Using a Metacognitive Approach with Case-Based Instruction to Enhance Teacher Reflection and Promote Effective Educational Practices for Diverse Learners

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ABSTRACT: Many teacher educators have enthusiastically embraced case-based instruction in teacher education programs. However, the research base on whether pre-service and inservice teacher educators’ case-based reflections on educational issues is comprehensive and critical manner is equivocal. This study explores the use of a metacognitive strategy, the Case Decision Making Scaffold (CDMS), in the context of recommended case-based practices to determine what aspects of reflective practice are revealed by their written responses. Furthermore, the study examines whether students report that their experience of analyzing case studies using the CDMS to promote reflection helps them create educational environments that are inclusive and responsive to diverse student populations. The results indicate that graduate students who use the CDMS are capable of considerable reflective skills on issues regarding diverse student populations: however, only half the students had a positive response to using the CDMS. Modifications and appropriate use of the CDMS are discussed.
Case-based instruction in teacher education has been enthusiastically embraced by many who believe this approach can bridge theory and research (Miller & Kantrov, 1998; Shulman, 1996; Sudzina, 1999). The assumption is that by grappling with multidimensional, situated cases, students will acquire practical knowledge or “knowledge-in-action” in an apprenticeship provided by the context of a case analysis (Schön, 1987, 1991). Furthermore, advocates for the use of teaching cases claim this pedagogy promotes skills of reflection that extend beyond the classroom and instructional decision-making (Harrington, 1995; Kleinfeld, 1998; Lundeberg, Levin, & Harrington, 1999).

Exactly what constitutes effective reflective practice in teacher education is still evolving. Many researchers would assert that reflection involves recognizing a problem, framing and reframing the problem (i.e., moving from standard assumptions to a carefully considered perspective), making decisions, and taking action (Loughran, 2002; McAlpine, Weston, Beauchamp, Wiseman & Beauchamp, 1999; Schön, 1987). Furthermore, a teacher’s rationale for action should be informed by the educational community and the moral, social, cultural, and political context of schooling (Genor, 2005; Hatton & Smith, 1995; McAlpine et al., 1999; Liston & Zeichner, 1990). Reflection may occur in different time frames and focus on varying levels of problem complexity. Schön (1987) refers to adjusting instruction while teaching as reflection-in-action whereas reflection-on-action is planning before instruction or evaluation afterwards. While it is possible for expert teachers to both reflect-in-action and on-action (McAlpine et al., 1999), there is general agreement that pre-service or novice teachers need to be provided with meaningful opportunities such as case–based instruction to reflect-on-action (Hatton & Smith, 1995; Shulman, 1996). For the purposes of this study we have drawn from the McAlpine et al. model, which views reflection as an ongoing iterative process involving action,
knowledge, goals, monitoring, decision making and corridor of tolerance. We define reflection as the process of linking knowledge and action based upon careful monitoring of the teaching and learning environment in a case study and making decisions to improve educational goals.

**Research on the Case-Based Instruction**

Despite enthusiastic support for case-based instruction, the research on its effectiveness as a means for promoting reflection and, subsequently, development as a teacher is mixed (Lundeberg, Levin & Harrington, 1999; Moje & Wade 1997; Powell, 2000). Faculty who use the case study approach overwhelmingly believe that it enables their students to think critically, view an issue from multiple perspectives, make connections across content areas, and show more engagement in learning (Lundeberg & Yadav, 2006).

While faculty perceptions are extremely positive, studies that report on what and how students have learned are less encouraging and somewhat equivocal (Copeland & Decker 1996; Flynn & Klein, 2001; Lundeberg, 1999). In particular, studies of pre-service and in-service students’ responses to dilemma-based cases found their solutions were constrained by their own educational experiences, a technical view of teaching, and unquestioned assumptions about students’ abilities, needs, ethnicity, class or gender (Moje & Wade, 1997; Powell, 2000). These studies suggest that case instruction must encourage teachers to consider the educational literature, rethink their assumptions about pedagogical knowledge, develop metacognitive learning strategies, and think about teaching as a moral and political endeavor.

