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ABSTRACT

A qualitative study documented the use of reflection-in-action by adult educators in problematic situations. Its focus was to investigate the mental processes involved in problem solving. Since individuals engage problem situations from a personal conceptualization that is unobservable, qualitative interviewing was used to provide respondents with the greatest opportunity to express their understanding of their decision processes. A standardized open-ended interview protocol with think-aloud problem situations was used to collect data that revealed the individual's inferences and identified salient features of a situation and strategies used. During phase 1, a questionnaire with a problematic situation was sent to 52 novice and experienced extension educators. In phase 2, an interview protocol was used to generate descriptions of individuals' problem-solving processes. Data were inductively analyzed using Strauss and Corbin's (1990) coding process. Five primary themes emerged: definition of problematic incident, generation of solution alternatives, testing-in-action of selected solutions, reaction to incongruence, and reflection-in-action: a learning strategy. Reflective educators, whether novice or experienced, used reflecting-in-action and reflecting-on-action as a means of developing expertise. Results indicated that experience alone was not the master teacher of the reflective process. (Contains 18 references.) (YLB)

THE USE OF REFLECTION-IN-ACTION BY ADULT EDUCATORS: AN INQUIRY INTO SCHÖN'S EPISTEMOLOGY OF PRACTICE

Natalie M. Ferry

Abstract: This qualitative study documented the use of reflection-in-action by adult educators in problematic situations. The results demonstrated that novice and experienced reflecting educators use reflecting-in-action and reflecting-on-action as a means to develop expertise. The results indicated that experience alone is not the "master teacher" of the reflective process.

Introduction

Highly successful practitioners have developed a level of expertise which is characterized by their ability to spontaneously generate solutions within problematic situations (Cervero, 1990; Schön, 1987). Experience generated within the context of action is viewed as playing a key role in the development of professional expertise by both Donald Schön's (1987) reflection-in-action model and cognitive psychology theory (Benner, 1984; Dreyfus & Dreyfus, 1986; Elbaz, 1981). Both theoretical frameworks focus upon the key role experience provides in the development of expertise.

A review of cognitive psychological literature reveals that experience is viewed as the mechanism that refines the novice's rule-driven performance into the highly personal, fluid, holistic practice of the expert (Chi, Glaser & Farr, 1988; Dreyfus & Dreyfus, 1986; Patel & Groen, 1991; Salthouse, 1991). From this perspective, experience is viewed as the "teacher" of skills and knowledge needed to become an expert.

Donald Schön (1987) also proposes that reflection-in-action evolves from experience. However, within Schön's writings a contradiction appears to exist in how the reflection-in-action process develops. Schön indicates that reflection-in-action is an innate process emulating from the competencies one already possesses while also postulating that reflection-in-action is generated and reshaped through experimentation and reflection.

This paper reviews and reports research findings of an investigation that studied these two theoretical frameworks of expertise. The research study was designed to collect descriptive documentation that could be used to clarify ambiguities of Schön's theory of the development of reflection-in-action and its role in the emergence of expertise.

Methodology

The study's focus was to investigate the mental processes involved in problem solving. Since individuals engage problem situations from a personal conceptualization that is unobservable, qualitative interviewing was used to provide respondents with the greatest opportunity to express their understanding of their decision processes. A standardized open-ended interview protocol with think-aloud problem situations was used to collect data that revealed individual's inferences and identified salient features of a situation and strategies used (Ericsson & Simon, 1984).

During the first phase of the study, a questionnaire with a problematic situation was sent to fifty-two novice and experienced extension educators. Novice educators with less than two year's extension experience and experienced educators with more than ten year's extension experience were purposefully selected. Using criteria based on Schön's five indicators of the reflective process, responses to the problematic situation were coded and used to sort participants into novice and experienced subgroups who were judged to be using or not using reflection-in-action. The final novice interview subgroups were composed of one reflecting and seven non-reflecting educators. The experienced subgroups were composed of five reflecting and five non-reflecting practitioners.

In phase two of the study an interview protocol was used to generate descriptions of individuals' problem-solving processes. Think-aloud interview questions were designed using real world practice situations with a deliberate insertion of problematic outcomes that could trigger reflection-in-action. The interviews were taped and transcribed to provide a verbatim record.

The data generated were inductively analyzed using Strauss and Corbin's (1990) coding process. Five primary themes emerged: definition of problematic incident, generation of solution alternatives, testing-in-action of selected solutions, reaction to incongruency, and reflection-on-action: a learning strategy. Through selective coding, the core theme, reflective decision-making vs. performance of duties, evolved as the study's central phenomenon.

