TAMING THE ‘MANY HEADED MONSTER’:
Metacognition, self-regulation and the new NSW English syllabus

Michelle Bannister-Tyrrell and Deidre Clary,
University of New England

Most people are unaware that I am so much more than what they see.

Douglas Pagels

Understanding how students direct their individual learning has received growing interest among educational practitioners in recent years. Researchers agree that metacognition is an essential key to successful learning (Alexander, Carr & Schwanenflugel, 1995; Armbruster, 1983; Dinsmore, Alexander, & Loughlin, 2008; Efklides, 2001; Magno, 2010; McCormick, 2003; Paris & Winograd, 1990; Schneider, 2008; Schraw & Moshman, 1995; Shavinina, 2009; Tariconne, 2011; Whitebread, Bingham, Grau, Pino Pasternak, & Sangster, 2007).

As Australia prepares to roll out the Australian Curriculum, there appears to be growing concern in the wider community (Pyne, 2014) about how the curriculum will prepare our students to live and work in a very different and globalised world. In the Australian Curriculum, students are expected to:

- develop capability in critical and creative thinking as they learn to generate and evaluate knowledge, clarify concepts and ideas, seek possibilities, consider alternatives and solve problems. Critical and creative thinking are integral to activities that require students to think broadly and deeply using skills, behaviours and dispositions such as reason, logic, resourcefulness, imagination and innovation in all learning areas at school and in their lives beyond school. (ACARA 2010a)

In the English Curriculum, students are encouraged to develop metacognitive awareness about themselves. The curriculum engages students in:

- thinking about thinking (metacognition), reflecting on actions and processes, and transferring knowledge into new contexts to create alternatives or open up possibilities. Students reflect on, adjust and explain their thinking and identify the thinking behind choices, strategies and actions taken. They apply knowledge gained in one context to clarify another. (ACARA 2010b)

In this article, we first provide an overview of the various notions of metacognition and self-regulation that are prominent in the educational research literature, then look at the potential of metacognition which allows us to examine the constructed understanding of our classroom teaching. We introduce Kyle (pseudonym), a Year 10 English student, engaged in a poetry lesson. We then discuss ways to support learners in the development of their metacognitive and self-regulative behaviours within the context of the NSW English curriculum.

Metacognition and self-regulation

Metacognition has been described by experts in the field as ‘complex,’ ‘obscure,’ ‘faddish,’ ‘vague,’ ‘fuzzy’ ‘a buzzword,’ ‘ill-defined,’ ‘messy’ and ‘a many headed monster’ (Efklides, 2001; Perfect, 2002; Hacker, 2009; Metcalf, 2008; Schraw, 2009; Tarricone, 2011; Veenman, Van Hout-Wolters & Afflerbach, 2006; Wilson, 1999; Winne, 2010). This confusion, in part, has been the result of ‘the ballooning corpus of research that has come from researchers of widely varying disciplines and for widely varying purposes’ (Hacker, 1998, p. 2).

Metacognition research in educational settings confirms that the ability to self-regulate is at the core of our assumptions about learning, decision-making, and problem solving, and has developed assessment instruments and intervention programs to foster self-regulation and encourage learners to use their metacognitive strategies (Cubukcu, 2009; Israel, 2007). For some, metacognition and self-regulation lie at the very core of learning:

... it is not just individuals’ cultural, demographic, or personality characteristics that influence achievement and learning directly, or just the contextual characteristics of the classroom environment that shape achievement, but the individuals’ self-regulation of their cognition, motivation, and behavior that
TAMING THE ‘MANY HEADED MONSTER’: Metacognition, self-regulation and the new NSW English syllabus

mediate the relationships between the person, context and eventual achievement.

(Pintrich, 2005, p.453)

It is our metacognitive skillfulness that enables problem solving, strategy selection, task engagement, comprehension monitoring, awareness of personal and others’ strengths and weaknesses and self-regulation, and it has been described as the ‘engine of our learning’ (Marzano, 1998). However, simplistic definitions such as ‘thinking about thinking’ do little to empower educators in our understanding of the nature and potential of metacognition.

