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Strategies and Secrets for Effective Tertiary Study: Reading, Understanding, and Learning in the Academic Setting

Ali Wegner, University of Canterbury, Canterbury, New Zealand
Brendan Bartlett, Griffith University, Queensland, Australia

Abstract: This article reports a study in which text structure instruction was provided for student teachers, with the first author teaching a first year university course in communication skills. Participants undertook a pre-intervention task at the first class meeting and a post-intervention task in the final session. Course content included study strategy skills (specifically the metacognitive strategy, top-level structuring [TLSing], and the use of visual organizers associated with TLS to organize and distil information from textbooks and course readers) as a regular part of the teaching-learning curriculum. Students compiled and discussed journal entries about their practice with the newly-acquired strategy to record their own developing procedural know-how and what this meant for their academic work. Comparison of pre- and post-intervention tasks indicated a shift in students' strategies used and their metalanguage about these strategies. This study confirms earlier findings that learning to identify the organisational structure of text and using that knowledge strategically enhances learners' metacognition, motivation, and self-confidence. The authors argue that the development of metacognitive skills is critically important and useful where universities espouse development of teacher education students' own learning skills, and easily accomplished as part of coursework.

Keywords: Metacognition, Teacher Education, University Study, Top-Level Structure, Text Structure, Organization of Text, Reading Comprehension, Reading Recall

Introduction

RECENT RESEARCH EXPLORES the issue of academic success in tertiary education and the ways which colleges and universities might use to help students achieve better outcomes (Yazedjian, Toews, Sevin, & Purswell, 2008; Wilson & Scalise, 2006; Kuh, Kinzie, Schuh, & Whitt, 2005; Roe Clark, 2005; Kinzie & Kuh, 2004). Factors significant in students' successful completion of studies and in high levels of achievement throughout them include the degree to which students actively engage in their learning tasks, the extent to which they build learning communities as part of this, students' valuing and expecting success, and accessibility of help for students to become better learners (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; McCabe, Kraemer, Miller, Parmar, & Ruscica, 2006; Ross, Green, Salisbury-Glennon, & Tollefson, 2006; Smith, & Wertlieb, 2005; Taylor, King, Pinsent-Johnson, & Lothian, 2003).

The traditional pattern of interface for undergraduate students is one in which they typically attend large lectures, participate in tutorials in smaller groups, and complete extensive reading from textbooks and course readers. At the end of such courses, students' content and/or procedural knowledge is assessed via exams or essays. Course content is taught using

verbal transmission and requires students to process information from lectures and printed text, and to understand and remember it. Many universities offer courses in university preparation to support new students and there is some indication that these are beneficial (Schrader & Brown, 2008). Time management, assertiveness, formal writing techniques and reading comprehension are often included as major components of these ‘support’ courses. Others offer student learning support in specific areas of skill such as searching databases or academic writing. Students access such services typically by self-identifying as needing support.

Research indicates that developing effective study strategies is a critical skill for tertiary students and learners of all ages (Bartlett, 2008; Gorga Crukas, 2006; Hock & Mellard, 2005; Kiewra, 2002; Meneghetti, De Beni, & Cornoldi, 2007; Protheroe & Clarke, 2008; Wall, 2008). Text structure strategy theory has been used to inform study guides and teaching resources for all grade levels and tertiary education (McCarthy, Rasool, & Banks, 1996; Morris & Stewart-Dore, 1984; Ryder & Graves, 2003; Vacca & Vacca, 2002). In Meyer’s work over many years, text structure instruction has been shown to promote an effective strategy for understanding text, identifying the main idea, and recalling details (Meyer, 1975; 1999; 2003; Meyer, Middlemiss, Theodorou, Brezinski, McDougall, & Bartlett, 2002; Meyer & Poon, 2001; Meyer, Talbot, Stubblefield, & Poon, 1998; Meyer, Young, & Bartlett, 1989, 1993). The basis of this effective strategy has been described as *top-level structuring* [TLSing] (Bartlett, 2008), a procedure through which a strategist identifies, sorts, and arranges information in a deliberate way against one of a range of known organizational frameworks.