**Case Problem Solving and Metacognition**

Typical case-based instructional methods include (1) reading or viewing the case and relevant literature; (2) preparing for case discussions; (3) discussing the case in class; and (4) responding to the case. To ensure the effectiveness of case studies as a teaching tool, research
indicates the need of a competent facilitator, meaningful discussion groups, and broadly based theoretical and practical grounding to avoid solutions that are narrowly focused (Harrington, 1995; Lundeberg, 1999). Even with this pedagogy in place, many students are unable to offer responses that challenge conventional experience and beliefs, examine multiple perspectives, propose alternative solutions, determine consequences and critique solutions (Harrington, 1995).

One explanation for the apparent inability of some students to reflect on complex cases and suggest a grounded and comprehensive response is their lack of a metacognitive strategy for reflective practice (Clift, Houston, & Pugach, 1990). The importance of deliberately teaching students metacognitive skills essential to reflection can be found in Ertmer, Newby, and MacDougall’s (1996) study where students with high self-regulation were more persistent and more likely to value case-based instruction than those with low levels of self-regulation. This suggests that case-based instruction might be more effective for individuals lacking self-regulation when they are taught a strategy that scaffolds the reflection process.

Various definitions and models for metacognition have been advanced (Flavell, 1976), but only recently have there been attempts to compare metacognition with reflection (McAlpine et. al., 1999; Risko, Roskos, & Vukelich, 2005; Wilson & Clarke, 2004). While reflection is typically viewed as a more general term, metacognition involves more specific cognitive activities such as knowledge of one’s own thinking and self-regulation of cognition (Brown, 1980). The latter is often referred to as executive skills, including the learner’s ability to evaluate a task, set goals, choose strategies or actions, monitor progress, and make modifications. The ability to self-regulate has been shown to be essential to successful performance of a variety of cognitive tasks and many studies suggest that individuals lacking self-regulatory skills can be
taught metacognitive strategies through modeling or scaffolding them through the reflective process (Butler, 1998; Meltzer, & Montague, 2001; Westby, 2006).

Because metacognition is not normally associated with teacher development and definitions of reflection are still evolving, studies on what might qualify as a metacognitive strategy for improving teacher reflection are primarily descriptive and focus on instructional approaches such as journals or portfolios (Risko, Roskos, & Vukelich, 2005). Only two models of decision-making strategies for case analysis have been suggested (Mauffette-Leenders, Erskine, & Leenders, 1997; Stivers, 2003). Stivers (2003) utilized a framework for case analysis involving the following habits of mind: consider multiple perspectives, examine evidence critically, make connections, seek alternatives, and find meaning. This approach requires students to examine other individuals’ viewpoints, base assertions on facts in the case, question assumptions, strengthen their professional knowledge base, consider long and short term consequences of alternatives, and reflect on changes in their thought process. Mauffette-Leenders, Erskine, and Leenders (1997) described a detailed ten-step problem-solving process. Although both strategies follow a problem-solving paradigm, neither has been tested empirically.

This study used a Case Decision-Making Scaffold (CDMS) designed by the first author that outlines five basic metacognitive tasks involved in analyzing a case with several accompanying questions (see Figure 1) (Taylor & Whittaker, 2003). The CDMS was designed to serve as a framework for group discussions and an organizational structure for written case responses.

**Figure 1.1. Case Decision Making Scaffold**

<table>
<thead>
<tr>
<th>Recognize the Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there a trigger event that causes an individual to recognize a problem?</td>
</tr>
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</table>
What facts do we know about the individuals, the school, the family, and the community?

What discrepancies exist between the school's expectations and actual events?

Reframe the Problem

What is the perspective of the problem or issues held by various individuals?
What underlying assumptions, values, or beliefs do individuals involved hold?
How can we reframe the problem to address the important issues?

Search for Alternatives

What can we learn about the issues from those who have experience and expertise?
What alternative goals might address the important issues involved in the cases?
What short and long term consequences will each alternative goal have for the student, school, family, and community?
Which goals best address the important issues?

Develop and Implement a Plan of Action

How can we prioritize the goals to facilitate implementation?
What activities, referrals, resources, and strategies must be included in the plan of action to address the goals?
Who is responsible for performing the various components of the plan of action?
What criteria will we use to evaluate progress?

Evaluate Progress

What progress has been made based upon established criteria?
Are all individuals and groups satisfied with the progress?
What new problems have developed?

