

Using Mediated Learning to Improve the level of Reflection of Preservice Teachers

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Early in the 1900's John Dewey advocated the use of reflection to enable teachers to learn from their experience. "Experience plus reflection equals growth," Dewey said. (1910, 1933). Dewey defined reflective thought as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (p. 9). Dewey contrasted reflective thinking with habits of thought that are unsystematic, lack evidence, are based on false beliefs or assumptions, or mindlessly conform to tradition and authority. Reflective thought revisits assumptions and beliefs to be sure they are founded in logic and evidence and looks forward to the consequences of a particular course of action. (Valli, 1997).

During the last twenty years, there has been an explosion of theoretical and philosophical writing on the topic of reflective thinking (Mewborn, 1999). Many writers have used Dewey as the bases of their formulations on which they have added their own conceptions. Mewborn (1999) points out that today there is not much agreement about what constitutes reflective thinking about teaching with the exception that it makes teaching problematic. She points out that it is qualitatively different than recalling an event or of rationalizing an event.

Even though there is almost universal acceptance of reflection as a method for improving teaching practice, the experimental basis for reflection is still not well established. Cook (1993) reviewed 170 articles on reflection appearing in the literature from 1980 to 1993 and concluded that there were only nine studies that were experimental, where an independent variable was manipulated to see its effect on

dependent variables in a controlled setting. Of the 170 articles examined only 37 could be viewed as research studies and the majority of these were qualitative studies. There is little reason to believe the situation has changed since that study was reported. The literature on reflection was originating largely from philosophers and theorists.

Without reporting the details of the literature on reflection, we will summarize the current situation. It seems to be fairly well established that new teachers can be taught to be reflective (Cook, Young & Cutler, 1990; Hillkirk and Dupuis, 1989; Nolan, 1989; and Beyer, 1984). This is somewhat more difficult in the early years when teachers lack experience and background upon which to ponder. There are many ways reported in the literature of teaching reflection, for example, having the new teacher keep a reflective journal (Zeichner, & Liston, 1987), conducting peer teaching sessions (Gore & Bartlett, 1988), providing written feedback on interview transcripts (Gore & Bartlett, 1988), receiving lesson critiques (Zeichner, & Listen, 1987), doing action research projects (Mahlios, M., Wedman, J. Gordon, T., Whitfield, J. (1987), giving instruction in seminars (Korthagen, 1985), and conducting reflective conferences (Zeichner, 1987). It is not well established which of these ways may be better than another in changing problematic beliefs or encouraging professional development in new teachers. While it is possible to teach new teachers to be reflective, the link between improved reflection and improved learner outcomes (children's achievement under a reflective teacher) is less well established. This causal connection appears to be a difficult to make in any substantial way (Kirby, & Teddlie, 1989; Cook, Young & Cutler, 1990). There is still much to be learned about the impact of reflection on teachers' beliefs, practice, and development apart from student outcomes. This paper is concerned with how to foster and develop

reflective practice in beginning teachers. This is where mediated learning strategies may come in.

Feuerstein's has developed an approach to learning called Mediated Learning Experience (Feuerstein, 2001). Although it seems that using this approach might encourage and help beginning teachers learn to reflect, a review of the literature has been unable to locate any literature on the topic. In this paper we will describe research on teacher reflection that is similar to using mediated learning as defined by Feuerstein and his associates. We will then report on some preliminary investigations we have undertaken with students to investigate the impact of mediated learning using peers as mediators. While most reports of mediators using Feuerstein's' methods seem to be adults working with children, or teachers working with students, reports of the effectiveness of peers as mediators is not extensive. One of the conditions of Mediated Learning Experience is a level relationship (Feuerstein, 2001). That is, the mediator does not pretend to know the answer as to how the learner should be thinking. Nevertheless, the mediator should be expert in helping the learner understand the learner's thinking processes—another key feature of the Mediated Learning Experience. Peers may be able to maintain the level relationship better than a teacher mentor, who is by definition in a hierarchical relationship with the student. However, peers will lack the expert knowledge of metacognitive processes needed for working with their peers effectively without training.

