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ABSTRACT

Staff developers who have worked intensively with teachers to promote higher order thinking tend to emphasize similar types of training activities, especially involving teachers in higher order thinking and authentic problem solving in their subjects and translating ideas about the teaching of thinking into specific lessons for students. Developers stress the importance of teachers working with colleagues to formulate their own goals and strategies for thinking. But staff developers also perceive substantial barriers to progress, such as demands for curriculum and assessment that perpetuate lower order cognitive activity, and the lack of time and organizational support needed to develop conceptions of teaching more consistent with higher order thinking. Examples of two staff development programs are appended. (Author/JD)

STAFF DEVELOPMENT FOR HIGHER ORDER THINKING: A SYNTHESIS OF PRACTICAL WISDOM

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ABSTRACT

Staff developers who have worked intensively with teachers to promote higher order thinking tend to emphasize similar types of training activities, especially involving teachers in higher order thinking and authentic problem-solving in their subjects and translating ideas about the teaching of thinking into specific lessons for students. Developers stress the importance of teachers working with colleagues to formulate their own goals and strategies for thinking. But staff developers also perceive substantial barriers to progress such as demands for curriculum and assessment that perpetuate lower order cognitive activity and the lack of time and organizational support needed to develop conceptions of teaching more consistent with higher order thinking.

INTRODUCTION

The Problem

For years teachers have been urged to change their ways. Instead of spending so much time transmitting information and covering material, critics have told them to devote more attention to enhancing students' ability to reason, to create, to solve problems - in short, to think. What it means to think and the extent to which it can be improved through teaching are, of course, problematic issues.[1] Based on a review of literature, especially Schrag (1988), we define higher order thinking as the interpretation, analysis, or evaluation of information to solve a problem that cannot be solved through routine application of previously learned knowledge (Newmann, in). To succeed in higher order challenges, students must apply in-depth knowledge, skills and dispositions to the problem at hand. Examples of teachers or programs that concentrate on the teaching of thinking have been reported, but there is good reason to believe that in most classes, the persistent paradigm - teachers giving out information and students giving it back - continues (Goodlad, 1984; McNeil, 1986; Powell, Farrar & Cohen 1985; Sizer, 1984).

A substantial literature on school change indicates tremendous difficulties in making deliberate, fundamental changes in the ways that teaching is conducted (Berman & McLaughlin, 1978; Cuban, 1984; Little et al, 1987; Popkewitz, Tabachnik & Wehlage, 1982; Sarason, 1971). Neither supplying teachers with new curriculum developed by national experts, nor offering them periodic in-service workshops have led to substantial long-term impact. Studies seem to agree that if fundamental change is to occur, it will require not only more intense, long-term technical assistance for teachers, but also changing the teaching job itself to support professional development on a daily basis through more collegial interaction (Fullan, 1985; Huberman & Miles, 1984; Little, 1981; McLaughlin & Marsh, 1978; Saxl, Miles & Lieberman, 1988; Stevenson, 1987).

Much of this literature on school change argues that for innovations to be institutionalized, teachers must come to "own" them, and for this to happen, innovations or changes in practice must be crafted and adapted by teachers themselves to suit local needs. In this sense, teachers must be empowered; change cannot be imposed by outside experts. At the same time, technical assistance from authorities beyond the school is often necessary to familiarize teachers with and to stimulate interest in new developments in the profession.

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[1]Recent reviews of literature related to the teaching of thinking are offered by Nickerson (in press), Resnick (1987) and Sternberg and Bhana (1986). Proposals for approaches to the teaching of thinking are found in Chance (1986); Costa (1985); Educational Leadership (1988, 45:7); Marzano, Brandt, Hughes, Jones, Presseisen, Rankin & Suhor (1988), Walsh and Paul (1987).

What particular forms of assistance are most likely to help teachers develop a pedagogy that fosters higher order thinking? What changes in the organizational features of high schools may be required for this assistance to pay off in terms of teacher ownership of pedagogy that promotes higher order thinking more consistently? Unable to locate useful research on this issue, we decided to explore it by interviewing authorities with extensive experience in helping high school teachers increase their emphasis on higher order thinking. The purpose of the study is to synthesize the experience and insights of these staff developers. Their practical wisdom should be helpful to schools and districts when considering how to approach staff development for higher order thinking.[2]

Methodology

Through a national search, twenty five persons were selected on the basis of nominations and a telephone interview to participate in the study. Beyond their reputations as highly respected professionals and our impressions from exploratory interviews with each nominee, we had no evidence of the developers' actual effectiveness in working with teachers. It is possible, therefore, that some of the developers were no more qualified than many insightful teachers in addressing this topic. But even with this degree of uncertainty about the expertise of our staff developers, we considered it useful to see whether an informal knowledge base exists on this topic.

The staff developers include faculty in colleges and universities, curriculum specialists in state and local education agencies, and other professionals working for special projects.[3] In this study they completed two lengthy phone interviews (questions were mailed in advance) and two written questionnaires. First we asked them to reflect upon their efforts to assist teachers and to select from these a single program or intervention that they considered most effective in improving teachers' ability to promote higher order thinking.[4]

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[2]This study grows out of a larger research project which is investigating how to overcome a number of barriers to the promotion of higher order thinking in high school social studies (Newmann, 1988).

