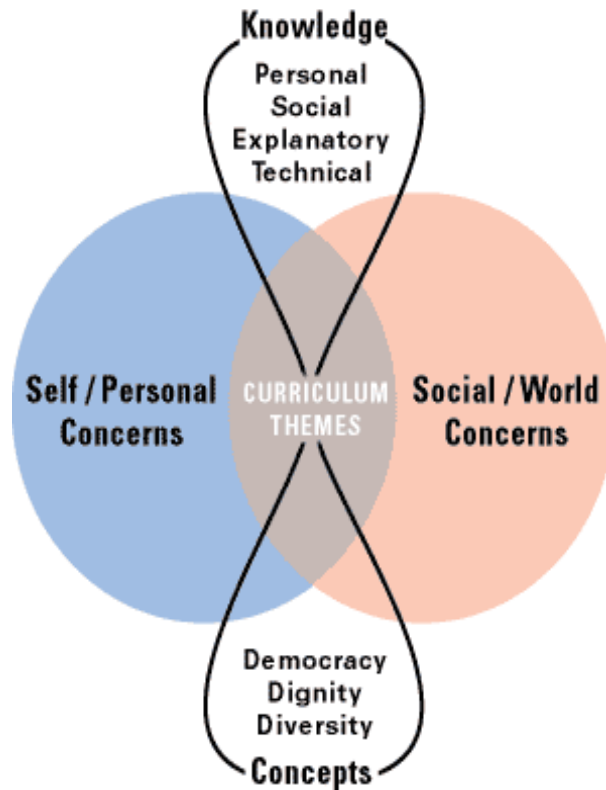
1. *Integrated means blended into a whole.* Two great minds of the 20th century—Howard Gardner (multiple intelligences) and Carl Jung (learning

styles)—have supplied us with our two learning models. Yet both multiple intelligences and learning styles have particular strengths and weaknesses that directly correspond to the strengths and weaknesses of the other. This means that a truly holistic approach to education—one that allows educators to engage a full range of *human diversity* and meet rigorous academic standards—occurs only in the blending together of these two models.

2. ***Integrated means incorporated as part of a larger picture.*** From an educator's perspective, any learning theory, model, or approach is only as good as its applicability. If it cannot be used without excessive effort, it is not very valuable. The reality of schools dictates that teachers follow curriculum frameworks, meet national standards, and prepare students for national examinations (WAEC, SSCE, NECO) and academic and vocational callings. Integrated learning *should* respect these realities. The approach is designed so that it can be incorporated into current practices easily without asking teachers to rethink everything they do.
3. ***Integrated means driven by the goal of equality.*** We live and learn in an increasingly diverse world. New students, new issues, and new ideas appear on an almost daily basis, fueling the movement to address all forms of diversity—intellectual, physical, and cultural. By uniting the two best models we have for understanding the diverse ways students think and learn, integrated learning strives to create an environment where all learners feel that their ideas, contributions, and work are valued, and that they are able to succeed.

Thus curriculum integration is a way to increase student understanding by teaching ***across the disciplines***, teaching subject areas according to their natural ***connections*** rather than in ***isolation*** from one another. It doesn't mean, for instance, that science teachers suddenly must teach English, or vice versa. It may be one teacher within a discipline making connections to other disciplines. It may be all the teachers at a class level (e.g. JS 2) planning a unit that ***combines several disciplines***. Curriculum integration focuses on making learning ***reflect life*** so that students see the value of what they are being taught.

The following diagram reflects one perspective on curriculum integration:



James A. Beane, *Curriculum Integration* Teachers College Press, New York. 1997.

Another term that is often used synonymously with integrated curriculum is *interdisciplinary curriculum*. Interdisciplinary curriculum is defined as “a curriculum organization which cuts across subject-matter lines to focus upon comprehensive life problems or broad based areas of study that brings together the various segments of the curriculum into meaningful association” (Good 1973). The similarity between this definition and those of integrated curriculum is clear. Jacobs defines interdisciplinary as “a knowledge view and curricular approach that consciously applies methodology and language from more than one discipline to examine a central theme, issue, problem, topic, or experience” (1989, p. 8). Thus an interdisciplinary curriculum is one that combines several school subjects into one active project since that is how children encounter subjects in the real world-combined in one activity.