Background of the Study

There are many reports in the literature on the application of supervision in teacher training and preparation as an aid to learning and in case reflection. Teacher

education institutions are mandated by law to require teachers in training to have work experience in a school setting, which is termed *field experience*. Field experience allows preservice teachers to try newly learned strategies, learn from professional teachers, and experience first-hand teaching in the classroom. During this experience the student is assigned a field university supervisor, who observes their teaching and gives feedback. This process is called clinical supervision.

If we look specifically at the impact of clinical supervision on teachers we find these sessions help teachers learn to reflect. A typical study is the one reported by Mahlios, Wedman, Gordon and Whitfield (1987), where teachers in training perceived reflective supervisory conferences as the program component that contributed most to their growth in being reflective. Another example is that of Nolan (1989) who used case studies to provide evidence that clinical supervision can help teachers become more thoughtful and reflective about what they do.

Certain forms of clinical supervision are similar to mediated learning as defined by Feuerstein and his colleagues and other forms of supervision are not. Hunter (1980) described five types of supervision which can occur during conferencing: Types A, B, C, D, and E. Most of these occur immediately after a teaching performance the supervisor has observed. We will briefly describe each of these to inform us about these conferences are typically conducted.

The objective of a type A conference is for the teacher to identify teaching behaviors that are appropriate and enhance the possibility of student learning, then to determine why those behaviors should be repeated. In this type of conference the supervisor needs to bring to the attention of the teacher specific behaviors that were

appropriate and explain why they were effective in that situation and the focus is on the outcome as. The relationship is typically hierarchal.

The Type B instructional conference is designed not only to point out specific techniques that were effective, but also to help the teacher select alternative strategies to teaching situations that occurred. The supervisor would point out appropriate techniques and then ask the teacher to consider what might be done if the technique failed to work. The relationship is hierarchal, and the focus is on the behavioral outcomes rather than on the cogitative process of the teacher.

The Type C instructional conference is to help the teacher analyze her teaching in order to determine what strategies might be repeated and which might need to be replaced. Here the supervisor helps the teacher identify the strategies that were effective or not rather than pointing them out. The behavioral outcome of the teacher, however, is the focus, and the relationship is still mostly hierarchal.

The type D instructional conference contrasts with the previous three types in that the supervisor is responsible for identifying cause-effect relationships and to explain to the teacher what went wrong. The objective for the conference is for the teacher to be able to select more appropriate teaching strategies to replace those that are currently unsuccessful. However, the focus in this type of conference is still on the behavioral performance of the teacher and the relationship is still hierarchal.

The Type E instructional conference emphasizes a more level relationship between the supervisor and the teacher. It is considered more appropriate for teachers who are more experienced. The objective of the conference is to encourage continued growth by identifying ways that a teacher's expertise can be shared and expanded.

However, this type of conference may still be focused on the behavior performance of the teacher as well as cognitive processes.

We can see from a description of these various types of conferences that the latter conference is the one most similar to Feuerstein's mediated learning model. It is more level in the relationship between the supervisor and the teacher, but is somewhat different in that it does not focus exclusively on the cognitive processes of the teacher.

In a search for what may have been done to investigate the impact of supervision on cognitive processes during reflection, we were unable to locate more than two studies that dealt with the investigation of cognitive processes. One of these was a study of cognitive process of supervisors through the use of journals (Niemeyer, Roger, and Moon, 1987) and the other was a study to detect reflection-in-action in preservice elementary science teachers using the concepts of Schön. In this paper, we will report in some detail on an unpublished thesis done by one of the authors, Nancy Evensen (1993), to explore the effects of reflective supervision on teaching effectiveness that did emphasize cognitive processes. The study was not a direct attempt to use mediated learning methods, but is very similar to mediated learning methods in that it emphasized a level relationship in the supervisory conference and encouraged the investigation of thought processes used to arrive at instructional decisions. Second, we will report on a preliminary study we have just completed to investigate more directly the impact of mediated mentoring by peer tutors on the level of reflection.

