

## REFLECTION: ISSUES RELATED TO IMPROVING PROFESSORS' TEACHING AND STUDENTS' LEARNING

**Key words:** Reflection, improving teaching, teachers' knowledge

**Abstract:** In this chapter we describe the outcomes of our research on the reflection of six professors considered exemplary in their teaching. For instance, we found that they all held and used considerable knowledge about learners, as groups and as individuals, and used this knowledge in reflecting on the impact of their teaching. We use this information to elaborate on the role of reflection in the construction of teaching knowledge. Lastly, we address how the model of reflection we developed helps us understand the factors influencing one's ability to reflect effectively on teaching.

### 1. INTRODUCTION

There are different traditions in reflective practice that influence how one conceptualizes the role or emphasis of reflection in the life of the teacher (Zeichner, 1994). An academic orientation focuses on the organization of subject matter, a social efficiency orientation on how well practice matches what research says, a developmental orientation places priority on understanding students' thinking, a social reconstructionist orientation sees reflection as a political act, and finally the generic orientation is one in which any reflection is good because teachers can then be more intentional and deliberate in their thinking about teaching.

Our orientation currently could be characterized as the last. We would agree with Neufeld and Grimmer (1994) that growth can result from reflection on "the ordinary day-to-day experience of instructing students in classrooms ... (which) ... elevates the activity of instruction from the level of mundane drudgery to one that has the potential to educate practitioners, thereby changing and improving their practice".

What we want to do first in this chapter is describe the outcomes of our research on reflection. We have documented and analyzed in detail the reflective processes

of six successful university professors<sup>1</sup> in their day-to-day planning, instructing and evaluating of learners. The result is an empirical model which represents how reflection operates as a metacognitive process for evaluating and improving teaching. We have also developed a coding scheme that operationalizes the process of reflection. Both provide a language for describing reflection and therefore a way to think about how to improve teaching. Carrying out this research has not only provided some answers, but has also raised a number of issues. We also explore some of these in the chapter. Specifically, we elaborate on the role of reflection in the construction of knowledge about teaching: how we see these two inextricably linked. Then, we go on to explore the relationship of reflection to teaching development, which we conceive of as a conceptual change process. Last, we address the relevance of linking reflective teaching to student experience of learning and describe our goal in researching this little explored area.

## 2. THE PROCESS OF REFLECTION

Although reflection was a term used by Dewey, the recent interest in reflection was stimulated by Schön (1983) who highlighted the value of reflection in helping professionals learn about and improve their practices. Although reflection can be useful in learning from any experience, our interest is on how reflection serves as a mechanism for turning experience into knowledge about teaching. Ongoing use of the process of reflection is essential for building knowledge, and increasing knowledge increases one's ability to use reflection effectively and to develop as a teacher.

The process of reflection can operate in different spheres or arenas. We use the term sphere to designate these different arenas of reflection since the word does not suggest levels that must be achieved or transcended in a particular order. Diverse schema have been suggested to differentiate this varying nature of reflection (e.g., Carr & Kemmis, 1986; van Manen, 1977). From our perspective, practical reflection focuses on improving actions in a particular course or class. Strategic reflection involves an attention to generalized knowledge or approaches to teaching that are applicable across contexts. Epistemic reflection represents a cognitive awareness of one's reflective processes, as well as how they may impede reflection and enactment of plans. Although in our research we documented instances of strategic and epistemic reflection, the focus of our inquiry and the bulk of the reflection we documented was in the practical sphere, in which the focus is improving actions in a particular course or class.

Reflection can also occur prior to, concurrent with, and retrospective to instruction. That is, reflection may occur asynchronously when considering future actions (reflection-for-action) in light of past experience (McAlpine, Frew & Lucas, 1991); this is distinct from planning, although related, since planning need not draw on previous experience. Reflection can also be continuous and synchronous with

<sup>1</sup>Professors' in the sense of 'university teaching staff'; not necessarily 'full professors' or professors in the British sense.

teaching, in which case it is concurrent or reflection-in-action (Schön, 1983; 1987). Reflection may also occur asynchronously at some point after class, and thus be disconnected from teaching actions. We think that retrospective reflection-on-action (Schön, 1983; 1987) represents the most common conception of reflection. We also believe reflection-on-action provides the opportunity for dramatic, extensive structural changes, and is more likely to take place in the strategic or epistemic sphere. Concurrent reflection-in-action and retrospective reflection-on-action were about equally represented in the reflection we documented. We have not yet completed the analysis of the data that will enable us to understand reflection-for-action done prior to instruction.

Despite the extensive discussion of reflection in the literature, there is, in fact, little research that has been theory-based, or has attempted to operationalize the term (Kompf & Bond, 1995; Kremer-Hayon, 1988). We believe our work does both; it draws from theory, and then operationalizes these concepts. We began with constructs from the literature (i.e., reflection, metacognition, domains of knowledge) and developed an initial model of the cognitive processes that are linked to improvements in teaching, a process in which one evaluates the relation between one's intentions and the impact of actual teaching actions, and makes adjustments to teaching as appropriate (e.g., Alexander, Schallert and Hare, 1991; Chi, Glaser and Farr, 1988; Kagan, 1992; Nelson & Narens, 1990; Shulman, 1986). Based on these theoretical constructs, we used the actual reflections of successful university teachers to verify, refine and elaborate the major constructs of our representation of the metacognitive process of reflection.

### 3. METHOD AND DATA SOURCES

Six professors recognized for their teaching excellence participated in the inquiry: three at McGill University in Montreal, Canada and three at Queen's University in Kingston, Canada. Three, trained as teachers, were in Faculties of Education; we call them math educators. Three, not trained as teachers, were in Faculties of Science; we call them mathematicians. There were two women and four men, all at least 45 years of age. All were experienced professors having taught in universities a minimum of ten years.

