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Supporting the Transference of Knowledge about Language within Teacher Education Programs

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Abstract: Teacher education is effective when pre-service teachers are able to transfer knowledge from content areas to practice. This study investigates the extent to which curriculum and assessment designs, along with teaching practices, supported pre-service teachers to transfer knowledge gained about language from a first-year course into a second-year course on planning for effective learning in diverse contexts. Questionnaires and discourse analysis of assessment tasks provided insight into the extent to which the strategies designed to support transference succeeded. The findings indicate that transference of language knowledge occurs when this goal permeates curriculum and assessment design, as well as teaching practices.

Introduction

The most effective teacher education programs prepare educators to work in diverse contexts by integrating content knowledge with teaching practice. Graduates who have deep conceptual knowledge of content areas can transfer this learning to teaching practices that are essential for supporting students from culturally and linguistically diverse backgrounds. Most importantly, these kinds of graduates can apply content knowledge flexibly to analyse curricula, assess students' progress and adapt a range of teaching and learning strategies designed to support every students' learning (Darling-Hammond, 2000, 2006a; Florian, 2010; Goodlad, 2005; Hattie, 2009, 2012; Jordan, Schwartz, & McGhie-Richmond, 2009; Kincheloe, 2004; Loughran, 2006; Poplin & Rivera, 2005; Shulman, 1987; Zeichner, 2008).

The requirement that teacher education programs develop the capacities of educators to transform content knowledge into effective pedagogies has been clearly articulated in the literature on teacher education, but achieving this goal effectively remains a challenge. Past studies have concluded that the most successful teacher education programs are those that avoid fragmentation and provide coherence (Darling-Hammond, 2006a, 2006b; Goodlad et al., 1990; Hardman, 2009; Howey, 1996; Poulson, 2001; Villegas & Lucas, 2002; Wideen et al., 1998). Programs that make connections between courses are more likely to produce graduates who can work effectively in diverse contexts (Darling-Hammond, 2006a, 2006b; Hardman, 2009; Tatto, 1996; Villegas & Lucas, 2002).

While the need for greater coherence has been well document, few studies exist that trial and assess methods for avoiding fragmentation in teacher education programs (Grossman et al., 2008; Hammerness, 2006). Previous research on coherence tends to focus on the ways in which the goals of university course work can be aligned with field experiences in schools (Grossman et al., 2008; Montecinos et al., 2011; Wideen et al., 1998). Such studies conclude that the learning of pre-service teachers is enhanced when the visions

and practices of schools involved in field placements articulate with university-based course work (Darling-Hammond, 2000; Grossman et al., 2008; Hammerness, 2006; Wideen et al., 1998).

However, some research also suggests that coherence within teacher education programs needs to involve more than ensuring the alignment of field experiences with university-based learning. Effective links between courses within university programs are also required (Darling-Hammond, 2006a, 2006b; Goodlad et al., 1990; Tatto, 1996; Villegas & Lucas, 2002). While the need to link learning between courses has been identified, little research exists on the ways successful connections can be made. A small number of studies emphasise how presenting the same key ideas and practices across courses can support coherence (Darling-Hammond, 2006a; Tatto, 1996). However, these studies do not provide insight into how content knowledge developed in one course can be successfully transferred to another course.

More research is required that examines the strategies that may be employed within teacher education programs to support the transference of knowledge from courses focusing on content to those that emphasise teaching practice. This study investigates the following research question: To what extent do teaching practices, curriculum design and assessment assist pre-service teachers to transfer content knowledge from one course to another course with an emphasis on practice? The specific example used here involves strategies that were designed to support primary-focused pre-service teachers to transfer knowledge about language from a first-year course into a second-year course on planning for learning in diverse contexts.

Transference in Higher Education for the Professions

The concept of coherence within teacher education programs, as well as other degrees involving training for professions, is closely associated with the successful transference of content knowledge into practice. Professional degrees are deemed to have succeeded if graduates are able to transfer knowledge flexibly within a range of contexts relevant to their chosen field (Biggs and Tang, 2007; Boulton-Lewis, 1998; McKay & Kember, 1997; Ramsden, 2003; Schwandt, 2005). Often, however, new graduates of education for the professions struggle to transfer knowledge from one context to another and cannot use their knowledge to problem solve when contexts change (Biggs & Tang, 2007; McKay & Kember, 1997; Ramsden, 2003; Schwandt, 2005).

Recent criticisms of teacher education programs have been similar to those found within the general literature on education for the professions. Teachers currently entering the profession have to be able to meet the needs of an increasingly diverse student population. They are required to have deep conceptual understanding of content areas, which they can transfer to create flexible pedagogies within complex learning situations (Aspland, 2008; Darling-Hammond, 2000, 2006a; Howey, 1996; Zeichner, 2008). The knowledge and skills now expected of teachers have resulted in the requirement that teacher education programs are coherently structured and support students to transfer content knowledge to teaching practices that can be adapted to meet the needs of diverse learners (Darling-Hammond, 2000, 2006a, 2006b; Grossman et al., 2008; Loughran, 2006).

Only a few studies focus on how greater coherence can be achieved within teacher education programs. Tatto (1996) analysed 9 teacher education programs in the United States to determine the extent to which the program successfully prepared their students to work with diverse students. The findings indicate that the most successful programs are those where the philosophies, goals and practices in all courses concentrate on supporting pre-

service teachers to work with diversity (Tatto, 1996). Another teacher education program in the United States attempted to ensure that their pre-service teachers incorporated criterion-referenced assessment into teaching practices by modelling and using this kind of assessment within every course that the pre-service teachers undertook during their degree. By doing this, the teacher educators hoped that their graduate teachers would use explicit, criterion-referenced assessment within their own classrooms to support student reflection on learning (Darling-Hammond, 2006a).

These examples demonstrate the importance of including common ideas and teaching practices across courses within teacher education programs, but they do not investigate how content knowledge developed in one course can be successfully transferred to another course of a teacher education program. One study attempted to do this when evaluating reforms made to the Stanford Teacher Education Program. Most of this study focused on assessing the strategies initiated to emphasise a key vision across the program and to ensure alignment between course work and field experiences (Hammerness, 2006). However, a small part of the research also analysed the effectiveness of initiatives designed to provide links between courses within the program. The findings suggest that sharing texts across courses and emphasising common key ideas within assessment tasks throughout the program support coherence (Hammerness, 2006).