Study 1

Evensen (1993) set out to determine whether participation of preservice teachers in supervisory conferences that emphasized reflective thinking would generate higher

levels of teacher effectiveness as measured by the Scales of Effective Teaching (SET) than when preservice teachers participated in non-reflective conference sessions. Her study used a single-subject multiple baseline design using four subjects. She also measured whether these reflective conferences improved the reflective ability of the teachers using the “Taxonomy of Teacher Reflective Thinking Rating Scale (TTRT). Finally, she assessed the teacher’s attitudes toward reflective supervision.

Her subjects were four female students enrolled in an introductory teacher education course at the university. This was their first field experience. The course was six semester hours and required attendance at a weekly 3 hours seminar where basic teaching principles were discussed. In addition each student participate in a field experience 3 hours a day, four mornings a week, in an elementary school where she was assigned to a cooperating teacher and classroom. The subjects in this study were chosen only from those with second and third grade assignments to control for unwanted extraneous variables that would be introduced by dissimilar grade assignments.

The teachers varied in age and background, one being a 42 year old mother of eight children, another a 20 year old newlywed, a third who was a 21 year old single woman coming from an international background with a mother from Canada, and a father from England. The fourth teacher was a 23-year-old single student who had returned from a mission to Italy for the Church of Jesus Christ of Latter Day Saints.

The first instrument used in the study was the SET. It is a behaviorally anchored rating scale used to rate teaching performance in several school districts in Utah. It has ten different subscales providing a broad range of feedback on teaching performance and two more subscales assessing teacher performance outside the classroom. Only the 10

classroom subscales were used in this study. They were: learning outcomes, use of instructional media/materials, instructional techniques, academic learning/engaged time, positive reinforcement of student academic responses, correction of student responses, classroom discipline, instructional style, instructional efficiency, and monitoring student progress during the lesson. Each of the 10 subscales can be scored from 1 to 5 with a possible total score of 50.

Weekly teaching performance of each subject was video-taped and their performance was rated by 3 tenured elementary teachers who were paid to act as raters and trained in the study to use the SET instrument. Two raters rated each videotaped teaching performance and the total score for each observation was computed. If there was a difference of more than 8 (later in the study this was reduced to 5) points in the total score a third rater was used. The two closest scores were then averaged for the rating. Interrater reliability of $r = .73$ was obtained between raters in the study.

In the multiple baseline study reflective conferences were introduced to each teacher as the independent variable but at different times. The type of conference was changed from a Type A or D conference to a reflective conference. The dependent variable was scores on the SET. Figure 1 shows how the design was applied to the four teachers.

In the reflective conference the supervisor used questions to probe teacher practices, asking them to think aloud and analyze the lesson concerning strengths and weaknesses. Using this process the supervisor was able to evaluate the teacher's beliefs, thinking, and decision-making processes in relation to what was observed. The students were asked such questions as: "Did you notice that...?" or "Did the student respond the

way you anticipated?" or "Take me through your thinking when..." The teachers were encouraged to consider their reasons for their decisions, to make judgments and to contemplate other choices available to them. The supervisor assumed the role of listener and facilitator rather than instructor. This process was similar to mediated learning but metacognitive processes were not the exclusive focus. In an effort to support and nurture the reflection, the supervisor responded with positive affirmations to support reflective thinking. These conferences were audio taped and randomly monitored by an external evaluator to ensure that the supervisor conducted a Type A or D conference and a reflective conference as prescribed by the design. The four teachers were observed teaching a 10-40 minute lesson twice a week. Afterwards the teachers participated in a supervisory conference for 10-15 minutes.

