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Strategic Questions: A Means of Building Metacognitive Language

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Conversations between educators and students about choices and strategies are an important pedagogical mechanism to examine the abstract concept of learning. Although students have tacit knowledge about their approach to learning, they are often unable to coherently communicate their ideas. Drawing on the theory of metacognition, the technique of strategic questions is outlined as a means to represent, organize, and communicate students' abstract ideas about themselves as learners. Strategic questions provide a metacognitive language that allows students and teachers to examine a learning experience. In particular, reasoning for decisions and action, doubts or concerns, explanation of engagement and effort, and values and expectations. A case study is outlined of the use of strategic questions within a pre-service teacher education degree as a method that supports a reflective practitioner approach to learning.

The context for higher education is rapidly changing. Academics are increasingly required to provide learning experiences using a range of media and technology that promote the active and often independent construction of knowledge. In return the assumption is that students have self regulatory skills, including a capacity to monitor and adapt their approaches to learning in terms of effectiveness and efficiency.

However, we cannot know exactly the decisions a student makes about his or her approach to learning. When we see our students typing in the computer lab or sitting in a lecture, we imagine that this activity signifies a positive response to our instruction. While we can make assumptions about students' engagement or their sense of task value, it is perhaps only through conversations about learning that we can begin to examine how our students are negotiating contemporary education contexts.

The central purpose of this paper is to explicate a means of enabling students to represent and communicate ideas about their personal learning experience. What follows is a definition of what I have called *strategic questions* and a rationale for how this process provides one means of building a language of metacognition. This metacognitive language contributes to building student self-regulatory capacity within contemporary higher education contexts. A case study is outlined of this method in use with teacher education students, as are the implications for higher education pedagogy. This case study is located within a student-focused approach to teaching that encourages self regulated learning and where time is allocated to discuss problems, debate issues raised by course material, and to question student ideas (Trigwell, Prosser, & Waterhouse, 1999).

Students have a strategic approach to learning in reaction to their perception of the requirements of an instructional task (Warburton, 2003). That is, students examine the characteristics of a task and make decisions about the degree of effort they will invest. Perhaps educators in higher education would like to think that the strategic approaches of their students do not include passivity, dependence, surface learning, or inefficient use of learning strategies. Conversations between educators and students about choices and strategies are thus an important pedagogical mechanism to explore the multi-faceted and complex concept of learning. Educators need a way to implement metacognitive discussions that will work within the complex and busy world of the contemporary higher education classroom (Kuhn & Dean, 2004). Methods are needed to support students and teachers critical reflection on instructional tasks. This paper provides a pedagogical technique to frame discussion between students and educators of the contemporary learning experience.

The Concept of Strategic Questions

The learning environment of higher education often encourages independent, self-regulating, student learning behaviour. Tasks structured to encourage student self-regulation are integral in the development of understanding of complex knowledge (Stefanou, Perencevich, DiCintio, & Turner, 2004). A variety of instructional formats support independent learning behavior (see Grinsven & Tillema, 2006); although, all have the common purpose of overtly involving the learner in the learning process (Niemi, 2002). Metacognitive skills are key components of approaches to learning where the learner has to monitor, evaluate, and regulate their own learning strategies.

Metacognition is an important construct in relation to knowledge acquisition that emerged from the seminal work of Flavell (1976) and is concerned with how one thinks about one's own cognition. Awareness of one's own thinking and increasing knowledgeability about cognition and learning processes enable students to learn more effectively (Pintrich, 2002).

Metacognition is usually conceptualized having two components: knowledge of cognition and regulation of cognition (Schraw, 1998). Knowledge of cognition includes a general knowledge of strategies that can be used for different tasks, knowledge of which strategies are effective under certain conditions, and knowledge about oneself (Flavell, 1976). For example when attending a lecture students have a number of strategies for listening, taking notes, and checking ongoing comprehension. Students also are aware of their motivation, strengths, and weaknesses in relation to the lecture topic. Students can also use situational knowledge such as making a judgment about how to access information covered in the lecture though alternative strategies.