[3]Our search for experts specified three criteria: (a) experience working with at least six high school teachers for a sustained period of time (e.g. minimum of 6 hours) spread over several meetings, preferably with teams of teachers from single schools or districts; (b) sufficient interaction between the staff developer and the teachers so that the developer can comment on the ways that teachers view higher order thinking, their subject areas, their students, their competencies, and organizational features that influence their teaching; and (c) if possible, access to evidence regarding the results of or reactions to the staff developer's intervention. Thanks to the cooperation of people and organizations involved in the movement to promote thinking in schools, over 100 staff developers were nominated. Twenty five were invited to participate, and all agreed; their names and affiliations appear in Appendix A.

[4]Staff developers participated in a variety of interventions, but comparable data on their effectiveness are not available. Rather than discussing interventions in a general way, we felt that

They described the major goals of this program, the strategies and activities that seemed most successful, and the difficulties and obstacles they encountered. Analysis of initial data suggested areas for clarification and elaboration. In the second interview, we asked how they dealt with such issues as content versus skills, depth versus coverage, at-risk students, possible remedies for the barriers they recognized, and assessing the effectiveness of their efforts.

The staff development programs included high school teachers in all of the main academic subject areas, but only a few programs focused on single subjects. The interventions varied enormously in the number of teachers involved (from 6 to 300), but the average program involved 24 teachers, and about half worked with 12 to 40 teachers. The programs reached schools of low, medium and high enrollments and schools with low, medium, and high percentages of minority and lower income students. The training occurred over periods that varied from 2 days to 42 weeks, but about two thirds of them ran for 12 weeks or less. In 70% of the programs, the actual time spent by teachers in training was the equivalent of at least six 8-hour days. Most of the programs provided some released time for the training. Seven programs supported more than twenty teachers with released time and most programs offered either stipends or reimbursement of some expenses. On average, the staff developer devoted about 13 days to the training and was assisted, on average, by 19 person-days of other professional help.

Findings will be described in terms of the goals, activities, barriers and remedies reported by the staff developers. The purpose is to describe general tendencies, areas of agreement and disagreement among the authorities. Accounting for differences among the staff developers based on their roles or institutional affiliations might also be interesting, but our sample is too small and the differences among the developers here are too subtle to warrant such speculations.

GOALS AND ACTIVITIES OF STAFF DEVELOPERS

Goals

We asked the staff developers to describe the major objectives or purposes of their most effective staff development intervention. About 70 different goals were mentioned (roughly three per person) which we categorized into the goals in Table 1. Two thirds of the developers said they were trying to improve teachers' classroom behavior directly by providing them with specific instructional techniques and practices. Close to half of the developers described one of their goals as helping teachers write curriculum that emphasized thinking, and a similar number wanted to develop teachers' conceptual understanding of thinking. One-third wanted teachers to see their instructional role as a

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focusing upon the single one that each developer considered most effective would provide a more concrete and thorough understanding of potentially powerful approaches and optimal conditions.

facilitator of student thinking and learning rather than as a disseminator of knowledge. One in four felt it was important to foster collegiality among teachers and to enhance an academic culture of thoughtfulness. A similar number stressed teacher ownership of the change efforts stimulated through the staff development project itself.

These goals can be categorized more broadly to distinguish between the attempt to affect teachers' thought (e.g., conceptualizing thinking, seeing one's role as facilitator rather than disseminator), to improve teachers' practice directly (e.g., provide alternative instructional practices, facilitate the writing of lessons emphasizing thinking), or to change certain organizational dimensions (e.g., collegiality, teacher ownership of reform efforts). Most staff developers attempted to affect aspects of teachers' thinking and teachers' practice. Yet, almost one-half of the staff developers were concerned also with changes in school organization and culture, especially with regard to staff collegiality, academic expectations, and teacher ownership of reform efforts.

We also asked whether staff developers' goals, with respect to all of their interventions, included special attention to the problem of facilitating higher order thinking with students at-risk, and if so, what were they trying to accomplish. One-third of the sample had not addressed this problem in any of their development efforts. More than a third of them did make deliberate efforts to address special needs of at-risk youth, either through their own initiative or by teacher request. An additional quarter of the developers stated that they did not give special attention to low achievers and at-risk students, but that this omission was quite intentional. They argued that at-risk students should generally receive the same instruction for thinking as other students. Regardless of the extent to which they addressed the issue explicitly, most of the developers framed the problem primarily in terms of correcting common teaching deficiencies to which at-risk students are probably most vulnerable: too much lecture and recitation, low expectations for students, and teachers' lack of knowledge about students' personal lives and culture.

Activities

Staff developers described what they considered to be their most effective activities and strategies, and they offered explanations for their apparent success (see Table 2). Most of the developers stressed the importance of conceptualizing thinking, either generally or with reference to a subject area. Some developers emphasized their own conception of thinking, some had teachers read widely from the diverse literature on thinking to help them construct their own conception, while others discussed thinking in terms of substantive concepts or ideas germane to particular domains (e.g., concepts in mathematics, or epistemic and historiographic issues in social studies).