SET scores are reported for the individual students in Figures 2. Each diagram reports the rating received for each measurement in baseline and treatment conditions. The research hypothesis was that teaching effectiveness as measured by "Scales of Effective Teaching" (SET) would increase as a result of reflective supervisory conferences was not supported. Teaching effectiveness did not improve with the introduction of the reflective conferences.

The results were complicated by a change in classroom and cooperating teachers that came midway during the experiment. All four students were placed in a second and third grade classroom for the first six weeks and in the fifth and sixth grade classrooms for the following six weeks. This change in placement fulfilled a certification requirement that students have field experience in both lower and upper primary classrooms. This change meant that during the study such factors as the personality and

attitude of the cooperating teacher, the variability in the age of the students, and the subject matter taught were not held constant. As the students moved to their second block placement in the upper grade, without exception their SET scores dropped. It was difficult to determine whether the variations in SET scores were caused by the treatment or by the second block placement.

The second variable studied by Evensen was the impact of reflective conferencing on level of reflectivity. This was assessed with the Taxonomy of Teacher Reflective Thinking Rating Scale (TTRT). The TTRT, developed at Eastern Michigan University in 1987-88 (Simmons & Sparks, 1989), was used to assess level of reflective thought. This scale was developed as a "framework for categorizing seven levels of more-to-less sophisticated examples of reflective pedagogical thinking from students." The same raters who did the scoring for SET were trained to use the TTRT with procedures similar to those used for SET. Two raters independently rated the level of teacher thinking in each conference. When the two rater's scores were more than a point different, a third rater was used. In every situation, the third rater's evaluation matched either rater 1 or rater 2, resulting in a correlation of $r=1.0$.

Student 1 was reflecting at level 1 during baseline but moved to level 2 during the treatment. Student 2 was at level 2 during the baseline, but progressed to level 6 during treatment. Student 3 was at level 2 during both the baseline and treatment phases of the study. Student 4 was at level 2 during baseline but during the treatment phase moved to 7. In summary, three of the four students showed a positive change in their reflection level with the introduction of the reflective conference.

The student's attitude toward reflection was also assessed. Three of the four students involved in the study reported positive opinions about the effects of reflective supervision. Although Student 1 enjoyed Type A and D supervision at the beginning of the semester, she felt she grew from reflective supervision and matured in her teaching abilities. She welcomed the challenge to evaluate her teaching. Student 2 felt the reflective supervision was more effective than the Type A and D conferences because reflecting helped her make judgments about her teaching: a skill she felt would be necessary throughout her professional career. According to Student 4, the reflective process helped her internalize best teaching practices. Only Student 3, who liked the comfort of having someone telling her what went well, what didn't, and how to improve her teaching skills, preferred the Type A and D supervision. She felt that the supervisor was an expert; she found it much harder to evaluate herself.

This issue of the subject's responses to the reflective style of supervision has been previously noted. Hillkirk & Nolan (1990) found that using a reflective coaching program some teachers experienced frustration with their coaches' unwillingness to provide evaluative feedback. In their study after four months this frustration subsided as the teachers began to focus on the reflective rather than technical coaching. In other studies researchers have reported that teachers enjoy reflective supervision and feel it contributes to their professional growth (Holton & Nott, 1980; Mahlios et al., 1987). Three of our four subjects had positive feelings towards reflection and were glad they had experienced it. However, at pivotal times after reflective conferencing had replaced earlier Type A and D discussions, all of the subjects asked for specific prescriptive advice. They were frustrated trying to reflect from their limited knowledge base of

teaching. During the semester, the students went through various developmental stages, occasionally reverting back to earlier stages with new challenges such as the grade-level change. However, the supervision methods remained constant, with either a traditional supervision model or a reflective supervision mode as prescribed in the design.

Evensen found that reflective thinking was not linked to improved teaching performance, which is consistent with the findings of other researchers (Kirby, & Teddlie, 1989; Cook, Young & Cutler, 1990), who also reported difficulty in linking reflection to improvement in teaching. The impact of changes in thinking cannot be easily seen in classroom performance, although evidence of such impact might logically be expected.

