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Daisy E. Arredondo
University of Missouri-Columbia

Terrance T. Rucinski
RARCO, Inc.

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Integrated Curriculum: Its Use, Initiation and Support in Midwestern Schools

Daisy E. Arredondo, University of Missouri - Columbia
Terrance T. Rucinski, RARCO, Inc.

Abstract

Survey data based on a random stratified sample of 400 schools were utilized to compare schools that use integrated, interdisciplinary or multidisciplinary curriculum (IC) with those that do not (No IC). This study explores the extent and type of use of IC, how school principals rate IC success, and differences between IC and NoIC schools in terms of their characteristics, and teacher involvement and support across different school levels. Selected data tables and analyses are presented and discussed.

Integrated curriculum is central to the contemporary vision of truly effective schools designed to accommodate learner diversity. That vision comes from what we know about teaching and learning. Abundant research supports the assertion that students learn best when instructional tasks require them to use knowledge in meaningful ways (e.g., Bereiter & Scardamalia, 1985; Resnick, 1987; Scardamalia & Bereiter, 1991; Leinhardt, 1992). Integrated curriculum units designed to involve students in complex thinking processes such as problem solving, decision making, investigation, experimental inquiry or invention provide ideal vehicles for students to develop and meaningfully use knowledge (Bransford, Vye, Kinzer, & Risko, 1990; Marzano, 1992; Roth, 1990).

Middle level educators have for more than two decades called for reform of their educational programs. Progress has been made in changing middle school climate and institutional features (Beane, 1991). On a national basis, 57% of the schools responding to a survey conducted by the National Association of Secondary School Principals (Valentine, Clark, Irvin, Keefe, & Melton, 1993) reported using interdisciplinary instructional teams; and yet, these and other middle level scholars contend that curricular reforms have taken a back seat to organizational changes (p. 62, Valentine et al.). Beane (1993), however, questions the validity of this perception. He reports that most of the interdisciplinary teams in middle schools begin curricular planning by identifying a theme or topic and then asking what each subject area can contribute to that topic. He argues that this type of planning and the resultant curriculum would more correctly be labeled multidisciplinary or even multi-subject.

Following the pilot of our survey instrument, we decided that for the initial data collection for this study, the terms integrated, interdisciplinary, and multidisciplinary, would be used synonymously. We have followed the same convention in this article.

Study Purposes and Methods

The *purposes* of this research are: (a) to ascertain the extent and type of use of integrated, interdisciplinary, or multidisciplinary curricula (IC); (b) to determine how these curricula are initiated and supported at the building level; and (c) to explore relationships between implementation of integrated curricula (IC), instructional supervision, teacher involvement in decisions, and principal beliefs about knowledge and learning. Four hundred elementary, middle school/junior high, senior high, and other schools were selected as components of a stratified, random sample representative of the population of public and accredited private schools in the state of Missouri. These schools were then surveyed using items designed to collect both qualitative and quantitative information.

Of the 400 schools comprising the total sample, 174 returned useable surveys, for a response rate of forty-four percent. Responses to survey items were tallied and analyzed using descriptive statistics. Analysis of variance was used to determine significance of differences between means on selected items. Open-ended survey responses were analyzed using a constant comparative method to develop emergent themes and categories (Lincoln & Guba, 1985; Miles & Huberman, 1984). These themes and categories were developed separately by each of the investigators. Data sets were then compared for similarities and the categories collapsed to eliminate redundancy. Follow-up interviews were then conducted with a purposeful sample of principals to gather more in-depth information about instructional supervisory practices supportive of integrated, interdisciplinary, or multidisciplinary curriculum and instruction; to probe unclear item responses; and to ascertain principals' epistemological beliefs.

This paper presents base-line data specifically collected in response to the following seven questions:

1. What are the characteristics of schools reporting some level of use of integrated, interdisciplinary, or multidisciplinary curriculum (IC schools)?
2. How do such schools differ from those reporting no use of integrated, interdisciplinary, or multidisciplinary curriculum (Non-IC schools)?
3. What is the type of use (e.g., at the awareness or experimentation level to use by three or more teacher teams) of integrated, interdisciplinary, or multidisciplinary curriculum in elementary, middle, senior high and other Mid-western schools?
4. How do principals rate the level of success of their teachers' use of IC?
5. How was the use of IC initiated in the schools? And, who initiated the use?
6. How is the use of IC supported in the schools?
7. Do IC schools and Non-IC schools differ with regard to teachers' involvement in decision making? If so, how?

