



Higher Education Research and Development Society of Australasia, Inc

# Higher education in a changing world

Research and development in higher education

*Proceedings of the*

## 28<sup>th</sup> HERDSA Annual Conference

3-6 July 2005

Sydney, Australia

Brownlee, J., Thorpe, K. & Stacey, P. (2005) Improving learning and teaching in early childhood teacher education: A focus on personal epistemology, in *Higher education in a changing world, Proceedings of the 28th HERDSA Annual Conference, Sydney, 3-6 July 2005: pp 60.*

Published 2005 by the  
Higher Education Research and Development Society of Australasia, Inc  
PO Box 27, Milperra, NSW 2214, Australia  
[www.herdsa.org.au](http://www.herdsa.org.au)

ISSN: 0155 6223  
ISBN: 0 908557 62 0

This research paper was reviewed using a double blind peer review process that meets DEEWR requirements. Two reviewers were appointed on the basis of their independence, expertise and experience and received the full paper devoid of the authors' names and institutions in order to ensure objectivity and anonymity. Where substantial differences existed between the two reviewers, a third reviewer was appointed. Papers were evaluated on the basis of originality, quality of academic merit, relevance to the conference theme and the standard of writing/presentation. Following review, this full paper was presented at the international conference.

Copyright© 2005 HERDSA and the authors. Apart from any fair dealing for the purposes of research or private study, criticism or review, as permitted under the Copyright, Design and Patent Act, 2005, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the publishers, or in the case of reprographic reproduction in accordance with the terms and licenses issued by the copyright Licensing Agency. Enquiries concerning reproduction outside those terms should be sent to the publishers at the address above.

## Improving learning and teaching in early childhood teacher education: A focus on personal epistemology

Joanne Brownlee

Queensland University of Technology, Australia  
j.brownlee@qut.edu.au

Karen Thorpe

Queensland University of Technology, Australia  
k.thorpe@qut.edu.au

Phillip Stacey

Queensland University of Technology, Australia  
p.stacey@qut.edu.au

***Abstract:** A growing body of research about personal epistemological beliefs has provided tertiary educators with evidence to inform strategies in promoting effective teaching and learning. Personal epistemological beliefs refer to an individual's beliefs about the nature of knowing and knowledge and are considered to influence how one engages in teaching and learning experiences. There has been very little research, to date, that has explored how pre-service teacher education students' beliefs change over time and identified factors associated with such changes. No research exists in the area of early childhood teacher education. This paper uses current literature on the development of epistemological beliefs to provide a conceptual framework on which to base intervention for early childhood pre-service teacher education students. It is focused on providing a constructivist approach to knowledge through personal engagement and authentic experiences.*

***Keywords:** personal epistemology, teacher education, epistemological intervention, early childhood teacher education, tertiary learning*

Since education deals with knowledge, epistemology is really education's most fundamental concern" (Peterson, 1986 in Fitzgerald & Cunningham, 2002, p. 210)

### Higher education in the 21st Century

Students in higher education are diverse in age, socio-economic background, sexual orientation, gender, ethnicity and ability (Baxter Magolda & Terenzini, 2004). This increased diversity has necessitated changes in teaching and learning.

In a post-modern society, higher education must prepare students to shoulder their moral and ethical responsibility to confront and wrestle with the complex problems they will encounter in today's and tomorrow's world. Critical, reflective thinking skills, the ability to gather and evaluate evidence, and the ability to make one's own informed judgments are essential learning outcomes if students are to get beyond the relativity to make informed judgments in a world in which multiple perspectives are increasingly interdependent and "right action" is uncertain and often in dispute...Holistic views of learning in which thinking, feeling, and relating to others are integrated are increasingly prevalent (Baxter Magolda & Terenzini, 2004, p.2)

It is our position that a constructivist view of learning and knowing (personal epistemology) must underpin higher education. Devlin (2002) states that common objectives of higher education include students being able to think reflectively and engage in life-long learning. A focus on personal epistemology in higher education can support these goals of reflective learning as it helps students take responsibility for their learning and directs them to develop metacognitive skills and critical thinking about learning. Personal epistemology refers to those beliefs held by the individuals rather than "epistemologist-scientist" (Kitchener, R. 2002, p. 94) that reflect "untutored" views about the nature of knowledge (p. 89). There is no real consensus regarding the exact nature of personal epistemology in terms of whether it reflects beliefs, attitudes, knowledge, ways of knowing, or reasoning skills however there is some agreement that it does involve an individual's cognition or perspective regarding knowing and knowledge (Pintrich, 2002).

