Beginning teachers’ conceptual understandings of effective history teaching.

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The paper reports on the investigation of seven preservice teachers who studied a nine-week unit of a secondary History methods course in postgraduate diploma of education studies program. The focus of the study was to look at participants’ conceptions of effective History teaching, especially pedagogical content knowledge over a period of time, that is, a study of conceptual change. Participants constructed concept maps in their first and last tutorial of the course. Only two participants’ concept maps indicate conceptual change, and growth in pedagogical content knowledge in History teaching, although other participants’ concept maps show a generic understanding of subject matter, curriculum knowledge and pedagogical content knowledge in teaching and learning.

Towards a re-emphasis on the History curriculum
The pressure from the national level of government on state authorities to install the study of History as a compulsory subject alongside maths, English and science continues to grow. In a recent statement on a national curriculum, the Prime Minister, Kevin Rudd, vowed to have school children studying History as one of the four core subjects by 2011 (Coorey & Patty, 2008). Those in the History community are no doubt heartened by Rudd’s pronouncement, as the status of History teaching in schools has been under challenge in recent years. By the same token, the drive to have History as a core component of the national curriculum will ensure that History methods courses within university schools of education need to be capable of producing more teachers of History to cater for a broadening clientele in schools. It is pertinent then to investigate what is learnt by prospective teachers of History in a History methods course. This study investigates the knowledge growth of preservice History teachers, especially their pedagogical content knowledge over a nine-week History methods course.

The nature and significance of pedagogical content knowledge in History teaching.
Knowledge of subject matter and associated pedagogical skills are essential for effective teaching. The aims and objectives of the History methods course in this study, for example, emphasise an understanding of the discipline of History, Aboriginal History, student centred approaches, knowing the cognitive and affective abilities of learners, the curriculum of History, and making History fun. The New South Wales Institute of Teachers Professional Teaching Standards (http://www.nswteachers.nsw.edu.au/Main-Professional-Teaching-Standards.html) expect that initial teacher education program at universities will include content that covers, inter alia, knowledge of subject matter, knowledge of pedagogy, knowledge of students, and knowledge of the NSW curriculum. Both the Ancient and Modern History Stage 6 Syllabuses (Board of Studies, NSW, 2004) state in the objectives that
(a) students are expected to develop skills of the process of historical inquiry, (b) communicate their understandings of History, and (c) understand the value of History for personal growth and lifelong learning. The Objectives of the Stage 4 and Stage 5 of the History Yrs 7-10 Syllabus (Board of Studies, NSW 2003) clearly show that students should develop (a) an interest and enthusiasm for History, (b) the skills of historical inquiry, and (c) knowledge of the nature of History.

The literature also stresses the critical importance of subject matter knowledge, curriculum knowledge, knowledge of students, and the pedagogical skills needed to teach students. Feiman-Nemser and Parker (1990) state that the “Understanding of subject matter is *sine qua non* in teaching” (p.40). If teachers are expected to prioritise key ideas, skills, and concepts in subject matter knowledge and determine representation during the transformation process, they should have an understanding of the structural organization of the subject matter knowledge (Bruner, 1977). While content knowledge is essential for teaching, the effective teacher is one who is then able to accommodate it into curriculum knowledge, that is, knowing the syllabi and work programs for a particular subject area, the particular topic, the level at which it is to be taught, the resources, and materials to be used. As Shulman (1986) explains,

The curriculum and its associated materials are the *materia medica* of pedagogy, the pharmacopoeia from which the teacher draws those tools of teaching that present or exemplify particular content and remediate or evaluate the adequacy of student accomplishments (p.10).

In order to successfully transform subject matter for student learning, teachers must also have a knowledge base of their learners; in fact, writers such as Cochran, DeRuiter and King (1993) give students equal standing to content knowledge when identifying the components contributing to pedagogical content knowledge.