While only a few studies exist on the strategies that may be used to support transference of knowledge within teacher education programs, research has begun to define broadly the ways in which graduate teachers need to be able to transfer content knowledge to practice to meet the needs of diverse learners within schools. Transference within the literature on teacher education usually relates to a pre-service teacher's ability to take knowledge gained within a setting focused on content knowledge into one involving teaching practice (Darling-Hammond, 2000, 2006a, 2006b; Poplin & Rivera, 2005; Shulman, 1987; Zeichner, 2008). To transfer knowledge successfully, the pre-service teacher needs to understand how the knowledge is relevant to the practical teaching practices they are learning about. Having understood how the knowledge is relevant, the pre-service teacher then needs to apply it in an accurate and appropriate way that will result in effective pedagogy. Some of the teaching practices considered to be the most important when meeting the needs of students from a diverse range of backgrounds include interpreting curriculum to create relevant and challenging learning goals, evaluating the prior learning of students and their contexts, employing a range of instruction methods flexibly to support learning, assessing the progress of learners and providing detailed feedback to students based on clear learning goals and detailed criteria for achievement (Darling-Hammond, 2000, 2006a, 2006b; Hattie, 2009, 2012; Poplin & Rivera, 2005). Each of these teaching practices requires the transference of content knowledge. To employ such practices effectively in their classrooms, pre-service teachers need to have developed deep conceptual knowledge and understanding of content, which constantly inform their planning and delivery of lessons (Darling-Hammond 2000, 2006a, 2006b). However, traditionally teacher education programs do not integrate well the development of content knowledge with practice (Darling-Hammond, 2006b; Goodlad et al., 1990). Programs often involve the teaching of content knowledge followed by an emphasis on practice (Korthagen & Kessels, 1999 cited in Montecinos et al., 2011). Much more integration is required in teacher education programs to support pre-service teachers to transfer content knowledge gained from one course, into another course with a practical teaching focus (Darling-Hammond, 2000, 2006a, 2006b).

Transferring Knowledge about Language to Teaching Practice

One specific body of knowledge that pre-service teachers are expected to transfer between contexts relates to language. Research within the field of sociology of education in the 1970s in France highlighted how schooling favours specific cultural and linguistic backgrounds (Bourdieu & Passeron, 1990). Other studies have since replicated these findings. For example, in more recent work in Australia, Teese and Polesel (2003) demonstrated how school curricula work for those from wealthy backgrounds in Australia. Students from these contexts in Australia tend to achieve during their schooling because of the cultural and linguistic capital their backgrounds provide (Teese & Polesel, 2003).

Detailed studies since the late 1970s have demonstrated that one of the reasons why schooling tends to reproduce inequality is because teaching practices tend to favour students with particular backgrounds and teachers generally lack the knowledge and skills required to build linguistic capital. For example, Shirley Heath (1983) demonstrated how children from two different working class contexts in the United States came to school with language related to the everyday worlds of their families, which did not match the middle-class expectations of academic language use found within schooling. Similarly, Sarah Michaels (1981) found that first-grade students, whose language experiences in the home related closely to the experiences and expectations of their teacher, received more effective support during an oral language activity. Another study, focusing on students in Hawaii from minority ethnic backgrounds, found that a reading intervention program was successful if it included structures for participation that were similar to those used for story telling within the students' everyday lives (Au, 1980). Educators who can make links with the language experiences children bring to schooling from their cultural contexts, extend children's linguistic abilities and support students to make appropriate language choices in the academic context of schooling will help to prevent certain groups of students being marginalised and becoming disengaged from education (Au, 1980; Heath, 1983).

Knowledge about Language and the Functional Model

Teachers capable of developing the linguistic capacities of their students require deep knowledge about language that can be applied during the planning and implementation of teaching. Knowledge about language can be used to analyse the linguistic demands of curriculum areas, as well as the related abilities of individual students. Teachers are then able to plan activities that can support students to gain the language expertise required to access the curriculum and achieve. They are also able to provide explicit feedback to students on their use of language (Athanases & De Oliveira, 2011; Derewianka, 2012; Gebhard et al., 2011; Gibbons, 2009; Lewis & Wray, 2001; Lucas, 2011; Macken-Horarik, 2012; Macken & Slade, 1993; Reynolds, 1998).

The knowledge about language that teachers require to support students includes morphology, syntax and the ways in which language use changes according to context (Lucas, 2011). Teachers can support the linguistic capacities of their students if they have knowledge of two different forms of grammar. Traditional grammar concerns accuracy and correctness in the use of language, while Systemic Functional Linguistics, otherwise known as functional grammar, emphasises the use of appropriate forms of language in specific contexts (Derewianka, 2012). The functional model focuses on how social and cultural contexts, as well as more specific situations, affect language use (Halliday, 1985; Halliday & Matthiessen, 1999). It proposes that the ways in which creators of genres use language to express ideas, define relationships and generate cohesion and structure will be affected by the

context in which the genre is being created (Halliday, 1985; Halliday & Matthiessen, 1999). This socially-situated system of language, developed by the Australian-based linguist M.A.K. Halliday, is particularly useful for teachers in school contexts, as it enables them to understand that each discipline area will emphasise particular genres that include specific uses of language, which work to achieve the overall purpose of the genre. Within each genre, certain language features will dominate and it is through these language features that the purposes of texts within a discipline are achieved. The repetition of dominant language features within a genre form patterns that can be identified and taught. If educators have an understanding of the specific ways in which language is operating within particular school discipline contexts, they can scaffold this learning for students in their classrooms (Acevedo & Rose, 2007; Brisk & Zisselsberger, 2011; Cope & Kalantzis, 1993; Jones & Chen, 2012; Rose & Martin, 2012; Rothery, 1996).