Detailed analysis of the conceptions of thinking held by the staff developers is beyond the scope of this study, but three general orientations or conceptions seemed to emerge. About two-thirds of the developers view thinking as the interplay of skills and processes in the understanding of subject matter The goal is typically to infuse thinking into a content area to develop skilled thinkers about that content, rather than to develop students' thinking skills in a domain-general sense. These developers would acknowledge the importance of both elements but would tend to place greater emphasis on content

understanding. In contrast, almost one-third of the developers discuss thinking in terms of generic or domain-general skills and processes (e.g., interpretation, evaluation, analysis, metacognition, etc.). These developers are more likely to recommend teaching directly to the thinking skills or processes, rather than infusing them into the existing curricula. Here, content serves as a vehicle to skill and process development. They are also more likely to assume that thinking skills readily transfer from one domain to another. Finally, a few developers discussed thinking in highly context-specific ways that focused on central ideas within a subject, but did not assume or offer any terms that implied general modes, styles, skills, or processes of thinking as necessary to the comprehension of the ideas. For example, a developer might discuss with teachers the concept of irrational numbers in mathematics or historical interpretation in history, and suggest an instructional approach that helps convey the meaning of the concept to students, without referring explicitly to thinking or thinking skills. Our review of the literature (Newmann, in press) favors the first position presented above.

Whatever the approach, developers felt it was important to help teachers build a grammar or common language to discuss their efforts to promote students' thinking. In one program, for example, after reading an article describing the characteristics and dispositions of the good thinker, teachers were to observe their students and then share their observations with peers during the next staff development session. Developers assumed that working toward an articulated conception of thinking can stimulate some teachers to reframe their teaching goals and rationale, releasing them from a previously rigid emphasis on content acquisition.

Most developers stressed the importance of discussion time, structured according to a common set of tasks: (a) review workshop ideas and techniques from previous sessions; (b) brainstorm applications of these ideas and techniques to their own classroom efforts; and (c) share with colleagues recent attempts to incorporate workshop ideas into their own units and lessons. Discussion of particular lesson plans and de-briefings on actual teaching were considered vital for teachers to incorporate workshop ideas into their own practice.

Most of the developers encouraged or required teachers to share instructional practices with colleagues, both as an observer and presenter of actual lessons. Teachers either brought a videotape of their teaching to staff development sessions for group viewing, presented a lesson in front of colleagues in their own classroom, or presented a demonstration lesson in a workshop, with fellow participants assuming the role of students. Discussion of lesson presentations seemed to reduce teacher isolation, foster collegiality and collaborative instructional efforts, and provide an opportunity for teachers to receive constructive feedback on and recognition for their work.

Developers highlighted the importance of modeling instructional strategies, whether in workshops, during visits to teachers' classrooms or on videotape. Examples included demonstrations of Taba's concept attainment approach (1976), cooperative learning and inquiry activities, and strategies for visual thinking. Modeling was usually used to demonstrate specific alternatives to lecture and recitation, allowing teachers to see the results with students. Developers said that when the modeling is done with the teachers'

own students it often raises teachers' expectations for the possibility of high quality discussion and can build credibility for the developer.

About half of the developers found it useful to pose special challenges that require teachers to think, and then to help them reflect upon their own thinking. This may involve paired problem solving tasks (e.g., how to produce twelve sections from an originally whole bagel, using only three straight cuts), group discussion of a novel, film, or contemporary public issue; or teachers role-playing students while the developer conducts specific instruction for thinking (e.g., hypothesis generation, testing, analysis, and evaluation using a computer data base program). Developers see these kinds of activities as building teacher interest and excitement in teaching thinking, building their confidence as competent thinkers, and helping them to articulate more consciously the kind of thinking they wish to promote.

Based on each developer's identification of the activities critical to the success of the intervention he/she considered most effective, we created a list of commonly mentioned activities (see Table 3). Then they were asked to rate on a three-point scale the necessity of engaging teachers in each activity. Three activities were rated as "absolutely necessary" by 24 of 25 staff developers: (a) involve teachers themselves in higher order thinking activities or authentic problem-solving in their subject fields; (b) provide time for teachers to translate ideas about the teaching of thinking into specific lesson activities for students; and, (c) have teachers try out these activities in their classes. An additional four activities were viewed as either absolutely necessary or desirable by all of the developers. The remaining three activities were considered necessary or desirable by over 90% of the developers.

Summary. Combining qualitative discussion of the open-ended responses summarized in Table 2 with quantitative results in Table 3, we found staff developers giving most emphasis to involving teachers in higher order thinking tasks, developing a conception of thinking, allowing substantial time for discussion and application of workshop ideas to specific lessons and classrooms, and modeling instructional strategies by the developers or through peer demonstration lessons. These activities were considered successful on several grounds, including increased teacher confidence and pride, opportunities for peer recognition, greater teacher ownership of and commitment to the intervention effort, reduction in teacher isolation and increased collegiality and collaborative teaching efforts, and the reframing of one's teaching goals and rationale. Appendix B contains narratives of two programs which illustrate more concretely how the goals and activities endorsed by staff developers were applied.