Results

Extent of use

Descriptive statistical analyses of data indicate that the extent of use of integrated curriculum across the K-12 schools in Missouri is somewhat less than the 50.8% reported in Illinois (Irvin, 1993), and is also less than might be expected from the 57% of middle schools reporting involvement with interdisciplinary teams on a national basis (Valentine et al., 1993). Use of integrated curriculum was highest at the elementary level (65.12%), and lowest at the high school level (30.3%), with the other schools reporting 30.56%. (see Table 1) This percentage of use of integrated curriculum in Missouri middle schools was somewhat surprising, and may represent a much lower level of use than in middle schools across the nation; or, as is more likely, it may simply mean that the reported 57% (on a national basis) involvement with interdisciplinary instructional teams is not synonymous with use of integrated curriculum.

Table 1

Numbers and Percentages of Schools using Integrated, Interdisciplinary, or Multidisciplinary Curricula

	Total	IC Schools	Percent
Elementary	86	56	65.12
Middle School	19	7	36.84
High School	33	10	30.30
Other	36	11	30.56
All Schools	174	84	48.28

School Size

Schools using integrated, interdisciplinary, or multidisciplinary curriculum were generally larger than those who didn't. This was particularly true for the high schools and middle level schools. See Table 2.

Table 2

Means and F-values of School Sizes

	Mean IC School	Non-IC School	F
Elementary	426.20	368.67	1.993
Middle School	776.00	442.00	9.533**
High School	1215.80	620.57	12.684**
Other	208.27	232.88	.268
All Schools	517.74	403.49	5.372*

*p<.05 **p<.01

School Type

Sample schools were asked to describe themselves in terms of inner city, suburban, rural, or other. In this instance, other was exemplified by terms like: city, urban, affluent, etc. IC schools and Non-IC schools were then compared to ascertain characteristics. Among all schools using integrated curriculum, the largest percentage (45.12%) described themselves as rural, followed by suburban (32.93%), then inner

Table 3

Comparison of IC and Non-IC Schools by School Type

School Classification	School Type	IC Schools	Non-IC Schools
Elementary Schools	Rural	41.07	76.67
	Suburban	32.14	10.00
	Inner-City	17.86	13.33
	Other	8.93	0.00
Middle Schools	Rural	57.14	81.82
	Suburban	42.86	0.00
	Inner city	0.00	18.18
	Other	0.00	0.00
High Schools	Rural	22.22	75.00
	Suburban	66.67	15.00
	Inner-City	11.11	10.00
	Other	0.00	0.00
Other Schools	Rural	80.00	100.00
	Suburban	0.00	0.00
	Inner city	20.00	0.00
	Other	0.00	0.00
All Schools	Rural	45.12	83.72
	Suburban	32.93	6.98
	Inner City	13.41	9.30
	Other	8.54	0.00

city (13.41%), and finally, Other (8.54%). Non-IC schools, on the other hand, were predominantly rural (83.7%) with fewer than 10% describing themselves as urban (9.4%) or suburban (6.98%), and none in the other type. Table 3 presents these data.

Student Socio-Economic Status

Across all schools, the greatest number (46.77%) described their student populations as primarily low socio-economic status (SES), the second largest number (41.94%) described their students as primarily middle SES, while only 11.29% had high SES students. Among all Non-IC schools, a much larger percentage (65.96%) described their students as low SES, while smaller percentages enrolled middle (31.91%), and high (2.13%) SES students. Table 4 presents a summary of these data. It should be noted that those schools that do not use any form of integrated curriculum are more likely to be populated with students from lower socio-economic status families as well as more likely to be rural.