Studies across a number of countries have found that explicit teaching of particular language features found within disciplines supports learners to access knowledge and present information specific to a discipline area (e.g. Achugar, Schleppegrell & Oteíza, 2007; Brisk, 2011; Coffin, 2006; Folkeryd, 2006; Gebhard, Demers, & Castillo-Rosenthal, 2008; Martin, 2010; May & Wright, 2007; Schleppegrell, Greer, & Taylor, 2008). For example, Schleppegrell, Greer and Taylor (2008) found that teaching students about the kind of language used in the discipline of history during history lessons in the US supported students with their written tasks and helped them to understand the concepts involved. Another study within the discipline area of history found that incorporating language learning helped students to access and produce the kinds of texts relevant to a specific subject area (Coffin, 2006). Australian and New Zealand studies have supported these findings across a range of disciplines (Polias & Dare, 2006; Wright, 2007). Other studies have demonstrated that explicit teaching of language in curriculum areas enables students learning English as an additional language to access the curriculum and achieve (Brisk & Zisselsberger, 2011; Gebhard et al., 2011; Gebhard & Martin, 2010; Gibbons, 2002; Hammond, 2008; Saracini-Palombo & Custance, 2011).

While the studies summarised above indicate that knowledge about how language functions within different contexts can be used by teachers to support the conceptual understanding and linguistic capacities of students within discipline contexts, there is little research on the methods that teacher education programs can use to support pre-service teachers to transfer knowledge about functional grammar into practice. One recent study of pre-service teachers training to work in high schools in Australia suggests that opportunities to work within professional contexts, at the same time as learning about language, are vital (Love, 2010). However, this study did not take into account that, within many teacher education programs, courses focusing on knowledge about language do not occur at the same time as school placement experiences. Another general study on the preparation of pre-service teachers to be advocates for equity in schools found that teachers felt prepared to work in diverse contexts when their learning about language included case studies of students with specific language needs (Athanasios & Martin, 2006). However, this work also did not examine issues of transference of knowledge about language between courses within a teacher education program.

Studies of professional development programs that aim to provide teachers with an understanding of functional grammar suggest that it is difficult to provide the depth of knowledge required for educators to be able to apply the information to teaching practices. Research conducted in two elementary schools in Massachusetts found that the participants required one-on-one support to translate the knowledge about functional grammar gained in group professional learning sessions into their practice (Brisk & Zisselsberger, 2011). Another study, also in Massachusetts, analysed the experiences of one teacher who undertook

a course on functional grammar and attempted to apply her new knowledge to practice. The results indicate that the successful transfer of knowledge about functional grammar to teaching practice is not easy to achieve and ongoing support is required as teachers make attempts to link language theory to practice (Gebhard et al., 2011). These findings suggest that pre-service teachers would find it extremely challenging to incorporate knowledge of functional grammar into their still developing teaching practices.

Theorising about the Transference of Knowledge

The literature previously discussed emphasises that education for the professions requires coherent programs that support the transference of content knowledge, such as language, to practice. While transference is highlighted, there has been little attention paid to the complexities involved in taking knowledge from one context and applying it within another. Research related to education for the professions generally, and teacher education, suggests that if students develop deep understanding of content knowledge they will be able to recognise when its application to practice is relevant and they will apply content knowledge accurately and effectively (Biggs and Tang, 2007; Darling-Hammond 2000, 2006a, 2006b; Hattie 2009, 2012; Ramsden, 2003). However, knowledge transfer is an extremely complicated process because knowledge is defined by the context in which it is situated. The work of Michel Foucault (1995, 2002) highlights how, within any given context, certain knowledge will be privileged and particular associations between concepts will be made. As a result of particular associations, or ‘discursive formations’, being made, a particular discourse will be generated, which serves the purposes of individuals and institutions within a specific context (Foucault, 2002, 129). The practices of individuals operating within a particular discourse will then be guided and restricted by the ways in which knowledge has been constructed (Foucault, 1995, 2002).

Michel Foucault’s (1995, 2002) theory of discourse can be related to the complexities involved in transferring content knowledge to practice. To transfer knowledge effectively, students are required to take associated ideas from one discourse and make different connections with concepts in other discourses. If students are able to make the new connections between discourses, that are required in a specific context, their practices will be appropriate. In the case of functional grammar, pre-service teachers are required to relate the ideas within this theory to discipline contexts, such as history and science. New associations between concepts from two discourses are required, so that pre-service teachers can analyse the language demands of different discipline areas contained in the curriculum effectively and plan activities that will support language development within these specific learning areas. To apply knowledge about language to practice, pre-service teachers therefore have to make complex associations between different discourses. Foucault’s discourse theory, and, more specifically, the idea that knowledge formation depends on associating elements from different discourses, informed the notion of transference in this study.

The Context of this Study and Methodology

The research presented here took place within an Australian four-year teacher education program, preparing educators to work within primary schools. During the first year of their degree, the pre-service teachers in this study had learnt about Systemic Functional Linguistics, as part of a 12-week course. Within this course, 2 weeks were spent on traditional grammar and 6 weeks on the functional model. Other topics covered during the

linguistics unit included early language acquisition and the relationship between oral and written language. Courses within the first year of study in this program generally concentrate on building content knowledge in the areas of literature, language, mathematics, science and psychology-based learning theories. In the second year, the program emphasises how context can affect students' prior knowledge and experiences of schooling. It is during this year that the courses begin to link content knowledge with practice. The third year of study includes a course on how whole-school approaches can create safe and supportive learning environments, while the other courses continue to build content knowledge and to develop pedagogies. In their final year of study, the pre-service teachers undertake courses related to action research and successfully transitioning into the profession, as well as further study related to content knowledge and pedagogy.

During the first half of the second year of their degree, the pre-service teachers undertake a course focussing on planning for learning in diverse contexts. Educators involved in both the first-year linguistics course and the course on planning observed that the pre-service teachers often struggled to apply their knowledge about functional grammar within the second-year planning course. The lecturers and tutors involved in both the first-year course on linguistics and the second-year course on two separate campuses of the university worked together to develop a curriculum design, as well as teaching and assessment practices, that aimed to support the pre-service teachers to make the kinds of associations required to use their knowledge of functional grammar when planning a lesson. This study analyses the extent to which the curriculum design, teaching practices and form of assessment supported the successful transference of knowledge about language to lesson planning.