Effective writers and speakers use such a technique to clearly communicate their message to readers and listeners. According to Bartlett, there are four frameworks that commonly structure written exposition. A text may be *a description*, *a problem-solution*, *a cause and effect*, or *a comparison*. A writer’s declaration of this structure at its most generalized level (TLS) and use of appropriate headings and signal words to support it provide prompts about the cohesion and clarity of the information. A strategic reader or listener will consciously look or listen for this declaration – and then follow the prompts to identify and exploit linkages that bind information into related chunks. By doing so, comprehension and recall are enhanced. In the absence of an explicitly-declared or signaled TLS, or when a communication is muddled, an astute reader or listener will select a suitable structure to organize the information.

The hierarchical nature of related ideas in fluent text is what differentiates TLSing as a strategy from others such as concept mapping (see for example, Kern & Crippen, 2008; Salmon & Kelly, 2008), which requires a reader or listener to create representational blueprints showing relationships among ideas. TLSing calls for one unifying or organizational arrangement. That arrangement is the central idea of the text with informational details below it. Furthermore, the declarative knowledge required for TLSing can be easily acquired by learners of all ages (Meyer et al., 1989, 1993) into what Bartlett, Barton, and Turner (1989) call the *‘knowing what and knowing how’* of being communicative as a language user.

Resources have been produced (see for example Bartlett & Fletcher, 2002) to assist students in learning how to understand academic tasks – what the language used in describing the task and topic will tell them about what a lecturer has in mind when setting them, about what is required of them, and about how attention to the top-level structure that frames key propositions, keywords, and content provides a template to organise their response. School children have also been taught to identify text organization with beneficial outcomes for

learning (for example, Bartlett, 2008; Marinak & Gambrell, 2008). Visual organizers [VOs] (Vacca & Vacca, 2002) are useful for organizing information from lectures (Kiewra et al., 1997), texts, and readings and many are accessible on the Internet. In Figure 1 we show six visual organizers that we adapted to highlight Bartlett's four common TLS types and included in our intervention in this research.

Figure 1: Visual Organizers Taught to Students Source: Retrieved 19 March, 2005, from the World Wide Web <http://www.sdcoe.k12.ca.us/score/actbank/tchain.htm>

The first provided a model for *description*, allowing us to highlight listing, sequencing, and explanation as sub-types. The second enabled us to explore with participants how to disassemble a text and reorder it into clusters of information that share a common core. The Venn diagram was used to demonstrate how configurations of similar and dissimilar aspects of

information about a topic are clustered within a *comparison* framework – the grid helped us to work on how to identify these aspects, and sometimes to order and prioritize them. We continued this instructional purpose with the fifth and sixth VOs that were models for *problem-solution* and *cause-effect* clustering, respectively.

Teacher Education

Polished skills in communication, reading, and writing are particularly important in teacher education. Not only are candidates required to successfully meet the challenges of their own practical and academic work, but are also expected to gain and apply pedagogical knowledge about teaching and learning once in the profession. In New Zealand [NZ], individuals who want to teach must complete a three-year course of study to teach in the pre-compulsory sector (teaching 0 to 5 year-olds) or primary school (teaching 6 to 13 year-olds). Graduates of this programme seeking teaching positions must apply to a national licensing and monitoring professional body. This Teachers' Council is charged with examining the character, ability, and experience of all teachers in New Zealand. To that end, they have prepared a list of requisite skills and knowledge by which new teachers are evaluated and experienced teachers are re-certified against standards. This list is organized into general headings: Professional Knowledge, Professional Practice, and Professional Values & Relationships.

Under the heading of Professional Knowledge, Standard Two states that:

*“Graduating Teachers know about learners and how they learn...
c know how to develop metacognitive strategies of diverse learners.”*

This is a clear statement that NZ teachers must have knowledge and expertise regarding the co-constructive nature of learning, the active involvement of learners, and the ability to awaken learners' self-awareness about their own learning.