What revisions to the plan of action need to be made?

In summary, while researchers agree that a critical component of the case-based learning model is the reflection aspect it provides for the learner, research suggests there are mixed outcomes associated with its use. The context of case pedagogies that researchers have suggested promote reflection include: pertinent readings, in-depth discussion of educational issues, the reframing of problems on multiple levels, and formal written case analyses and presentations (Moje, Remillard, Southerland, & Wade, 1999). A possible reason for the mixed outcomes may be poor metacognitive skills required for effective reflection. Thus, students who are deliberately taught a specific metacognitive strategy may demonstrate enhanced reflective abilities. To date, however, no study has specifically examined the impact of using a metacognitive strategy combined with case-based instruction for developing students’ abilities to reflect on practice. The focus of this research study is the effect of using a metacognitive strategy within recommended case-based pedagogy to develop effective reflective practice. Specifically, this study explores two questions: (1) When students use a metacognitive strategy in the context of recommended case-based practices, what aspects of reflective practice do their written responses reveal? and (2) Do students report that their experience of analyzing case studies using a metacognitive strategy for reflection helps them create educational environments that are inclusive and responsive to diverse student populations?

Method

Participants

The graduate students studied were enrolled in a multicultural education course in fulfillment of their master’s degree in education. Of the 22 enrolled, 21 consented to participate
in the study. All had already obtained teacher certification in one area, most frequently elementary education. Eleven were currently teaching full-time, one was a teaching assistant, six were substitute teachers and three were full-time graduate students. Of those who were or had taught fulltime, three had taught more than five years, nine had taught between one and five years, and one was in her first year of teaching. Twenty of the twenty-one subjects were female and all were White.

*Teaching Case Format*

The course was structured around complex, dilemma-based teaching cases that focus on issues of diversity (Taylor & Whittaker, 2003). During the semester the students discussed nine different cases and wrote case response papers for three. Students read the cases and related research prior to class and participated in instructor-led and small group discussions on issues of educational diversity. In the beginning of the semester the instructor presented the CDMS and modeled its use for analyzing cases. Although students were introduced to all five steps of the CDMS, the focus of class discussion during weeks 3 though 5 was on the initial steps: “recognize the problem” and “reframe the problem”. Students were encouraged to recognize several major problems and support them with facts from the case. To reframe the problem students identified the beliefs of the major characters relating to the problems and reframed them by finding common belief systems amongst the characters. The fifth week they submitted a paper that analyzed another case using just these two steps of the CDMS with a rationale from relevant research. During the sixth week the instructor explained the third component of the CDMS, “search for alternatives” with an emphasis on identifying goals that address the problems identified and common beliefs. For three weeks, the instructor facilitated discussions on additional cases, putting emphasis on establishing multiple goals that were research-based,
involved short and long term planning, and had the potential to affect change not only in the classroom, but on the school, district or community levels. The ninth week another written case response was submitted structured around the first 3 components of the CDMS.

Emphasis during the tenth through thirteenth weeks of the semester was on developing a plan of action. A plan of action included the statement of several goals, each of which was addressed using a planning matrix. During the twelfth week another case response was evaluated and expanded the analysis to the first four of the five parts of the CDMS.

**Measures and Data Collection Procedures**

Two measures were used to understand the effects of using the CDMS with complex case studies about diverse school populations to develop effective reflective practice. First, informants completed a written response on the final case of “Fome Querishi.” In this case, Fome is a recent immigrant from Pakistan whose family has come to the United States to gain a better education for their children. Fome is a second language learner whose parents are concerned about the cultural differences between Fome’s Muslim school in Pakistan and his new American school. The response was written outside of class and was used to address the first research question regarding the effects the metacognitive strategy had on students’ ability to reflect on practice.

Second, the students were given the following two open-ended questions to respond to: (1) In what ways has analyzing case studies helped you better understand how to create an educational environment that is inclusive and responsive to diverse student populations?, and (2) Did you like using the Case Decision Making Scaffold to address school-related problems? The students responded anonymously on a written survey to these questions at the end of the semester. These two questions were used to gauge students’ perceptions about the usefulness of
this model of instruction in assisting their work to make educational decisions in diverse environments, the second research question.