The teacher educators involved in this research revised the second-year course on planning for learning in diverse contexts in ways that they thought would support the pre-service teachers to make links between the discourse of functional grammar and the discourses involved in planning to teach within a discipline context. First, the teacher educators incorporated more theoretical content into the beginning of the second-year course on linguistic capital and associated this with the theory on linguistic capital that had been taught in the first-year course. The lectures and tutorials then focused on the kinds of associations that the pre-service teachers would have to make between the functional model of grammar and discipline contexts. In lectures, the concept of language use being associated with context was linked to the idea that each discipline area taught within schools contains its preferred language and texts. Lectures and tutorials then included examples and short activities designed to demonstrate how associations could be made between the curriculum for a specific discipline and knowledge of functional grammar. After reading parts of the curriculum for a discipline area, the pre-service teachers had to explain which kinds of texts and language students would require to be successful.

The teacher educators then revised the curriculum and designed teaching practices for the second-year course to support the pre-service teachers to associate their knowledge of functional grammar with planning activities to support achievement in a discipline area. At this point, the teacher educators included content in lectures and tutorials that linked again with the theory of functional grammar. This content reminded the pre-service teachers that the model of functional grammar included three main ways in which language could be used to make meaning in a context, including the expression of ideas, the establishment of interpersonal relationships and the generation of textual cohesion and structure. Lectures and tutorials then included examples of teaching activities that could be used to support students' capacities to use language to achieve these three ways of making meaning within particular discipline areas. Models of lesson plans that included examples of language being scaffolded within a discipline area were then provided to the pre-service teachers.

The teacher educators then designed a major assessment task in the second-year course that involved the transference of knowledge about functional grammar into lesson planning. The pre-service teachers were asked to select a discipline area and year level, choose a small part of the achievement standard from the curriculum, analyse the chosen part of the curriculum for language requirements and then plan a lesson that included one strategy designed to scaffold language learning within a class of diverse learners. The language activity had to support students to understand and use the language associated with one of the three ways of making meaning within a discipline context. At the same time, the pre-service teachers were required to demonstrate capacity to write appropriate learning outcomes and success criteria for the lesson, as well as design other activities that did not have an explicit language focus, but would also support the learning required by the chosen part of the achievement standard from the curriculum. A written outline of the task was provided to all the pre-service teachers as part of their course outline for the semester. The description of the task has been included as appendix A.

The pre-service teachers designed a lesson plan for an abstract class. The lecturers provided descriptions of the students making up the class, using case studies that were included within the course readings. These case studies described students living in poverty, as well as individuals from ethnic minorities learning English as an additional language. The lecturers explained that, as a result of the students' backgrounds, they all needed assistance with language in the classroom.

The teacher educators then taught the revised course on two separate campuses of the university. The two cohorts of students were invited to participate in the study. Of the 174 pre-service teachers undertaking the second-year course on planning for learning in diverse contexts, 77 agreed to participate. The vast majority of the pre-service teachers involved were white and from middle class backgrounds. Only 11% of the participants were male.

All of the pre-service teachers involved had undertaken the linguistics course in the previous semester. Most of the learning about functional grammar involved analysing linguistic features of genres at a clause level. The learning was structured around the three ways in which meaning within a genre can be made through the use of specific language features. First, the teacher educators taught about the language features that can be used to express ideas, including participants, processes, circumstances, nominal groups and nominalisation. The pre-service teachers then learnt how choices involving the kinds of participants, processes, nominal groups, as well as the extent of nominalisation, can work to set up relationships between the creator, topic and intended audience of the text. In this section, modality and mood were also taught. Finally, the teacher educators taught about language features that create structure and cohesion, including text and paragraph previews, theme, rheme, reference items, lexical cohesion and text connectives. A detailed discussion of the teaching strategies used by the teacher educators in the linguistics course can be found in a 2014 publication (Fenwick et al., 2014).

The completion of ethics requirements for this study included practices that would be used to ensure that the pre-service teachers could choose whether or not to be involved without fear of their decisions affecting academic results within the second-year course. The information letter provided to the pre-service teachers explained clearly that participation was voluntary and that assessment was not connected with involvement in the research. It also made clear that the pre-service teachers could leave the study at any stage without adverse consequences.

Methods used for Data Collection

The data collection methods used within this study come from qualitative research traditions. Qualitative research is suited to broadly defined research problems that require exploration into participants' perspectives and experiences (Creswell, 2008). In this instance, the researchers wanted to explore pre-service teachers' perceptions of the second-year course, as well as the extent to which they successfully transferred their knowledge of functional grammar into lesson planning. The use of two data collection methods enabled the researchers to analyse if there was a difference between the way in which the pre-service teachers perceived their learning and the actual learning that occurred. The pre-service teachers' perceptions were gained through a questionnaire completed at the end of the second-year course on planning for learning. The questionnaire is provided as appendix B. The items included in the questionnaire aimed to gather information about the pre-service teachers' perceptions of their levels of confidence associated with applying knowledge about language to planning, as well as their views on the key ideas taught in the course and the teaching and assessment strategies used to support their transference of knowledge about functional grammar. For each item, the pre-service teachers could choose to respond with 'strongly agree', 'agree', 'disagree' or 'strongly disagree'.

The questionnaire could provide insight into the extent to which the curriculum design, as well as teaching and assessment practices, used in the second-year course had supported the pre-service teachers to develop the confidence to apply knowledge about language to planning and the belief that teaching about language in curriculum areas was important. It could also indicate the extent to which the pre-service teachers thought that specific teaching and assessment strategies had supported their transference of knowledge about functional grammar. However, the questionnaire could not provide insight into whether or not the curriculum design, teaching practices and form of assessment resulted in the successful transference of knowledge about functional grammar. To analyse the extent to which the pre-service teachers successfully transferred their knowledge, the researchers analysed the lesson plans produced by the pre-service teachers for assessment purposes. Seventy-seven pre-service teachers across the two campuses agreed to complete the questionnaires, while 50 volunteered for their lesson plans to be analysed. Of these 50 volunteers, 45 had also participated in a preliminary study by the authors, which assessed the extent to which the pre-service teachers had developed deep learning about functional grammar during the linguistics course. The results from this first study are used to contextualise the results presented in this second study. Conclusions about the transference of knowledge from one context to another can only be made if information about an individual's knowledge base is first known. The first study provided the researchers with this information for most (90%) of the participants in the second study.