Teacher education at the undergraduate level is a highly structured degree course at the first author's university and requires 360 points over three full-time years of study. Students preparing for a teaching career in early childhood services undertake courses in professional studies and practice, curriculum studies, and professional education. The majority of these courses are year-long. The university website lists the following requirements as descriptions for the programme:

- Professional Education: 115 points
- Professional Studies and Practice: 135 points
- Curriculum Studies: 95 points
- [One] Optional 300-level course: 15 points

In Professional Education [students] learn about the aims and purposes of education, child development, teaching and learning, assessment, the New Zealand education system, socio-political and cultural contexts, communication skills, information skills and contemporary issues in education. In Professional Studies and Practice [students] learn practical teaching skills and spend time working in a classroom alongside an experienced teacher. In Curriculum Studies [students] learn about Te Whāriki - the Early Childhood Curriculum [New Zealand Ministry of Education, 1996]. Students gain the pedagogical knowledge, skills and dispositions required to teach effectively in each curriculum area. (Retrieved 13 December 2008 from

the World Wide Web: [http://www.canterbury.ac.nz/courses/undergrad/btchln\(earlychildhood\).shtml](http://www.canterbury.ac.nz/courses/undergrad/btchln(earlychildhood).shtml))

Whilst understandably brief given the purpose of such general overviews of a course, there is no statement in descriptions of these three areas of the university's course that fits explicitly with General Standard 2 of the NZ Teachers' Council requirement for Professional Knowledge. The pedagogical knowledge inherent in GTS 2 above is not specifically stated here, nor does it appear in the fuller account given in subject outlines for constituents of these areas. Indeed, it seems to be a well-kept secret of the institution just how teacher education candidates will come to have expertise in knowing how "*to develop metacognitive strategies of diverse learners*" with whom they will have charge.

It seems reasonable to expect that in order to foster the learning of others as required for ongoing accreditation in New Zealand or Australia, a teacher should know about and understand something about his/her own learning. Earlier research by the authors, however, indicates that this is not the case (Wegner & Bartlett, 2006). In fact, we have found that students in this programme reported no direct instruction about metacognition, their own or that of children, other than that received through the first author's instructional intervention (Wegner, 2006; Wegner & Bartlett, 2006; Wegner & Bartlett, 2008). Our research also indicated that participants benefited from specific instruction in identifying text structure and applying this new knowledge in their academic studies. Participants reported that not only had they come to better understand themselves as learners but that they expected to use this knowledge to better meet the learning needs of the children with whom they would work.

Purpose of the Study

The findings of these earlier studies led to a re-design of a first year course in communication skills. Instruction about text organisation and how to use one's knowledge of it to improve reading, understanding, and learning were embedded into the course content of the Year 1 course, EDCS154, Inter- and Intrapersonal Skills. Course content was added to include study strategy skills [specifically, metacognition, TLSing, and the use of visual VOs (Figure 1) to organize and distil information from textbooks and course readers]. Other course topics included assertiveness; active listening; conflict resolution; and professional communication with infants, toddlers, and young children, parents and care givers, and teaching colleagues.

In this study, the authors sought to investigate the effect of explicit instruction about learners' own metacognition when such instruction was embedded as a component of a compulsory course.

Method

Participants

In 2008, there were 104 students enrolled in the first year communication skills course. Forty-six enrolled in the distance delivery version of the course were not asked to participate in the study because the planned intervention required face-to-face contact. Ethical consent was received from the ethics committee of the university that enabled the first researcher's tutorial group to be used for purposes of the research. This provided a study sample of 20 participants.

This group met for a regular class session for 1 hour twice each week from March to September for a total of 60 hours. The first and last sessions were used to collect test data with the instructional intervention spaced throughout the other 58 hours.

Procedure

All participants undertook a pre-intervention task that had two components. First, they read a short text about the characteristics of young children's play that we extracted and adapted from Feeney, Christensen, and Moravcik (2001, p. 171-172). The text had 750 words and a well-signalled description. Although there is evidence that readers mark texts in idiosyncratic ways (Swarts, 2004), our experience is that first year university students highlight, underline, or make notes on texts without strategic intent (Wegner, 2006; Wegner & Bartlett, 2008). Participants were instructed to write on or mark the text as they would when reading or studying and to identify strategies they used for identifying the main idea, comprehending the text generally, and recalling details, as three critical aspects of deriving meaning from expository texts. The text and list of strategies were collected by the researcher and each student then received the second component of the task. Here the student was asked for reports of the main idea, their general understanding, and their recall of details from the text and for a statement about how their strategies helped them with each aspect. The final question asked if the student had any prior knowledge about identifying top-level structures in text. None of the 20 participants reported any such knowledge.

In the class session following the pre-intervention task, students were taught about top-level structures. Handouts depicting TLS in VO form (see Figure 1) and lists of common signal words were distributed to provide information about TLS. The lecturer reviewed and discussed the text that had been used in the pre-intervention task. She worked with students to identify its structure, to select a suitable visual organiser, and to complete it to reflect the text.