Data Analysis

To determine the coding categories for the written responses, the first author applied the six categories from the McAlpine et al. (1999) model of reflection to the student responses to the first open-ended question. Based on this initial analysis, it was determined that not all categories were evident or clearly separated from each other; thus three major categories were selected. At this point, not all data appeared to fit in any of the six components, so an additional category was added for a total of four categories.

Second, to verify the categories, the second author independently examined the data and determined that all four categories were evident. Third, definitions for each category were generated. The following categories and definitions were agreed upon: (1) Knowledge – responses that show the acquisition of new information or awareness related to self (i.e., beliefs), subject matter, pedagogy, the learner, or the educational environment; (2) Decision making – responses that show initiating, maintaining, adjusting or terminating a plan as a result of monitoring the environment; (3) Goals – responses that establish expectations that drive action based on monitoring the environment and decision making; and (4) Extent of Analysis – responses that show the degree (i.e., amount, time span, or scope) of knowledge acquisition, decision-making or goal-setting. Fourth, the data from both measures were sorted into the four categories. Fifth, the number of entries in each category was counted for descriptive statistics (Berg, 2004; Creswell, 2003). Additional steps regarding analysis of data for each measure are described in the following sections.
Written Case Responses – Fome. Because the Fome case is open-ended and does not have “set answers,” it was recognized that the major problems of the case needed to be determined and agreed upon before proceeding any further. While case study researchers generally agree that there are many appropriate responses to a case depending upon the goals of a course, there also are inappropriate responses (Taylor & Whittaker, 2003). To determine appropriate responses, five experts in the field of multicultural education were asked to read the case and to list what they perceived to be the major problems in the case based upon the following definition: a problem that has a long term negative effect on a student’s educational progress; is multifaceted; stems from longstanding differences in beliefs; has implications beyond the classroom to the district, community and organization levels; is recognized in the educational literature; and requires a comprehensive plan of action. Their responses were analyzed and five categories of major problems emerged: (1) Second Language Acquisition Issues; (2) Cultural and Religious Diversity; (3) Family-School Communication; (4) Cross-Cultural Competence; and (5) Acculturation to U.S. Schooling. After the first coding of the written responses, the researchers collapsed the last two categories, which overlapped considerably, into one category, Cross-Cultural Competence, thereby reducing the protocol to four major problems and four matching goals.

Once the problems and matching goals were identified, a protocol was developed to identify critical components that contributed to the four major categories of reflection. The researchers separately used the protocol with several written responses from a previous semester and revised it based upon their discussion of the CDMS and the types of written student responses that exemplified aspects of reflection. This process was repeated until both researchers agreed upon the content of the protocol (see Table 1). Following the development of the
protocol, the first author and a graduate student who took the course during a previous semester read each case separately to determine the presence of the problem solving components. Once the written responses were scored on the protocol, the researchers met to discuss agreements and disagreements and jointly agreed on a final coding. The inter-rater agreement for categorizing the written case responses was 91.8 percent.

Open-Ended Question Responses. Both researchers categorized the responses for the first question separately. Agreements and disagreements for each response were then discussed to arrive at a final categorization of the data. The inter-rater agreement for categorizing the written responses was 74.2 percent. For the second question, responses were not coded into the categories, rather the number of “yes”, “no”, or “ambivalent” responses were tallied.

Results

Reflective Practices Evident in Written Case Responses

Nineteen written case responses were analyzed to determine the aspects of reflective practices, the first research question, were applied by the students for the Fome case. Two were not analyzed due to missing data. Overall, high levels of reflective practice were evident in the written responses by the students (see Table 1).

<Insert Table 1 here>

Two protocol questions were categorized as displaying the acquisition of knowledge. All the students were able to identify values, beliefs and assumptions of major stakeholders, or case characters, with 94.7% of the students identifying 3 or more stakeholders. In addition, all the students were able to identify a commonly held belief system amongst the stakeholders.

Similarly, two protocol questions were categorized as responses that demonstrate decision making. All students were able to recognize major problems in the case identified by
experts. Furthermore, high levels of decision making skills were evident in that all students cited relevant theoretical or empirical research to support problem identification, reframing, or choice of alternatives.