DEVELOPERS' VIEWS OF EFFECTIVENESS

No systematic data had been collected on the effectiveness of these staff development programs, but we were interested in whatever examples the developers could provide of the long-term impact of their efforts. They were asked to describe any lasting changes that took place among two or more teachers as a result of staff development focused on higher order thinking. Most of the developers offered anecdotal examples of ways in which

teachers had seemed to change, but none could provide confirmed accounts or solid empirical evidence of significant and lasting changes in teaching at particular schools. This further confirms the paucity of serious efforts to evaluate the impact of staff development activities (Fenstermacher & Berliner, 1983; Griffin, 1983), especially those conducted by outside consultants.

The most commonly described changes were increased collegiality, curriculum and instruction more focused on thinking, testing procedures more appropriate for assessing thinking, and increased student participation of higher quality. Frequent mention was made of teachers now working together in team teaching, peer coaching, peer observation, and discussion of classroom techniques and other professional concerns. Some developers added that as a result of these practices teachers now shared a more common language. Others cited changes in the writing of curriculum, from a preoccupation with listing of content topics to an emphasis on thinking processes. In general, many teachers apparently now paid greater attention to their instructional methods, having become more aware of their teaching behavior and their effect on student thinking and learning. The increased use of more open-ended tests (e.g., essays and extended writing instead of multiple choice and short answer) and grading practices that emphasized thinking processes were also attributed to staff development efforts. Changes in student behavior were often mentioned as outcomes of staff development for thinking, especially increased student engagement and more active student participation, a result, in part, of increased discussion in small groups.

Despite examples of changes in individual teachers and reports of several supportive principals, the developers generally had not seen changes among a critical mass within a department, or organizational changes at the school resulting from staff development. Given this perceived limited impact of staff development for higher order thinking, it is important to examine the barriers that apparently stand in the way of both individual teacher change and general patterns of instruction in high schools.

BARRIERS TO STAFF DEVELOPMENT FOR THINKING

Developers were asked to describe the most serious difficulties they encountered in the "effective" staff development program we discussed, and also the barriers they believe inhibit staff development for thinking in high schools generally. The barriers were of three general types: (a) teachers' practice, attitudes and knowledge; (b) the demands associated with the standard high school curriculum or with assessment procedures; and (c) the organizational features of high schools (see Table 4).

Teachers' current classroom practices (e.g., emphasis on lecture and recitation) and attitudes were each perceived by half the developers as a problem. Developers noted teachers' underdeveloped teaching skills (e.g., leading discussions), problems in classroom management or control, or general beliefs about teaching that inhibit the promotion of student thinking. Attitudinal barriers included a resistance to change or an unwillingness to experiment with new methods; skepticism toward both the promotion of thinking as a new focus (it was often viewed as another fad or beyond the capability of their students) and toward staff development programs in general (because of previous experiences with

poor quality programs); and the absence of a sense of efficacy and ownership in implementing a different approach to schooling (due to a feeling that decision-making power is centralized in the school administration). Also mentioned were teachers' lack of formal knowledge about thinking, manifested in an inability to articulate a conception of thinking, unfamiliarity with basic processes such as reasoning, and a concern for strategies that are immediately and practically successful.

In regard to the demands of curriculum and assessment, two-thirds of the staff developers found the pressure for content coverage a barrier to changing teachers' practice. Teachers' claimed that demands for covering material in their courses prevented them from devoting time to teach for thinking. Different opinions were voiced about the source of this pressure: some thought it came from curriculum guidelines or tests prescribed by the state or district, others blamed textbooks, while others suggested it was self-imposed by teachers whose own education was dominated by survey courses in which extensive, but superficial, coverage negated opportunities to experience the value of more thoughtful study. Some developers felt the pressure for coverage was used as an excuse to avoid change. Standardized tests and curriculum materials also were mentioned as barriers, quite often independently of content coverage. Tests and existing curriculum materials were seen by developers to be oriented primarily to lower order cognitive tasks, such as recall of discrete facts, and were, therefore, regarded as inhibiting higher order thinking.

Finally, organizational characteristics of secondary schools featured prominently in most developers' discussion of obstacles. They highlighted the lack of time set aside for extensive staff development, for teachers to engage in curriculum development and for other avenues of professional interaction with colleagues (e.g., observing and critiquing classes, discussing and sharing ideas). Several staff developers emphasized that the dominant conception of teacher training and even newer approaches fail to recognize that "people need long, drawn-out experiences to work with and to internalize, through a careful process of dialogue and reflection." Another common theme was the lack of leadership or on-going support from administrators; for example, being subject to supervisors who are unable to model thoughtfulness, or administrators' failure to provide technical resources or even moral support for teachers trying to promote thinking in their classrooms.