These definitions support the view that integrated curriculum is *an educational approach that prepares children for lifelong learning*. There is a strong belief among those who support curriculum integration that schools must look at education as a process for developing abilities required by life in the twenty-first century, rather than discrete, departmentalized subject matter. In general, all of the definitions of integrated curriculum or interdisciplinary curriculum include:

- A *combination* of subjects
- An emphasis on *projects*
- Sources that go *beyond* textbooks
- *Relationships* among concepts
- *Thematic* units as organizing principles
- *Flexible* schedules

- **Flexible** student groupings.

However, within the scope of what may be considered integrated curriculum, there may be many levels of integration (Fogarty & Stoehr, 1991). These levels can be conceptualized as a continuum, ranging from a simple connection of topics within a discipline or course to an overlap of skills, concepts, and attitudes common to multiple disciplines in order to mirror and examine real-world issues, problems, or experience. At the most extreme position, Brady (2000) calls for strongly limiting the traditional disciplines as artificial, academic specializations and augmenting or replacing them with a "supradiscipline." This "supradiscipline" would encompass, organize, and integrate all present knowledge with the function of producing future knowledge.

Forms of Integration

Worthwhile integration implies that a single activity accomplishes significant curricular goals in **two or more subjects simultaneously**. Integration comes in many forms. Sometimes the nature of the topic makes integration natural or even necessary. Some topics inherently cut across subjects (to teach about ecology, for example, one must draw content from both science and social studies). Other topics are primarily identified with one subject but require applications of another to be learned meaningfully (e.g., map and globe studies are part of geography and consumer education is part of economics, but both of these topics require applications of mathematical knowledge and skills). Problems with integration activities usually do not occur with these more natural forms of integration.

Most of the problems occur with forms of integration that **are not inherent** in the topic and thus involve integration for integration's sake. Teachers can use these forms productively, however. For example, adding content drawn from a secondary subject can enrich the content in the primary subject (e.g., reading about and displaying the works of an artist as a means of enhancing the study of a historical period). And combining knowledge from a content-area subject such as social studies with processes from a skills subject such as language arts can be effective.

In the latter forms of integration, the focus of the instruction and the accountability pressures placed on students may be on the knowledge, the processes, or both. If students were asked to write to their political representatives about their legislative roles or policy positions, the assignment would be primarily a social education activity although it would include application of writing skills. In contrast, students might be asked to write about an imaginary visit to Aso Rock as an exercise in descriptive writing. If the emphasis in structuring and marking were placed on the technical aspects of composition and form, the assignment would be mostly a language arts activity, not a social studies activity.

Finally, students who were studying book reporting skills in language arts and the Nigerian Civil War in social studies might be asked to read and report on biographies of key figures in the war. Such an assignment might promote progress toward important goals in both subjects, especially if the goals were made clear to the students and the reports were marked separately for technical features and for historical content.

Background to Integration

The subject of curriculum integration has been under discussion off and on for the last half-century, with a resurgence occurring over the past decade, especially in the United States and Australia. The “explosion” of knowledge, the increase of state mandates related to myriad issues, fragmented teaching schedules, concerns about curriculum relevancy, and a lack of connections and relationships among disciplines have all been cited as reasons for a move towards an integrated curriculum (Jacobs 1989).

These forces in contemporary schooling are reinforced by Benjamin (1989, pp. 8-16), when he cites the trends towards *global interdependence* and the *interconnectedness* of complex systems, the increase in pace and complexity of the twenty-first century, the expanding body of knowledge, and the need for workers to have the ability to draw from many fields and solve problems that involve interrelated factors.