Specific Method used for Analysing the Lesson Plans

Analysis of the lesson plans focused on the associations that the pre-service teachers made between their knowledge of functional grammar and a discipline context. The form of discourse analysis used looks for the 'discursive formations' being made between ideas (Foucault, 2002, 129). It is through these associations that new meanings are formed (Foucault, 1995, 2002; Gee & Handford, 2012; Olssen, Codd & O'Neill, 2004; Taylor, 2013). A framework was developed, which enabled the researchers to analyse the nature of the associations being made by the pre-service teachers as they made links between the discourse of functional grammar and discipline discourses to plan a lesson. Initial analysis involved

determining if there had been any attempt to link functional grammar with a discipline context. If an attempt had been made, the analysis then focused on the way in which knowledge about language had been associated with the curriculum for a discipline. The pre-service teachers were judged to have transferred their knowledge of functional grammar successfully if, at this point, they could identify at least one language feature that was relevant to the chosen part of the curriculum and the discipline context. Unsuccessful transference of knowledge occurred if the chosen language focus was not appropriately associated with the identified part of the curriculum. The final stage of analysis involved an examination of the language learning strategy that the pre-service teachers had incorporated into their lesson plan. The pre-service teachers successfully transferred knowledge of functional grammar to planning if they could use their knowledge of language to develop a language learning activity that would support student achievement in the chosen curriculum and discipline context. The design of the language activity had to be able to support students to achieve one of the following:

- Learn about the language required for understanding and presenting the ideas central to the discipline;
- Learn about the language that is typically chosen to establish certain kinds of relationships within texts created by authors operating within a discipline context;
- Learn about the language used to create structure and cohesion within texts created in a discipline context.

The framework with criteria used to analyse the lesson plans is included in Table 1. An example of lesson plan analysis has been included as appendix C.

Kind of association made	Attempt made	Attempt not made
Attempt to associate language knowledge to a discipline context		
Language knowledge associated with the discipline context to interpret the curriculum	Appropriate identification of one or more language features that is/are relevant to the chosen part of the curriculum and the discipline context	Inappropriate identification of one or more language features that is/are not relevant to the chosen part of the curriculum and the discipline context
Language knowledge used to incorporate an activity for language learning in the curriculum and discipline context	Language knowledge used appropriately to develop a planned activity for language learning that would support student achievement in the chosen curriculum and discipline context. The language activity supports students to achieve one of the following: <ul style="list-style-type: none"> • Learn about the language required for understanding and presenting the ideas central to the discipline (may include participants, processes, circumstances, nominal groups, nominalisation); • Learn about the language that is typically chosen to 	Language knowledge not used appropriately to develop a planned activity for language learning that would support student achievement in the chosen curriculum and discipline context. The planned activity does not support students to achieve one of the following: <ul style="list-style-type: none"> • Learn about the language required for understanding and presenting the ideas central to the discipline (may include participants, processes, circumstances, nominal groups, nominalisation); • Learn about the language

<p>establish certain kinds of relationships within texts created by authors operating within a discipline context (may include kinds of participants, processes, nominal groups, modality, mood);</p> <ul style="list-style-type: none"> • Learn about the language used to create structure and cohesion within texts created in a discipline context (may include text and paragraph previews, theme, rheme, reference items, lexical cohesion and text connectives). 	<p>that is typically chosen to establish certain kinds of relationships within texts created by authors operating within a discipline context (may include kinds of participants, processes, nominal groups, modality, mood);</p> <ul style="list-style-type: none"> • Learn about the language used to create structure and cohesion within texts created in a discipline context (may include text and paragraph previews, theme, rheme, reference items, lexical cohesion and text connectives).
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Table 1: Framework used to analyse the associations made between functional language and discipline contexts

Once the framework for analysing the lesson plans had been developed, two of the researchers used it to analyse the same lesson plan. Their analyses were then compared to determine if the framework generated shared conclusions. The responses of the researchers were found to be the same. One of the researchers then analysed the 50 lesson plans, which ensured consistency across the sample.

Results

Almost all of the pre-service teachers participating in the study either agreed or strongly agreed that the strategies used during the semester supported their transference of knowledge about language into the second-year course on planning. Table 2 summarises the pre-service teachers’ perceptions of the strategies used.

Effectiveness of strategies to support transference of knowledge about language	% of pre-service teachers (N=77)				
	Strongly agree	Agree	Disagree	Strongly disagree	No response
The lectures in this unit helped me to understand how to incorporate language into	44	54	2		

the teaching of lessons					
The lectures in this unit made links with my prior learning	32	66	2		
Activities within tutorials helped me to apply my knowledge about language to planning for teaching	43	55	2		
Models of lesson plans helped me to apply my knowledge about language to planning for teaching	60	35	4	1	
The assessment task for this unit helped me to develop my capacities to apply language knowledge to planning for teaching	56	42	1		1

Table 2: Pre-service teachers' perceptions of the effectiveness of strategies used in the second-year unit

The results also suggest that the strategies used throughout the course resulted in most students building their confidence to use functional grammar when planning for learning. Fourteen per cent of the 77 pre-service teachers who completed questionnaires reported that they felt very confident about using their knowledge about language at the beginning of the second-year course, while 51% indicated that they had some confidence. Thirty per cent did not feel confident about transferring and applying their knowledge of language and 5% reported that they felt very unconfident. Levels of confidence had changed considerably by the end of the second-year course. When responding to the proposition 'I now feel confident about using knowledge of language to plan for effective teaching', 39% of the pre-service teachers strongly agreed, 59% agreed, 1% disagreed and 1% provided no response. However, while most students felt some degree of confidence by the end of the course, this confidence did not necessarily mean that they could successfully transfer knowledge about language to practice. Of the 50 pre-service teachers who consented to their assessment tasks being used for analysis, 80% (N=40) made some attempt to use their knowledge of language within their lesson plans. Of these 40 students, 36 had demonstrated some elements of deep learning about language at the end of the linguistics course in the previous year. (For a discussion of how deep and surface knowledge was measured in the previous study see Fenwick et al., 2014). The other 4 students had not taken part in the first study. Twenty per

cent (N=10) of the pre-service teachers did not transfer their knowledge about language from the first year course. Of these 10 students, 9 had only demonstrated surface-level knowledge about language during the linguistics course. The other 1 student had not participated in the first study. Results from the questionnaire indicate that the lack of transference for these 10 students was related to the extent to which they had attained knowledge about functional grammar in the linguistics course, rather than a belief that language learning was unimportant. Almost all (98%) of the pre-service teachers expressed a belief that including language within planning and learning was important to achieve greater equity in schooling.