Table 4

Comparison of IC and non-IC Schools on Socio-Economic Status

<u>School Classification</u>	<u>Socio-Economic Status</u>	<u>IC Schools</u>	<u>Non-IC Schools</u>
Elementary Schools	Low	45.95	73.68
	Middle	37.84	26.32
	High/Affluent	16.22	0.00
Middle Schools	Low	42.86	80.00
	Middle	42.86	20.00
	High/Affluent	14.29	0.00
High Schools	Low	44.44	44.44
	Middle	55.56	44.44
	High/Affluent	0.00	11.11
Other Schools	Low	55.56	64.29
	Middle	44.44	35.71
	High/Affluent	0.00	0.00
All Schools	Low	46.77	65.96
	Middle	41.94	31.91
	High/Affluent	11.29	2.13

Level of Teacher Involvement with IC

Table 5 presents the numbers of teachers by school classification using integrated, interdisciplinary or multidisciplinary curriculum. This Table seems to indicate that in schools where integrated curriculum is used, such use is not confined to isolated classrooms, but rather is a more widely used, and hence, accepted way of structuring teaching and learning experiences. For example, at all levels, more than fifty percent of schools, regardless of classification, report from 2 to 10 teachers involved in the use of integrated curriculum. While this might seem discouraging

at first glance, knowing that a ratio of 30 students to 1 teacher is not uncommon repudiates that impression. When the data for IC schools from Table 1 is taken into consideration, it would seem that, in all classifications except high school, more than half the faculty and students are involved in the use of integrated curriculum.

Table 5

Percent of Teachers Who Use Integrated Curriculum

<u>Number of Teachers</u>	<u>2-5</u>	<u>6-9</u>	<u>10-14</u>	<u>15-20</u>	<u>21-30</u>	<u>>30</u>
Elementary	33.9	19.6	12.5	19.6	14.3	
Middle School	42.9	14.3	14.3	14.3	14.3	
High School	30.0	40.0	10.0	20.0		
Other	72.7	27.3				
All Schools	39.3	19.0	13.1	15.5	10.7	2.4

Type of Teacher Use

Schools were queried about the type of teacher use of integrated curriculum. See Table 6. These data seem to show that a relatively large percent (69.5%) of teacher involvement with integrated curriculum in Missouri schools is through a team approach rather than use by individual teachers in isolated classrooms. However, while 51.2% of all schools report three or more teams of teachers using integrated curriculum, this extent of use is more prevalent at the elementary and middle school levels, with 61.1% and 71.4% respectively. High Schools (70.0%) and other schools (72.8%) report that their use of integrated curriculum involves individual experimentation or only one or two teams involved with initial experimentation which could give credence to an earlier assertion, especially at the high school level, that a subject centered approach stultifies attempts at curriculum integration (Beane, 1991).

Table 6

Type of Teacher Involvement

	<u>Elem</u>	<u>Middle</u>	<u>High</u>	<u>Other</u>	<u>All Schools</u>
Little awareness or experimentation.	14.3%	10.0%	9.1%	3.7%	
Individual teachers aware/some experimentation.	25.9%	50.0%	27.3%	26.8%	
1-2 teams involved in initial experimentation.	13.0%	14.3%	20.0%	45.5%	18.3%
3 or more teams use IC with parts of some curricular units.	25.9%	42.9%	10.0%	9.1%	23.2%
3 or more teams use IC with more than one complete unit.	35.2%	28.6%	10.0%	9.1%	28.0%

Level of Success with IC

Principals rated the level of success of their staffs' use of integrated curriculum. These ratings were collected via a four-point scale ranging from 1 (low) to 4 (high). Table 7 presents these mean ratings by school classification. In spite of the high schools reporting a large number of staff using integrated curriculum, their success rating is low. This may be due to the fact that even with the current high interest in and experimentation with block schedules at the high school level, most high schools are still not structured in ways that facilitate implementation of an integrated curriculum. The prevalent six or seven period high school day in which students move from classroom to classroom at 50-55 minute intervals means that any success at all with integrated curriculum would entail heroic efforts on the part of both staff and students. More middle school principals wrote comments about levels of success than did principals of other school categories. For example, several wrote that it was, Too early to determine success or that they were, Unsure about the criteria for judging success. These responses suggest that perhaps middle level principals tended to be a bit more cautious about rating the level of success of their use of integrated curriculum than did their colleagues at other school levels. Many of these comments came from principals of schools with longer histories of involvement with integrated curriculum.