Regulation of cognition is where a learner exerts conscious monitoring and control over their cognitive and learning processes (Pintrich, 2002). Brown (1987), for instance, presents four types of regulation: (a) prediction, (b) planning, (c) monitoring, and (d) evaluation. This paper focuses on metacognition as a set of self-instructions for regulating performance on tasks (Veenman, Van Hout-Wolters, & Afflerback, 2006).

Metacognitive development is a gain in knowledge, awareness, and control over an individual's learning, leading to a purposeful improvement of performance. Since metacognition is an abstract concept, it necessarily involves students imaginatively reconstructing thoughts and actions invoked in response to an instructional task. This involves more than simple description and includes analytical and evaluative interpretations. Georghiades (2004) for example, argued "the practice of non-critical metacognition is not possible" (p. 371) and commented that metacognitive reflection involves noting important moments, acknowledging mistakes, and identifying relationships and links between prior and learnt knowledge.

Educators have been urged to support student autonomy and self-regulatory practice by including metacognitive strategy training as an integral part of instructional tasks (Hattie, Biggs, & Purdie, 1996; Veenman et al., 2006); and challenged to provide a framework to support student conversations about learning that is neither prescriptive nor vague (Schwartz & Heiser, 2006). Recent research has emphasized that explicit instructions about metacognitive and cognitive strategies are likely to help students to improve learning and performance (Askell-Williams & Lawson, 2005; Hattie et al., 1996; Veenman et al., 2006), and that students should be provided with opportunities to self-assess as a basis for developing a repertoire of regulatory learning strategies (Zimmerman, 2002). For instance, asking students about what strategies they used, as well as how and when they were used (Cromley & Azevedo, 2006), or they may have to describe what they did before, during, and after a task (Pressley & Gaskins, 2006).

The metacognitive exploration of instructional tasks suggests that students explicitly enter into a conceptual dialogue about learning. The implication is that students need to build and use a language that enables them represent and communicate their abstract, speculative and dynamic thoughts about their metacognitive experience. This is the important point upon which the remainder of this paper hinges.

Students are likely to have, usually in implicit form, unformed ideas that are a potential basis for explicit discussion of learning (Askell-Williams & Lawson, 2005). This tacit knowledge is not always available to communicate, although there may be evidence that such knowledge exists (Pylyshyn, 2002). Asking a student to discuss their ideas about learning disadvantages those students who may not have a rich enough vocabulary to coherently describe their thoughts (Boekaerts & Corno, 2005). Reasons for this include a poor conceptual understanding of the learning, cognitive and metacognitive process, an absence of descriptive labels, difficulty in separating learning processes from other influences (Siegler & Jenkins, 1989), and a lack of experience in monitoring their learning (Boekaerts & Corno, 2005).

Given the probable difficulties of students self-assessing their internal learning processes, there is a need to provide students with a coherent and durable framework that allows them to access, interpret, and use their implicit metacognitive knowledge. Students need to be able to draw upon their knowledge and views about the learning process and variables that affect their thinking to actively self-regulate their classroom learning (Vermunt, 1998). Provision of an explicit framework for metacognitive discussion is preferable to the assumption of many educators that students will somehow indirectly acquire metacognitive wisdom (Pintrich, 2002).

Mackenzie (2007) suggests that asking questions to build and refine understanding is a basis for conceptual dialogue. Asking questions is a part of negotiating experience (Ramsden, 1987), and students may ask questions in order to seek clarification, comprehend information, and test the application of knowledge (Nyikos & Hashimoto, 1997). Gourgey (1998) comments that student passivity and dependence is a function of a "lack of internal dialogue driven by self-questioning" (p. 95). Student learning can be characterized as a process of adaptive reaction to their environment and expressed through personal, often unspoken, questions about a task such as "Is this useful?" (Ramsden, 1987).