They were chosen based on the following criteria: recognized for teaching excellence (awards, positive student course evaluations, peer recommendations), and teaching a course they had taught before. The fact they were acknowledged for their achievements in teaching over a period of time by a variety of different sources can be interpreted as a mark of expertise (Ericsson & Smith, 1991). Exemplary teachers were chosen because research suggests that experts tend to exhibit more metacognitive activities than nonexperts and are better able to articulate them (e.g., Chi, Glaser, & Farr, 1988; Scardamalia & Bereiter, 1986). In this way, we could hope to document 'best practices'. Teaching a class they had taught before meant they would be familiar with the instruction related to the course and the nature of the students, and would thus be better able to display their expertise. The classes varied in size. Three were around 25 students and three were between 80 and 100.

During the delivery of the course, each professor was videotaped in one third of each of the 39-hour courses. The professors were interviewed pre and post class for each of these videotapings. The postclass interviews included a viewing of the videotaped class sessions which stimulated recall about their reflections during teaching. The verbal data were transcribed and then verified by the professors.

The analysis of the data consisted of coding the transcripts, drawing on constructs from the literature and constructs that emerged from the data (code book available from the authors). This analysis expanded and refined our understanding of how the professors reflected. When we had finished the analysis we held a symposium with the six in order to present to them the results and the model representing our understanding of the metacognitive process of reflection. Their overall reaction supported our interpretations. Although none of the professors had previously attempted to articulate what it was they were doing, by the end of the symposium, they were using the language of the model to discuss how they went about evaluating their teaching. (See McAlpine, Weston, Beauchamp, Wiseman and Beauchamp (1999a), for a full description of this research.)

#### 4. THE MODEL OF THE METACOGNITIVE PROCESSES OF REFLECTION

Reflection as we define it is anchored in experience, in teaching *action*. Teaching actions are *monitored* in terms of external cues in order to track the achievement of *goals*, prior to, concurrent with and retrospective to instruction. Monitoring may lead to *decision-making*, decisions to modify teaching actions, dependent on where cues fall in relationship to the *corridor of tolerance*, a mechanism for explaining why only some cues lead to decisions to change. Ongoing use of the processes of monitoring and decision making are essential for building *knowledge*. Each of these components of the model (see Figure 1) will now be described in detail.

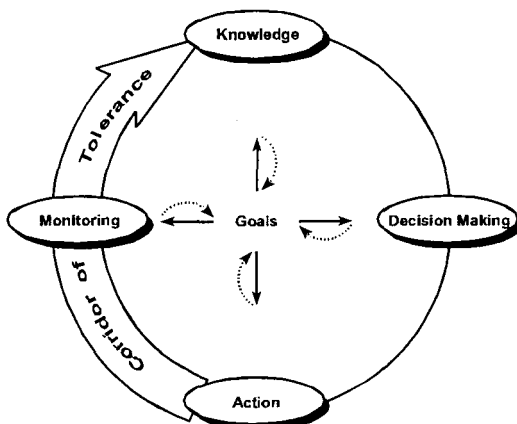


Figure 1.

#### 4.1 Teacher actions - experience

What is apparent but not often made explicit in discussions about reflection is the critical importance of having actual experience upon which to reflect. Reflection is the vehicle for turning experience into learning (Boud, Keogh and Walker, 1985; Sternberg and Horvath, 1995). Webster's dictionary (1961, p. 800) defines experience as "direct observation of or participation in events: an encountering, undergoing, or living through things, in general, as they take place in the course of time". For instance, going to a baseball game is an experience of baseball since it involves external engagement in events whereas reading about a baseball game is an experience of reading.

Experience enables us to become skilful, e.g., in driving, teaching, cooking, managing. However, experience alone may not be sufficient to become skilful. As noted by Chi, Glaser and Farr (1988) and Ericsson and Smith (1991), one must distinguish practice from mere exposure to experience; specific long continued practice is important to develop skill. We concur and believe that multiple, repeated observations and interactions with the phenomenon in particular contexts may be necessary. Further, we believe that it is the analysis of these multiple experiences through reflection which enables one to detect patterns that then lead to knowledge. "Practice is about increasing your repertoire of ways to recover from mistakes" (Gutin, 1999, p.108) since "learning [in our case about teaching] requires feedback in order to be effective" (Ericsson & Smith, 1991, p.27). In other words, turning experience into knowledge may be dependent on the ability to use reflection to recognize patterns in the multiplicity of variables in experiences.

In terms of the model, experience is the base upon which the process of reflection is grounded. It represents the external actions of the teacher, the arena in which teaching is enacted, as cognitions are transformed into behaviours. Reflection is visualized as the continuous interaction between actions related to teaching and knowledge. In our research, we did not analyze teacher actions, but rather the professors' cognitions about their actions.

#### 4.2 Goals

Goals are the component around which the process of reflection takes place since goals represent the teacher's expectations or intentions about what is to be accomplished in terms of instruction and form the basis for actions to be taken in order to achieve these. It is for this reason that they are placed centrally; they both direct and constrain the other features of the model. Although goals remain relatively constant (based on our research), feedback from the other components may lead to a change in the goals. Thus, the interaction between knowledge and action occurs related to specific goals. In our study, we found that the professors attended most to goals related to instructional methods (33%), next to student understanding (26%), and then to content (24%). The attention addressed to teaching goals (i.e., method and content) by these professors was expected and natural. What was of particular interest to us was the extent to which goals related

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