In the teacher education context, personal epistemologies influence pedagogy and curriculum decision making (see Arredondo & Rucinski, 1996) because such beliefs are core and filter other beliefs and knowledge. However, very little research, apart from pilot work undertaken by the author (see Brownlee, Berthelsen & Boulton-Lewis, 2004), has investigated the development of personal epistemology in early childhood teacher education students. It is important that we understand better the nature of early childhood teacher education because quality child care, a national priority, is determined by higher levels of education (Whitebook, 2003). This paper presents a conceptual framework that relates the personal epistemology and student learning literature to provide a platform on which to base early childhood teaching programs.

## **Personal epistemology**

Given the intrinsic link between epistemology and education, it is surprising that only in the last decade has psychological and educational perspectives on personal epistemology started to impact on instructional practice (Hofer, 2002). From the 1960s until the 1980s much of the epistemological beliefs research focused on unidimensional, stage like views of change in individuals' epistemological beliefs. Perry (1970) and Belenky, Clinchy, Goldberger, and Tarule (1986) provide two such approaches to the study of epistemological beliefs. Perry found that, over time, progressively more complex and integrated ways of viewing the world developed as university students progressed through their studies. These epistemological beliefs ranged on a continuum from a dualistic view that knowledge is simple and certain and could be transmitted by authorities to a relativist view that knowledge is complex, tentative and uncertain. The term contextual relativist is now preferred because it distinguishes more clearly between a view of relativism that "anything goes" to one that is based on critique and evidence (Moore, 2002). Kuhn and Weinstock (2002) postulated that individuals move from copies (realism), to facts (absolutist), to opinions (multiplism) to judgments (evaluativism) related to knowledge and knowing. Epistemological beliefs provide a way in which to understand student learning and guide instruction (Schommer-Aikens, 2002) because they filter knowledge and beliefs (Schommer-Aitkens, 2004). Indeed, most personal epistemology research has taken place in academic domains (Schraw & Sinatra, 2004). Individuals may view knowledge as dualistic, absolute and handed down by authority, while other

individuals believe that objective knowledge is not possible and knowledge development is an ongoing process of inquiry (Kitchener and King, 1981; Schommer, 1993). There is also evidence to suggest that epistemological beliefs are related to the metacognitive capacities of individuals. Brownlee (2001), Perry (1981) and Belenky et al (1986) proposed that individuals with more sophisticated epistemological beliefs (e.g., evaluativistic) were more likely to engage in personal reflection and analysis about their understandings and use of knowledge.

Baxter Magolda (2004) described the development of epistemological beliefs from a social constructivist perspective which is context specific:

People actively construct or make meaning of their experience – they interpret what happens to them, evaluate it using their current perspective, and draw conclusions about what experiences mean to them (p. 31).

Therefore epistemological beliefs are social constructions which allow individuals to move from a dependence on others in authority to a reliance on self as knower. People make meaning in a context and changes takes place due to a combination of personal (personal epistemology, etc) and situational (the context) factors (Baxter Magolda, 2004). The internal and external factors described by Baxter Magolda (2004) are similar to the presage factors of learning in John Biggs (1993) 3 P Model. The Model presented in Figure 1 includes 3 P's: presage (environmental and personal factors that influence learning), process (approaches to learning) and product (outcome) factors. These are considered to interact with each other in any learning event.

Epistemological beliefs can be considered to be a personal presage or internal factor (Baxter Magolda, 2004). Brownlee's (2001) research with pre-service teacher education students found that relativistic epistemological beliefs were personal presage factors that affected transformative or deep approaches to learning and metacognitive reflection. It is likely that individuals with relativistic epistemological beliefs and deep approaches to learning will have learning outcomes that are meaningful and linked to prior knowledge. Within this model, epistemological beliefs are socially constructed. The way in which we interpret our experiences is based on our epistemological beliefs, cognitive dissonance and the particular environment in which the dissonance occurs, with the result that epistemological beliefs are context specific.