Each student bought or was provided with a small notebook to be used as a 'Text Structure Notebook'. Instructions were given to bring the notebook to communication skills class every week for practicing TLS and to use it when studying to facilitate their understanding of academic texts and recall of information. With explicit scaffolding from the lecturer following Bartlett's (2008; 1978) model, participants explored how this 'know-how' might be applied as deliberate and useful declarative knowledge about texts and as strategic procedural knowledge in composition and comprehension in academic readings. In the first of the two hours each week, students discussed their most recent notebook entries with one another and what TLS they had identified in that week's reading and compared the VOs they had produced.

In June, a TLS workshop was held over two regular class periods. This allowed students to investigate applications of TLS in non-academic contexts using an *embedded model of strategy training* (Rhoder, 2002). Students worked in pairs and were provided with sample commercial ads (household products, jewellery, cars) and short texts (1-2 pages in length) downloaded from Internet sites about topics of general interest, for example, mountains of the world, vertebrates and invertebrates, and devices for converting salt water to fresh water. Students examined the ads and discussed the texts to identify the TLS. The lecturer provided individual support and emphasised the importance of the active engagement of each reader in selecting an organisational structure. Notebooks were collected and sighted by the lecturer

once in July, mid-way through the academic year. This check confirmed that all but one student (Student 7) in the instructional group had a notebook into which they were recording notes and information from academic readings and texts.

In the last session of the course, twenty students undertook a post-intervention task, exactly like the pre-intervention task but using a different text. Pre-intervention and post-intervention responses were compared for quantity of strategies reported and for descriptions of how each strategy helped. Responses were numbered 1-20 for identification and collated in Table 1 which shows students' reports of strategy use and of how strategies helped for pre- and post-intervention tasks.

Data Analysis

Data about the 20 students were gathered from three sources (pre-intervention tasks and questionnaires, post-intervention tasks and questionnaires, and notebooks) and recorded as in the original study (Wegner, 2006).

Participants' strategic action prior to the intervention was compared with that after it through their responses to questions regarding strategy use. As it eventuated, no participant registered prior knowledge of top-level structuring and responses to the post-intervention task are viewed as an indication of the beneficial effect of strategic instruction. This general absence for specific knowledge of TLS was reflected in the lists and descriptions that participants provided of strategies they used and of how these worked. High incidence on the post-intervention measure of both assertions that participants knew about top-level structuring and viable descriptions of its operation formed the basis of analysis concerning the effectiveness of the intervention in establishing the strategy. The results of this analysis are reported in this writing.

In contrast with belief statements concerning TLS (or other) strategy, analysis of what participants did when retrieving information and understanding from a stimulus text was calculated from three measures. The first was a measure of memory as represented by the total score of possible units using a content analysis of the text as a scoring template. The second was a measure of comprehension as represented in a statement of main idea in both content and structural terms. The third was a measure of TLS procedure as represented in identification of the overarching structural framework of the text. Furthermore, a qualitative account of participants' responses to the intervention was drawn through four case studies, each of a participant's Text Structure Notebook. The results of this analysis are to be reported elsewhere.

Results

Students' Reports of Strategy Use

Pre- and post-intervention reports from participants about what strategies they used to understand text, identify the main idea, and remember details are presented in Table 1. The reports are numbered 1-20 in Column 1 and correspond to the 20 students who completed both a pre- and post-intervention task and questionnaire. In column 2 is the list of strategies reported by each participant pre-intervention. For example, Student 1 reported pre-intervention that one of her four strategies was "highlighting". Column 3 indicates whether or not the parti-

cipant provided a coherent report of how the named strategy was useful. Student 3's report of processing was deemed coherent (indicated by 'yes' in Column 3) in that she reported: *"By highlighting the information I thought was important it made the information stick out and was a bit easier to remember."* None of the 20 participants reported prior knowledge of TLS in the pre-intervention task.