While metacognition as a concept can be found in the early writings of Confucius, Socrates, and Descartes, John Flavell’s 1979 publication of Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry is extensively acknowledged as the birth of the label metacognition (Dunlosky & Metcalf, 2009; Griffith & Ruan, 2005; Hacker, Dunlosky & Graesser, 1998; Helms-Lorenz & Jacobse, 2005; Jausovec, 2008). In line with her own research into the role of metacognition in reading, renowned educational psychologist Anne Brown redefined metacognition, and this explanation continues to be quoted in reading literature and research today.

Flavell (1978) defined metacognition as ‘knowledge that takes as its object or regulates any aspect of any cognitive endeavour.’ Two (not necessarily independent) clusters of activities are included in that statement: knowledge about cognition and regulation of cognition... The first cluster is concerned with a person’s knowledge about his or her own cognitive resources and the compatibility between the person as a learner and the learning situation... The second cluster … consists of the self-regulatory mechanisms used by an active learner during an ongoing attempt to solve problems.

(Baker & Brown, 1984, p.353)

Metacognition in the classroom

There is nothing either good or bad, but thinking makes it so.

Shakespeare, Hamlet

In recent years the focus for many researchers has shifted from the ‘theoretical to the practical, from the laboratory to the classroom’ (Hacker, 1998, p.19). Australian researcher Pina Tarricone’s book titled The Taxonomy of Metacognition (2011) presents a much-needed synthesis of the many theories and research into this concept. Tarricone’s non-hierarchical taxonomy model reflects the complex nature of metacognition and Figure 1 (below) shows a skeletal representation for the purpose of this article, which makes the concept accessible while reflecting its multidimensional nature (Bannister-Tyrrell, Smith, Merrotsy, & Cornish, 2014).

Figure 1 Adaptation of Tarricone’s (2011) model of Metacognition
Metacognition involves both the knowledge and regulation of one’s cognition. This duality might be considered a synergistic action, as it is the interaction of the knowledge of cognition with the regulation of cognition that produces an effect as Aristotle once coined ‘greater than the sum of its parts’. It is the synergy of the knowledge of cognition with the regulation of cognition that embodies and enables metacognitive behaviours. Tarricone’s model (Figure 1) classifies the different components of metacognition as core-components, supercategories, subcategories, and further key elements and elements that are not shown on this diagram.

**Core component: Knowledge of Cognition**

The core-component Knowledge of Cognition is the knowledge we have about our thinking, including our learning strengths and weaknesses and the strategies we need to apply to complete tasks. It relies on reflectivity, which enables self-awareness and self-appraisal. It is very much influenced by our personal beliefs about our capabilities and opinions about the task at hand. Knowledge of cognition is divided into the three supercategories of Declarative Knowledge, Procedural Knowledge and Conditional Knowledge (Tarricone, 2011, p.155).

An important aspect of each of the knowledge of cognition supercategories is that they are influenced by three variables, that being: ‘person,’ ‘task’ and ‘strategies.’ ‘Person’ includes our understanding of ourselves and others as cognitive beings, the ‘task’ that is being undertaken and the ‘strategies’ employed to complete the task.

**Declarative Knowledge** is knowing what we do and do not know. It includes our thoughts on what we need to know and the strategies needed to complete a task. Declarative knowledge requires reflection and is statable; however, it may also be fallible as this knowledge can be untrue or incorrect (Tarricone, 2011, p.157).

**Procedural Knowledge** is knowing how to do something. This knowledge is built up over time through experience, and can become automatic and unconscious with practice. Procedural knowledge requires reflection and knowledge of one’s abilities and knowledge as well as knowledge of task demands and complexity as well as the knowledge of the appropriate strategies required to complete a task (Tarricone, 2011, pp.160–162).

**Conditional Knowledge** is knowing why, when and where to use declarative and procedural knowledge.

**Core component: Regulation of cognition**

The second core-component is Regulation of Cognition and includes the cognitive functions we use to control our learning. These are the processes of goal setting, monitoring, planning, diagnosing and predicting in problem solving situations.