Findings

The data from this study revealed two significantly different patterns in the ways reflecting and non-reflecting educators resolved practice problems. Reflecting educators, whether notice or experienced, resolved problems by becoming personally involved in a holistic contextual exploration of the problem's definition and solution process. Reflection-on-action was the vital component of their decision-making process which provided the mechanism for learning that improved their future decision-making strategies. The novice reflecting educator demonstrated as skillful use of the reflecting-in-action and reflecting-on-action processes as did the experienced reflecting practitioners.

The non-reflecting practitioners, both novice and experienced, consistently demonstrated their strong reliance upon using the technical rational model for decision-making. These educators viewed their decision making as applying the steps of a process with limited personal involvement. By distancing themselves from the process the results were viewed simply as outcomes; outcomes to be evaluated as successful or not. The outcomes were not used as a stimulus for further problem solving or for reflecting-on the decision process. "I try not to second guess cause you just beat yourself on the head. Hindsight's twenty-twenty vision."

Mode of Problem Identification

The mode of problem identification emerged as one of the most significant differences between the reflecting and non-reflecting groups. The novice and experienced reflecting educators spent more time in the process of contextually defining the uniqueness of the problem within a context of contributing factors. They sought

to know as much as possible about the problem that clearly defined its unique parameters. The reflective practitioners further contextualized problems by framing them in terms of the people involved and the occurring interaction. The reflecting educators involved others in helping them to define the presenting problem.

In contrast the non-reflecting novice and experienced educators approached problem identification by focusing upon isolating what's wrong as quickly as possible so it could be addressed. A situation was categorized as a problem, "because it's not happening as it should," therefore, action was warranted to react. Once identified the problem was quickly put into a category so it could be defined, solutions generated and resolved. Novice non-reflecting practitioners spoke of bypassing the defining stage to moving directly into the action phase. "I don't think I take the time to stop and say okay this is the problem. I just see something that's not right and try to fix that."

Solution Generation

The non-reflecting practitioners sought to, as quickly as possible, identify a self-perceived acceptable solution that was available within the confines of the present situation. The reflecting educators interactively generated solutions by involving others within the situation and looked beyond the parameters of the context to address the problem to meet the expressed needs of those involved.

Testing-In-Action Of Solutions

The testing-in-action of selected solutions was evidenced in descriptions of reflecting educators as a mental rehearsal process which supported the generation of new alternatives that had not been previously identified. They described a kind of interactive experimentation in which competing solutions were tested to gain feedback which was used to adjust one's problem definition and generate new solutions. "You've got to think about all your alternatives and then you've got to think about the impact, and there's always an impact."

The non-reflective practitioners, weighed the pros and cons of alternatives, then selected the alternative that was judged "best" and enacted it. The process only involved others if they asked for advice about "what I should do" in the situation, not for the purpose of testing the appropriateness of alternatives.

Response To Inconsistencies

Inconsistencies occurring within the problem-solving process were viewed as positive occurrences that strengthened the reflective educators' decision-making process. Incongruence triggered in them the reframing process. "Maybe that glitch is because you're working on the wrong thing so I'd go back, not just to what are my alternatives, but go back to the situation and decide if I really defined the problem right to begin with."

Non-reflecting educators portrayed an impersonal perspective of dealing with unexpected problem inconsistencies. Experienced non-reflecting educators viewed inconsistencies as inconveniences which one had to deal with by returning to their previously identified list of alternatives to select another solution. "If it's not going to be one solution I'm going to have a B and sometimes even a C, at least an A, B and a C." Novice non-reflecting practitioners reacted with an emotional response of

"not knowing what to do." The distancing process fostered their conception that they had limited control over problem resolution. "I really kind of have the attitude that if things are supposed to happen they'll happen, if things aren't supposed to happen they won't and there's not a lot of need to get real upset or concerned about it."

Reflection-On-Action

The use of reflection-on-action, a reconstructive mental review, played an integral role in the reflecting educators' decision process and provided the avenue to learn from the process. "It's almost like reliving the situation or second guessing yourself if you would have made another decision or you would have said something else or if you would have done something different, then maybe things would have been different and again it's not just the wrong decisions that I reflect." The reflective process focused on the role the individual played in the problem resolution process. The reflective educator's personal involvement provided the mechanism that supported their assessment of their assumptions and behaviors in relation to the problem's resolution.