Pedagogical content knowledge is the knowledge base necessary for teachers to achieve effective teaching of their subject area to meet the cognitive and emotional needs of students. First enunciated by Shulman (1986: 9) pedagogical content knowledge involves the blending of content and pedagogy into an understanding of how particular content knowledge is organised, represented and adapted to the diverse interests and abilities of students, and presented for instruction. That is to say, pedagogical content knowledge is that “…particular amalgam of pedagogy and content [that] makes teachers different from [other] scholars in the field…” (Gundmundsdottir, 1987:4). The amalgam concerns

…the most regularly taught topics in one’s subject area, the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations…an understanding of what makes the learning of specific topics easy or difficult: the conceptions and preconceptions and misconceptions that students of different ages and backgrounds
bring with them to the learning of those most frequently taught topics and lessons (Shulman, 1986b:9).

Chen and Ennis (1995) found in a study on high school physical education teachers that although they shared a common content knowledge, they differed in their personalized pedagogical content knowledge repertoire, based on their perceptions of students’ physical ability to deal with “basic” or “advanced” concepts and skills in volleyball. As the above study suggests because students are different in abilities, prior knowledge, and learning styles, effective teachers should be able to teach a concept in “150 different ways” (Wilson, Shulman & Richert, 1987).

However, as Stimpson (2005) notes, the process of developing pedagogical content knowledge is a challenging one for beginning teachers as they try to accommodate the varying theories of classroom practice. Beginning teachers are inclined to make incorrect judgements about students’ misconceptions and tended to view teaching as telling rather than rather than representing content for student understanding (Hogan, Rabinowitz & Craven, 2003). But Wilson (1991) states that we cannot expect beginning teachers to have a wealth of representations that experienced teachers may have accumulated after years of practice. Instead, teacher education courses should at least equip preservice teachers with the skills and understanding necessary to generate representations of subject matter knowledge in ways that take advantage of what students already know and believe. The challenge, then, for lecturers of History is to provide opportunities for preservice teachers to develop methods of effective History teaching, often in a limited amount of time, that is, to change their conceptual understandings of History that moves from being “subject matter knowers” to “subject matter teachers” (Berliner, 1986, pp.9-10)

**Developing pedagogical content knowledge: Conceptual change for student teachers.**

One model of conceptual change suggests that learners use assimilation to deal with new phenomena. In his study of conceptual change, Ausubel (1985) stressed the importance of prior knowledge in new learning. He said that learners use a process of ‘assimilation’ in which “… the processes of acquiring information result in a modification of both newly acquired information and the specifically relevant aspect of cognitive structure to which new information is linked” (p.74). This new information is generally linked to a relevant concept or proposition, which Ausubel called ‘ideas’ within the cognitive structure, the relationship of which may be subordinate, superordinate or a combination of both. Since cognitive structures are usually hierarchical in terms of ideas and abstractions, the inclusion of new propositional meanings typically involves a subordinate relationship to the existing cognitive structure. “Most meaningful learning is essentially the assimilation of new information” (Ausubel, 1985:76). New understandings and reorganization of thought processes should be enhanced if beginning teachers are given the opportunity to reflect on their own understandings of teaching. Participants in this study were given the opportunity to reflect on their knowledge structures by constructing concept maps on two occasions.
Methodology
The study used qualitative research and case methodology to investigate the conceptual understandings of seven preservice teachers in a History methods course of over nine weeks, and to answer the following research question:

*What is the pedagogical content knowledge growth of preservice teachers of History in a methods course?*

Participants constructed concept maps on two occasions - at the beginning and at the conclusion of their History methods course. The concept map is a schematic device that provides an external representation of structural knowledge (Novak & Gowin, 1984). Studies have shown that concept mapping is an effective method for assessing conceptual change (Markow & Lonning, 1998). It is also regarded as a potentially useful tool for researchers who seek an insight into how teachers construct their concepts (Zanting, Verloop & Vermunt, 2001). By comparing an individual’s successive concept maps on a specific topic over time, one may observe his/her developing mastery of the topic by monitoring changes from one concept to the next “the researcher can see how knowledge is structured in the course of the acquisition” (Cary, 1986:1126). Research has found that concepts allowed preservice teachers to (a) elicit thoughts behind their mentor teachers’ teaching; (b) to reflect about their own teaching performance; and, (c) to make useful comparisons between their mentors’ and their own maps (Meijer, Zanting & Verloop, 2002).