Each of these trends is relevant to the discussion of integrated curriculum, as schools move away from teaching *isolated* facts toward a more *constructivist* view of learning, which values in-depth knowledge of subjects. This view finds its basis in the work of Piaget, Dewey, Bruner, and others who hold a holistic view of learning. Each of these theorists is concerned with children having an understanding of concepts and underlying structures. Proponents of the progressive education movement of the 1930s advocated an integrated curriculum, sometimes identified as the “core curriculum” (Vars 1987). The movement towards integrated curriculum is a move away from memorization and recitation of isolated facts and figures to more meaningful concepts and the connections between concepts. The twenty-first century requirement for a flexible use of knowledge goes beyond a superficial understanding of multiple isolated events to insights developed by learning that is connected-or *integrated*. Perkins advocates teaching for transfer and thoughtful learning when he states:

A concern with connecting things up, with integrating ideas, within and across subject matters, and with elements of out-of-school life, inherently is a concern with understanding in a broader and a deeper sense. Accordingly there is a natural alliance between those making a special effort to teach for understanding and those making a special effort toward integrative education (1991, p.7).

This view supports the notion of curriculum integration as a way of making education more meaningful. Concerns about national achievement levels and high dropout rates have put the spotlight on any educational change that can lead to increased student success. In addition to the realization that curriculum integration may be an effective element in making education both manageable and relevant, there is a body of research related to *how children learn* that supports curriculum integration. Cromwell (1989) looks at how the brain processes and organizes information. The brain organizes new knowledge on the basis of previous experiences and the meaning that has developed from those experiences. The brain processes many things at the same time, and holistic experiences are recalled quickly and easily. “The human brain,” writes Shoemaker, “actively seeks patterns and searches for meaning through these patterns” (p. 13).

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This research is supported by Caine and Caine (1991) when they connect neuropsychology and educational methodologies and state that the search for meaning and patterns is a basic process in the human brain. In fact, the brain may resist learning fragmented facts that are presented in isolation. Learning is believed to occur faster and more thoroughly when it is presented in meaningful contexts, with an experiential component. Of course, every brain-every student-is unique. While the search for patterns and context may be universal, every learner will have his/her own learning style. To meet these diverse needs means providing choices for students.

Put to use in the classroom, the brain research points toward interdisciplinary learning, thematic teaching, experiential education, and teaching that is responsive to student learning styles. These findings are summarized by Shoemaker (1991, pp. 793-797).

The current movement toward an integrated curriculum, then, has its basis in learning theorists who advocate a constructivist view of learning. There is a body of brain research that supports the notion that learning is best accomplished when information is presented in meaningful, connected patterns. This includes interdisciplinary studies that link multiple curricular areas. There are many examples in the literature of such efforts by teachers in the United States, as well as those teachers involved in vocational education and higher education.

Another rationale for curriculum integration finds its basis in the commonsense wisdom of teachers, who are coping with an increased body of knowledge, large classes, and many mandates related to everything from drug awareness to AIDS to bus safety. When all of these requirements are added to the traditional body of knowledge for which teachers feel responsible, integration is seen as one way to meet both the needs of the students and the requirements of the state. The integration of curricular areas and concepts allows teachers to assist students as they prepare for the next century.

Finally, the movement toward a global economy and international connections, as well as the rapid changes in technology, are pushing education toward integration. The ability to make connections, to solve problems by looking at multiple perspectives, and to incorporate information from different fields, will be an essential ingredient for success in the future.

An enduring argument for integration is that it represents a way to avoid the fragmented and irrelevant acquisition of isolated facts, transforming knowledge into personally useful tools for learning new information (Lipson, et al. 1993, p. 252).

Several authors have gone beyond a single definition of curriculum integration to a continuum of integration. Fogarty has described ten levels of curricula integration (1991). The following chart summarizes some of her work. The reader who is interested in a more complete explanation is referred to Fogarty's book, *The Mindful School*. Within these arguments, the following table represents the domains of curriculum integration.