Evensen's finding that three of the four subjects grew in their ability to reflect through participating in reflective supervision conferences upholds the conclusions of researchers that beginning student teachers can be taught to be more reflective (Cook, Young & Cutler, 1990; Hillkirk and Dupuis, 1989; Nolan, 1989; and Beyer, 1984). This strengthening of reflective skills is particularly evident with reflection on the technical aspects of teaching, but may be less evident with reflection on moral and ethical levels, as previously reported in Cook's review of the literature (1993). All of the students in this study reflected at the technical level, but only two of them demonstrated reflection at the moral and ethical levels.

Study 2,

The participants in the second investigation were also students in an elementary teacher preparation program at Brigham Young University. Students were largely middle-class, Caucasian students and all but one were female. Students were in the first

semester of a two-semester sequence of courses prior to a formal student teaching experience. One of the courses they were taking was a one hour religion course designed to help them investigate their own beliefs as teachers and to integrate faith and learning into their teaching philosophies and their classroom experiences. In the 14-week semester experience of the cohort, students were in methods courses for 4 weeks, in full time practicum experiences for the next 4 weeks and back in methods courses for the final 6 weeks. The mediated learning experience took place on the 9th and 10th weeks immediately after their experiences in the schools where they had a variety of field based experiences including teaching lessons, managing classrooms, monitoring children's activities, observing each other in teaching, etc.

The student's level of reflection was assessed using the Rating Scale of Reflection Reports-Applying a Principle (RSRR-AP). This was a rubric developed by the authors consisting of five scales based on Dewey's (Dewey, 1933; Mewborn, 1999; Valli, 1997) theory of the cycles of reflection adapted to reflection applying a principle from a propositional knowledge base. The five scales are: problem statement, principle identified, alternate ways of applying the principle considered, action taken, and impact on beliefs. Each scale was a Likert scale ranging from 1 to 5 with descriptions at levels 1, 3 and 5. A total score of 25 was possible on the scale. (A copy of the scale is attached in Appendix A)

Students were first asked to write a reflective report making some aspect of their field-based experience problematic and telling how they applied a principle to the solution of the problem. They were then given a presentation on reflection explaining foundational principles of reflection. This included its function and use, and Dewey's

conceptions of reflection: what constitutes reflection, his cycles of reflection, and the attributes of an effective person doing reflection. They were then introduced the RSRR-AP and asked to rate their own reflective reports using the scale.

Students were then instructed in Feuerstein's Mediated Learning Experience method. They were given a sheet of instruction for Peer Mediators that were adapted from Feuerstein's article on Mediated Learning Experience (2001) (See Appendix B). After a brief discussion of these instructions, the students were paired and asked to share their reflection reports with each other taking turns with one sharing and one mediating the learning of the reflecting person. Then they recorded what they had learned from their mediation experience.

Approximately 4 weeks later, they considered another aspect of their teaching that was problematic, discussed it with a peer mentor, and wrote another reflective report. They were given the following instructions:

Think of something that was troubling, puzzling or interesting when you were teaching in the schools. How did you apply a principle ... to make meaning of what was happening, or to turn it into a problem, or try to solve it? After discussing this issue with your mentor, write a reflection describing the problem and what you did with it.

The authors rated the reflective reports using the RSRR-AP. Mean ratings were computed for the first and second reflection. The mean for Group 1 was 17.7, and the mean for Group 2 was 17.5. These means showed no change in level of reflectivity as a group indicating that the mediated learning experiences had no immediate effect on their level of reflectivity.

When the teachers were asked to describe the impact the mediated learning activity had on their reflections, they made comments about several issues. Many said they should be less vague and more detailed in their responses. For example Mandy said, "I learned that I should write about the problem in more depth." Geneva said, "I should talk about different solutions more specifically." Jennifer said, "I learned that I don't really reflect on the initial problem but only after it is a major problem. Also, my problems are vague and don't get to the heart of the matter. I should delve deeper for better solutions." Mary wrote, "I could have gone into more depth...I felt I did identify the problem, and it is easier to come up with a plan when dealing with a student when you have categorized and organized your information." Shannon said, "I learned that I needed to be more clear about the plan of action that I am going to take."