Of the 80% (N=40) of pre-service teachers who used knowledge about language in their planning, 88% (N=35) were able to identify one or more language features that were relevant to the chosen part of the curriculum and the discipline context. For example, one pre-service teacher, working in the curriculum area of drama, chose part of the curriculum related to writing scripts with strong character development. The pre-service teacher decided that the students would need to know how to create noun groups containing describers, rather than other elements that are more common within noun groups in factual texts, including numeratives and classifiers. Another pre-service teacher, working within the arts, chose part of the curriculum requiring students to provide critiques of art works. She decided that students could not do this without having some understanding of the technical terms used in the arts discipline. She then focused on the non-human, concrete and specific participants commonly associated with the arts. Another pre-service teacher chose a section of the curriculum concerned with communicating ideas in science. For part of the lesson, he decided to focus on noun groups and how they typically contained classifiers, rather than general describers, within the discipline of science. Another pre-service teacher, working within the humanities, chose part of the curriculum associated with how Aboriginal culture had contributed to Australian society. The pre-service teacher concluded that the students would require an understanding of words associated with Aboriginal culture, as well as those relating to more general understandings in the humanities, such as 'culture' and 'society'. She decided to focus on the concrete, abstract, specific and generalised participants that the students would need.

While some of the pre-service teachers focused on specific language features, in the chosen discipline context, others concentrated first on the kinds of texts that students would be required to produce and then identified language features relevant to these. One pre-service teacher decided to develop a lesson within the discipline area of geography and chose part of the curriculum associated with using atlases. He presented atlases in the lesson plan to be texts designed for a specific purpose within a specialised context. He then focused part of the lesson on helping students to understand how elements, such as symbols and alphanumeric grids achieved structure and cohesion in atlases. One pre-service teacher developed a lesson plan in the discipline area of science. She chose part of the curriculum associated with reporting results after completing an investigation. She then built explicit teaching of the structure of science reports into her lesson.

Twelve per cent (N=5) of the pre-service teachers, who made an attempt to apply knowledge about language to lesson planning, were not able to do so appropriately when interpreting the curriculum. Within their lesson plans, these pre-service teachers made reference to language, but there was no appropriate connection with the requirements of the curriculum statement for a discipline area. For example, one pre-service teacher chose to work within the history learning area, with part of the curriculum requiring that students engage with a variety of Indigenous Australian stories. While the pre-service teacher acknowledged that the students may need support with some of the language in the stories, she did not apply her knowledge about language in a meaningful way to the chosen part of the curriculum statement. If viewed through knowledge of functional grammar, the learning

could have involved analysing the different structures and language features to be found within a variety of Indigenous Australian stories. Links could then have been made between the techniques used by authors in their stories and the specific purposes that each author wanted to achieve. Another pre-service teacher chose to design a lesson within a part of the arts curriculum requiring that students interpret, critique and reflect on art works. Within the lesson plan, the pre-service teacher mentioned that she would help students to edit their reflections on an artwork, but she did not use her knowledge of language to unpack the different understandings that students would need to access this part of the curriculum. For example, she did not include teaching and activities associated with understanding the differences between interpretations, critiques and reflections.

Of the 80% (N=40) of the pre-service teachers who transferred knowledge about language into the second-year course and included it in lesson planning, 70% (N=28) used their knowledge to develop a carefully planned activity for language learning that would support student achievement in the chosen curriculum and discipline context. Of this 70%, 72% (N=20) designed a strategy that supported students to learn about language required for understanding and presenting ideas, no pre-service teachers created an activity designed to establish certain kinds of relationships within texts and 18% (N=5) planned learning involving the creation of structure and cohesion within texts. Three students went above the requirements of the task and developed extended activities that would support language learning essential for understanding and presenting ideas, as well as for creating structure and cohesion in texts. For example, one pre-service teacher used her knowledge about language to identify that students would need to know and understand a range of words on a topic if they were to build lexical cohesion within their final reports on a topic in science. She then designed a task where the students had to first identify the meanings of specific topic words and then group them according to similarities in their meanings. Once the students had sorted the words into groups, they were required to give each group of words a heading, which captured the overall meaning of the group of words. Students could then use this knowledge to build lexical cohesion throughout their writing on the topic.

Another pre-service teacher planned an extended activity that aimed to support students to learn the language required to understand and present ideas within health and physical education and to structure a relevant text. The curriculum that she chose to work with required that students explain the physiological, social, cultural and economic reasons for people's food choices. The pre-service teacher first designed an activity to develop students' understanding of the key participants in the discipline area. She divided the class into groups and provided each group with sets of cards. One set contained key participants related to the topic, while the other set consisted of definitions of the terms. In groups, the students matched the definitions to the terms. Class discussion of the different terms then followed. The next activity, designed by the pre-service teacher, involved students working in groups to apply their understanding of participants such as 'physiological causes' and 'social reasons'. The teacher provided each group with a set of cards containing pictures of different foods. The students then worked in their groups to discuss the reasons why people may choose to eat a particular food and then classify it according to the reason identified. Each student in the class then had to choose one of the reasons that may inform food choices and write a paragraph explaining it. Before the students wrote their paragraphs, the pre-service teacher planned to model the elements that made the paragraph effective when explaining a phenomenon, including a paragraph preview. Through the activities planned in the lesson, the pre-service teacher scaffolded the language learning required by the students for concept development in the discipline area, as well as for the creation of the kind of text common in that learning domain.