Curriculum Integrating Strategies	
Fragmented	Connected
<i>Description:</i> The traditional model of separate and distinct discipline, which fragments the subject area.	<i>Description:</i> Within each subject area, course content is connected topic to topic, concept to concept, one year's work to the next, and relates ideas explicitly.
<i>Example:</i> Teacher applies this view in Math, Science, Social Studies, Language arts OR Sciences, Humanities, Fine and Practical Arts.	<i>Example:</i> Teacher relates the concept of fractions to decimals, which in turn relates to money, grades, etc.
Nested	Sequenced
<i>Description:</i> Within each subject, the teacher targets multiple skills: a social skill, a thinking skill, and a content-specific skill.	<i>Description:</i> Topics or units of study are rearranged and sequenced to coincide with one another. Similar ideas are taught in concert while remaining separate subjects.
<i>Example:</i> Teacher designs the unit on photosynthesis to target consensus seeking, sequencing, and plant life cycle.	<i>Example:</i> English teacher presents a historical novel depicting a particular period while the History teacher teaches that same period.
Shared	Webbed
<i>Description:</i> Shared planning and teaching take place in two disciplines in which overlapping concepts or ideas emerge as organizing elements.	<i>Description:</i> A fertile theme is webbed to curriculum contents and disciplines; subjects use the theme to sift out appropriate concepts, topics, and ideas.
<i>Example:</i> Science and Math teachers use data collection, charting, and graphing as shared concepts that can be team-taught.	<i>Example:</i> Teacher presents a simple topical theme, such as the circus, and webs it to other subject areas.
Threaded	Integrated
<i>Description:</i> The metacurricular approach threads thinking skills, social skills, multiple intelligences, technology, and study skills through the various disciplines.	<i>Description:</i> This interdisciplinary approach matches subjects for overlaps in topics and concepts with some team teaching in an authentic integrated model.
<i>Example:</i> Teaching staff targets prediction in Reading, Math, and Science while Social Studies teacher targets forecasting current events.	<i>Example:</i> In Math, Science, Social Studies, Fine Arts, etc. teachers look for patterning models and approach content through these patterns.
Immersed	Networked
<i>Description:</i> The disciplines become part of the learner's lens of expertise: the learner filters all content through this lens and becomes immersed in his or her own experience.	<i>Description:</i> Learner filters all learning through the expert's eye and makes internal connections that lead to external networks of experts in related fields.
<i>Example:</i> Student or doctoral candidate has an area of expert interest and sees all learning through that lens.	<i>Example:</i> Architect, while adapting the CAD/CAM technology for design, networks with programmers and expands her knowledge base.

After Fogarty, R., and Stoehr, J. *Integrating Curricula with Multiple Intelligences: Teams, Themes, and Threads*. Palatine, IL: Skylight Publishing, Inc., 1991.

This work has been supported by others involved with the implementation of curriculum integration (Jacobs 1989; Shoemaker 1989). These differentiations may move from two teachers teaching the same topic but in their own separate classes

(e.g., both English and history teachers teaching about the same period of history), to team design of thematic units, to interdisciplinary courses or thematic units, to a fully integrated curriculum, which is also referred to as synergistic teaching. Bonds, Cox, and Gantt-Bonds (1993, 253) write:

Synergistic teaching goes beyond the blurring of subject area lines to "a process of teaching whereby all the school subjects are related and taught in such a manner that they are almost inseparable. What is learned and applied in one area of the curriculum is related and used to reinforce, provide repetition, and expand the knowledge and skills learned in other curriculum areas. This process of synergistic teaching allows the student to quickly perceive the relationships between learning in all curriculum areas and its application throughout each of the school subjects.... Synergistic teaching does more than integrate; it presents content and skills in such a manner that nearly all learning takes on new dimensions, meaning, and relevance because a connection is discerned between skills and content that transcends curriculum lines. In a synergistic classroom, simultaneous teaching of concepts and skills without regard to curriculum areas would have a greater effect than the sum of learning skills and concepts in individual subject areas.

