# ARTICLES

*Abstract*

This paper seeks to clarify the ways in which teachers think by integrating some aspects of artistry in teaching discussed by Rubin (1985) and some aspects of reflective practice identified by Schoen (1983). These aspects of artistic and reflective practice are amplified and elucidated by using Polanyi's notion of tacit knowledge and Dreyfus and Dreyfus' description of expert practice. The paper illustrates the points made with quotations from experienced teachers and develops some implications for teacher education.

*Résumé*

Dans l'article, l'auteur se propose de clarifier les modes de penser des enseignants en intégrant quelques-uns des aspects de l'enseignement qui en font un art et dont a traité Rubin (1985), et quelques aspects d'une pratique réflexive que Schoen (1983) a identifiés. Ces aspects d'une pratique à la fois artistique et réflexive sont développés et expliqués en faisant appel à la notion de la connaissance implicite de Polanyi et à la lumière de la pratique experte telle que décrite par Dreyfus et Dreyfus. L'auteur illustre les point qu'elle avance avec des citations d'enseignants d'expérience en même temps qu'elle fait ressortir certaines implications pour la formation à l'enseignement.

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## PRACTITIONER KNOWLEDGE: AN EXAMINATION OF THE ARTISTRY IN TEACHING

*Introduction*

In many of the education courses I teach, there comes a time as we discuss the ideas of an educational theorist or researcher when a student will ask, "Well, what would this theorist do to handle the problem I described having in my class?" And I will often have to answer, "Well, it depends." Or, if I am able to formulate a response which I feel would be consonant with the thinking of the theorist, the student will respond, "Well, *I* couldn't do that — it wouldn't work for my situation." And, whichever the case, all of us end up feeling somewhat frustrated.

Many writers have contrasted the thinking of practitioners with that of researchers and theoreticians (e.g. Freidson 1972, Hogben 1982, Eraut 1982). Often, researchers and theoreticians characterize — and stigmatize — the thinking of practitioners as being unscientific: atheoretical, particularistic, subjective (i.e. biased), and poorly articulated.

In a recent project to examine how experienced teachers worked through a microcomputer simulation of classroom problem situations, I recorded teachers as they thought aloud while they worked.

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Some educational researchers who read sections of the transcripts were disappointed or annoyed at the way the teachers decided upon options. These researchers felt that the teachers were not thinking scientifically, that they had failed to use the generalizations and principles which they *should* have learned in their education courses. Although the focus of the original study was a different one, comments such as these have led to a further contemplation of what the transcripts revealed about these teachers' thinking and the implications for teacher education.

In this paper I will examine some bases for the criticisms educational researchers made when they read the transcripts, and present another perspective from which to examine practitioner thinking, using work of Schoen, Rubin, and Polanyi. Use of this perspective will lead to suggestions for both pre-service and in-service teacher education.

*How Should Teachers Think?*

Generally, those who criticize practitioners as being unscientific seem to hold a notion of professional practice and knowledge strongly influenced by elements of a positivist notion of science. The goal of a positivistic science has been the discovery of generalizations, of regularities which obtain in all situations, or in a calculable proportion of situations (Smith 1983, 1984). These notions derived from aspects of positivism have been discussed and critiqued by many writers (e.g. Habermas 1971, Gadamer 1976). There are now attempts to examine and understand teaching using other conceptions of science (e.g. Bredo and Feinberg 1982). Macmillan and Garrison (1984) used the "new philosophy of science" to examine critically process-product research, a major tradition in educational research. Process-product research, Macmillan and Garrison maintain, ignores important aspects of the teaching situation, including the content being addressed and the intentions of teacher and of students. To do so is to develop a science of teaching whose "methods . . . of research focus on peripheral aspects of teaching rather than attempting to penetrate its core" (Macmillan and Garrison 1984, 19).

There are several serious consequences when the intentions and knowledge of practitioners are ignored. In a review of recent national commission reports on education in the United States, Duckworth (1984) observed that few of these commissions involved teachers in any significant fashion, a move which treated teachers as another "civil servant, with no professional understanding worth paying attention to". Such a move not only devalues the knowledge of teachers, it also contributes to the process of deskilling of teachers described by Apple (1984).

