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ABSTRACT

Considerable research supports the notion that individuals' level of cognitive complexity influences their behavior. This paper presents findings of a study that explored the relationship between principals' supervisory beliefs and the implementation of integrated-curriculum approaches. The first phase of the study surveyed a total of 400 elementary, middle/junior high, and senior high schools in Missouri about the extent to which they used integrated-curriculum approaches. Phase 2 involved followup interviews with an unspecified number of principals from the schools identified as using integrated curricula. One-half of the principals were from schools reporting higher levels of use and one-half were from schools reporting lower levels of use. The interviews, which included a subset of scaled items from Schommer's Epistemological Questionnaire, 2nd revision (1989), assessed supervisory practices, epistemological belief systems, teacher-team planning practices, and teacher involvement in decision making. The data did not support the expected relationship between the extent of implementation of integrated curriculum and principals' epistemological beliefs. Conclusions that can be drawn from this study include: (1) As teachers gained experience with integrated curricula, their use became more sophisticated; (2) teachers relied less on textbooks and more frequently used an approach focusing on important themes; (3) schools using integrated curriculum reported that teachers and students took a renewed interest in learning; (4) the use of integrated curriculum in Missouri schools was on the increase; (5) schools rarely had a formal support structure in place for planning; and (6) support structures and time are essential for effective implementation of school reform efforts. (Contains 22 references.) (LMI)

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This paper presents results from Phase II of a broader based research effort conducted at a large comprehensive midwestern university. The purposes of this phase of the research were to explore relationships between implementation of integrated curricular approaches, supervisory beliefs and practices, and school reform. Follow-up interviews were conducted with a purposefully selected subset of principals of schools using integrated curriculum. The interview items were designed to gather more in-depth information about supervisory practices and belief systems supportive of integrated curriculum, changes in use since the initial survey, teacher team planning practices and supports, and teacher involvement in decision making. In addition, the interview protocol included a subset of scaled items, extracted from Schommer's Epistemological Questionnaire, 2nd revision (1989), to probe principal beliefs concerning certainty of knowledge and avoidance of ambiguity. Analysis of the data did not seem to support the expected relationship between the extent of implementation of integrated curriculum and principals' epistemological beliefs, as measured by the Schommer survey.

A number of other conclusions, however, can be drawn from this study. These are: 1. As teachers gain experience with integrated curriculum, their use becomes more sophisticated. 2. Teacher reliance on textbooks has lessened while an approach centered more on important themes from key content areas has increased with the use of integrated curriculum. 3. Schools using integrated curriculum report that teachers, as well as students, are taking a "renewed interest in learning." 4. The use of integrated curriculum is increasing. 5. Principals, teachers, and students seem to feel it is an effective way to design instruction, however there is rarely a formal support structure in place for its planning. 6. Support structures and time are essential for effective implementation of school reform efforts.

Principals' Epistemological Beliefs and Their Support of Integrated Curriculum

by

Daisy E. Arredondo and Terrance T. Rucinski

Introduction

Considerable research supports the idea that "humans behave in accord with the level of complexity of their mental structures" (Reiman & Theis-Sprinthall, 1993, pp.180-181). For example, a study of school principals (Silver, 1975) found that higher levels of cognitive complexity tended to show more democratic behaviors with teachers. More cognitively complex teachers tended to use more diverse and effective teaching strategies, showed greater empathy with students, and were more willing to innovate (Miller, 1981). Similarly, reviews and meta-analyses of developmental research by Rest (1986) and Miller (1981) confirm that higher order stages of cognitive developmental reasoning are predictive of complex professional behavior. Higher level cognitive mental structures are characterized by a view that knowledge is not a "given" but instead is actively constructed within a specific context, as well as by the idea that claims are understood in relation to the context in which they were generated (King & Kitchner, 1994).

Teachers' beliefs about learners, curriculum, and numerous other factors directly influence and/or mediate classroom practice (Clark & Peterson, 1983; Clark 1988). For example, classrooms that differ in goal orientation have an impact on the learning strategies students employ, the degree to which they seek out and persist with challenging tasks, and the attributions they make for success and failure. We are also aware that teachers' fundamental views about knowledge and how it is acquired influence how reform efforts are enacted in classroom practice (Prawat, 1992). What has not been systematically studied is how principal's views about knowledge and learning (epistemological beliefs) might affect the use of or the implementation of a particular set of strategies in a school. [Here, we use the term "epistemological beliefs" to refer to the beliefs one holds regarding the structure, source, and certainty of knowledge, as well as the source of control of the knowledge acquisition (Schommer, 1990).]

Integrated curriculum is central to the contemporary vision of truly effective schools designed to accommodate learner diversity. Integrated or interdisciplinary curriculum units designed to involve students in complex thinking processes such as problem solving, decision making, investigation, experimental inquiry, and invention provide ideal vehicles for students to develop and meaningfully use knowledge (Bransford, Vye, Kinzer, & Risko, 1990; Marzano, 1992; Roth, 1990). It would seem reasonable, then, that schools should move forward in implementing an integrated instructional program as an integral part of reform efforts. Subject associations such as American Association for the Advancement of Science, the National Science Teachers Association, and the National Council of Teachers of Mathematics, have also supported this approach to school reform.