While Tarricone’s model breaks down Regulation of Cognition into the supercategories of Regulation of Cognition and Executive Functioning and Metacognitive Experiences it is their subcategories that more clearly define this core-component.

**Self-Regulation** is considered a major process in its own right and metacognition a subprocess of self-regulation. It is becoming more common to see metacognition and self-regulation being paired together in current research communities to highlight the interconnectivity of these two cognitive processes.

**Monitoring and Control** are interactive processes that work with self-regulation and involve frontal lobe executive functioning for planning and organising information, goal setting, monitoring clarity and accuracy. Control processes are modifiable and adaptable and are stimulated by past control experiences (Tarricone, 2011, p.208).

The final supercategory Metacognitive Experiences was a term originally coined by Flavell and includes metacognitive feelings and judgements that result during the monitoring of cognition and inform and initiate control and self-regulation (Tarricone, 2011, p.211).

**Metacognitive Feelings** (not the same as emotions) rely on reflection and reflective assessment. They also include aspects of ‘person,’ ‘task’ and ‘strategy’ knowledge and include feelings of confidence (under and over) and satisfaction (Tarricone, 2011, p.212).

**Metacognitive Judgements** include our estimations of our learning, rely upon reflective assessment, and are influenced by our ‘person,’ ‘task’ and ‘strategies’ knowledge (Tarricone, 2011, pp. 212–213).
Metacognition and self-regulation in action

Here we introduce Kyle, a Year 10 student, who enjoys his English classes. He considers himself a promising poet, and has been looking forward to this year’s poetry unit.

Mrs Jones begins the lesson reading Dylan Thomas’ ‘Do not go gentle into that good night’. Kyle listens to the reading, following the words on the whiteboard. He instantly recollects from a previous lesson that Thomas, a Welshman, left school at 16 to become a journalist. Kyle ponders the prospect of journalism as a worthwhile career. He promptly makes a mental note to find out the ATAR required to gain him entry into the best courses. He subsequently realises he has broken his concentration on the reading and attempts to refocus on the poem. He skims the lines he has just missed to pick up the gist. Inadvertently, Kyle notices that Thomas has used two different repetition patterns across the last lines of each stanza. He wonders if inserting repetition in his own poem would improve its overall cadence. He promptly realises he has lost concentration and attempts to refocus his concentration on the reading and the words of the poem on the board. At this point Kyle is self-regulating his learning and attention, employing monitoring and control techniques to get back on task. Here he accesses his metacognitive experiences once again as he judges his lack of knowledge to adequately satisfy the upcoming task.

Engaging in metacognition is particularly important for adolescents such as Kyle. As students move through their high school years, there is an increasing specialisation in literacy development. In the middle years, students add more complex routines and responses to their reading and writing repertoires. However, their routines and responses tend to be general rather than subject specific. In the senior years of secondary school, the literacies become more discipline specific (Shanahan & Shanahan, 2008). Drawing on metacognition, therefore, will enable learners to better evaluate the range of learning situations, including more specialised subject-specific texts and vocabulary, and modify their strategies to suit those contexts (Wood and Blanton, 2009).
Metacognition and the new NSW English syllabus

Always conscious of how to integrate ‘more’ into an already crowded curriculum, it may come as good news to teachers that aspects of metacognition and self-regulation are already embedded in the NSW English syllabus, specifically in the form of Objective E Outcome 9. The links between the various aspects of Outcome 9 and metacognition have been highlighted in the following table.

<table>
<thead>
<tr>
<th>OBJECTIVE E</th>
<th>Outcome 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 4</td>
<td>Stage 5</td>
</tr>
</tbody>
</table>

**A student:** uses, reflects on and assesses their individual and collaborative skills for learning EN4-9E

Related Life Skills outcome: **ENLS-17E**

Knowledge of cognition

Regulation of cognition

**A student:** purposefully reflects on, assesses and adapts their individual and collaborative skills with increasing independence and effectiveness EN5-9E

Related Life Skills outcome: **ENLS-17E**

Knowledge of cognition

Regulation of cognition

**Engage personally with texts**

- Articulate and reflect on the pleasure and difficulties, successes and challenges experienced in their individual and collaborative learning