And, when the intentions and knowledge developed by teachers *in their practice* are ignored, these intentions and knowings are not examined systematically. The neglect allows, enables, or forces teachers to rely upon their personal, possibly biased "subjective knowledge" (Fenstermacher 1979), upon their common sense. The lack of attention to teachers' knowledge has major implications for the evolution of the profession in a complex, changing, and increasingly politicized context. As Berger and Mohr have pointed out:

> It is generally thought that common-sense is practical. It is practical only in a short-term view . . . Common-sense is part of the home-made ideology of those who have been deprived of fundamental learning, of those who have been kept ignorant . . . . common-sense is essentially *static*. It belongs to the ideology of those who are socially passive, never understanding what or who has made their situation as it is.
>
> (Berger and Mohr, 1967, 95)

Macmillan and Garrison (1984) referred to educational researchers who have speculated that the intentional aspect of teaching makes a scientific investigation of teaching difficult if not impossible. Such speculation is possible only when one holds some positivist-influenced assumptions about the nature of science and knowledge. A danger is that such speculations can be interpreted to leave us with no systematic and rigorous ways to examine teaching. On some level such speculations can imply that good teaching is an ineluctable art, probably little informed by research generalizations and formal theory.

Although artful teaching of high quality may *not* rely to any great extent upon the generalizations produced by process-product or similarly focused kinds of research, it is not the case that artful teaching cannot be examined, studied, refined, and made accessible to neophytes. Louis Rubin's recent book, *Artistry in Teaching*, provides an excellent framework from which to examine teaching and teacher education. It is complemented by Schoen's book, *The Reflective Practitioner* which deals with high quality practice in a number of professions.

*Practitioner Thinking*

In their 1977 book Argyris and Schoen examined the intentional aspects of practice and explicated ways in which the thinking of practitioners is guided not merely by common-sense and habit but also by theory. Argyris and Schoen used the term theory-in-use to describe practitioners' theories that are often more implicit than explicit and evident primarily in actions, in practice. This acknowledgement of the theories-in-use of practitioners honored the knowledge that practitioners develop in their work but did not hold any romantic faith that such knowledge was without flaws. Argyris and Schoen (1977) did not aver that practitioners' theories should be honored unquestioningly and accepted without critique. They discussed ways in which theories-in-use could be amended, changed and improved.

Schoen (1983) continued the examination of practitioner thinking with a concern to identify aspects common to the thinking of expert practitioners in several professions. Schoen referred to the dominant conception of knowledge in the professions as the Technical Rationality view. Technical Rationality is comparable to the view of knowledge identified by Macmillan and Garrison in process-product research. The emphasis is on the production of knowledge freed of contextual influence, expressed as generalizations that describe relationships between variables which can be demonstrated to hold across settings.

The contrasting view of knowledge implied both by Schoen and Rubin envisions knowledge as developing as the result of the knower's actions in the world. This knowledge can be refined, altered, or made more explicit but does not exist independent of the knower and its use in specific situations. Meaning arises in context and because of this, the same "variables" can have different meanings when seen in different contexts (Mishler 1979).

Such context-bound knowledge is reflected in the transcripts of the teachers as they thought through the problem situations on the computer-delivered simulation. Teachers rarely referred to explicit rules or generalizations when making decisions. Rather, they would read the descriptions and say, "Well, that behavior might mean A, so I would try that third option to deal with it." Too, teachers often referred to previous experiences to interpret situations and decide upon options. Sometimes this reference was obvious, sometimes not. The one teacher who seemed not to refer to earlier incidents was one with only six months full-time teaching experience. (The others had from two to six years of full-time teaching experience).

*High Quality Practice*

Schoen (1983) identified several aspects of well-developed practice. The two I will consider in this paper are reflection and the integration of seemingly disparate pieces of information. Rubin identified perception and intuition as essential to master teaching. These four aspects seem to be mutually interdependent and the relations between them help to form a dynamic view of some of the essentials for quality teaching.