There were several responses indicating that more alternatives should be considered. Geneva wrote, "I learned that we should consider alternative ways of applying principles to solve the problems. There can be many solutions to a problem—explore them all." Rosemary said, "I did not include alternative ways of applying the principle and only talked about the one way I dealt with the situation." However, continuing she said, "When I think about this idea however, I don't really see why it is logical to include alternatives on reflection. To me, a reflection is looking back at a problem and how I solved it, not looking at how many ways did I think of solving it." Lisa summarized by saying, "I learned that in order to fix something, the problem must be discovered and stated. I also learned to consider other multiple solutions before determining just one right off."

Discussion

Clearly these two preliminary studies only begin to show how mediated learning activities might be applied to teacher reflection. One observation that may be considered is that mediated learning activities need to be more extensive than reported in these studies to show any effect on deepening the level of teacher reflectivity. As we saw from the comments of the beginning teachers, even this limited mediated learning experience with a peer was helpful in drawing attention to various aspects of reflection such as being more detailed in their reflecting, considering alternative options without rushing in on a trial and error basis, and the observation by many that reflection is more than reasoning, it must include an action component. The mediators in the second study had only limited time to become skilled mediators. While they were instructed to not focus on outcomes but to stay with helping their partner focus on the processes of their reflection, the positive results of the mediated experience reported by the teachers seemed to include more clarity in the outcomes they were considering as well as insight into their cognitive processes.

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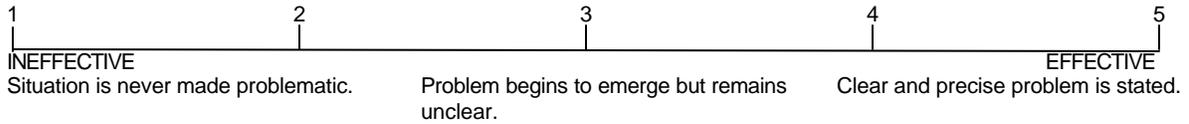
Appendix A
RATING SCALE OF REFLECTION REPORTS- APPLYING A PRINCIPLE