  - Knowledge of cognition

**Understand and apply contextual knowledge**

- Understand and value the differences between their and others’ ways of learning in English

  - Declarative knowledge

- Understand the demands of a task and the outcomes and criteria for planned assessment

  - Procedural knowledge

**Develop and apply contextual knowledge**

- Purposefully reflect on and value the learning strengths and learning needs of themselves and others

  - Declarative knowledge

- Understand the learning purposes, specific requirements and targeted outcomes of tasks

  - Procedural knowledge

**Understand and apply knowledge of language forms and features**

- Develop and use vocabulary for describing, analysing and reflecting on their learning experiences

  - Knowledge of cognition
  - Regulation of cognition

- Understand and apply appropriate metalanguage to reflect on their learning experiences

  - Knowledge of cognition
  - Regulation of cognition

- Adapt knowledge of language forms and features for new learning contexts

  - Knowledge of cognition
  - Regulation of cognition
### Respond to and compose texts

| Discuss and explain the processes of responding and composing, identifying the personal pleasures and difficulties experienced | Understand and confidently integrate their own processes of responding to and composing a wide range of different types of texts |
| Procedural knowledge | Procedural knowledge |
| Declarative knowledge | Self-regulation |
| Knowledge of cognition | Monitoring and control |
| Regulation of cognition | |

- Use and reflect on metacognitive processes used for planning including brainstorming, mind mapping, storyboarding, role-play and improvisation.

- Identify, plan and prioritise stages of tasks, making use of organisation strategies, e.g. drawing up a schedule, monitoring progress and meeting deadlines.

- Reflect on and assess their own and others’ learning against specific criteria, using reflection strategies, e.g. learning logs, blogs and discussions with teachers and peers.

| Procedural knowledge | Procedural knowledge |
| Knowledge of cognition | Conditional knowledge |
| Regulation of cognition | Regulation of cognition |

- Understand the roles and responsibilities of individuals in groups, performing an allocated role responsibly in a group and assessing the success of individual and collaborative processes.

| Knowledge of cognition | Procedural knowledge |
| Regulation of cognition | Self-regulation |

### Metacognitive Strategies for Learning

*The metacognitive system is the engine of learning.*

Robert Marzano (1998)

While we routinely find that both young and older students often do not reflect on, monitor or critically evaluate their work, research has shown that metacognitive skills can be taught and learned. In fact, integrating metacognitive strategies and skills into instruction has proven strong effects on enhancing the knowledge domain being taught, students’ self-system beliefs and learning processes, and metacognitive skillfulness (Marzano, 1998, p.127). However, it has also been shown that when focus on these skills no longer exists, students often stop using them. In keeping with Vygotskian theory, children’s metacognitive skill development is influenced and strengthened by social interaction with adults and peers (Carr & Biddlecome, 1998). Therefore, it is essential, if we wish to develop these powerful learning strategies and thought processes, to help students like Kyle more effectively navigate the cognitive and learning process that will in turn lead to more meaningful and relevant learning and strategic thinking.
TAMING THE ‘MANY HEADED MONSTER’:
Metacognition, self-regulation and the new NSW English syllabus

There are a number of ways to teach and focus on different aspects of metacognition. Some aspects to consider include:

**Give students the language of thinking**
To talk about thinking students need to have opportunity and a vocabulary that allows them to focus on their thoughts. This in turn gives them the tools to evaluate their thinking and to link the knowledge and regulation of cognition with feelings and judgements. Marzano (1998) states that metacognitive talk is one of the ‘most powerful tools for improving student learning’. Therefore, as part of giving students thinking vocabulary, include information about the nature and importance of using the metacognitive system. Costa (2008) encourages teachers to use specific cognitive metalanguage rather than ‘vague abstract terms’ to assist their students in internalising the language of thinking as part of their own vocabulary. Teaching students the different aspects of metacognition and self-regulation and then using this language during reflective practices may achieve this. Other are offered in point 4 below and in the Appendix.