Participants constructed two sets of concept map diagrams on what they knew about effective History teaching. Prior to the construction of their concept maps, participants were instructed for only an hour on how to construct a concept map because they said that they had used concepts maps in some courses during their education studies. They were also shown a series of concept maps, ranging from simple ones to those of greater complexity. Participants were then given A3 sheets of paper, a block of ‘Post-it’ page markers, pencils, erasers, and then instructed to draw a map based on their understanding of ‘effective History teaching’. After they had written down as many concepts they could think of on the page markers, they were asked to rearrange the concepts into hierarchies, adding more concepts if they wanted. Once participants were satisfied with the location of their concepts, they glued them onto the A3 sheets of paper. They then added arrowheads with linking words to show the relationship between concepts.

Several ways exist to analyse and interpret concept maps, depending on the purpose of the exercise. Quantitative evaluation procedures involve assessing the number of concepts used, the number of main categories, and the number of levels in a hierarchy. Lawless, Smee and O’Shea (1998) argued that a quantitative scoring system can conceal the uniqueness of the concept map, believing that more meaningful results were likely to result when concept maps are presented as an essentially qualitative instrument. A qualitative approach can observe changes in perceptions over time (Beyerbach & Smith, 1990) and allow for the comparison of structures before after instruction (Champagne, Klopfer, De Sena, & Squies, 1981). This study used a qualitative approach that sought to establish relationships between
general concepts, subordinate concepts, branches, hierarchy levels, cross-links, and outcomes concepts.

Findings
Participants’ concept map constructions ranged from the well structured, to overly complex, and to the incomplete. Emma’s concept maps are an example of well structured concept maps that expresses strong conceptual understandings of History teaching because: first, the concepts on her maps are essentially hierarchical - from general concepts to subordinate concepts; second, the general concepts are explicitly linked to the key concept through grammatically correct connecting words, which also link other subordinate concepts further down the hierarchy; third, linking arrows and connecting words assist in providing relationships between concepts and within the hierarchy; and, finally, by using cross-linking arrows to bind hierarchies into a powerful statement of History teaching (Figures 1 and 2). For example, from the general concept of ‘Knowledge’, a hierarchy of specific concepts follow – all connected by linking arrows and appropriate connecting words: ‘Knowledge’ including ‘Skills development’ which may be ‘Practical skills (mapping, graphs) which develop ‘Cognitive skills’. In this branch, ‘Knowledge’ comes from ‘Sources that are interesting’ which can be ‘Primary sources’ used in ‘Secondary sources incorporating ‘Tangible examples’. The networks of concepts that are subordinate to ‘Knowledge’ are connected through a cross-link to another network of concepts subordinate to ‘Values’ (Figure 1).

Emily’s concept maps on the other hand, are challenging to the reader because there are too many linking arrows that are trying to establish too many relationships among concepts within hierarchies and across hierarchies. Some of her connecting words need more attention because they are grammatically unclear (Figures 5 and 6). Nero’s concept map constructions (Figures 3 and 4) indicate a strong tendency for item streaming of concepts, and a lack of attention to detail. Both concept maps show that there were no linking arrows or connecting words between concepts within in the hierarchies. Relationships between concepts across the hierarchies were not clear, even though there was an attempt to link concepts by using arrows and words, mainly because words between concepts are missing the necessary verbs or pronouns to establish meaningful relationships between concepts. Indeed, the construction of both concept maps show that focus was on establishing relationships between concepts across the hierarchies, but without success. Both Jody’s and Sandra’s concept maps indicate that they gave a lot of thought about the concepts involved in History teaching, but their concept maps were incomplete because either linking arrows or connecting words were not included in their concept map constructions (Figures 7 and 8; 13 and 14).