Table 7

Principals' Ratings of Level of Success with Use of Integrated Curriculum

Mean Elementary	3.07
Middle School	2.36
High School	2.10
Other	2.91
All Schools	2.88

Initiation of Use of IC

Principals were asked to describe how integrated curriculum had been initiated in their schools. All the IC schools reported that principals or central office administrators were involved at some level in large percentages of the initiation efforts for using integrated curriculum. For example, initiation was by teachers or teams of teachers and the principal in 45.7% of the schools, and by the principal in 12.3% of the schools. Classroom teachers initiated use in 41.2% of schools. Three IC schools reported other initiators of use, however. One said that their school became involved with integrated curriculum after a district cadet teacher introduced the ideas to the faculty; one reported initiation of use after the superintendent and school board directed them to begin use; and one school reported that they initiated use of integrated curriculum as a result of consortium meetings with

local college faculty. Among the elementary schools, principals were involved in all of the initiation efforts.

In 80% of the schools the principal, along with one or more teachers, initiated the use of integrated, interdisciplinary or multidisciplinary curriculum; in only 20% of the elementary schools use was initiated by the principal alone. For middle schools reporting use of integrated curriculum, principals were involved in initiation efforts with one or more teachers in most of the schools (62.5%). In 12.5% of the schools, the principal initiated the use. In one case, this initiation occurred after the principal attended several state department meetings where integration was being encouraged. Classroom teachers initiated the use of integrated curriculum in 25% of the middle schools. From analysis of the total sample of IC schools, the following patterns appear to be emerging. For example, elementary and middle schools reported that principals were highly involved in initiation of use efforts, while high schools and other schools reported dramatically less involvement by the principal in initiation efforts. Teachers appear to be the initiators of curriculum integration efforts without the involvement of principals in increasing numbers as we look at schools from the elementary to high or other classifications of schools.

Support Mechanisms for Use of IC

Principals were asked to describe the methods they used to support integrated, interdisciplinary, or multidisciplinary curriculum. These data show that in addition to the expected support mechanisms in use by principals (i.e., common planning time, staff development, and material resources), several less frequently reported support mechanisms were also being used. For example, policy statements about integrating curriculum and instruction, and initiation and encouragement of continuous dialogue about student learning. More specifically, among all IC schools, principals reported the following support mechanisms: frequent classroom visits, observations of classes, supportive conferences with teachers, listening to their success stories and problems, provision of instructional materials and supplies, scheduling faculty meetings for teacher sharing and problem-solving, cross-referencing Missouri Mastery Achievement Test (MMAT) objectives with units as they are being developed, use of outside consultants to help in developing curriculum units, participation in a research group with a nearby university, forming a partnership with another school to establish a focus committee for curriculum integration, establishing dialogue structures (e.g., study teams, informal forums, etc.) to ensure faculty talk about learning, and encouragement of teacher use of whole language as a vehicle for integration and of cooperative learning as an instructional model that facilitates integration.

Principals also reported staff development on integrative techniques, common planning times within the work day, encouragement of interdisciplinary teams, promoting discussion of means and ideas at regularly scheduled meetings (twice per month), encouraging innovative thinking,

adopting policy statements supportive of integrated curriculum, and establishing an acceptance of experimentation within the school culture as ways of supporting the use of integrated curriculum. Middle school principals also reported establishing supplemental team planning times, block scheduling, and teacher involvement in shared decision making as support mechanisms for integrated curriculum. High school principals also reported encouragement of department chairs to plan discussions about integrated curriculum at department meetings, consideration and adoption of 8-block schedules, and informal promotion of the idea(s) during staff evaluation conferences as mechanisms used to initiate integrated curriculum.

Teacher Involvement in Building Decisions

Considerable research shows that the amount and type of teacher involvement in decisions at the building level can be used as an indicator of teacher empowerment, and hence, may serve as a proxy measure of the progress of efforts to implement innovations such as integrated curriculum (e.g., Husband & Short, 1994; Valentine et al., 1993). In order to ascertain the type and level of teacher involvement in decision making processes in IC schools and Non-IC schools, principals were asked to categorize the nature of teacher involvement on sixteen items representing seven categories believed by the researchers to be important. Principals the level and type of teacher involvement in these decisions by responding to a five-point Likert-type scale. Mean responses for each of the 16 items for both IC schools and Non-IC schools were calculated and an analysis of variance was used to determine the significance of differences between means across all schools. Seven of the 16 items yielded significant differences between means across all schools. See Table 8. Principal responses to this series of items indicate that teachers appear to be more involved in building decisions in schools that use integrated, interdisciplinary, or multidisciplinary curriculum than they are in Non-IC schools.