**Use ‘think aloud’ strategies**
‘Think aloud’ strategies have been proven to be highly effective in modelling thinking by the teacher, but also as an effective diagnostic tool for discovering where students’ might be having difficulties in their learning. Describing your thoughts or thinking out loud during a reading or an activity models the ‘messiness’ of the thinking process. Explaining that effective problem solvers subvocalise or talk to themselves throughout the process is an empowering understanding for students. When used by teachers ‘think alouds’ are powerful tools for illustrating the thinking that takes place at each step of a process (Kolencik & Hillwig, 2011, p.23).

**Help students to activate their metacognitive skills**
Activities that develop metacognitive skills and processes in the classroom help students include active reflection in their learning. Activities that call on students to reflect on their own thinking and how they obtain their own knowledge include: **Journaling** (where students keep a journal in which they reflect on what they understand, what they are learning, and what they do not understand); **process reflection** (where students reflect on their process of learning, including what worked and what did not work for them); or **self-assessment** (where students assess their own work against standards or criteria for quality). Such activities provide students with means to activate their metacognitive skills (Darling-Hammond, Austin, Cheung & Martin, nd, p.164).

**Pose questions**
Modelling and promoting metacognitive behaviours in students can be achieved through the deliberate construction of questions to include cognitive or higher order language. Careful word choices by teachers can change questions from eliciting superficial thinking to deeper metacognitive engagement. The table below shows how a simple shift in phrasing can achieve this.

**Frequent question starters**
- Metacognitive question starters
  - What do you think happened?
  - Support your view.
  - What evidence do you have?
  - Can you list ...?
  - How would you prioritise ...?
  - How do you know ...?
  - How would you distinguish between ...?
  - How can you explain ...?
  - How would you justify ...?
  - Tell me ...
  - Convince me ...

Adapted from Kolencik & Hillwig (2011)

Darling-Hammond, Austin, Cheung & Martin (nd) state that teachers commonly use reflective activities as an ‘add-on or afterthought,’ thereby diminishing the impact of continuous reflection, evaluation, and revision, and being intentional about our work. Developing and encouraging metacognition and self-regulation in a classroom critically relies on how much the teacher models, communicates, expects and makes time for thoughtful learning (Kolencik & Hillwig, 2011). Purposefully designed questions can raise student awareness of themselves as learners, the task at hand and the strategies they are or could be employing. Further examples of questions that can encourage metacognitive behaviours are offered in the Appendix.
A culture of metacognition in the classroom

Developing a culture of metacognition in the classroom in which students such as Kyle feel confident in developing a metacognitive awareness requires explicit and systematic teaching. Learning environments that are knowledge-centred and learner-centred, and take cognizance of the role of assessment in learning establish the groundwork for a reflective classroom (Bransford et al., 2000). In these classrooms, students engage in activities that grow their prior knowledge, present challenging tasks, and require ‘active sense-making’ (Darling-Hammond, Austin, Cheung & Martin, nd, p. 162). In these classrooms, students need to access procedural knowledge, and conditional knowledge as Kyle was doing.

Metacognitive activities that encourage students to reflect on ‘what they know, care about, and are able to do’ instil in learners an awareness of themselves (Bransford et al., 2000, p. 136), but they also endow teachers with rich data to inform their teaching. Consistent with the principles of ACARA, metacognitive learning is also supported by a culture of assessment based on explicit achievement standards and criteria. As students such as Kyle engage in activities/projects that draw on metacognitive thinking, they need immediate feedback to gauge whether their thinking is effective and useful to their learning. Using rubrics for self-assessment, peer assessment, and teacher assessment provides students with concrete and specific data about their performance, therefore enhancing their own learning and deepening their understanding (Brown et al., 1983). Researchers confirm the value of self-assessment that can help teachers learn about how to help their students.