Another example also demonstrates how a pre-service teacher used knowledge about language to help students learn about the language associated with both the presentation of ideas and the creation of a text relevant to a discipline area. The pre-service teacher chose to work with a part of the science curriculum requiring that students identify and describe the life cycles of insects. In his lesson plan, he included activities designed to scaffold topic-specific language, as well as the language appropriate for descriptions in science. The first planned activity involved the students working with their teacher to create a list of specific, concrete participants and processes related to the life cycles of insects. Through discussion with the students, meanings were extended and everyday language was replaced with scientific terms. As a result of this initial activity, a word wall was created in one part of the classroom, which was then referred to in the remainder of the lesson. In the next activity, the pre-service teacher aimed to extend the students' understanding of the terms and definitions by asking the students to apply the terminology to pictures of the life cycles of insects. The next activity also involved the students working together with the language specific to the topic, but began also to introduce the language required to create a description of an insect's life cycle. Each student was given a card with a small part of a description of a life cycle on it. The students then had to create the description by deciding whose card fitted next. The completed description, created by the involvement of every student in the class, was then used to model the structure and foregrounding of theme when the students were asked to write their own life cycle of an imaginary insect.

Thirty per cent (N=12) of the pre-service teachers made some attempt to link their knowledge of functional grammar to planning an activity, but the result would not have supported students to learn about language required for understanding and presenting ideas, establishing certain kinds of relationships within texts or creating structure and cohesion within texts in a discipline area. For example, one pre-service teacher, working in the area of history, planned a lesson in which the students had to imagine that they were on the gold fields and write a letter to family back in England. The pre-service teacher explained that she would provide a model of a personal letter, but she did not design any activities to help the students to understand how specific language features worked to produce an effective personal letter. Another pre-service teacher described how she would end the lesson plan with a cloze activity, where students had to fill in gaps in a text with topic specific vocabulary. Through this strategy, she wanted to assess if students understood the terms used during the lesson, but no activity was included to support language learning within the discipline context.

Discussion

The findings presented here suggest that the inclusion of strategies designed to ensure the transference of content knowledge from one course into another supported most of the pre-service teachers. The strategies used aimed to support the pre-service teachers to make associations between functional grammar and discipline contexts. Lectures and tutorials highlighted the concept of linguistic capital, made links with prior learning about functional grammar and demonstrated how to link elements from the language theory with disciplines taught in schools during lesson planning. Models of lesson plans, which incorporated knowledge about language, were provided. The main assessment task emphasised the transference of knowledge about language to lesson planning. Results from the questionnaire indicate that the pre-service teachers valued all of the strategies that were used to support their transference of knowledge and the strategies resulted in higher levels of confidence to use language knowledge in a discipline context. A majority (80%) of the pre-service teachers transferred knowledge about language from the first-year linguistics course into the second-

year course. The results indicate that pre-service teachers are supported to transfer knowledge about language into discipline contexts when the goal of transference guides curriculum design, teaching and learning activities, as well as assessment practices. However, a limitation of this study is that it does not provide insight into whether particular strategies were especially supportive. Further studies are required to examine if all of the strategies employed in this study are required to support transference of knowledge from one course to another, or if certain approaches are more successful than others.

The approach used within this study is situated within Foucault's theory of discourse (Foucault, 1995, 2002). Every context will include knowledge that is associated in particular ways (Foucault, 1995, 2002; Gee & Handford, 2012; Olssen, Codd & O'Neill, 2004; Taylor, 2013). To transfer knowledge effectively from one course to another in a teacher education program, students are required to make new associations, which will enable them to develop practices that are appropriate to a particular situation. In this instance, students were required to apply elements of a theory of language to discipline contexts to analyse the demands of a learning area and plan activities that would support student language learning. Most of the pre-service teachers who brought knowledge about language to their lesson planning could make appropriate associations between the discourse of functional grammar and a discipline area. However, it is not possible to suggest from this study that the strategies employed here would be successful with all forms of knowledge. The strategies used supported pre-service teachers to associate a discourse about language with discipline discourses, but further studies are required to determine if these strategies are successful when making associations between other discourses.

The results indicate that the pre-service teachers found some elements of functional grammar much easier to link with disciplines than others. Most of the pre-service teachers who created an appropriate language activity worked within the area of functional grammar that involves the ways language can be used to understand and present ideas. Usually these pre-service teachers focused on the vocabulary associated with the participants and processes involved in a topic. This result suggests that knowledge about language associated with ideas can be linked to a discipline context much more easily than other parts of the functional grammar model. A smaller number of pre-service teachers could transfer knowledge of language associated with the structure and cohesion of texts to practice, but none of the pre-service teachers could transfer knowledge related to interpersonal meanings. The second-year course included examples and activities about how ideational, interpersonal and textual meanings could be related to curriculum areas. However, these findings indicate that more examples concerning textual and interpersonal meanings needed to be used. More research is now required on the reasons why pre-service teachers struggle to relate some aspects of functional grammar to practice and how they can be supported within teacher education programs to do so.

Twenty per cent (N=10) of the pre-service teachers who agreed to have their lesson plans analysed did not transfer any knowledge about language. Results from the questionnaires indicate that the lack of transference of knowledge from the first-year course was not a result of lack of confidence or a clash of beliefs. One of the reasons why these pre-service teachers struggled to transfer knowledge about language may be because they had not developed a deep understanding of functional grammar during the linguistics course in their first year. Nine of the 10 students who did not transfer any knowledge about language into their lesson planning had only developed surface levels of knowledge at the end of the linguistics course (Fenwick et al., 2014). Of the 12 students who transferred knowledge of language to practice in a limited way, 8 had demonstrated some elements of deep knowledge about language in the linguistics course, but there were still gaps in their knowledge (Fenwick et al., 2014). The remaining 4 students who demonstrated only limited capacities to

transfer knowledge to practice had not participated in the first study. A limitation of this study is that for 10% (N=5) of the students who had their lesson plans analysed, information about their knowledge about language at the end of the linguistics course was not known.

This study highlights that the transference of knowledge about language to practice requires that pre-service teachers can make associations between elements of a language theory and discourses particular to the disciplines taught within schools. The results of this study indicate that pre-service teachers cannot transfer their knowledge of language to discipline contexts if the level of understanding about language is superficial or incomplete. However, this study does not take into account the degree of discipline knowledge held by the pre-service teachers. It is likely that those students with strong backgrounds in particular disciplines could more easily understand discipline-related discourses and that this would help them to make associations between curriculum requirements for certain subjects and knowledge about language. Further studies are required that analyse the ways in which levels of discipline knowledge affect pre-service teachers' capacities to make associations with knowledge about language.