Participants’ conceptions of knowledge categories also varied. Although ‘subject matter knowledge’ was nominated as a concept (mostly as a general concept) on all maps, surrounding networks of concepts indicated participants’ different understandings from other participants. For example, Birdwood’s concept map (Figure 9) showed ‘subject matter’ as a general concept, but with subordinate concepts that were essentially curriculum in nature, that is, ‘lesson plans’, ‘syllabus’,
and ‘outcomes based’. Jack’s conceptual understanding of subject matter knowledge indicated that it was both a general concept and a subordinate concept, that latter reinforced by lesson planning and preparation - ‘lesson and task structure’ (Figure 12). Interestingly, subject matter knowledge for most participants was conceptually directly linked to syllabus knowledge, but subordinate concepts were of a curriculum nature (Figures 3 and 4; Figures 5 and 6; Figure 8; Figures 13 and 14) and not explicitly about History.

Those participants who nominated historically related subject matter concepts on their maps generally showed some understanding of the significance of these concepts within the wider network of concepts. Jody, for example, nominated ‘narrative components’ (Figure 7) which demonstrates at least that she has some understanding of the importance of historical literacy, even though the nomination of this concept is not propositionally linked to any concept on her map. Use of ‘sources’ in History was a commonly nominated concept to the remaining three participants. Birdwood shows ‘primary sources’ can be used as a tool in the inquiry process which helps promote student subject matter knowledge such as ‘opinions’ and ‘values and attitudes’ (Figure 9). ‘Values and attitudes’ is also a nominated concept in his second map (Figure 10). Jack sees his nomination of ‘primary and secondary sources’ as part of developing student research skills, while his nomination of ‘civics and citizenship’ is an outcome of linking lessons to real world activities (Figure 12). His first concept map (Figure 11) also makes reference to real world activities as a result of the concept of ‘real life examples’ and ‘up-to-date-knowledge’. Emma’s concept maps indicate the strongest focus on historically based subject matter concepts. Her understanding of the value of sources in teaching is clearly evident: both primary and secondary sources should be interesting, have a number of perspectives, and come with clear examples (Figure 1). Emma also sees the important outcomes for students in terms of their knowledge of Australia and developing their own set of values when exposed to values that are multi-perspective and incorporate civics and citizenship. In addition, Emma regards such skills as mapping and graphs as components of subject matter knowledge.

However, Emma’s concept maps were devoid of any explicit concepts relating to the History curriculum (Figures 1 and 2). Jody, on the other hand, nominated Modern and Ancient History as explicit curriculum understandings as well as ‘themes and topics’ (Figure 7). She nominated ‘cross curriculum content’ in her second map (Figure 8), an indication of her awareness that students are expected to achieve broad learning outcomes as defined in the NSW Board of Studies K-10 Curriculum Framework. Sandra’s curriculum understandings of History were most prominent on her first concept map (Figure 13). Unlike the generic syllabus nominations of other participants, Sandra nominated ‘key competencies’ as one subordinate concept to both Modern History and Ancient History. Key competencies – “collecting, analysing and organising information” and “communicating ideas and information” are the core process of historical inquiry in both Ancient and Modern History. Sandra further demonstrates her awareness of the Ancient History Syllabus by nominating ‘case studies’ - a component of the Year 11 Preliminary course content.
The remainder of participants’ curriculum understandings can be described as generic to teaching and learning or implied understandings of History, but their conceptual understandings should not be diminished because at one level at least, they are beginning to consider curriculum as the ‘pharmacopeia’ of their teaching. Lesson planning and preparation was a commonly nominated concept for most participants, indicating that they are cognisant of the fact that good planning is the foundation for effective teaching. Participants referred to lesson planning in a number of ways. Emma identified it as ‘effective planning and lesson structure’ (Figure 1); she nominated it again in her second concept map (Figure 2), this time as ‘effective planning strategies’. Nero expressed his understanding of lesson planning in a number of ways: first there is the essence – the basic ‘lesson planning’, then, there is ‘advanced lesson planning’ and finally, ‘ability to change lesson’ (Figure 3). Nero clearly regards the lesson plan as a flexible document that can change to suit the circumstances, where reminder notes can be at a minimum, or at a more comprehensive level for other teachers to use. Furthermore, he nominated ‘unit planning’ (Figure 4), an aspect of long term planning that no other participant considered. The concept of resources also featured prominently in participants’ concept maps. Emma considers resources as promoting knowledge growth by using a range of sources, and by providing a range of perspectives in values education (Figure 2), while Emily sees resources as a linchpin in providing a variety of learning methods (Figure 5). Emily also identified time management as an important factor in her teaching, because it results in a considered and calm approach to teaching (Figure 6). Although a number of other participants nominated outcomes on their concept maps, Jack was the only participant to establish a link between three essential components of teaching - content, assessment, and outcomes (Figure 11).