*Reflection*

Schoen found that reflection was essential to good practice and referred to reflection-in-action and reflection-on-action. Reflection-on-action occurs after the action has taken place, and requires an imaginative reconstruction of the action and its setting. Reflection-in-action occurs during the time the artist practitioner is engaged in practice, during what Schoen referred to as the action-present, "the period of time in which we remain in the 'same situation'" (Schoen 1983, 278).

Although reflection-in-action may seem an impossibility, the belief that thought and action *are* and *must be* separate can be interpreted as a dualism inherited from certain philosophical traditions (for a thorough discussion of this point, see Rorty 1979). The acceptance of this dualism is not constructive for seeking to understand teaching or other professional practice. Schoen noted that illustrations of the impossibility of mixing thought and action involve worst case examples — "on the firing line, in the midst of traffic, even on the playing field" (Schoen 1983, 278). Other educational writers have also objected to the separation of thought from action. Sharp and Green (1975), for example, employ the conception of perspective to indicate the interpenetration of thought and action. The interdependence of thought and action seems especially salient in teaching where the practice situations encountered by teachers, their action-presents, are relatively long. Teachers usually work with the same students in the same classes over an extended period of time. As Eraut (1982) observed, teachers' knowledge of their students and classes evolves as a result of repeated action and reaction so that teachers can come to know their students and classes in ways which are rich in contextual and interactional detail.

> In actual reflection-in-action, as we have seen, doing and thinking are complementary. Doing extends thinking in the tests, moves, and probes of experimental action, and reflection feeds on doing and its results.
>
> (Schoen 1983, 280)

Teachers will vary in the ways they are able to act, react, and interact in their action-presents, of course. Some will fill the action-present with a great deal of reflection-in-action, with moves, probes, and tests. Others will engage in little reflection-in-action, will venture relatively little.

*Perception and Integration: Tacit Knowledge*

Reflection-in-action and consequent reflection-on-action require observation of complex phenomena which include individual students and the class as a whole. The descriptions of the skills of the artist or master teacher of Rubin, the reflective practitioner of Schoen, assume a conception of perception as an active and meaning making process.

The workings of perception as an active process have been demonstrated in a large number of students. De Groot (1966), for example, observed chess players of various abilities. He found that more experienced players were able to determine the positions of all of the individual pieces far

more rapidly than were less experienced players, unless the pieces were placed in ways not found in usual chess games. The experienced players attended to the overall pattern of pieces on the board and made sense of the positions of the individual pieces as they contributed to the whole, this *gestalt*.

> We know that increasing experience and knowledge in a specific field (chess, for example) has the effect that things (properties etc,) which at earlier states had to be abstracted, or even inferred, are apt to be immediately perceived at later stages. To a rather large extent, *abstraction is replaced by perception*, but we do not know much about how this works, nor where the borderline is.
>
> (de Groot 1966, 33)

The conception of tacit knowing developed by Polanyi (1962, 1969) helps to illuminate this process of perception as abstraction. Polanyi made the case that when we recognize a complex entity, a face for example, we are aware of the separate features of that face primarily as they contribute to the appearance of the the face as a whole or *gestalt*. When asked to describe some aspect of that face, the shape of the nose for example, we might be unable to do so even though we would be able to distinguish that particular face from scores of others. In attending to the face as a whole we are *subsidiarily* aware of its many separate particulars which are integrated as we are *focally* aware of the whole.

> This act of integration, which we can identify both in the visual perception of objects and in the discovery of scientific theories is the tacit power we have been looking for. I shall call it *tacit knowing*.
>
> (Polanyi 1969, 140)

Here then are two important aspects of tacit knowing: *awareness*, both focal and subsidiary, and *integration* of particulars into a whole and of subsidiary and focal awareness. Knowing involves attending to a number of cues and integrating this attention and these cues. Polanyi's explication also makes clear the importance of context in determining meaning, for the cues which are attended to subsidiarily give meaning to the gestalt and take on meaning as they contribute to the gestalt.