Strategic questions are conceptualized here as deliberate questions that students ask themselves to inform the strategizing of their learning. The term

strategic is defined as a conscious choice students make in order to control and regulate their cognition and learning. A strategic question is invoked in response to and indicates an awareness of context, and is an intention to exert control over specific learning experiences. The question "Is this important?" is strategic in the sense that a student has to allocate attention, effort, and energy among competing demands. The resolution of a strategic question requires interaction with metacognitive awareness and shapes metacognitive regulation.

Strategic questions are those questions that a student wishes to have resolved (Haroutunian-Gordon, 2007). They are, to use Dewey's (1944) still salient term, a genuine question, emerging from the student's experience. Such questions can become the focus of the learning and teaching experience (Commeyras, 1995). In simple terms, strategic questions are imagined as the core of a student's reasoning about his or her learning choices.

Strategic questions represent a student's metacognitive awareness and regulatory intention. They provide a language that supports student and teacher conversations about the learning process and the conditions of learning beyond the technical process of task completion (Rudduck & Flutter, 2000). A language allows the modeling of the metacognitive process and, by implication, an improvement in metacognitive awareness (Fielding, 2004).

The conceptualization of strategic questions here raises the issue of whether these questions can be categorized into, for example, surface or deep approaches to learning, or into performance or mastery orientations. Can one question be more strategic than another? While these questions offer possibilities for further research the purpose of this paper is to outline the generation process for strategic questions that support a co-regulated reflection process. The strategic questions provide a language to represent and communicate students' metacognitive experience. The value and meaning of using strategic questions is not in the designation of some questions as more or less appropriate than others, but to discuss the meaning and implications of these questions with the students.

It is acknowledged that strategic questions provide a speculative model of metacognitive language. However, it offers students a focused means to represent, organize, and communicate their abstract ideas about themselves as learners within specific contexts. A student's strategic questions in reaction to an instructional task can also provide the lecturer with a sense of how the intentions of the task are being understood and mediated.

The conditions of the learning environment need to be appropriate to learners generating questions. This includes allocating time for students to generate questions and for group discussion and reflection, allowing students to practice asking and answering questions, discipline-based modeling of the process and importance of metacognition, and designing tasks that require students to make choices about strategy use (Pedrosa de Jesus, Almeida, Teixeira-Dias, & Watts, 2007; Schraw, 1998). The process also assumes that students have the capacity and motivation to devise their own strategic question.

Strategic questions are thus students' attempts to move inner thoughts about themselves as learners, given a specified task and context, to overt exploration of task engagement. They represent student ideas in response to the learning environment and are a starting point for discussion about learning and teaching of discipline knowledge. In simple terms, strategic questions provide a basis for critical consideration of how students strategize their learning.

Case Study: Pre-Service Teacher Education

Learning is an abstract and dynamic concept that teachers seek to understand throughout their classroom lives. Engaging pre-service teaching students in discussion about learning is thus a key aspect of teacher education courses. Including metacognitive discussion as part of an undergraduate teaching degree has the purpose of impacting the students' teaching knowledge and practice. The use of strategic questions is a natural part of a learning environment where pre-service teachers can attempt new ideas, reflect on the outcomes, and co-construct new knowledge about teaching (Butler, Lauscher, Jarvis-Selinger, & Beckingham, 2004). This case study highlights the use of strategic questions as a basis for constructing dialogue with students about their learning decisions.

Theories of Learning is a first year unit in a primary teacher education course at La Trobe University, with approximately 200 students enrolled in 2007. The campus where the study was conducted is in a regional area of Victoria with a student catchment area covering central and northern parts of the state. Students tend to be from lower to middle socio-economic areas and most students had recently completed secondary school. While undertaking this unit, the students are often required to reflect on their learning. This study emerged from a personal perception that student reflection was often uncritical and largely descriptive, possibly due to the abstract nature of reflection where students were uncertain about the "correct" answer.

Chiu (2006) outlined a process of reflective practice where the practitioner moves from reflecting on their experience, through representing ideas to critically reflecting in order to gain useful knowledge. This study outlines an attempt to move students from

merely completing the task requirements to critically reflecting by engaging in discussion about their strategic approach to learning (Boyer, Maher, & Kirkman, 2006). Reflection is particularly relevant where students have to react strategically and make choices about their learning behaviour (Evans, Kirby, & Fabrigar, 2003). The use of strategic questions is based on consideration of individual reasoning for choice, and thus provided a basis for the reflection process.