Research Findings

Effect on Content Knowledge

The literature indicates *no detrimental* effects on learning when students are involved in an integrated curriculum. The areas of integration included: 1) art, mathematics, and reading; 2) writing across the curriculum; 3) history, science, and mathematics; 4) history and literature; 5) integrated humanities; 6) health and reading; 7) areas of mathematics; 8) social studies, health, and the arts; 9) physical education, the arts, health, and literature; and 10) science, social studies, health, and the arts (Aschbacher 1991; Edgerton 1990; Greene 1991; MacIver 1990; Shoemaker 1991; Vars 1965; Vye 1990; Williams 1991).

Vars (1965) summarized five major research studies and reported that in middle school programs that adhered to block time and core programs — both forerunners of the current integrated curriculum discussion — there was *no loss of learning* of subject matter and that, overall, students in the integrated programs did as well or better than students in separate-subject programs. The fact that teachers who plan and teach together have the same expectations across subject areas is a factor in the overall performance of the students.

The Humanitas program, an interdisciplinary, thematic, team-based approach to high school humanities in Los Angeles (Aschbacher 1991) has been compared to 16 other schools which are more traditional in their approach. Performance-based assessments; surveys of teachers, students, and administrators; classroom observations; teacher and student interviews; analysis of assignments and examinations; analysis of portfolios; records of student attendance; records of discipline incidents; and records of college-oriented behavior and standardized tests were all considered in this research, making it one of the most thorough explorations of curriculum integration.

The findings show that the Humanitas program has a *statistically significant effect on writing and content knowledge*, even after students have been enrolled for only one

year. The largest gains were shown in conceptual understanding. The control groups of students made no gains in conceptual understanding during the same timeframe.

Students in the Humanitas program stay in school longer, work harder (by objective measures and their own report), and like school better. The expectations are higher in this interdisciplinary program, and the students are involved in more complex discussions that require them to make connections between content areas and the real world. These same expectations hold true for the students' written work, as students may be asked to write an essay that includes a discussion of the beliefs of more than one culture and the way those beliefs are influenced by cultural factors and values. The students are to include perspectives from art history, literature, and social institutions and make links to their own lives.

While the evaluation of the Humanitas project involved large numbers of students and a control group, there are also many smaller-scale studies reporting positive achievement outcomes for students who participate in an integrated curriculum. Levitan (1991) reports that a change from a literature-based language arts program to a science-literature-based program for sixth graders resulted in achievement increases for the majority of the students. Similar results are reported by Willett (1992) in a study of 87 fifth graders. Integrating the study of math with art resulted in higher posttest scores than those students who were taught mathematical concepts in isolation by the regular classroom teacher. "The data indicate that the integration of art activities into mathematics and reading can enhance the learning of specific concepts" (Levitan, 1991, p. 12). Similar results were reported by Friend (1984) in a study of mathematics and science integration with seventh grade students.

These findings seem very logical when one considers the work of Schmidt (1983), who found that in integrated language arts classrooms the amount of time spent in art and literature is more than double the amount of time spent on these subjects in classrooms where integration is not a priority.

Effect on Attitude

There is a small body of research related to the impact of an integrated curriculum on student attitudes. MacIver (1990) found that integrated program students developed team spirit and improved their attitudes and work habits. This was attributed, in part, to the fact that teachers met in teams and were able to quickly recognize and deal with a student's problem. Vars (1965) also reports that motivation for learning is increased when students work on "real" problems—a common element in integrated programs. When students are actively involved in planning their learning and in making choices, they are more motivated, reducing behavior problems. Jacobs (1989) also reports that an integrated curriculum is associated with better student self-direction, higher attendance, higher levels of homework completion, and better attitudes toward school. Students are engaged in their learning as they make connections across disciplines and with the world outside the classroom.