Rubin and Schoen both indicated the importance of perception to quality practice. How can Polanyi's notion of perception help us to understand the remarks of the teachers cited in this paper? There are two ways. First, the experienced teachers all commented about what they felt was a lack of information in the simulation, and often offered different interpretations of the same descriptions. For example, these two contrasting explanations were offered in response to one description:

> It sounds like a pretty easy problem. It sounds like he doesn't know his math facts. That would be a starting point, to see if he's accurately placed.
>
> (Amy)

> O.K. It could be a confidence problem. If that were the case, then you would have to increase his confidence level by giving him smaller chunks of work to do and reinforcing him. It could be . . . the skill level. It might be too easy or too hard, in which case you'd have to adapt it.
>
> I think I would start by observing his behavior, looking at examples of his work. If it's simply the case that he's a fidgeter and a talker, try giving a quieter place to work. And if that doesn't work, set up some kind of reward system.
>
> (Frances)

One explanation for these differences is that the descriptive information was ambiguous because it lacked a context which would have given meaning to the details cited. In the absence of such context, each teacher formed her own interpretation of the meaning of the behaviors described.

Second, when the experienced teachers identified additional information which could help them to understand the problem situations, they identified different kinds of information as important. They did not all want to know the same things. An explanation for this difference consistent with the notion of tacit knowing is that teachers are not consciously aware of all the information to which they attend when working with pupils. Teachers say that their actions in a situation "would depend," but are unable to articulate the factors to which they would attend because they would be only subsidiarily aware of these particulars in their practice.

Another explanation of the different requests for further information is that these teachers differed in their skill and artistry. The more accomplished teachers would routinely attend to a greater range of information and so would be able to articulate a wider range of information which would be helpful in understanding problem situations. Less skilled teachers might attend to fewer data and/or be less aware of those factors which contributed to their thinking about students.

*Mystification of Practice*

Because much of tacit knowing is not articulated, there is a danger that practice, artistic and reflective practice, can be seen as somewhat mysterious or can become mystified. The master teacher somehow "knows" what the right action is, but cannot explain just how (s)he knows this. The processes by which the expert makes sense of complex situations may seem impenetrable to the novice or less reflective teacher. The processes may not even be clear to the expert. Schoen acknowledged the possibility and danger of such mystification but added that it was not inevitable. Skilled practitioners can work to become more articulate about their tacit knowledge. Much of the work of Polanyi offers descriptions of how tacit knowing can be made better.

Polanyi argued that education in the descriptive sciences was based on the development of students' powers to perceive the entities important to that science. The process of developing perceptive powers involves both learning the particulars to which one must attend and developing the ability to integrate these particulars into a whole. The process of improving the abilities of teachers to observe must, by extension, involve helping them to become focally aware of particulars to which they *might* attend, either focally or subsidiarily, when working with important entities. Next, they would need to then integrate these particulars into complex wholes.

Rubin (1985) referred to exercises which required experienced teachers to observe and evaluate the classroom activities of other teachers. Although most teachers initially attended to very few factors in the environment, soon their observations and judgments became richer and more sophisticated. Teachers were able to increase their powers of perception and integration.

The complex nature of masterful teaching is suggested if one merely begins to identify the gestalts teachers must interpret daily in the practice. There are the individual children, each unique. "The effectiveness of the teacher-student relationship therefore rests on the degree of correctness with which one 'reads' the other" (Rubin 1985, 51). There are the children as they interact together in large and small groups. There are the children and the groups of children as they respond to classroom exercises in the different subject matter areas. There is the classroom as it exists in and is effected by the ecology and climate of the school. And so on. Not only are there great quantities of cues to which teachers can attend, but these cues can also be integrated into a number of different wholes or gestalts.

*Intuition*

If these processes of attending to and integrating required linear, stepwise thinking and full conscious awareness, they would be overwhelming. That something else occurs is attested to by the fact that teachers do survive, and even develop to become masters. Rubin (1985) used the term intuition to refer to the process teachers frequently use to make sense out of their complex world. Intuition requires rapid and accurate inference from what information exists. Intuition "nurtures the skill Jacob Kounin labeled 'with-it-ness'" (Rubin 1985, 62). The next section will examine some bases for intuition.