Table 8

A Comparison of Differences Between Mean Responses of IC Schools and Non-IC Schools on Teacher Involvement in Decision Making

<u>Mean Item</u>	<u>User</u>	<u>Non-User</u>	<u>F</u>
Selection of support staff.	2.167	1.435	13.384****
Selection of teaching staff.	2.154	1.557	9.230***
Evaluation of support staff.	1.582	1.287	3.761*
Budget development at the building level.	2.455	1.931	4.946**
Budget allocation at the building level.	2.169	1.557	8.938***
Staff development content.	4.141	3.871	2.867*
Staff development format.	4.091	3.667	6.082**

*p<.10 **p<.05 ***p<.005 ****p<.0001

Discussion, Implications, and Conclusions

This study presents the results of the first phase of a broad-based research effort being conducted by researchers at the University of Missouri-Columbia. These data seem to indicate that in schools where an integrated approach is used, such use is not confined to isolated classrooms, but rather is a more widely used, and hence, accepted way of structuring teaching and learning experiences. Teachers in schools that use integrated curriculum tend to have greater involvement in decision processes than do teachers in Non-IC schools. Information about the initiation of use of integrated curriculum and about support mechanisms consciously developed and used by principals are also reported.

The base-line data reported in this paper are important to the development of both regional and state policy regarding integrated curriculum. Given that the state of Missouri, like neighboring states, is currently in the process of developing curriculum frameworks, and that these curriculum frameworks emphasize integrated or interdisciplinary curriculum, reports describing current conditions and practices should assist policy makers as well as practitioners seeking guidance for future actions regarding use of integrated curriculum in the schools. Non-IC schools are mainly rural (83.7%) and have student populations with large numbers of low SES students (65.96%). This may be attributable to the fact that in rural areas school leaders are subjected to less pressure from parents and community members to adopt innovations that may be readily accepted and adopted in suburban or urban schools. This highly rural nature of the Non-IC schools may also reflect the fact that staff development is simply less available to school staff in rural areas. But, for whatever reason, given the high percentage of rural and low SES schools that are NOT involved with any type of integrated curriculum, policy maker attention should be drawn to the potential requirement for provision of special assistance to these types of schools if they are expected to be successful in implementing the newer research on teaching learning.

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numbers of people well and served as a useful "social glue" that has bonded Americans, regardless of social class, in a common set of shared experiences."

David G. Armstrong
Texas A&M University
College Station, Texas

"While there is much rote learning in schools throughout the world, in some countries I find great emphasis on problem solving, applications of principles, analytical skills, and creativity. Such higher mental processes are emphasized because it is believed that they enable students to relate their learning to the many problems encountered in day-to-day living. These abilities, which are retained and used long after the individual has forgotten the specifics of the subject-matter taught in the schools, are regarded as essential characteristics needed to continue learning and to cope with a rapidly changing world. Some also believe that higher mental processes are important because they make learning exciting.

In these countries, subjects are taught as methods of inquiry into the nature of science, mathematics, the arts, and the social sciences. These subjects are taught as much for the ways of thinking they represent as for their traditional content. Much of this learning makes use of observations, reflections on observations, experimentation with phenomena, and the use of firsthand data and daily experiences as well as primary printed sources. All of this is reflected in the materials of instruction, the learning and teaching processes used, the questions and problems used in quizzes, formative testing, and final summative evaluation.

In sharp contrast to these teaching methods, teachers in the U.S. use textbooks that rarely pose real problems. The textbooks emphasize specific content to be remembered, and give students little opportunity to discover underlying concepts and principles, and even less opportunity to attack real problems in their environment.

I believe that the higher mental processes should be taught as early as the first grade, where ideas can be related to day-to-day situations in the lives of the children. Even at that level, the higher mental processes can make learning exciting, constantly new, even playful."

Benjamin Bloom
The University of Chicago

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