Little or no evidence of reflection-on-action was revealed in the responses of non-reflecting practitioners. Problem resolution was viewed as "done and over" not to be "worried about." Only a major negative outcome triggered a reconsideration of the problem. The major focus of review was to resolve issues of fault, not to foster learning to strengthen one's decision-making strategies.

Discussion

The contrasting nature of the study's reflecting and non-reflecting educators' problem solving supports Schön and other researchers (Cervero, 1990; Munby & Russell, 1989) who propose that practitioners who reflect-in-action use a profoundly different problem-solving process than those who are non-reflecting. The reflecting educators fluidly used Schön's reflection-in-action decision process while the non-reflecting practitioners followed a sequential, technical rational model of problem resolution. Problem solving for the non-reflective practitioners had become a job to be performed by using the steps in the problem-solving process with as little personal involvement as possible. In contrast, the reflective practitioners were so actively involved in their decision-making process that the process was viewed as an ongoing cycle, an ever expanding learning process which builds upon past experiences.

The importance of the difference in the reflecting and non-reflecting practitioners problem identification processes may be the most significant aspect in determining the effectiveness of problem outcomes. The study's findings strongly support the significant role problem definition plays in the reflecting educators' problem-solving; however, it was found to play only a perfunctory role in the non-reflecting educators' problem resolution. This is consistent with cognitive psychology research which has described experts as spending more time in the problem definition process; becoming personally involved with the problematic context; and contextualizing the problem situation far beyond its immediate parameters (Benner, 1984; Lawrence, 1988; Simon, 1973; Vost & Post, 1988).

In contrast the findings indicate that the non-reflecting practitioners are triggered into a technical rational problem-solving sequence by their approach to problem definition. Similar to the cognitive psychology literature's description of novices, the non-reflecting educators approached problem framing by quickly isolating surface symptoms to define a problem, thus creating a well-formed structure that could be treated as an instrumental problem to be solved by applying professional knowledge (Chi, Feltovich & Glaser, 1981). Both novice and experienced non-reflective educators appeared to be confined by the presenting facts of the situation and to using ritualized evidence gathering procedures. While these findings add to our understanding of the reflection-in-action process, they point to a weakness in Schön's theory. The highly influential and distinctively different problem framing process that reflecting and non-reflecting novice and experienced educators portrayed in the study is not adequately described in Schön's writing.

The crux of Schön's model is the reflecting-in-action process in which generated and selected alternative solutions are tested-in-action. The study's results provided only weak support of Schön's hypothesis. The reflecting-in-action educators most frequently tested solutions in a mental rehearsal process. A mental rehearsal process is one in which an individual dialectically considers the relationship of one's thoughts and possible actions in a particular context (Boud, Keogh & Walker, 1985). In contrast the non-reflecting practitioners weighed the pros and cons of alternatives to identify their "best" choice. Using an instrumental problem-solving process contributes to alternatives being measured by their effectiveness in achieving a pre-established goal that has been determined outside of the context. The practitioner, not the contextual problem, determines the best "fit" to solve the problem.

Schön's writings draw a clear distinction between reflection-in-action and reflection-on-action. Within his writings, limited emphasis is placed on the role reflection-on-action plays in the reflective decision makers' strategies. Supportive of cognitive research reflection-on-action played a significant role in the novice and experienced reflecting educators' decision process (Scardamalia & Bereiter, 1991; Sweller, 1988). The reflecting educators spoke of the ongoing reflection process that occurs after a problem as a vital learning mechanism that had great impact on improving their future problem solving. Scardamalia and Bereiter (1991) have proposed that nonexperts fail to learn from problematic situations by not pausing to reflect-on the specifics of the problematic situation. "In general, non-experts seem inclined toward a unidirectional process of do it and be done with it" (Scardamalia & Bereiter, 1991, p. 176), however, the expert pauses after solving a problem, seeking to extract generalizable knowledge from the experience.

The study found that not all experienced educators were using reflection-in-action and that a novice reflecting educator exhibited true artistry in her use of it in resolving problems. This would seem to support Schön's (1987) hypothesis that reflection-in-action evolves from "competencies we already possess" (p. 32) or is a learned process. However, why some individuals do exhibit these competencies which the reflective practitioners, novice and experienced, clearly demonstrated is not adequately addressed in Schön's theory. It appears it is not experience alone that generates the emergence of reflection-in-action. Rather, how one uses experience is the more crucial element to understanding why some individuals reflect-in-action.

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