*Generalizations Versus Exemplars*

As I have pointed out, the teachers working through the simulation rarely referred to generalizations or principles. Most frequently, they interpreted the problem situations in terms of their own experiences. Debi, for example, weighed her decisions about dealing with the problem students presented in the simulation by considering how her most troubled student, Richard, would have reacted. Amy often did not refer to specific former students in working through the problem situations, but relied on the testing cues in the simulation to guess which option would be scored as optimal. She generally regarded the simulation as a test and worked to do well. However, one situation did remind her of a former student and on this situation she failed to figure out an optimal answer and repeatedly answered in a way which would have been appropriate for her former student. In this instance the image of her former student was powerful enough to distract her from her test-taking behavior. Why did the teachers so frequently refer to their personal experiences? Is this something teachers should be taught to avoid?

Schoen (1983) and Dreyfus and Dreyfus (1984) argued that the use of previous experiences is not something to be eschewed but can, in fact, form the basis for expert practice. Previous experiences can serve as *exemplars* which allow the reflective practitioner or master teacher to make use of previously forged knowledge in a new situation. In a sense, exemplars perform the same functions which a Technical Rational view assigns to generalizations and principles. However, exemplars do not provide rules which can be directly and instrumentally applied in a new situation. Rather, exemplars provide the practitioner with ways to understand and conceptualize a new situation. The new situation is construed as if it were a former one. This construal, or intuition, is a rapid process and will provide a basis for initial action in the new situation. The results of initial action may call forth other exemplars or deepen the reliance on the original exemplar.

> For the expert, not only situational understandings spring to mind, but also associated appropriate actions. The expert performer, except of course during moments of breakdown, understands, acts, and learns from results without any conscious awareness of the process. What transparently *must* be done *is* done . . . An expert's skill has become so much a part of him that he need be no more aware of it than he is of his own body.
>
> (Dreyfus and Dreyfus 1984, 586)

If we accept this conception of exemplar, teachers should not be criticized for relying heavily upon their own experiences to interpret and react to new situations. The *act* of relying upon exemplars is not in question. What must be questioned is the quality of the exemplars used, the skill with which comparisons between exemplars and new situations is made, and the ability to "see" new situations in terms of as many exemplars as are needed to produce constructive action.

The responses of the teachers to the microcomputer-delivered simulation cannot illustrate any

exemplars in full detail since the situation was quite removed from actual practice conditions. The teachers' responses can, however, provide a way to concretize at least a few facets of exemplars held by the teachers. By examining how the teachers interpreted the simulation problem descriptions, we can see differences between these teachers.

In her work on the simulation, Amy tended to rely on very concrete exemplar elements. When she referred to students or teachers she had known, the descriptions focused on physical and behavioral characteristics with scant speculation about motives or other factors which could contribute to the condition. For example, when she had finished work on a problem situation involving a girl who did not work in class she said:

> I had a picture of Jane right away. She was taller than the other kids and she had very long brownish blond hair and she was real skinny.
>
> (Amy)

Amy may have had in mind many different factors which could have contributed to the girl's behavior, but did not articulate these at all.

Frances, in contrast, typically offered various possible explanations for problems described on the simulation. She used abstract concepts to describe her former students, and applied these to her analyses of the simulation. Her talk revealed the range of data to which she could be expected to attend in the classroom and her ability to conceptualize situations in more than one way. When she had finished the work on the situation with Jane she said:

> (Jane) probably had a low confidence level and she was quiet and shy, one of those unassuming people that just go through school and no one notices them. She seemed less verbal which tends to give me some sort of an idea she's not very self-confident. Something social may be out of whack, such as not feeling comfortable with her peers.
>
> (Frances)

The responses of these teachers to an exercise removed from actual practice provide a clear indication of some of the personal constructs (Kelly 1955) of the teachers. The fact that the teachers' responses varied as widely as did the two cited suggests an important first stage in a teacher education program, particularly for experienced teachers. One could have teachers work individually through some kind of simulation and then orchestrate a discussion between the teachers. In the discussion the different interpretations, and some reasons for these differences, could be examined systematically. Such dialogue could help novices learn of the wider range of cues to which they could attend in their practice and the greater variety of explanatory schemes which could be invoked. The dialogue could also help more expert teachers examine and make more explicit the cues they had learned were important and the explanatory schemes which they had developed or internalized.