Participants’ understandings of curriculum were also reflected in their appreciation of the cognitive and affective needs of learners. According to Emma’s first concept map (Figure 1), student engagement should be about making History ‘fun’, a clear objective of the History Yrs 7-10 Syllabus (Board of Studies, NSW) that asserts that students, during the mandatory phase of the course at least, are expected to develop an enthusiasm for History. But first, there must be ‘student engagement’ - by appealing to students’ needs that considers individual differences, and variety that caters for students’ preferred learning strategies (Figure 1). Nero also considers the joy of learning of History by making it ‘interesting for students’, by engaging learners (Figure 3). The concepts of ‘understand students’ and ‘communicate with students’ on his second concept map reflects the essence of developing a knowledge base of students (Figure 3). Understanding student needs was also a concept nominated on Jody’s second concept map (Figure 8). Jack’s nomination of ‘inclusive classroom’ (Figure 11) indicates his understanding of difference and diversity and clearly resonates with the broad learning outcomes from the cross-curriculum content in the History Years 7-10 History Syllabus.

A number of participants identified feedback to students, variously expressed as ‘positive feedback’ and ‘student feedback’ (Figure 3), ‘constructive feedback (Figure 7), and ‘positive student feedback’ (Figure 11) as important to their teaching. Properly tailored feedback in the form of explanations, illustrations, analogies is a powerful
tool that caters for individual needs of students, by reinforcing and/or building knowledge, and minimising the student misconceptions. This kind of pedagogical skill that transforms knowledge through tailored representations is example of pedagogical content knowledge. Participants’ concept maps (Figures 1, 7, 8, 9, 10, 13 and 14) identified knowledge of multiple intelligences and Bloom’s Taxonomy as a means of assisting them to unpack knowledge with the appropriate use of pedagogical skills to cater for students’ preferred learning styles. Participants nominated concepts such as ‘pedagogy, good pedagogy, pedagogical knowledge’ (Figures 3, 5, 7, 10), and ‘pedagogical strategies’ (Figure 13) as a means delivering content, but it also indicates that they are developing a literacy specific to teaching school students.

Significantly, Emma nominated the concept of ‘pedagogical content knowledge’ on her second concept map (Figure 2), an indication that she has been reading the educational literature. All the subordinating concepts in one way or another indicate pedagogical content knowledge. Her nomination of the core inquiry method - IGASAR (Initiate, Gather, Analyse, Synthesise, Apply, and Reflect) reflects the facilitating role the teacher must adopt in order to promote effective learners as researchers and reflective inquirers. Emma also nominated QTM (Quality Teaching Model) as she refers to it - a NSW Department of Education and Training teaching and learning framework that contains the elements of pedagogical content knowledge, which all teachers in public schools should adopt in their classroom practice (Quality teaching in NSW public schools: Discussion Paper, pp. 9-15). Further subordinate concepts of ‘site studies’ and ‘teaching strategies’ indicate other processes in her understanding of pedagogical content knowledge. Evidence of pedagogical content knowledge thinking was also evident in her first map (Figure 1) when nominated ‘teacher modelling’ and ‘guided instruction’ as pedagogies that should be included in lesson planning.