Another reason why some of the pre-service teachers demonstrated limited or no transference of knowledge about functional grammar to practice may be because of the complexities involved in the lesson planning task. Analyses of the lesson plans reveal that the pre-service teachers who transferred little or no knowledge of functional grammar also did not perform well against other assessment criteria. They struggled to select an appropriate part of the achievement standard from the curriculum, to design appropriate learning outcomes, indicators and success criteria, to structure the lesson appropriately, to create a range of activities relevant for the lesson, and to include opportunities to provide feedback. This conclusion is supported by other studies that report pre-service teachers often struggle with the complexities of lesson planning (Ruys, Van Keer, & Aelterman, 2012; Theoharis & Causton-Theoharis, 2011).

The results of this study reflect the findings from research about professional learning on functional grammar for practicing teachers. Translating knowledge of functional grammar to teaching practice is extremely challenging and requires ongoing opportunities and support (Brisk & Zisselsberger, 2011; Gebhard et al., 2011). The findings presented here indicate that pre-service teachers would benefit from other courses in their degree taking up the challenge of both developing further knowledge about the functional model of grammar, as well as supporting the transference of knowledge about language into teaching practices.

Conclusion

Previous research within teacher education emphasises that greater cohesion can be attained by building connections between university-based course work and field experience. Such links will support pre-service teachers to connect content knowledge to practice (Darling-Hammond 2000; Grossman et al., 2008; Hammerness, 2006; Wideen et al., 1998). However, the opportunity for pre-service teachers to be undertaking practical teaching experiences during, or immediately after, a content-based course does not always exist. The achievement of coherence in teacher education programs also involves building links between university-based courses (Darling-Hammond, 2006a, 2006b; Goodlad et al., 1990; Tatto, 1996). The findings presented here suggest that transference of knowledge about language into a practice-based course can be supported if curriculum design, teaching practices and assessment emphasise the associations between discourses that pre-service teachers are required to make to develop appropriate practices. More studies are now required to determine if these pedagogies also work with other discourses.

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Appendix A: Assessment Task- Lesson Plan

In this task, you are required to design a lesson plan for a class of diverse learners, where all of the students require support with language. You may choose the discipline area, the year level and the part of the achievement standard for your lesson plan. One of your learning outcomes and one of your activities must focus on providing students with the language they require to succeed within the lesson. To develop the learning outcome and activity on language, you will need to draw on your knowledge of functional grammar from the first-year linguistics course. The activity with a language focus that you design should be about one or more language features that will help students to understand key ideas, interpersonal meanings or the structure and cohesion of a text within the chosen discipline area.

Your lesson plan must be structured according to the template discussed during lectures and tutorials. The following sections must be included:

- Lesson topic, year level
- Domain and dimensions from the relevant curriculum
- Chosen part of the achievement standard from the curriculum
- 2-3 learning outcomes based on the chosen part of the achievement standard and including one with a focus on language learning
- Indicators
- Success criteria
- Opportunities to provide students with feedback
- Information of students' prior learning (use the case studies provided during the semester to discuss this)
- Resources required for the lesson
- Lesson content (activities described for each section – introduction, development, consolidation and practice, extension, closure – one activity within the lesson must have a focus on language learning)

Appendix B: Pre-service Teacher Questionnaire

	Strongly Agree	Agree	Disagree	Strongly Disagree
At the beginning of this unit, I felt confident about applying my knowledge of language to lesson planning.				
At the end of the unit, I now feel confident about using knowledge of language to plan for effective teaching.				
The lectures in this unit helped me to understand how to incorporate language into the teaching of lessons.				
The lectures in this unit made links with my prior learning.				
Activities within tutorials helped me to apply my knowledge about language to planning for teaching.				
Models of lesson plans helped me to apply my knowledge of language to planning for teaching.				
The assessment task for this unit helped me to develop my capacities to apply language knowledge to planning for teaching.				
I believe that knowledge about language helps pre-service teachers to interpret curriculum and plan for learning.				
I believe that including language teaching across the curriculum is an important aspect of equity in schooling.				

Appendix C: Example of lesson plan analysis for one pre-service teacher

Kind of association made	Judgements made by researchers about the associations made	
Attempt to associate language knowledge to a discipline context	Attempt made – continue analysis	Attempt not made – stop analysis
Language knowledge associated with the discipline context to interpret the curriculum	Appropriate identification of one or more language features that is/are relevant to the chosen part of the curriculum and the discipline context	Inappropriate identification of one or more language features that is/are not relevant to the chosen part of the curriculum and the discipline context
Details from pre-service teacher’s lesson plan	-chosen discipline context science -chosen part of the curriculum communicating ideas in science -identified language feature nominal groups with classifiers	
Language knowledge used to incorporate an activity for language learning in the curriculum and discipline context	Language knowledge used appropriately to develop a planned activity for language learning that would support student achievement in the chosen curriculum and discipline context. The language activity supports students to achieve one of the following: <ul style="list-style-type: none"> • Learn about the language required for understanding and presenting the ideas central to the discipline (may include participants, processes, circumstances, nominal groups, nominalisation); • Learn about the language that is typically chosen to establish certain kinds of relationships within texts created by authors operating within a discipline context (may include kinds of participants, processes, nominal groups, modality, mood); • Learn about the language used to create structure and cohesion within texts created in a discipline context (may include text and 	Language knowledge not used appropriately to develop a planned activity for language learning that would support student achievement in the chosen curriculum and discipline context. The planned activity does not support students to achieve one of the following: <ul style="list-style-type: none"> • Learn about the language required for understanding and presenting the ideas central to the discipline (may include participants, processes, circumstances, nominal groups, nominalisation); • Learn about the language that is typically chosen to establish certain kinds of relationships within texts created by authors operating within a discipline context (may include kinds of participants, processes, nominal groups, modality, mood); • Learn about the language used to create structure and cohesion within texts created in a discipline context (may

	paragraph previews, theme, rheme, reference items, lexical cohesion and text connectives).	include text and paragraph previews, theme, rheme, reference items, lexical cohesion and text connectives).
Details from pre-service teacher's lesson plan	-planned language activity includes students identifying nominal groups in model practical report and highlighting classifiers, followed by the students working in pairs to create nominal groups with classifiers for a practical report. Activity would support students to learn about the language required to understand and present the ideas central to the discipline.	