Videotapes and videodiscs could furnish a stimulus more complex and realistic than that furnished by the microcomputer-delivered stimulation. These more complex stimuli would probably be even more effective at eliciting facets of the exemplars of the teachers viewing them and allow a more detailed examination of these exemplars.

A discussion of the differences in perceptions of novice and more expert teachers brings to mind an incident which happened when I was teaching an undergraduate educational psychology class. I was showing a movie on Piagetian theory which contained segments from Piagetian interviews with adolescents during which they were presented with a variety of tasks. Some of the adolescents regularly used formal operational thinking, some were mixed, and some consistently showed only

concrete operational thinking. One girl had been shown responding with concrete operational thought on two or three tasks. In the movie, she was then shown grappling with a task requiring combinatorial logic. She had tried a few combinations more or less at random and then had quit. On impulse, derived from my hope to make the film viewing more active, I stopped the film at this point and asked my eager undergraduates what they would have done if they were the interviewer. Several said that they would continue to work with the girl and, by giving her hints and encouragement, help her to succeed at the task.

I was somewhat surprised at the reaction, for, as I had interpreted the situation, the girl was very frustrated, had given up, and was ready to throw something or cry. Her posture, her coloring, her language, her tone of voice, all suggested this to me. At the time I pointed out these cues to my students and assumed merely that they were not as used as was I to reading student reactions. However, as I reanalyze this situation I can isolate other factors also at play. Being acquainted with Piagetian theory, I assumed that the purpose of the interview was to elicit thinking, not to serve as a test on which a student could demonstrate mastery. My students, it appears, had assumed that the interview was a test (albeit an unusual one) and that anything tested would and should be taught. Too, I had viewed the girl's performance from a Piagetian perspective and, since the girl had previously shown only concrete operational thought, I did not expect her to be able to use formal operational thinking on this even more complex task. Hence, I assumed that explicit instruction would not only be ineffective but also unkind.

My students and I were both trying to do what was best for the girl. Our different perceptions of this situation led us to propose opposing strategies. The class discussion helped to surface several of the differences in our perceptions or exemplars, and also helped to clarify how theoretical understandings color perceptions and delimit what can be considered appropriate interventions. The incident has been a vivid one for me because it has generated many understandings as I have reflected on it, and supports the benefits which can derive from reflection-on-action.

*The Development and Refinement of Exemplars*

The image of teaching as a descriptive science, an activity based upon developed powers of observation, has heuristic value. Attention to the structure of tacit knowing can help us to understand ways in which practice can be made better by enlarging teachers' powers of perception, helping them to attend to and integrate more of the cues available to them. Master teachers might help less accomplished teachers improve their practice through exercises which help to make explicit important cues to which master teachers attend tacitly.

Reflection-on-action can also foster such explication and examination. Schoen (1983) asserted that those who are unable to reflect on their practice will soon come to behave rather automatically. They will perceive most situations as similar since their limited theories-in-use, unelaborated exemplars, will blind them to the complexity of the situations they encounter. Observing situations presented in written case studies or displayed on film or videotape and reflecting-on-action can help to increase the understandings and perceptual abilities of new or experienced teachers. However powerful such experiences can be, if they are divorced from action, the experiences themselves may not be sufficient to help a teacher practice in a more constructive fashion.

There is, then, a limit to the usefulness of the image of teaching as a descriptive activity. Polanyi's work was grounded in his experiences as a chemist, a field in which the interactions between the observer and the observed are limited. In the human science which is teaching, the

external reality with which the teacher deals is far more plastic. Humans affect, and are affected by, the other humans with whom they deal. The reality in which two people interact is negotiated. Thus, in teaching, the personal constructs (Kelly 1955) and actions of the teacher and the personal constructs and actions of the students interact in a complex and not always predictable fashion.