Columns 4, 5, and 6 indicate post-intervention reports. Student 1 again reported four strategies but in contrast to pre-intervention, she now provided coherent reports for all four responses of how her strategies worked. For example, insofar as her strategy of "summarising mentally" she explained that: *"by doing a summary in my head after the 1st reading I was able to have a general understanding of the article in my own words."* This explanation indicates conscious action and incorporates the metalanguage taught in the intervention. Column 6 indicates that Student 1 demonstrated new knowledge of TLS post-intervention. She defined TLS as:

"Top level structures are a study technique. After you read an article you write a summary of it in your own words according to the type of article it is. It can either be: description, sequence, compare & contrast or cause & effect. Using this study technique allows you to have a summary of that article in your own words which is more effective in your understanding & remembering it."

Fourteen responses (70%) specifically reported or were indicative of (see response for Student 7) participant knowledge of the strategy following the intervention.

Table 1: Summaries of Pre- and Post-Intervention Reports of Strategies and Processing of 20 Students

Student	pre-intervention		post-intervention	
	Reported strategy	Report of processing linked to named strategy?	Reported strategy	Report of processing linked to named strategy?
1.	<ul style="list-style-type: none"> • Highlighting • Re-reading • Look for evidence of main idea • Re-writing 	Yes Yes No No	<ul style="list-style-type: none"> • Summarised mentally • Looked for repeated ideas • Highlighted • Re-reading 	Yes Yes Yes Yes
2.	Re-reading Highlighting	No No	Highlighting and drawing arrows for understanding Re-reading for main idea Highlighting sections thought to relate to main idea	Yes Yes Yes
3.	Highlighting Re-reading Writing notes	No No No	Highlighting to remember Mentally scanning article	Yes Yes
4.	Re-reading Underlining Highlighting	No No No	Highlighting points related to heading Re-reading	Yes No
5.	Read first statement Note heading Underline	No No No	Remembering title Linking paragraph content to title Looking for connections to title Making notes	Yes Yes Yes Yes
6.	Re-reading Noting titles and subtitles Linking ideas to own experiences	Yes No No	Reading title and introduction Highlighting content related to title Noting biographical notes about author Using who, what, where, how, & why question format	Yes Yes Yes Yes

7.	Re-reading Highlighting Comparing to prior knowledge Listening to Ipod to reduce noise	No Yes No	Listening to Ipod Highlighting Sorting ideas mentally to categorise Considering what she understands/agrees with Considering what she doesn't understand/agree with	Yes No No	"No, but sounds like something I would not use" *
8.	Re-reading Imagining situation Comparing comments Highlighting	Yes No No Yes	Compare contrast...and...fishbone mapping Drawing on own experiences Highlighting and processing mentally	Yes No No	Yes
9.	Highlighting and linking ideas Colour-coding	Yes Yes	Highlighting and brainstorming Summarizing in own words	Yes Yes	No
10.	Re-reading Considering her response to content Highlighting	Yes No Yes	Reading slowly Re-reading and highlighting Making notes	yes Yes no	Yes
11.	Re-reading slowly Re-reading bold print Highlighting	No Yes Yes	Noting title and headings Highlighting sections of each paragraph	Yes Yes	Yes
12.	Highlighting Re-reading with intent Reviewing and linking points Summarizing	Yes Yes Yes No	Highlighting key ideas and summarizing from each paragraph Summarise in a few words what she sees as main idea Re-reading after summarising	Yes Yes Yes	Yes
13.	Using general structure [of the] article Highlighting Re-reading and underlining Writing out details in own words	Yes Yes Yes Yes	Looking for top-level structure Looking at title Look at opening paragraph Highlighting sentences that summarise paragraphs Looking for repetition of words/ideas Remembering quotes	Yes Yes Yes Yes	Yes

14.	Underlining and re-reading Highlighting	Yes Yes	Re-reading Underlining Reviewing	Yes Yes	No
15.	Concentrating Re-reading and writing notes	No	Re-reading Concentrating Reading heading and underlining Re-reading Writing notes	Yes No No No	Yes
16.	Marking on text Highlighting Re-reading Colour-coding	No No Yes Yes	Reading the introduction and scanning [the text] Taking note of relevant points Looking for key words and ideas and re-reading	Yes No	Yes
17.	Re-reading and highlighting Relating content to title Checking for meaning	No No No	Focusing on first sentence and title Highlighting Checking for meaning Reviewing points mentally and thinking about examples	Yes No No	Yes
18.	Quickly reading over text Re-reading slowly and imagining situation Making a decision about ideas Noting bold text	Yes Yes No Yes	Reading slowly and noting title and subtitle Highlighting ideas related to main idea of each paragraph Relating to own experiences Highlighting and re-reading	Yes Yes No Yes	Yes
19.	Underlining Circling words Re-writing ideas	Yes No No	Highlighting and making bullet points Concept/mind mapping [Memorizing] and paraphrasing	Yes No No	No
20.	Re-reading Looking for paragraph topics Underlining	No No No	Scanning and re-reading Reading the introduction and conclusion first Highlighting and reflecting on own experiences	No No No	No