Not surprisingly, the lack of funds for releasing and training teachers was mentioned by many developers, and several identified the organizational structure of secondary schools as a barrier. Large class size, the fragmentation and inflexibility of the daily schedule, and the physical isolation and separation of teachers in self-contained classrooms were considered serious constraints. Some developers characterized high schools more generally as non-reflective environments, "not committed to thinking, but to short-term skill development," with the result that "most reflective teachers can't adapt to the environment - they drop out and do something else."[5]

[5]From a broader perspective, one might also consider cultural barriers such as disinterest by the society at large in higher order thinking as a central goal. Our purpose here, however, is not to study all conceivable barriers, but to report those cited prominently by staff developers.

REMEDIES

Staff developers were asked to review the barriers they considered substantial and then to propose any key remedies that would address them. The proposed solutions were often general and predictable. For example, increased release time, summer institutes, and substitute teachers were suggested to give teachers more time to explore alternative approaches, both with outside experts and through peer planning and coaching. More specific ideas were also suggested; for example, having teachers interview and observe students to study more carefully how they think; or creating a national project. such as the National Writing Project, through which networks of teachers at regional sites can work on new models for the promotion of thinking.

One developer who regarded teacher resistance as the most fundamental barrier described two types of resisters: those who think everything is fine and don't see any reason to change, and those who may be interested, but find it very difficult to alter their traditional pattern of behavior. The former, he argued, can't be pressured, but need a critical mass of teachers within the school to gradually bring them "into the fold through very informal kinds of processes where the committed teachers would try ... to entice them into the prospect that maybe they could have more excitement in their classes." The latter, however, need on-going guidance and support from a group in which "they'll feel comfortable enough and non-threatened so they'll really open up to their colleagues and ask for help."

This is consistent with the views of nine developers who recommended restructuring the school schedule so that informal staff development activities could become an accepted and built-in part of teachers' jobs. This might be accomplished by extending both the school day and the school year so that more common time could be available for teachers to work collaboratively. Several mentioned this as part of a needed paradigm shift in the philosophy of administration: the role of district and building administrators must change from managing people to modeling and supporting ideal instructional practices for promoting thinking. One developer stressed the futility of the traditional in-service model, "where outside experts come in and do things to teachers." Instead, he advocated a different model:

> "It has to begin with principals to help their own teachers become more reflective and to enable them at the school site to take ownership of their work, to devise their own approaches. This can't happen unless there are significant organizational changes in the way teachers spend their time and the way curriculum decisions are made. This reflection and curriculum rebuilding must be a part of their daily work schedule, not something done as an add on.

The need for both substantial time to be allocated for professional development and for administrative leadership and support are recurrent themes in the school improvement and staff development literature (Bird & Little, 1983; Courter & Ward, 1983; Little, 1981, 1984; Stevenson, 1987). To inform the conversation on restructuring of teachers' work, we sought an estimate from staff developers of the minimal amount of teacher time during the

regular working day that should be reserved for the activities they considered "necessary" or "desirable" for promoting higher order thinking (see Table 3).[6] On average, staff developers felt that four hours per teacher per week was the minimal amount of time that should be reserved for on-the-job collaborative staff development activities if there were to be significant long-term benefits to the school.

SUMMARY AND DISCUSSION

This study collected and synthesized the practical wisdom of twenty five staff developers experienced in helping high school teachers move from didactic teaching to approaches that more self-consciously promote higher order thinking. Since the wisdom of staff developers on this issue has never, to our knowledge, been previously studied, we were most curious to learn whether common viewpoints would emerge from the diverse group of authorities. Commonly held perspectives on central goals, effective strategies, and central barriers would provide an informal knowledge base to help guide staff development efforts and school policy. The developers offered diverse perspectives, but we heard them sing some important tunes in concert. Their practical wisdom is consistent with literature on staff development in general and on more specific efforts to help teachers promote thinking (e.g. Martin, 1987).[7] This suggests directions not only for the nature of in-service programs, but also for fundamental changes in teachers' work.

In describing their goals for teachers, almost all staff developers wanted to improve instructional practice and teacher thinking that presumably affects classroom practice. In addition, more than half of them saw the need to alter organizational conditions of teachers' work, especially to increase time during the regular school day for collegial interaction and on-going staff development activities for higher order thinking. On average, these twenty five authorities recommend for each teacher at least four hours per week as the minimal amount of time that should be reserved for professional development if it is to have significant long-term benefit in the school.

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[6]To provide a common context for this estimation, the developers were to assume "a comprehensive high school of about 800 students and 80 teachers, without major problems of student discipline and truancy. The dropout rate is about 10%. Generally the teachers are competent in classroom management, but there is significant pressure for broad survey coverage of material. A few teachers from each department are interested in trying to promote higher order thinking and willing to participate in program development, but at this point they have no formal background in the teaching of thinking. The school administration and school board are sympathetic to a significant effort in which 'time will be made available to ensure that staff development becomes an ongoing, regular part of the job of teaching.' But the authorities would like some estimate of the amount of time during the school day that should be made available."

[7]See Journal of Staff Development, Fall, 1987, Vol 8, No 3 for several articles on staff development to promote thinking.