The way a teacher interprets a certain situation will lead him/her to act in a certain fashion. His/her actions may somehow elicit the expected responses, substantiating his initial interpretation. Or, they may not. The literature on teacher expectancies demonstrates not only the power of teacher expectancies but also the unpredictable ways expectancies can operate. (Of course, the ways that students perceive their teacher will contribute to their actions in the class). Each teacher, as a unique individual, will have her or his own way of being in the world. Because of this, each teacher will have different ways of being a master teacher, a reflective practitioner.

> Artistic techniques, in short, cannot be transplanted at will. Each teacher must, in one way or another, develop a collection of devices which work.
>
> (Rubin 1985, 5)

If we view exemplars as guides to future action, and accept the uniqueness of each individual's being in the world, it becomes clear that in order to become master practitioners, teachers must act in a reflective fashion in many particular cases. It is not enough to learn generalizations which relate to good teaching, practices which have been found to lead to increased student success. It is not enough to become a sophisticated observer. It is not enough to have had many experiences in classrooms, either during pre-service teacher education or in actual practice. Amy and Frances were both experienced teachers, and yet have developed very different ways of looking at students. Efforts such as those described by Zeichner (e.g. 1981) and Rubin (1985), which couple experience with reflection, are vital to the development of master teachers. Reflection is necessary to examine current and past actions so that the limits imposed by narrow personal constructs can be broken down. Action is necessary to develop exemplars. Reflection is necessary to refine them. And the development of a sophisticated language is necessary to speak of exemplars.

If one is to reflect, one must have concepts and categories with which to reflect, with which to name one's thoughts, feelings, and experiences. It is the theories of education which can provide the language with which to discuss teaching. For this reason the study of the varied and sometimes conflicting theoretical perspectives in education is vital. Such study can help practitioners refine their exemplars and can increase the flexibility of their reflection-in-action.

### *Conclusion*

The ideas presented in Rubin's examination of artistry in teaching provide a view of teaching and teacher education in sharp contrast to the common scientific view of professional knowledge which strives for the identification of principles and generalizations which can be applied in many settings by many teachers. In this paper I have focused on two aspects of Rubin's conception of teaching artistry, perception and intuition. Using work of several theorists I have tried to enlarge upon these two aspects, give evidence for their existence from interviews with experienced teachers, and suggest ways that teacher education can foster the development of these crucial aspects of artistry.

Acknowledging perception as an active and meaning-making process, I have used Polanyi's notion of tacit knowledge to describe ways in which perception can be improved. By applying Schoen's notion of exemplar and Dreyfus and Dreyfus' description of expert practice, I have

indicated how teachers can apply previously constructed knowledge to new situations. Such application occurs in a way quite different from the way in which it is often hoped that teachers will use principles or propositional knowledge learned in teacher education classes. The ideas of these authors help to clarify the complexity of the reflection-in-action of the artist teacher, a complexity which does not arise from analytical and stepwise rationcination but from an intuitive and flexible seeing and acting, reacting, re-seeing, re-acting, and so on.

Artistic practice is difficult to describe in writing. Sylvia Ashton-Warner conveyed some of the sense of artistry in teaching when she talked about planning for teaching.

> To some teachers the workbook is the middleman intercepting some of the energy and glamour directed upon the canvas. Leonardo da Vinci cut straight into his marble, Rabindranath Tagore wrote his verses neat, and I didn't hear of Jesus making notes. Teachers, all of them in one medium or another, who mistrusted the middleman.
>
> To the extent that a teacher is an artist, and according to Plato there should be no distinction, his inner eye has the native power, unatrophied, to hold the work he wants to do. And in the places where he can't see, he has a trust in himself that he will see it, either in time for the occasion or eventually. And he would rather risk a blank in his teaching than expend cash on the middleman . . . He wants to see in his mind, as he teaches, the idea itself, rather than the page it is written on.
>
> (Ashton-Warner 1963, 89).