Further examples of pedagogical content knowledge can be seen in other participants’ concept maps. Emily nominated ‘adaptability’ as an essential part of lesson engagement, indicating both a planned and a spontaneous aspect of pedagogical content knowledge. Interestingly, she contends that adaptability promotes positive attitudes in teaching such as patience and optimism, resulting in good leadership. ‘Scaffolding’ is a powerful example of pedagogical content knowledge, a strategy which Birdwood regards as inclusive in teaching; he notes the importance of inquiry as a means of promoting knowledge growth in learners as well as developing affective outcomes such as ‘opinions’ and ‘values and attitudes’ (Figure 9). His second concept map also identifies skills that should be taught to students by employing multiple intelligences and Bloom’s Taxonomy so as to appeal to their learning strategies. He shows that the pedagogical skills employed by teachers should be dependent on students’ learning strategies, not the other way around as in the case of teacher-centred approaches to teaching. Birdwood also linked IGASAR to Bloom’s Taxonomy; a properly structured IGASAR by students should incorporate these thinking processes as they move through the inquiry sequence.

Sandra considers inquiry learning as a process that is both teacher and student-centred, because it is the teacher who initially provides the stimulus for the inquiry
process (Figure 13). As she notes in her map, it is also the responsibility of the teachers to engage in appropriate pedagogical strategies that use multiple intelligences and Bloom’s Taxonomy to take into account students’ individual learning strategies. Jody’s pedagogical content knowledge base is clearly evident in her first concept map where her nominated concept of ‘sound pedagogical skill’ is dependent on a number of factors such as ‘understanding student needs’, ‘engaging lessons’ that are ‘student centred’ preferred learning strategies (Figure 7). Communication and having the skills to research are important factors for Jack’s teaching. Good communication is a precursor for student directed discussion that incorporates open-ended questions and debate (Figure 12). Nero identified a number of concepts on his maps that indicate a student-centred approach to his teaching. For example, he nominated different teaching methods and ‘student participation’ to engage students; and by being organised to ‘create student based activities’ (Figure 3).

Four of the participants’ second concept maps show a sharper focus of inquiry learning in terms of History learning through their nomination of IGASAR (Figures 1, 8, 10, 14), and in this regard at least, partially satisfies the assimilation process as outlined by Ausubel (1985). In other words, two of the participants’ concept maps show IGASAR as concepts that are not part of any cognitive structure to indicate relationships with other concepts on their maps (Figures 8, 14). Emma’s concept maps, on the other hand, show cognitive structures with concepts in relationships that establish propositional meanings, such as ‘inquiry based learning’ (Figure 1) and IGASAR (Figure 2). Her first concept map shows that inquiry learning is initially linked to other concepts in a pedagogical content knowledge relationship that are linked and reliant upon a network of concepts based on knowledge of learners (Figure 1). Although inquiry learning is still essential part of History teaching and learning in Figure 2, it can be seen that there has been an assimilation of new ideas about inquiry which is specifically related to Historical investigation, namely IGASAR. Birdwood’s understanding about inquiry on his first map (Figure 9) undergoes a process of conceptual change to a more specific understanding of inquiry to that of the IGASAR model of learning. Both Emma’s and Birdwood’s conceptual understandings of History teaching and learning, therefore, indicate growth in pedagogical content knowledge.

**Conclusion**

Participants showed that they were cognisant of the fact that subject and curriculum matter are important to teaching, along with pedagogical content knowledge to meet the needs of individual students. The range of pedagogical content knowledge examples reflects the uniqueness of participants’ perceptions of teaching and learning. Most participants’ nomination of concepts relating to subject matter, however, were not explicit to the History discipline but were generic concepts of content - despite the fact that they entered their post graduate diploma of education program with undergraduate degrees containing the requisite amount of History discipline subjects. The nomination of curriculum related concepts on participants’ maps, for the most part, also indicated a general rather than explicit understanding of the History curriculum. In short, the concept maps reveal that participants’ conceptual understandings about History teaching is not easy to embed in a nine-week methods
In terms of structure, a minority of participants’ concept maps were well structured and indicated conceptual change and growth in pedagogical content knowledge, while other concept maps were either incomplete or too complex to draw meaningful conclusions about change in knowledge structures. Nevertheless, the concept mapping activities gave participants an opportunity to reflect on their knowledge of History teaching, and share their understandings with their peers. This study also shows the value of using concept maps to seek insights into participants’ knowledge structures and to assess conceptual change.

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