According to at least half of the developers, all of the activities listed in Table 3 are absolutely necessary for effective staff development for higher order thinking, but three received virtually unanimous endorsement: (a) involving teachers in higher order thinking and/or authentic problem-solving in their subject areas; (b) having teachers translate ideas about the teaching of thinking into specific lesson activities for students; and (c) supporting teachers to try out these activities in class.

Regardless of the particular activity for helping teachers, developers consistently emphasized the need to support teachers as reflective practitioners and to provide them with the opportunity to develop goals and strategies autonomously. Specific direction and feedback should come primarily from teaching colleagues, rather than from administrators or outside experts. Administrators can be most helpful by supplying resources, especially time and recognition. Experts can offer analytic schemes, up-to-date literature, and specific curriculum and teaching techniques to consider, but ultimately teachers must depend upon themselves and colleagues for grow .

Developers also seemed to agree on substantial barriers that stand in the way. The barriers reside in teachers' current practices and resistance to change, but also significantly in demands for curriculum and assessment and in organizational obstacles (lack of time and sufficient administrative support for innovation) that suppress teaching for higher order thinking.

Regrettably we lack systematic data on the actual effects of staff development on teachers' thought and practice in promoting higher order thinking, but these interviews shed light on two broader issues in staff development and school change. We will discuss these respectively as the issue of outsiders' expertise and insiders' experience; and the attempt to change individual versus institutional practice.

Outsiders' Expertise and Insiders' Experience

A substantial literature indicates that when outside experts assume teachers are deficient in their thinking and practice and when the outsiders prescribe new visions or solutions to compensate for the deficit, teachers usually fail to accept the advice (Berman & McLaughlin, 1978; Fullan, 1982; Joyce & Showers, 1983). Why? One explanation is that teaching involves a highly uncertain technology with few possibilities for identifying a single "best" approach (Lortie, 1975). Another is that teachers operate according to a "practicality ethic" (Doyle & Ponder, 1977-78) in which current beliefs and practices are often the most functional for responding to the actual requirements of the job. In short, unless outsiders' ideas fit well with the insiders' experiences in their particular schools, the expertise can easily be dismissed. This suggests a fundamental tension between respect for the conceptions and practices that teachers have developed to cope with the status quo and the need to introduce new approaches or paradigm shifts (Marzano, 1987) which may, of necessity, reject basic premises of previous experience.

The developers interviewed here were outside experts, but almost all of them avoided prescribing specific solutions. Instead, they usually presented conceptual material and teaching techniques as resources and options for teachers to consider. These were to

be developed into lessons appropriate for the teachers' particular classrooms, evaluated and revised, based upon the teachers' trial experience and feedback from peers. Thus, although outsiders offered new visions, critiques, and practical suggestions, these were treated less as remedies to be adopted and more as alternatives to be considered and further developed by the practitioners, based on respect for the insiders' experience and their need to "own" whatever innovations seemed reasonable.

Changing Individual versus Institutional Practice

Most of the developers identified barriers to higher order thinking that reside in both individual teachers and in schools as organizations. They recognized the importance of institutional support to sustain changes in individual practice, especially support for collaborative work at the school site and teacher ownership not only of curriculum, but of staff development as well. The remedies they recommended included major organizational changes, but their own interventions and the "most effective" one they described for us focused primarily on helping individual teachers. Developers expressed enthusiasm about apparent growth in individual teachers, but in spite of this, and consistent with other research (Marzano, 1987), they were generally unable to identify high schools or departments in which staff development for higher order thinking had led to long-term instructional changes among a critical mass of staff or to organizational changes required for the kinds of ongoing development they would like to see.

In a sense, then, the full practical wisdom of these developers has never been put to work. Participating usually as outsiders to help teachers in a variety of schools, these authorities have few opportunities to influence the level of local support and continuous development that ought to take place at the school site. In listening to them, we heard a strained ambivalence. On the one hand, they recognized the high probability that without substantial organizational change and on-going institutional support, their efforts alone would have at best marginal influence on students' education. Yet, as a short run strategy, they still considered it worthwhile to assist individual teachers. Individual teacher commitment and technical know-how are certainly necessary, if not sufficient, conditions for the promotion of higher order thinking, and the developers seemed competent to offer both inspiration and technical assistance. To postpone individual training until schools commit themselves to more fundamental reforms could be self defeating, because teachers educated in the promotion of thinking are needed as agents for both incremental and substantial advances in this area.

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APPENDIX B

EXAMPLES OF TWO STAFF DEVELOPMENT PROGRAMS

This program occurred in a two-high school district over a 3 year period. Six full-day workshop sessions were held the first year, involving sixteen teachers, and two administrators. In addition, the developer observed and discussed two lessons with each teacher. During the summer after year one, workshop participants and the developer met to focus on specific district needs, set up long range strategies and goals, and prepare a budget to meet those needs. In the second year, the staff developer encouraged teacher ownership of the change effort by leading the first 4 workshop sessions with 16 new teachers, and then observing as 4 teachers from the previous year conducted the remaining two sessions. Classroom observations of teachers and follow-up discussions continued in the second year. In the final year, the developer conducted five full-day sessions with instructional supervisors from the district, while previously trained district teachers assumed full command of the six teacher workshop sessions with a third group of 16 teachers. For each session substitute teachers were hired to cover the classes of workshop participants. Teachers who served as workshop leaders received a summer stipend for their planning efforts and were occasionally freed from classroom assignment to prepare for an upcoming workshop session.