Ashton-Warner did not develop easily the courage and ability to plan in such a way. An earlier book (1958) described the anguish and doubt which accompanied her attempts to develop her own artistry as teacher. Those of us in teacher education, both pre-service and in-service, must work to help our students develop their artistry as teachers and must also work continually to refine our own artistry. As the work of Ashton-Warner indicates, this is a continuing and difficult process.

*NOTES*

Argyris, C. & Schoen, D. (1977). *Theory in practice.* San Francisco: Jossey-Bass.

Ashton-Warner, S. (1958). *Spinster.* New York: Simon and Shuster.

Ashton-Warner, S. (1963). *Teacher.* New York: Simon and Shuster.

Apple, M.W. (1982). Curricular form and the logic of technical control: Building the possessive individual. In Apple, M., (Ed.)*Cultural and economic reproduction in education* (pp. 247-274). Boston: Routledge and Kegan Paul.

Berger, J. & Mohr, J. (1967). *A fortunate man.* New York: Holt, Rinehart, and Winston.

Bredo, E. & Feinberg, W., (Eds.). (1982). *Knowledge and values in social and educational research.* Philadelphia: Temple University Press.

de Groot, A.D. (1966). Perception and memory versus thought. In Kleinmuntz, B. (Ed.) *Problem solving: Research, method, and theory* (pp. 21-38). New York: John Wiley and Sons.

Dreyfus, H.L. & Dreyfus, S.E. (1984). Putting computers in their proper place: Analysis versus intuition in the classroom., *Teachers College Record,* 85, 578-601.

Duckworth, E. (1984). What teachers know: the best knowledge base . . . , *Harvard Educational Review,* 54 (1):15-20.

Eraut, M. (1982). What is learned in in-service education and how., *British Journal of In-Service Education,* 9, 6-14.

Fenstermacher, G. (1979). A philosophical consideration of recent research on teacher effectiveness. In Shulman, L.S., (Ed.) *Review of research in education: 6*,pp.157-185. Itaska, Illinois: F.E. Peacock.

Freidson, E. (1972). *Profession of medicine: A study of the sociology of applied knowledge*. New York: David Mead.

Gadamer, H.G. (1976). *Philosophical hermeneutics*. Berkeley: University of California Press.

Habermas, J. (1971). *Towards a rational society*. London: Heinemann.

Hogben, D. (1982). The clinical mind: Some implications for educational research and teacher training., *The South Pacific Journal of Teacher Education*, 10(1),1-8.

Kelly, G.A. (1955). *The psychology of personal constructs, volume one*. New York: W.W. Norton and Co.

Macmillan, C.J.B. & Garrison, J.W. (1984). Using the ''new philosophy of science'' in criticizing current research traditions in education., *Educational Researcher*, 13(10), 15-22.

Mishler, E. (1979). Meaning in context: Is there any other kind?, *Harvard Educational Review*, 49, 1-19.

Polanyi, M. (1962). *Personal knowledge* (corrected edition). Chicago: University of Chicago Press.

Polanyi, M. (1969). The logic of tacit inference. In Grene, M. (Ed.). *Knowing and being*. Chicago: University of Chicago Press., 138-158.

Schoen, D. (1983). *The reflective practitioner*. New York: Basic Books.

Rorty, R. (1979). *Philosophy and the mirror of nature*. Princeton: Princeton University Press.

Rubin, L.J. (1985). *Artistry in teaching*. New York: Random House.

Sharp, R. & Green, A. (1975). *Education and social control*. London: Routledge and Kegan Paul.

Smith, J.K. (1983). Quantitative versus interpretive: The problem of conducting social inquiry. In House, E.R., (Ed.). *Philosophy of evaluation: New directions for program evaluation, n. 19*,pp. 27-52. San Francisco: Jossey-Bass.

Smith, J.K. (1984). The problem of criteria for judging interpretive inquiry. *Educational Evaluation and Policy Analysis* 6(4), 379-392.

Zeichner, K. (1981). Reflective teaching and field-based experience in teacher education., *Interchange* 12(4), 1-22.