The concept of providing an explicit framework for metacognition is crucial to the overall process, and it was introduced here to the students by asking them to identify the choices they had made over the past day about their own learning. For example, these choices included whether to attend a lecture or tutorial, or whether to complete the required reading.

Students were asked to write down their personal strategic question at the end of a lecture during which the concepts of metacognition and personal learning strategies had been discussed. This was defined as the main question they asked themselves prior to making a decision about their learning within a higher education context.

Students were given an example of two primary school students learning a list of spelling words at home. One student may ask themselves a strategic question, such as, "Who can I ask for help?"; while the other student may ask, "Why is this important?". The first student might ask a parent to help them study, while the other might not bother to study at all until the last minute. In other words, a strategic question was identified as a personal reaction to a task that informed the way the student's subsequent learning behavior. The student responses are detailed in Table 1.

Although an attempt was made to clearly define strategic questions, it is possible that some students may have misunderstood or been unable to clearly write down their thoughts. Two comments can be made about this apparent limitation. First, perhaps it is only through practice that students are able to coherently represent their thoughts about learning decisions in the form of a strategic question. Secondly, the students' attempts at generating strategic questions is the start of a guided reflective process about their intentions and ensuing learning strategies. Both of these points imply that while strategic questions may be somewhat imprecise, it is the subsequent discussion about learning strategies that is important.

The results were given back to the students during tutorials on the day following the lecture and were the basis for discussion about personal strategies for learning. The discussion was structured around the students identifying the choices made about learning as a result of asking their question. Students were asked to define effective and efficient approaches to learning in higher education and to make recommendations for designing an engaging classroom task.

The lecturer's role was to focus and guide conversation using the strategic questions as a basis for discussion of learning concepts. For example, discussion of the question "Is it worth my time and effort?" can lead to consideration of the concept of being an efficient learner. This approach is coherent with Bigg's (1999) argument that good teaching involves structuring learning contexts so novice students can learn to use the higher order learning processes spontaneously used by expert learners.

Table 1 shows that the students were mainly concerned with the relevance and usefulness of learning experiences in terms of becoming a teacher. The questions also provide an insight into the students' choices about the expenditure of effort. This immediately suggests that theoretical ideas need to be explicitly linked to practical experiences, or to resolution of anticipated future problems.

It is a reflection of my level of cynicism that I had expected questions such as "Is this worth my time and effort?" and "Do I need to do this to pass?" to be more highly ranked. Rather, most of the strategic questions showed a concern with using learning experiences to inform and improve their teaching practice. Students that had asked these questions were able to identify the various complex pressures and competing goals in their lives.

During the tutorial discussion, the students' strategic questions provided an entry point to explore the abstract concept of learning about becoming a teacher. For example, I particularly wanted to discuss the students' ideas about what they considered to be an effective learning experience. Knowing that the students were concerned with the relevance and practicability of learning theories to their own teaching provided a basis for a discussion about how the design of tasks can influence student engagement.

How to design learning experiences that will engage students is an enduring question relevant for educators at all levels. These students will themselves be likely teaching in their own classroom is a few years. Asking questions about what and how they were learning provided a means for the students to consider the relationship between teaching and learning (McAlpine, Weston, Beauchamp, Wiseman, & Beauchamp, 1999). It was hoped that knowledge of their own learning experience would inform both the pre-service teacher's student and practitioner perspective about learning (Goos, Galbraith, & Renshaw, 2002).