Students are not the only ones who respond favorably to the learning experiences that are part of an integrated curriculum. In a study of an integrated mathematics curriculum, Edgerton (1990) found that after one year 83 percent of the teachers involved preferred to continue with the integrated program rather than return to the traditional curriculum. MacIver (1990) found that teachers appreciate the social

support of working together and feel that they are able to teach more effectively when they integrate across subjects and courses. They discover new interests and teaching techniques that revitalize their teaching.

When teachers who participated in the Mid-California Science Improvement Program were interviewed by an independent evaluator, the findings indicated a dramatic increase in science instruction time and comfort with science teaching. The teachers involved in this program taught year-long themes, with a blend of science, language arts, social studies, mathematics, and fine arts. Improvements were noted in student attitudes, teacher attitudes, and student achievement. These findings were consistent for both gifted and “educationally disadvantaged” students (Greene 1991).

Research on Implementation

The research findings related to implementation have several common elements. One factor that comes through loud and clear is that *curriculum integration takes time*. Common planning time is needed to allow teachers to select themes, explore resources, discuss student learning styles and needs, and coordinate teaching schedules. Broad strands, such as community, change, or systems have been found to be effective thematic organizers (Shoemaker 1991). Based on an extensive review of the literature and discussions with teachers, Shoemaker lists the following as essential components of an integrated curriculum:

- **Core skills and processes.** These include basic skills, such as reading and mathematics, as well as social skills and problem solving.
- **Curriculum strands and themes.** These are the organizing principles around which the curriculum is built. They are broad-e.g., Human Societies-and integrate content from multiple areas.
- **Major themes.** Each curriculum strand is further divided into major themes, e.g., Environments or Diversity.
- **Questions.** Questions are used to further define major themes and focus activities.
- **Unit development.** From the major theme and the questions, knowledge, and skills related to the concepts, teachers plan activities that will lead to the development of knowledge and skills which will answer the questions. Teachers also collect resources and develop actual lesson plans and assessment strategies.
- **Evaluation.** Through an assessment of student progress the unit is evaluated.

When considering Shoemaker's essential components, teachers give broad definitions to her terms. For example, major themes may be drawn from existing structures within a school, such as works of literature or cross-subject areas.

Successful efforts toward integration tend to include the above elements or a variation. Palmer (1991) suggests that teachers and curriculum supervisors work together to identify common goals, objectives, skills, and themes. From these lists, the teachers work together to find appropriate connections to content areas. For example, research skills may be a part of science, math, music, language arts, and social studies. From this discussion, teachers devise plans for teaching. Any plan takes time, empowered teachers, flexible schedules, and teams whose members are able to work together (Brandt 1991).

Just as curriculum integration changes the way instruction looks, it may also lead to a change in assessment strategies. As students are involved in “real” tasks, teachers find that they need to design performance assessments that give a true picture of student understanding of concepts.

When beginning an implementation plan, Jacobs's experience has led her to identify four steps that are integral to success (1991, p. 27). They are:

1. Conduct action research to learn about current resources and best practices.
2. Develop a proposal for integration.
3. Implement and monitor the pilot program, with continual assessment of students and the program.
4. Adopt a program and continue to assess.

Making Sense of Curriculum Integration

Is there really a need to develop integrated curriculum, or is it just another passing fad? This question deserves to be examined carefully. We live in a global world characterized by ever-accelerating change, technological advances, a knowledge explosion, changing economic and social realities, and, perhaps, impending environmental disaster. The educational system seems to be constantly under attack. Critics claim that students are dropping out at an alarming rate. Those who stay in school are not doing well enough to be able to compete in a global economy and maintain a high standard of living.

In many districts there has been a demand for a restructuring in education to shift it to decentralization and site-based management. Teachers have been empowered as decision makers; this includes curriculum development. This shift has often led teachers to integrate the traditional subject areas because it made sense to those educators at the grassroots level.