The developer tried to (a) foster teachers' metacognition, problem solving and critical thinking, (b) heighten teachers' awareness of students' thinking, (c) develop teachers' conception of thinking, (d) model instructional strategies that promote thinking, (e) have teachers conduct thinking oriented lessons with students, (f) modify administrators' "commanding mode" of supervision, and (g) create greater collegiality and interdependence between teachers. Most of these goals are addressed in descriptions of the following activities.

The developer defined metacognition, presented research showing its importance, and modeled for teachers the way he thought through certain problems. To minimize teacher defensiveness and facilitate openness in sharing ideas, he invited criticism of his own thinking and at times intentionally exhibited flawed thinking. He assigned paired problem solving tasks in which teachers shared their thinking with a peer. The developer also presented and discussed classroom strategies to promote students' metacognition, problem solving and critical thinking.

To heighten teachers' awareness of students' thinking and develop their conceptions of thinking, teachers read Glatthorn and Baron's (1985) "The Good Thinker." Teachers were to look for the suggested attributes in their students and then in the following workshop session to discuss their observations. Other articles from the conceptual literature on thinking were read and discussed. Teachers were asked to administer to their students and then to analyze the results of the Cornell Thinking Test Level X and an ideational fluency test (e.g., if it never stopped snowing what would happen?). The test items themselves and discussion of results were used by teachers to help them identify specific needs and conceptualize instructional goals.

Between workshop sessions teachers designed and conducted thinking-oriented lessons in their classrooms. Successes and failures were discussed during workshops, explanations were offered for failed attempts and suggestions were made for future efforts. Later in the year teachers brought audio-taped lessons to workshop sessions. In small groups, teachers listened to lessons,

analyzed them, and provided suggestions. On a voluntary basis near the end of the year, teachers brought video-taped lessons to workshop sessions for observation and review. In addition, throughout the year the staff developer observed and/or video-taped two lessons of each workshop participant and spent a minimum of one-hour in post-observation discussion. In some cases, the teacher and developer reviewed the lesson on video-tape during the debriefing, otherwise tapes were left for teachers' later viewing.

Finally, the staff developer in five full-day sessions with administrator/supervisors discussed observation and lesson debriefing objectives and techniques, and general ways to insure the continued success of the thinking program. The developer also observed supervisors in their post-observation discussions with teachers. Supervisor and developer then met separately to discuss the supervisor's approach.

Program 2

The second example began in the fall of 1987, also with support from the district administration. The central goal was to deepen students' understanding of the various subject areas by infusing the instruction of thinking skills and the promotion of dispositions into the curriculum. The central strategy was to help teachers think more critically about their subjects and teaching by offering a conceptual understanding of thinking and classroom techniques to promote students' thinking.

The developer worked individually for 3 days with a district teacher who, the previous summer, had attended the developer's national training program in critical thinking and who was to serve as a key facilitator in the district during and after the six workshop sessions held in the fall. A group of 24 teachers (eight of whom were secondary level teachers) were released from their classroom assignments every other Thursday during a two-month period to attend the all-day sessions. Teams of two teachers represented each of the district's schools and were to eventually serve as facilitators/trainers in their respective buildings during the summer and following academic year. Three follow-up sessions took place in the spring (1 full-day and 2 half-day) to help prepare workshop participants for their future infusion efforts, and to discuss their own efforts at instruction for thinking since the fall sessions.

Each workshop challenged teachers to execute a thinking skill (and in the process to observe a method of instruction), to analyze it through readings and follow-up discussions, to practice the skill as students would be asked to do, and, finally, to develop an action plan for teaching the skill to their own students prior to the next workshop. Skills highlighted included making inferences, recognizing assumptions, sound versus fallacious reasoning, drawing conclusions, identifying an argument's structure, seeking evidence, and precise use of language. In two of the sessions, discussion also focused on the importance of cultivating dispositions important to effective thinking (i.e., open-mindedness, flexibility, intellectual curiosity, objectivity, persistence, respect for other viewpoints), and issues and methods in the assessment of critical thinking. In the final fall session, each teacher made a 15 minute presentation to the group (followed by 10 minutes of discussion/critique) illustrating an application of a strategy to develop and enhance students' critical thinking. This could be a demonstration lesson, a description of a sample lesson to be used in their own upcoming training efforts, or the presentation of audio-visual materials designed for classroom use.