It is natural to want to assign the students' strategic questions into categories. Yet is a student who asks, "Is

it worth my time and effort to go to this morning's lecture?" a less effective or efficient student than one

Table 1
Strategic Questions Informing Personal Learning Behavior (n = 164)

	%
Is this relevant or useful to becoming a teacher?	22.0
Is it worth my time and effort?	16.4
How can I use this in the classroom?	14.0
Will this make me a better teacher?	10.8
Is this important?	9.2
Will I learn something from doing this?	7.3
Do I fully understand this?	7.3
What is the point or purpose?	4.9
Do I need to do this to pass?	4.3
Is this an interesting idea?	1.9
Other	1.9

Table 2
Potential Outcomes of Strategic Questions

From	To
Undeveloped metacognitive language	Developing and using metacognitive language in the form of strategic questions to conduct dialogue with others about what it means to be a learner within a specific context
Passive and uncritical perspective	A perspective of learning and task performance critically informed by self-awareness and self-monitoring
Teacher has responsibility for design and assessment of learning	Teacher and students use strategic questions to support the co-regulation of learning

who attends every lecture and asks, "How can I use this information in my classroom?"? A number of strategies are available for students and a range of strategies are likely to be equally effective (Wade, Trathen, & Schraw, 1990). This is a direction for future research, using the method outlined here, but with a focus on intensively tracking student choices emerging from their strategic questions within a range of contemporary higher education contexts.

Implications for Pedagogy

In the example of teacher education, it was shown that pre-service teachers were largely concerned with the usefulness of the task to their future practice as classroom teachers. Perhaps students were likely to expend effort in relation to the degree to which the characteristics of the task positively matched their strategic question.

Strategic questions provided support for a process of critical reflection about engagement with learning. The questions from the teacher education students became a fruitful basis for abstract discussion about pedagogy and learning. Table 2 outlines the potential outcomes of using strategic questions as a basis for supporting conversations about learning.

Students' strategic questions can support discourse leading to deeper conceptual understanding of the learning process. On the basis of their strategic questions, students could be asked to construct a self-explanation of the impact of their orientation to learning; generate further questions; challenge their view of learning; construct their own version of effective learning; or design an instructional task (Graesser, Person, & Hu, 2002). Strategic questions can thus provide a metacognitive language to examine learning experiences, specifically reasoning for decisions and action, doubts or concerns, explanation for engagement and effort, and values and expectations. This is a means to increase self-awareness of personal choices made in response to learning experiences (Lin, 2001).

If metacognitive experience improves capacity to complete tasks efficiently (e.g., Gourgey, 1998), then students need to continually develop a language that enables them to build conceptual knowledge about learning. Students who are able to monitor, think, and communicate about themselves as learners can be said to be metacognitive (Lin, 2001).

This method would be useful in a learning environment where independent questioning learners are encouraged, and where a relationship is developing between a dynamic body of theoretical knowledge and practitioner questioning of the effectiveness of learning strategies. The use of strategic questions provides one method for use within disciplines that encourage a reflective practitioner approach.

Moving students from passive to active learning requires considerable effort on behalf of the lecturer. Metacognition is a complex and abstract idea for students to negotiate. Instructional tasks need to be carefully structured, including provision for metacognitive discussion. Strategic questions are a means of moving students from seeing tasks as

something to be done and then submitted, to building metacognitive knowledge about their learning and cognition. Although further research is needed, the generation and examination of strategic questions offers potential to improve students' knowledge and regulation of their learning.

There are residual questions about critical reflection, including whether methods like strategic questions will result in students using this knowledge and language in future practice. Also, any metacognitive capacity building requires repeated guided practice. There is no definitive causality established in the case study between building metacognitive language and improving learning performance. Rather the focus of this article has been on a means for students and educators to engage in dialogue about student learning and cognition.

Final Comment

Ramsden (1987) suggested that it is important to examine how our students learn and understand what we teach them. In this sense, the strategic questions can also act as a form of self-assessment for both student and educator about the task design. This information can be used to strategically adapt pedagogical approaches. The strategic questions generated by my students provided a number of hints about designing tasks to be more cognitively engaging.

The introduction of strategic questions offers an entry point to the development and use of a language of learning. As students negotiate their understanding of discipline specific concepts, learning about their reaction to tasks helps develop a critical perspective about their engagement with learning. In simple terms, the method of strategic questioning supports deliberate and purposeful thinking about the strategizing of learning and teaching behavior.

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