It is important to understand the context of integration as an idea with an intellectual history. Disciplines were artificially created by humans to organize their world, and were often defined by political needs (Beane 1991). Further as early as the 1920s the progressive movement in education advocated curricular integration through themes because proponents believed the disciplines prevented students from seeing the relationships between subjects and therefore decreased the content's relevance. In the 1960s, based on Jerome Bruner's (1960) concept of curriculum development, there was a shift to discipline-oriented curriculums where the structure of the discipline was considered to be the facilitator for the storage and retrieval of knowledge. Still, many students today move from science to history to math classes and are taught in a fragmented, disconnected way that has little resemblance to real life.

Today, some people criticize educators for not adequately teaching basic skills; others argue that the basic skills students will need for the 21st century are not the same skills that we are now teaching. The knowledge component of virtually every subject area is proliferating at an ever-increasing rate. Paradoxically, as distinct subject areas become overloaded, a surprising amount of duplication is occurring across classrooms. Educators are caught in a dilemma. Integration, by reducing duplication of both skills

and content, begins to allow us to teach more. It also gives us a new perspective on what constitutes basic skills.

The concept of integrated curriculum makes sense for other reasons. Students who drop out perceive little relevance in school life. Integration connects subject areas in ways that reflect the real world. When we set curriculum in the context of human experience, it begins to assume a new relevance. Higher-order thinking skills become a necessity as students begin to grapple with real issues and problems that transcend the boundaries of disciplines. Current newspapers offer an abundance of real-life issues that could be explored from a problem-based perspective. Conscious of age-appropriateness and student interest, the teacher may design problem scenarios based on reality; for example, issues that pit jobs versus the environment, the influence of media in shaping reality, violence in our society, schools and sports, the ethics of genetic engineering, or social issues such as AIDS, poverty, or the war on drugs. Current problems in these areas can be explored from a content perspective, but in searching for practical solutions they also require higher-order thinking skills that transcend both the content and the procedures of disciplines.

Another important consideration is how people learn. Recent brain research indicates that the brain searches for patterns and interconnections as its way of making meaning (Caine and Caine 1991). If humans do learn by connection-making, it only makes sense to teach through connections.

Recommendations

Factors that need to be considered in an integrated curriculum are (Gehrke 1991; Jacobs 1989; Lipson 1993; MacIver 1990):

- Common definitions of terms (such as theme, strand, or outcome)
- Available resources
- Flexibility in class time-tabling
- Support services
- Subjects and concepts that will be integrated
- Links between integration and broader outcomes
- Curricular scope and sequence
- How evaluation will occur
- Parent and community support
- Themes that promote the transfer of learning and connections
- Team planning time that is used to exchange information about content, students, special areas of teacher expertise, and teaching methods.
- Employer ratings
- Further education ratings

When teachers select themes, it is important that they avoid themes of convenience that have no meaningful, larger concepts. While an individual teacher may or may not have expertise in each content area, members of teacher teams are able to work together to find connections that cut across single content areas (Lipson 1993). Themes that promote the linking of concepts and lead to deeper understanding are more effective. A theme is more than a series of activities; it is a way to facilitate student learning and understanding of conceptual connections. Activities that are arbitrarily connected are not helpful (Brophy and Alleman 1991). Thus, an integrated

curriculum is a means, not the end result. Poorly designed units do not achieve this end of deeper understanding and thorough learning.

Each of these elements needs to be considered as teachers look at curriculum integration. It is necessary for each school to determine the best procedure to meet the needs of the particular student body. A secondary school may face different constraints than an elementary school. Rather than move from a traditional, subject-specific curriculum to an integrated curriculum in one sudden sweep, schools find more success when they make gradual changes, making sure that everyone involved feels a sense of ownership of and commitment to the changes.

Some areas may lend themselves more naturally to integration, such as math and science or language arts and social studies. However, as reported above, there have been very successful efforts in nontraditional alliances, e.g., art and math. As teachers are more and more involved in integration, they find that they see connections that they had not seen initially. As teachers see these connections and develop learning experiences and assessments built around the connections, students also understand them. This understanding leads to more successful learning.

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