Study Purposes and Methods

This paper presents data from Phase II of a broad based research effort conducted by researchers at a large comprehensive midwestern university. The purposes of this research were: (1) to ascertain the extent of implementation of integrated or interdisciplinary curriculum; (2) to determine how such curriculum has been initiated and supported at the building level (completed in Phase I); and (3) to explore relationships between implementation of integrated curricular approaches, supervisory beliefs and practices, and school reform (in Phase II).

Four hundred elementary, middle school/junior high, and senior high schools were selected as part 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 to gather demographic data, information about the extent of use of integrated curricular approaches, initiation and support of such use, etc. Survey items were designed to collect both qualitative and quantitative information. Results from Phase I of the study have been reported at national meetings and published in scholarly journals (Arredondo & Rucinski, 1995a, 1995b). This paper presents findings from a preliminary analysis of Phase II data.

In Phase II, follow-up interviews were conducted with a purposefully selected subset of principals of schools using integrated curriculum. Half of the interviewee sample was selected

from principals reporting higher levels of use of integrated curriculum in their schools and the other half from those principals reporting lower levels of use. The interview items were designed to gather more in-depth information about supervisory practices and belief systems supportive of integrated curriculum, changes in use since the initial survey, teacher team planning practices and supports, and teacher involvement in decision making. In addition, the interview protocol included a subset of scaled items, extracted from Schommer's Epistemological Questionnaire, 2nd revision (1989), to probe principal beliefs concerning two of the more robust subsets of factor structures identified in her questionnaire: certainty of knowledge and avoidance of ambiguity.

More specifically, research questions of interest were: 1. Do principal beliefs about knowledge and learning have an effect on their adoption or support of integrated curriculum as a reform effort? 2. Do principals believe that teachers should use integrated curricular approaches? 3. Do principals believe that use of integrated curriculum has benefited students? If so, how? 4. How does teacher use of integrated curriculum change over time? 5. To what extent are teachers involved in team planning and what are the major difficulties principals identify with teacher team planning? 6. Does there seem to be a relationship between teacher involvement in school decision-making processes and their involvement with peer observation and/or mentoring activities?

Data Analysis and Results

Schommer's original questionnaire contained sixty-three items, eleven of which were concerned with certainty of knowledge and avoidance of ambiguity. The principals were asked to respond to these eleven items using a 5 point scale, 1 meaning strongly disagree to 5 meaning strongly agree. Principals' mean scores on the two subsets were recorded. According to Schommer, the higher an individual scores on the subsets, the less "sophisticated" are that person's beliefs. From her perspective, individuals holding sophisticated views of knowledge generally believe that knowledge is constantly evolving and thus uncertain, some knowledge has yet to be discovered, and relatively small amounts are considered unchanging (Kardash & Scholes, 1996).

Analysis of these data proved interesting. There did not seem to be the expected relationship between the extent of implementation of integrated curriculum and principals' epistemological beliefs, as measured by the Schommer survey. For example, the principals with lower mean scores on both subsets of the survey (and hence holding more sophisticated beliefs about knowledge and learning) reported approximately half the staff and ten per cent of the staff, respectively, used integrated curricular approaches to instruction.

The principals seemed to be somewhat more comfortable with the belief that knowledge is uncertain than they did with avoidance of ambiguity. For example, eighty percent had an average score below 2.67 on the subset uncertainty, whereas the opposite appeared to be the case with the avoidance of ambiguity items, with two-thirds of the interviewed principals scoring above 2.40. From these data, one might surmise that at least the acknowledgment of the uncertainty of knowledge is a familiar part of an administrator's role. More likely, however, these are simply spurious data, since the purposeful sample of principals would not allow generalizability of the findings.

Responses to interview questions were analyzed using constant comparison methods, e.g. themes/categories were identified and collapsed to eliminate redundancies. Analysis of principal responses to interview questions two and three lend support to the idea that the epistemological ratings data are suspect. In response to question 2, about whether they believed that more teachers should be using integrated, interdisciplinary or multidisciplinary teaching, only one principal thought that her teachers should not expand their use of integrated approaches. Typical responses to this question included: "Yes, I believe that students learn better when they can see relationships between subjects." "Oh, yes. It's a better way for kids to connect things together; and, of course, it helps with transfer." "Oh absolutely! It adds excitement to the classroom when students can engage in tasks with real meaning." "Yes. Because life is not in neat little compartments. They need to see the interconnection."

Responses to question 3, about benefits of integrated instruction, contained both teacher and student themes. For example, principals saw added meaning, relevance, and cohesiveness of

student learning as benefits of integrated instructional approaches. They described integrated curricular units as "authentic learning", as more "natural", and as a way of "getting kids to see that learning is a process and that they can think about how they learn". Principals also described integrated curriculum as a way to get students to see that learning as a group is valuable and that it is not just something that is done in isolation. Somewhat surprising, however, were the benefits to teachers that principals identified. For example, they described increases in teacher interest and excitement for teaching, decreased levels of boredom, and a rejuvenating effect of teacher learning. One principal said that using integrated approaches to teaching "prevented teacher burnout" and caused her teachers to think about their own learning. Another said, a "revival of adult learning was evident" and that the "whole school seems to have become more of a learning community". A second teacher theme also emerged. Principals reported that integrated curricular units allowed teachers to "get everything in", that "teachers seemed to have traded the preparation of five or six smaller lesson plans for one that was more complex." This additional complexity appeared to have made planning a bit easier.