The following summary of a workshop on "analyzing arguments" represents the kinds of activities that occurred during the six fall training sessions. Teachers first discussed their classroom efforts in teaching the previous sessions's skill training on sound versus fallacious reasoning. Successes and failures were analyzed, and suggestions were made for future efforts. Teachers then rearranged themselves in groups of 5-6 for a small group task on analyzing arguments. They were to identify which of the passages on a handout were arguments and which were other types of information or statements. For each passage identified as an argument, teachers were to identify premises and conclusions. During small group discussion, teachers could refer to a previously assigned reading by Nickerson (1986) that outlined elements of an argument. The activity concluded with the developer reading aloud a current newspaper editorial, with teachers identifying premises and conclusions, and evaluating the merits of the editorial's argument based upon the supporting reasons offered. Teachers and the developer then completed similar activities regarding the identification and evaluation of supporting premises, and the assessment of an argument's validity by determining whether or not conclusions follow logically from the premises. The day's work concluded with teachers devising ways to incorporate the analysis of arguments into their instruction during the coming week.

The workshop session offered teachers a conceptual understanding of argument analysis through the Nickerson reading and the classroom activities. While placed in the role of thinker (i.e. identifying an argument's premises, conclusions, and reasons), teachers also observed instructional techniques used by the facilitator to promote thinking. Finally, teachers were able to talk with one another at the end of the session to assimilate workshop ideas and brainstorm methods of implementation into their own classes. Teachers knew that the ensuing session would begin with a debriefing regarding their own efforts to teach analysis of argument.

TABLE 1
GOALS OF STAFF DEVELOPERS IN THEIR
MOST EFFECTIVE INTERVENTION (N=25)

Goal:	# of Developers
- Change Teachers' Instructional Practices	16
- Help Teachers Write Curriculum that Emphasizes Thinking	11
- Develop Teachers' Conceptualization of Thinking	10
- Change Teachers' Role Conception from Disseminator to Facilitator	8
- Enhance Collegiality and Academic Culture	7
- Foster Teacher Ownership of Change Efforts	6
- Improve Teachers' Own Thinking	4
- Change Teachers' Knowledge About or Conceptions of their Subject Areas	4
- Promote Teacher Reflectiveness Generally	4

TABLE 2
MOST EFFECTIVE ACTIVITIES OF STAFF DEVELOPERS
IN THEIR MOST EFFECTIVE INTERVENTIONS (N=25)

Strategy	# of Developers
- analyze and develop a conceptualization of thinking	16
- time to discuss workshop ideas and techniques, and formulate classroom applications	15
- staff developer models instructional strategies and behaviors related to promoting thinking	14
- peer demonstration lessons in workshop, classroom, or on video-tape	13
- engage teachers in activities requiring them to think	12
- discussion time to talk about and reflect upon education and instructional practice generally	6
- place teachers in role of directing their own staff development effort	5
- writing curriculum goals, units, and lessons	3

TABLE 3
IMPORTANCE OF TEN COMMON STAFF DEVELOPMENT ACTIVITIES

	Mean Rating	Absolutely Necessary by by 90% Sample	Desirable or Necessary by 100% Sample
1. Involving teachers themselves in higher order thinking activities or authentic problem-solving in their subject fields	1.96	X	X
2. Translating the ideas about the teaching of thinking into specific learning activities for students.	1.96	X	X
3. Trying out the activities in class.	1.96	X	X
4. Developing or finding materials to implement these activities.	1.84		X
5. Collaborating with peers in the planning of courses and lessons.	1.72		X
6. Developing a common language or conception for discussing thinking as a major educational objective.	1.72		
7. Obtaining reflective feedback from colleagues based on peer observation and analysis of their own classroom practice.	1.68		X
8. Collaborating with peers in planning these staff development activities.	1.65		
9. Observing "model" lessons that illustrate new approaches.	1.64		X
10. Discussion of issues in changing one's role to become less of a disseminator of information.	1.56		

Each item rated 0 = not necessary or desirable
1 = not necessary, but desirable
2 = absolutely necessary
? = don't know

TABLE 4
BARRIERS TO STAFF DEVELOPMENT FOR
HIGHER ORDER THINKING

Individual Teacher Factors	# of Developers
- Teachers' pedagogical practices/skills (e.g., lack of discussion-leading skills, reliance on recitation/lecture)	14
- Teacher resistance (skepticism, inertia, etc., because of past experiences with staff development/change efforts or unwillingness to change, or unconvinced of need or believe already promoting HOT)	12
- Teachers' lack of background knowledge of thinking (no conceptualization of thinking or theoretical understanding of logic, reasoning, etc.)	5
- Teachers' practicality ethic (change invoives being told what to do)	3
Curriculum and Assessment Demands	
- Content coverage pressure	17
- Standardized tests (oriented to facts and coverage)	9
- Materials (existing materials emphasize facts, lack of materials that facilitate HOT)	7
Organizational Factors	
- Lack of time (for extensive staff development, for teachers to engage in curriculum development or to discuss and share their work)	17
- Lack of administrative leadership or on-going support (supervisors can't model thoughtfulness, no active support for thinking emphasis, HOT not valued)	14
- Organizational structure of secondary schools (scheduling, 'ass size, physical isolation of classrooms)	10
- Lack of money (for release time, training teachers, etc.)	9
- Concept of change ("quick-fix," "top-down" approach)	3
Wider Community or Societal Factors	
- Dominant community values (lack of support for HOT)	2