CANDIDATE _____

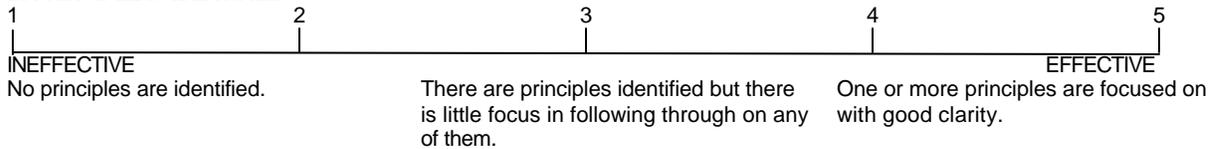
TOTAL SCORE: _____

RATER: _____

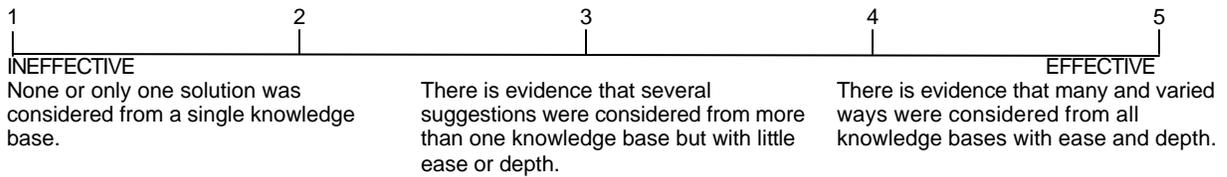
A. PROBLEM STATEMENT



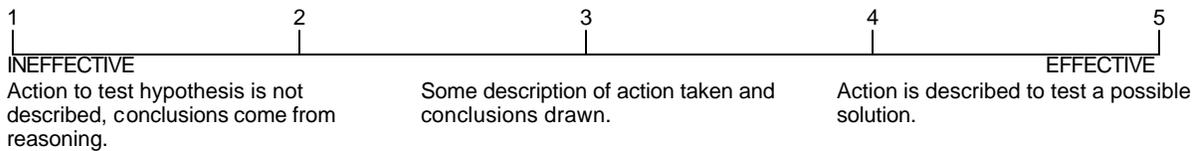
B. PRINCIPLE IS IDENTIFIED



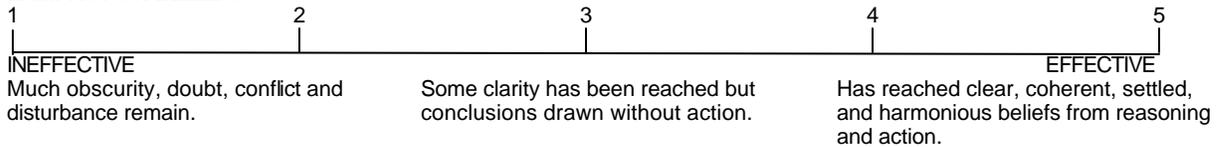
C. ALTERNATIVE WAYS OF APPLYING THE PRINCIPLE ARE CONSIDERED



D. ACTION TAKEN



E. IMPACT ON BELIEFS



COMMENTS:

Appendix B

Using Feuerstein's Mediated Learning Experience

Peer Mediator Instructions:

1. You are to help your peer become more successful in reflecting on her or his teaching. You will be called the mediator; your peer will be called the learner.
2. Your intention is not to help your peer solve the problem at hand. Rather it is to be concerned with how the learner approaches solving the problem. The problem at hand is only an excuse for you to be involved as a mediator with the learner's thinking process.
3. For the process to be successful, these important features must characterize your interaction:
 - Your intention is not to solve the problem but to mediate the thinking process of your peer.
 - You should stay on the same level as your peer, which is you should not pretend to know the answer as to how the learner should be thinking. Only the learner knows how the thinking proceeds. The mediator is a fellow explorer.
 - As a mediator you should try to interpret for the learner the significance of what the learner has accomplished. For example, you might say, "Did you notice that you identified your problem more quickly when you did a good job of describing the event?" or "Did you notice how it went more quickly when you decided you could be flexible in your approach?" or "Did you notice that you came up with a more precise plan when you categorized information?" In various ways your task

is to cause the learner to reflect not only on the solution to the problem but also on how the solutions was obtained.

- We have the capacity to transfer lessons learned from one experience to rules and methods to use in another situation. Indeed this is what learning should be about, for if a person does not generalize from experience, that person does not gain 30 years of experience, that person simply repeats one year 30 times. You should help your learner bridge from lessons learned in the current activity to new situations. For example, “Where else in your teaching do you suppose it is important to have a specific plan?” or “ How has just following your teacher gotten you into other teaching difficulties?” or “Where else would being more assertive help you in classroom management?”
4. The mediator also pays close attention to other aspects of learning from experience, and mediates for other components of learning. Other things you might pay attention to are:
- The learners regulation and control of their behavior
 - The learners feelings of competency
 - The learners disposition to set goals, to monitor their progress and achievement
 - The learners search for novelty and complexity
 - The learners awareness of the potential for change
 - The learners search for optimistic alternatives

Baseline	IV applied (after different lengths of time for different subjects)
Subject 1 (4 weeks)	9 weeks
Subject 1 (5 weeks)	8 weeks
Subject 3 (7 weeks)	6 weeks
Subject 4 (9 weeks)	4 weeks

Figure 1. The single-subject multiple baseline design across four subjects.