An emphasis on self-assessment helps students to develop the ability to monitor their own understanding and to find resources to deepen it when necessary.... Learners get opportunities to test their mettle, to see how they are doing and to revise their learning process as necessary. Without these assessment opportunities, the quality of learning can be disappointing—yet, [too often] this is not discovered until the end of the project when it is too late to change and revise the process. (Barron, Schwartz, Vye, Moore, Petrosino, Zech, & Bransford, 1998, p.284)

Concluding thoughts

Understanding how our brains operate can empower not only our day-to-day effectiveness, but also our ability to be effective learners and strategic thinkers. A current preoccupation in both national and international research is the role of the classroom teacher in making a difference to student achievement. In this article, we have provided an overview of metacognition and self-regulation, as defined and studied in educational contexts, and emphasised how metacognitive research can inform educational practitioners and researchers, and how the principles and practices derived from this research may play out in English classrooms. It has also been our intent to demonstrate that by simply defining metacognition as ‘thinking about thinking’ is to seriously undermine our understanding of the multidimensional aspect of this important concept as an essential component of successful learning.

Preparing our students to live and work in a very different world demands explicit and systematic teaching that helps them to develop ’metacognitive and metalinguistic awareness of what it means to interpret and to act in the world, and to be interpreted reciprocally by others’ (ACARA, 2010a). The Australian English Curriculum (ACARA) is built around the three interrelated strands of Language, Literature and Literacy. Altogether these strands focus on developing students’ knowledge, understanding and skills in listening, reading, viewing, speaking, writing and creating as the basis for a curriculum designed to support 21st century learning. Embedded in the English curriculum is creative and critical thinking that affords opportunities for teachers to engage their students in ‘demonstrating metacognition, and displaying intellectual perseverance and integrity’ (ACARA, 2010a). With the imminent rollout of the English curriculum, teachers will need to take ownership of the curriculum and shape it for their students in keeping the curriculum alive and meaningful.

*Your life is the sum result of all the choices you make, both consciously and unconsciously. If you can control the process of choosing, you can take control of all aspects of your life. You can find the freedom that comes from being in charge of yourself.*

Robert F. Bennett.
TAMING THE ‘MANY HEADED MONSTER’:
Metacognition, self-regulation and the new NSW English syllabus

APPENDIX A – PROMOTING METACOGNITIVE THINKING

Teachers can engage students in metacognitive thinking by posing questions.

Related to themselves as learners:
- What are my strengths? How do I use them?
- How can I adapt to a learning situation given my learning/preferences?
- What skills do I still need to develop? How will I adjust for skills I still need to develop?
- What resources, people, or materials can help me be successful?
- How will I monitor what is working for me?
- How has my thinking about this topic changed as I’ve gathered more information?

Related to a given task:
- What do I have to do? What am I trying to accomplish?
- What skills do I need to complete the task? Which of these skills are my strengths?
- How close am I to my goal? What will help me recognise that I am meeting the learning goal?
- What things have I accomplished that might help me be successful in this task?
- How is this task like other tasks I have attempted/completed?
- What are my options and alternative approaches?
- How well did my choice(s) work?

Related to strategies and how they use them:
- What strategies am I using? What strategies do I need to use?
- Are the strategies I am using helping me reach my goal? If not, are there other strategies or approaches that might move me closer to the target?
- Do I need to go back and re-read, re-do, or re-think anything?
- How am I practicing my strategies?

References


TAMING THE ‘MANY HEADED MONSTER’: Metacognition, self-regulation and the new NSW English syllabus


TAMING THE ‘MANY HEADED MONSTER’: Metacognition, self-regulation and the new NSW English syllabus


Bios

Michelle Bannister-Tyrrell has been both a primary and secondary English teacher for over 30 years. She completed her PhD on The engagement of metacognition during critical literacy discourse by young talented readers, and is a Lecturer in Gifted and Talented Education at the University of New England. She recently returned from working with metacognition and self-regulation researchers at the Faculty of Education at the University of Cambridge UK.

Deidre Clary is a Lecturer in English and Literacies Education at the University of New England (NSW). Her research interests include multimodal practices, cross-curricula approaches to literacy and disciplinary literacy. She taught at the University of South Carolina in Language and Literacy, and Secondary English Education. She previously taught Secondary English in Canberra for 30 years.

Acknowledgements:
The authors wish to express their gratitude to their fellow practitioners for their encouraging comments and constructive feedback from an English teacher’s perspective:

  Catherine Oliver
  Erin Sullivan
  Edie Wright