Responses were analysed for indications of increased self-awareness about each students' strategic behaviour. The two authors independently rated students' responses about their

strategic processing with an inter-rater reliability coefficient of 1.0. Table 2 shows the results of analysis, indicating the number of strategies and reports of processing for each student 1-20, pre- and post- intervention.

Table 2: Numbers of Students' Reports of Strategies and of Explanations of How These Worked in Pre-intervention and Post-intervention Tasks

Student	Pre-intervention		Post-intervention		Definition or awareness of TLS?
	Reported strategies	Report of processing linked to named strategies?	Reported strategies	Report of processing Linked to named strategies?	
1	4	2	4	4	Yes
2	2	0	3	3	No
3	3	0	2	2	No
4	3	0	2	1	Yes
5	3	0	4	4	Yes
6	3	1	4	3	Yes
7	4	1	5	1	Yes*
8	4	2	3	1	Yes
9	2	2	2	2	No
10	3	2	3	2	Yes
11	3	2	2	2	Yes
12	4	3	3	3	Yes
13	4	4	6	4	Yes
14	2	2	3	2	No
15	2	0	5	1	Yes
16	4	2	3	1	Yes
17	3	0	4	1	Yes
18	4	3	4	3	Yes
19	3	1	3	1	No
20	3	0	3	0	No
totals	63 reports of strategies	27 (43% of explanations are specific)	68 reports of strategies	41 (61% of explanations are specific)	14 (70% of students reported or indicated knowledge of TLS)

A pre- and post comparison of all 20 students based on Table 1 seems to indicate: (a) greater precision in accounting for a strategy used, (b) greater awareness that there is a describable process for "what a strategy does when it's at work" and an appropriate written description, and (c) three general levels of description of top-level structuring as a strategy - (i) comprehensive (title and action of the strategy identified), (ii) some (a partial account given), and (iii) none (no account given).

Discussion

The study investigated effects of knowledge and skill concerning the top-level structure of texts [TLS] as a deliberate strategy [TLSing] on student teachers' approach to academic work in a naturalistic setting. Students ranged in age from 18 to 51, all were full-time students, and all but two were from English speaking backgrounds.

The data presented in Table 1 of students' reports of pre-intervention strategy use and related explanations and post-intervention strategy use and explanations are comparable to and consistent with data presented in Wegner and Bartlett (2008) Tables 1 and 2. Consistency of these reports indicates that tertiary students in their first year possess strategies required for academic work and vary in their repertoire of skills for reading, understanding, and learning. They have varying levels of '*knowing how*' (Bartlett, Barton, & Turner, 1989). It is also possible that they vary instead in their ability to name and report strategies they use, but about which they have not been made aware.

Participants tracked their development and provided data in simultaneous reporting of behaviours used in simulated tasks involving the comprehension and memory of textual information and in response to reflection on work in academic tasks during the academic year. In 2005 and 2006, we found within the limitations of the studies that explicit text structure instruction had positive, beneficial effects for participants in personal and academic ways. These findings were again confirmed in the study reported here.

Wegner (2006) invented a theory to describe the process by which learners acquire new knowledge and respond to it. Some reject it; "Nancy" did so in the 2006 study; "Student 7" did so in the 2008 study. When asked in the post-intervention task what 'top-level structures' were, Student 7 responded: "I don't know — sounds like something I don't use or wouldn't use." Wegner (2006) speculated those learners to be 'ad hoc' strategy users who consider the new knowledge about TLSing and make a decision not to adopt it. The theory surmised that learners adopt and adapt new strategies in individual and idiosyncratic ways, and that:

[t]he challenge for the expert or teacher is to work collaboratively and consistently with learners to create a consciousness of task, of its purpose and how it relates to others, and of how a target strategy such as TLSing can be used to facilitate its successful and insightful completion. (Wegner, 2006, p. 127)

At the other end of the theoretical spectrum, Wegner identified those learners who '*optimised adaptation*' the strategy. In Wegner (2006), this was exemplified by 'Priscilla', who *adopted* TLS strategy, found it to be very effective, and *adapted* it to applications beyond her academic work. She went on to teach it to others and planned ahead how she would eventually incorporate it into her work with young children. In 2008, this is exemplified by at least one student, Student 13, who wrote that:

“Top-level structures help you identify what type of article you are reading so that you can gain a thorough understanding of what you are reading and this will help you remember the information. Then you can create a mind map to underline the main points of the article.”