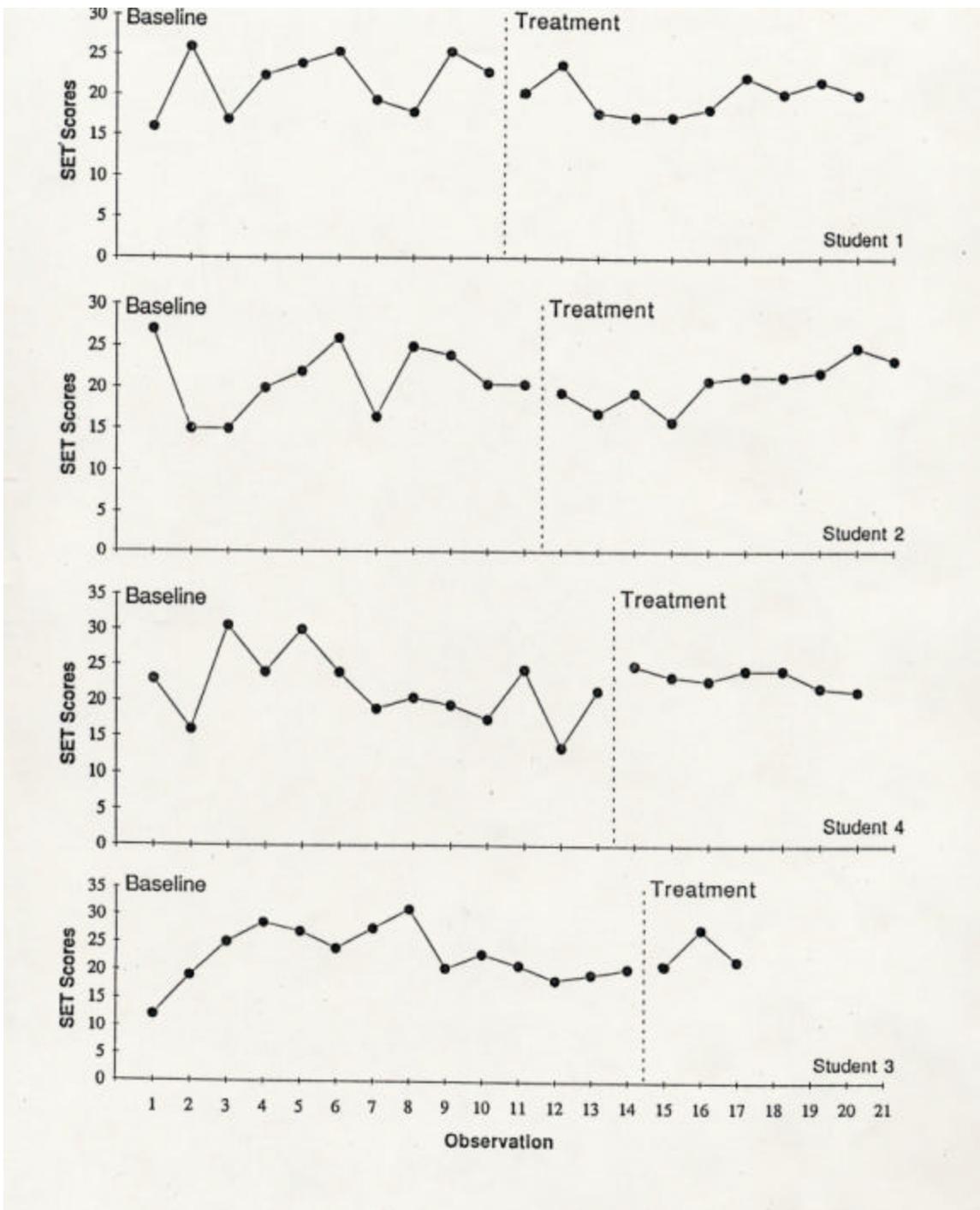


Figure 2. Multiple baseline showing SET scores for students 1-4