Three protocol questions addressed the category of goal setting. All students identified major goals that corresponded to the problems identified and outlined a plan of action to accomplish each goal identified. The majority of plans (89.5%) defined a series of sequential or logical activities that identified persons responsible, and a criteria and timeline for evaluation.

Finally, four protocol questions showed the extent of analysis (i.e., quantity, time and scope) of reflective practice within the various components of the CDMS. All but one student discussed the beliefs of three or more stakeholders when reframing the problem. The majority of students (78.9%) identified 3 or 4 major problems and goals. Specifically, nine students (47.4%) for each problem identified matched it with a corresponding alternative, 7 students (36.8%) had a corresponding alternative for 75% of the problems identified and 3 students (15.8%) had a corresponding alternative for half their identified problems. All the students identified short-term goals with 84.2% also identifying long term goals (i.e., requiring timelines of six months or more). Further, the majority of students (94.7%) identified goals that went beyond the classroom level and applied to the school district, with 57.9% also identifying goals that extended to the community, state or national level.

*Student Report of the Metacognitive Strategy as a Tool for Reflection*

Twenty students responded to two open-ended questions regarding the use of a metacognitive strategy combined with cases to create an educational environment that supports diverse learners. One student chose not to respond to this question. See summary of results on Table 2 and supporting statements for each category.
Student comments typically were categorized as illustrating one or two categories of reflection. The majority of student responses (60%) reflected a perception that using a metacognitive strategy with case-based instruction helped them acquire new information or awareness related to self (i.e., beliefs), subject matter, pedagogy, the learner, or the educational environment. Just under half of the students’ responses show a perception of enhanced decision making skills helping them to “evaluate”, “analyze”, “adjust”, and “apply”. The same number of students commented about an increased extent of analysis in terms of breaking down a large problem, examining an individual in a comprehensive manner, or making connections throughout the process. The smallest number of responses (30%) related to establishing expectations that drive action. These responses were general in nature and relate to the connection between problem and solution.

The majority of students (57%; 12 out of 21) reported that they “liked” using the CDMS, but a sizable minority (43%; 9 out 21) did not or were ambivalent. Those who gave reasons for their affective response provided a more nuanced picture. Some didn’t like it at first, but found it became easier to use with repeated practice. Others didn’t “like” it but could see the organizational benefit the scaffold provided or particularly appreciated one component (e.g., finding common beliefs). A few on both sides felt there were confusing aspects such as the difference between recognizing and reframing the problem.

Discussion

Students who use a metacognitive strategy to reflect on multidimensional case studies appear to be capable of considerable reflective skills. All students in the class were able to reflect on important aspects of the case by using knowledge about stakeholders’ values to decide on
major problems and appropriate goals. Most students were able to decide on a plan of action that was logical or sequential. Perhaps the most encouraging outcome was the extent of analysis displayed. All students looked at the case in a comprehensive manner, identifying multiple major problems and considering the values of several important stakeholders. Similarly, the goals they established went beyond the instructional level to address issues on the school and community level and included activities that involved both short and long term commitments.

Importantly, student responses to open-ended questions reveal that the framework helped promote meaningful reflection. Knowledge was the most frequent category of reflection noted. Responses show that, for some, just reading the cases and related research provided them with new knowledge about schooling and diverse student populations. The work of McAlpine et al. (1999) in which teachers reflected on videotapes of their own teaching demonstrated that even expert teachers frequently reflect on their own knowledge of the learner and pedagogical content knowledge. Depth of knowledge influences the ability to create plans and make adjustments, suggesting that the primary role reflection on knowledge takes for less experienced teachers is necessary.

The finding that student responses regarding extent of analysis and goal setting were equally represented but somewhat less frequent than knowledge is interesting but not unexpected. It appears that use of the CDMS for reflection requires students to think more comprehensively about problems and appropriate goals. Case analysis is reflection-on-action and, therefore, asynchronous with the teaching process. Not only is it a recommended practice for novice teachers (Hatton & Smith, 1995; Shulman, 1996), it may lead to more dramatic shifts in teaching and learning than is possible while reflecting-in-action (McAlpine et al., 1999).
The fact that the category of goals was represented least frequently in student responses is a positive result. Assignments were structured to introduce the CDMS section by section so that students had more practice identifying problems and beliefs than setting goals. A purpose of the scaffold is to avoid students’ proclivity toward setting narrow goals based upon limited problem identification.