In response to the interview question about how teacher use of integrated curriculum had changed over time, about seventy percent of the principals reported an increase in use. The remaining thirty percent of the principals reported that use had stayed the same or decreased slightly. The principal reporting decreased use attributed the decrease to loss of staff because her building had experienced a decrease in student population. The most frequently cited type of change in use of integrated curriculum was in what several principals labeled as a "more sophisticated approach". These principals described this type of use as "better planned", "more important themes being selected", "better choices about transferable concepts", "greater integration across science and math", "integration of key ideas and concepts from other content area, not just language arts and reading or social studies", and as "less frivolous" units. Another type of change identified by principals was in the use of additional materials. For example, one principal said they were moving more to a holistic curriculum, with less reliance on isolated subject textbooks, that they had "spent tons of money on trade books". Another principal said that in spite of the fact that

textbook companies packaged materials so that it was difficult to just pull out segments to support integrated units, that his teachers were still moving more toward using them as support materials for the units they created. Still another cited a movement away from district developed curriculum units and more to those designed at the specific building or classroom level. A final category of change in use centered around an increase in cooperative learning strategies. As teachers became more comfortable with the integration of curricular subjects, they seemed to find that cooperative or collaborative learning strategies helped students learn better.

In response to interview questions about the extent of teacher use of team planning and about the most difficult aspects of teacher team planning, principals reported both an increase in the number of teams and, overwhelmingly, that time was a major constraining factor. These constraints limited the number of teachers who were able to plan as teams, as well as the amount of time involved in planning integrated curricular units. Even those teachers who had scheduled team planning time were forced to do considerable amounts of planning as individuals. In other words, there was no organized structure for supporting team planning.

Some problems in team participation cited were "ownership of ideas" and hence unwillingness to share "neat projects", difficulty in articulation of desired outcomes, and resolution of differences in beliefs and philosophies in a positive manner. One principal went on to say that her staff needed "staff development workshops on conflict resolution." It would be difficult to say, however, that it is team planning and not something else that led her to that conclusion. On the other hand, one principal reported that he had not participated in team meetings but had the impression that the teachers "work O.K." together.

In response to the interview question about whether teacher involvement in school decision-making processes had coincided with teacher use of peer observation or mentoring, principals reported little or no involvement with these processes. One principal reported that some team members do coach newer faculty as they are added to the team, and that he always tried to "free up new teachers to watch more experienced ones". Another "longed for the day when peer coaching would be standard practice"; one principal said that Missouri's emphasis on use of a

performance based teacher evaluation system (the P.B.T.E.) "got in the way of such involvement"; most principals, however, said that none of their teachers were involved in observation or mentoring processes.

Conclusions

There is evidence that the epistemological beliefs of students have some predictive effect on various comprehension and metacomprehension tasks (Schommer, 1990, 1993; Schommer, et al, 1992). There is also some evidence that preservice teachers' views about informal and formal evaluation practices indicate they are related to their espoused epistemological beliefs and that, of the four factors identified by Schommer, certainty of knowledge is the strongest predictor (Kardash & Scholes, 1996). It would seem reasonable that epistemological beliefs of principals, especially those related to the certainty of knowledge, might have an effect on their supervision and evaluation practices as well as theories of teaching and learning to which they might be predisposed to support in their schools. Phase II of this research project attempted to assess the reasonableness of this assertion.

But is this a reasonable assertion? Some of the data collected in this study suggest that it is not. In spite of the fact that the principals generally reported an increase in the use of integrated instruction and that it seemed to be beneficial to the students, we can come to no generalization from the data collected about this use of intregrated curriculum and their epistemological beliefs. The size of the sample surely affected the results. Alternative explanations may also exist, however. While other research studies (e.g., Kardash & Scholes, 1996; Schommer, 1993) have supported the Schommer factor structure, the appropriateness of extracting subset items and using them in interview protocols is unclear. A combination of larger sample size and modification of the interview instrument may yield more reliable data.

A number of other conclusions, however, can be drawn from this study. As teachers gain experience with integrated curriculum, their use becomes more sophisticated. Teacher reliance on textbooks has lessened while an approach centered more on important themes from key content areas has increased.

Schools using integrated curriculum also report that their teachers, as well as their students, are taking a "renewed interest in learning." Learning becomes more meaningful to the students, they begin seeing that school is "not a series of isolated lessons."

The use of integrated curriculum is increasing. Principals, teachers, and students seem to feel it is an effective way to design instruction, however there is rarely a formal support structure in place for its planning. As has been shown elsewhere, support structures and time are essential for effective implementation of school reform efforts. This study lends support to that finding.

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