This research support for TLSing as a learnable, useful process serves students on two levels. At the more basic, it provides them with a simple strategy when reading text for identifying its main idea, comprehending its content, and remembering its details. This gives them a process for ‘tackling’ university courses, readings, and information.

On another level, positive response to this instruction will move some students to a clear and usable approach to engaging with and deriving meaning from course content, where they previously used relatively, ‘*ad hoc*’ (Wegner, 2006) strategies for doing so. By bringing the process of study and interaction with text to a conscious level, students become strategists who make decisions about their own thinking and learning processes. They may reject TLSing, they may try TLSing and then reject it, they may try TLSing and find it useful, or they may try TLSing and then adapt it to their own needs. In all cases, instruction about metacognition and study strategies serves to awaken students to new possibilities about their own learning and to new discoveries about themselves as learners.

Universities in Australia and New Zealand are acknowledging the need to support students in the development of critical thinking skills beyond the years of undergraduate study (see Wegner & Bartlett, 2006). The 2003-2010 charter of the university (University of Canterbury, 2003) in which the current study took place is sixteen pages long and available on its website. Section 1 identifies the vision, values, mission and charter goals. It speaks of vision and values that will “...*make a difference by the diligence [brought to its] studies...*”; as part of its mission that it will “...*contribute to a tertiary education system that is characterized by excellence, relevance...; ... work with others to enrich intellectual discourse... [and]... educational quality...*”. One of the university’s goals is: “*to pursue excellence in...teaching and life-long learning to a standard befitting an international research university and in a manner that will challenge and develop the capabilities, potential and intellectual independence of our students...*”. In Section 8 of the document is the “approach to meeting the educational needs of learners” with the following “aspirations in relation to the educational needs of our learners:

- To graduate students with educated, enquiring and critical minds
- To recognise the increasing diversity of students and help them all to reach their potential
- To create a supportive, exciting and intellectually stimulating context that will challenge students
- To help students through involvements...” (University of Canterbury, 2003, p. 3-4, 12-13)

The university profile states the university “seeks to ensure that its students are prepared for lifelong learning...” (University of Canterbury, 2007, p. 7). The authors argue that, while study preparedness, motivation, and developing study skills are implicit in these statements, lecturing staff in this university and elsewhere should consider ways to make metacognitive activities explicit.

Some students' reluctance in the tertiary sector to see instruction about learning as opportunity to develop procedural elaborations of existing strategic tools (e.g. as described for Student 7) is indicative of a tension between constructions of knowledge that privilege substantive information to the exclusion of procedural and conditional elaboration and those that do not. Such resistance might associate with extended success with previous strategies, entrenching both those strategies and a need-not-to adopt (or try) new ones. An alternative explanation is offered by Forman and McCormick (1995, p. 154) that

"...not all learners are eager to learn. Allowing oneself to be guided by others and then using their forms of discourse to guide oneself entails an act of identification with that person. Resistance to learning by a novice may be caused by a refusal to identify with the expert..."

This highlights the significance of the *cognitive relationship* (Collins, Brown, & Holum, 1991), as reported in this study and in Wegner (2006), involved in acquiring knowledge of all types with developing personal relationships with learners.

Conclusion

Findings of this research point positively to top-level structuring as a worthy and productive object of instruction for students in tertiary study. Our cases have again indicated to us that they themselves see value in the organisational advantages it brings to their literacy with greater coherence in their writing and more faithful recollection and construction in their reading. Importantly, it helped with routine tasks, such as selecting appropriate readings. In addition to setting a procedure for dealing with them – and our students seemed to enjoy the new “know-how” that arose with their learning in this procedural domain. Nonetheless, the research has several obvious limitations, and additional work is needed to address them – particularly to test issues such as whether users generalise their top-level structuring into professional and personal contexts beyond their own study, and to determine whether effects reported here are replicated across large samples in quantitative and mixed-model designs. Such further work would help us to attend to three reservations we have noted in the current research.