These findings appear to exceed the outcomes of previous studies in which students were constrained by their own experience, viewed teaching as a technical act and did not consider multiple perspectives (Harrington, 1995; Moje & Wade, 1997). In an undergraduate teacher education course that used dilemma-based cases, Harrington (1995) investigated whether students’ final reflections in written analyses were more grounded, warranted, inclusive and critical. Although there was improvement from the beginning of the semester, on the final case only about half of the students were able to identify problems grounded in facts, provide multiple sources of evidence to support their solutions and consider long term consequences involving social justice. Moje and Wade (1997) found that while inservice teachers saw teaching as more complex than pre-service teachers, both groups saw student abilities as innate and fixed and raised no questions about the influence of ethnicity, class, or gender and, therefore, did not address the need to alter social and school structures.

By contrast, the major problems and goals that the students focused on directly addressed issues of diversity which, by their own acknowledgement, were sometimes outside their own experience. Given the importance of infusing the principles of multicultural education throughout the teacher education curriculum and identifying meaningful instructional approaches that enable students to reflect on issues of diversity (Banks, 2006), some have suggested the use of culturally relevant case studies (Kleinfeld, 1998). However, both Powell (2000) and
Harrington (1995) found that students from a primarily homogenous, White culture did not reflect on issues of diversity when presented with cases that contained these issues. Since the students in this study were all White, it is significant that the major problems identified by the students in this study were similarly recognized by experts in multicultural education. By reading relevant literature and analyzing cases that directly address issues of diversity using the CDMS, students perceived that they had become more knowledgeable about issues relevant to diverse student populations. They also wrote goals and logical action plans related to these issues.

In addition to examining how the metacognitive strategy helped the students think about and plan for diverse learners in the classroom, they were asked whether or not they liked using the metacognitive strategy to identify and address problems. While the majority of students did see the benefit of using the strategy, it was interesting to see a number of them did not “like” it. The data in this study does not identify why some students had a negative affective response. However, other studies on using metacognitive strategies for promoting reflection suggest possible explanations.

First, the CDMS involves multiple steps. Some students had difficulty understanding the difference between recognizing problems and reframing the problem based upon individuals’ belief systems. Since common belief systems are recognized as a primary motivator for collaborative action (Taylor & Whittaker, 2003), clarification may be needed. Furthermore, the questions under each component may be confusing. In addition, the CDMS is presented as a linear model for clarity of exposition but in reality the nature of reflection requires a more recursive model (McAlpine et al., 1999).

Second, it is possible that using a metacognitive strategy may not be the most appropriate approach as a tool for promoting reflection for all pre- or inservice students. Findings from
several studies focused on teaching a metacognitive strategy in some academic area to students with learning disabilities may provide additional insight into this concern (Butler, 1998; Meltzer & Montague, 2001; Swanson, 1990). In general, strategies may not necessarily eliminate or address difficulties students have prior to being taught the strategy. A sufficient and appropriate knowledge base is required for the strategy to be used to its fullest extent. Furthermore, teaching a metacognitive strategy to someone who can already effectively complete a task is counterproductive. These findings also may apply to teaching pre- or inservice students to use the CDMS to promote reflection.

**Suggestions for Future Research**

This is a descriptive study and may not be able to be generalized to other groups. While it appears that students in this study identified many of the same problems and goals identified by multicultural experts, it is unclear if using the readings, cases and the CDMS really did improve their ability to reflect on cases. Future research could determine whether there were clear improvements from the beginning of the course and which components of the pedagogy (i.e., readings, cases, discussions, CDMS) were most influential in this improvement.

Regardless of racial and cultural backgrounds, all pre-service and in-service teachers are constrained by their own experience. Cases that include issues of diversity that are presented in conjunction with relevant theories, research and practice in multicultural education can lead to fairly robust written outcomes in student written responses. However, the question remains whether these reflective responses generalize to practice in the field. We agree with Moje and Wade (1997) that using teaching cases is an important part of a teacher education program, but it must be combined with structured field experiences in school settings, especially those that are
outside the students’ own cultural experience. Further research is needed to track teachers’
abilities to incorporate the principles of multicultural education into their classroom and schools.
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