First, while TLSing instruction succeeded in providing most of our students with a *metalanguage* (Quinn, 2004; Schleppegrell, Greer, & Taylor, 2008), it did not do so for all. We are uncertain about whether this issue is one of insufficient or inappropriate instruction, resistance that might be expected when accounting for the variety of learning styles and preferences that adult learners use even with learning procedures-for-learning, or failure on our part to pick-up on struggles some might have had in describing their mind plans. In relation to the last of these, Barton (Personal communication, Keith C. Barton, Professor, School of Education, Indiana University, 30 August, 2008) speculates “*whether these students (our cases) could reliably articulate in writing the strategies that they’re actually using—that is, they may be using a strategy but not able to explain it (especially in writing)...*”. We can argue that some of our learners are conscious in their strategic behaviour as indicated in comments by Students 12 and 13 reported earlier, for example. Also, the pre-intervention task used in this research was designed to examine not only what strategies students knew themselves to be using but also what their intentions were in using them. These data suggested

to us that notwithstanding the fact that some learners construct and articulate their strategic actions without explicit instruction, there is sufficient indication that including *metacognition* (Martinez, 2006) and metalanguage (Bartlett, 2008) in the instructional intervention could provide all students with such competence. That is, having reflective and descriptive capability seemed to us as likely to accelerate students' chances of learning top-level structuring effectively as a strategy. The corollary was that learning top-level structuring might also help students to become better at doing these things, an expectation firmly rooted in research with readers of all ages across 30 years (e.g. Bartlett, 1978, 2003; Meyer, 2003; Meyer et al., 1989, 1993). It did for some. We now need to check why it did not and the conditions under which it might help with those for whom it did not, and indeed, whether it is needed for them at all.

Second, informal discussions with one of our students after the study indicated that some may have found the wording of our tasks awkward. In asking: "*What strategies do you use for identifying the main idea? What strategies do you use for general understanding? What strategies do you use for remembering details?*", participants may have thought that they should be reporting different lists. Our questions were intended to challenge students to bring to consciousness what action(s) they saw themselves undertaking when reading, a purpose intended to elicit a metacognitive process about one and the same thing, top-level structuring, to accomplish all three tasks. We need to insert member checks into this aspect of our data-gathering to increase our confidence that our intentions are faithfully represented. This would help, too, with an additional issue raised by Barton concerning how much respondents attribute to a researcher's implicit knowledge about what responses are given, i.e. "*It can be very difficult to get someone to write down 'everything' they remember about something when they know the person reading already knows what's in it...*" (Personal communication, Keith C. Barton, 30 August, 2008).

We conclude with an observation about the systemic level of the profession – at least as the matter occurs in one of the two systems our current experiences traverse. Standards for beginning teachers mention metacognitive growth – but interestingly this is only about students' growth, not their own. This missing element of the complex relation across teachers and students, learners and educators reminds us of how easily overlooked something so important as learning about and in the procedural domain is for all of us who contribute to the relationship. We commend top-level structuring (or some other instruction in how to teach metacognitive skills) as pedagogically sound and important for teachers in their work with students or children (Kiewra, 2002).

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About the Authors

Dr. Ali Wegner

I am a lecturer in the School of Maori, Social and Cultural Studies. I teach in a range of subjects including professional studies, communication skills, and research methods. My research interests include teacher education, metacognition and learning, autism spectrum disorders, cultural identity, working with infants and toddlers, practitioner research, cognitive apprenticeships.

Prof. Brendan Bartlett

Brendan is a Gellibrand Scholar, UNICEF Fellow, King Mongkut Medallist and award holder of the Rotary International Certificate for Significant Achievement in Education. He teaches graduate and undergraduate programs in teacher education at Griffith University. He researches how people identify the "big" ideas in texts they create or read and in their everyday homeplace and workplace problems – and how they remember and make sense of such ideas.

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Salim Vally, University of Witwatersrand, Johannesburg, South Africa.

Gella Varnava-Skoura, National and Kapodistrian University of Athens, Greece.

Cecile Walden, Sam Sharpe Teachers College, Montego Bay, Jamaica.

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