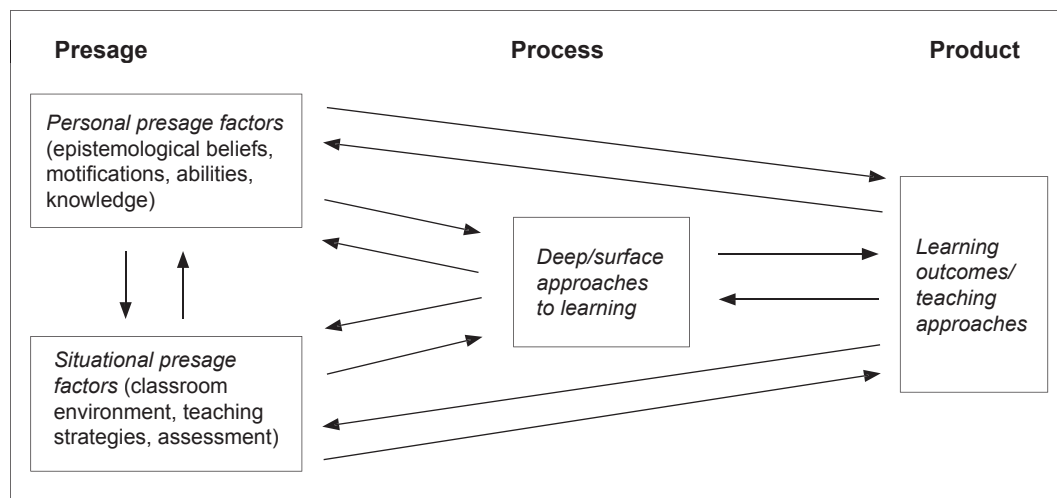


Figure 1. Biggs' (1993) 3P Model of Learning

## Interventions Focussed on Personal Epistemology

There is evidence to suggest that undergraduate students typically do not function from a sophisticated epistemological framework (Baxter Magolda, 1994). Fischer and Pruyne (in press cited in Kitchener, K. 2002) argue sophisticated personal epistemological beliefs are not evident until postgraduate level because there is no demand placed on undergraduate students to think in critical, evidenced-based ways. Higher education, according to Magolda (2004), does not encourage individuals to think in epistemologically sophisticated ways because it focuses on transmission of information rather than knowledge transformation. It is crucial to develop a scholarly, critical, evaluative, analytical climate as well as information literacy skills if the aim of education is to promote sophisticated, evaluativistic personal epistemological beliefs (Kitchener et al. 2001 in Kitchener, K. 2002).

Few studies have reported on interventions designed to develop personal epistemological beliefs (Kardash & Scholes, 1996). Walker and Roskos (1994) investigated preservice teachers' epistemological beliefs and found that after involvement in a reading literacy course designed to foster collaborative learning groups and reconstruction of prior knowledge using authentic teaching experiences, students' epistemological orientations shifted. Students relied less on received (reliance on experts as a source of knowledge) and subjective (reliance on personal feelings) ways of knowing and more on procedural (separate thinking from personal feeling and the use of more theoretically informed knowledge in decision making) ways of knowing. Hofer (1994) also described how students involved in an intervention designed to facilitate constructivist learning were more likely to have sophisticated beliefs about knowledge and were more intrinsically motivated with higher self-efficacy beliefs. Another study by Stanton (1996) helped first year students to be more reflective through the use of interactive discussions and specific reflection on learning strategies and the self as a knower. The students who completed the program showed better grades, retention rates, ego and career development and, two years later, more sophisticated epistemological beliefs.

All these studies reported interventions with some focus on students' personal epistemological beliefs from either an organisational or learning perspective. However, in these studies there does not appear to be any specific requirement for students to reflect specifically on the nature of their epistemological beliefs in order to develop more sophisticated beliefs. Brownlee, Purdie, and Boulton-Lewis, (2001) reported on a teaching program designed to facilitate development of epistemological beliefs by explicitly focusing on such beliefs throughout a year-long educational psychology unit. Epistemological belief change through explicit reflection on epistemological beliefs is also supported by Hofer (2004 in Schraw & Sinatra, 2004) and Phillips (2001). Few studies have endeavoured to achieve such a focus in relation to beliefs about knowing and learning.

There is no research that has examined epistemological interventions in Australian early childhood teacher education programs. Given that more sophisticated epistemological beliefs are linked to deep learning and meaningful outcomes, this paper proposes an approach to early childhood teacher education that focuses on the development of epistemological beliefs. This paper proposes that changes in epistemological beliefs are facilitated by focussing on both the situational and personal presage factors of the tertiary learning environment.

## Focussing on Personal Presage Factors to Facilitate Belief Change

Teaching programs that are focussed on improving learning need to focus explicitly on the personal presage factor of epistemological beliefs. Lyons (1990) and McLean (2001) indicated that students' conceptions of learning (and knowing) need to be made explicit. Similarly, Schommer (1994) recommended that teachers should model active construction of meaning, communicate that learning typically requires struggle and conflict (emotion), and facilitate the linking of theory with individuals' prior knowledge.

Schommer and Walker (1997) suggested that students 'who demonstrated more naïve core beliefs about knowing on entry into tertiary studies may need individual instruction in the nature of knowledge, as well as study strategies. For the majority of students, epistemological instruction incorporated within first-year introductory courses is likely to enhance their outlook on the nature of knowledge and learning' (p. 184).

However, it is important to realise that interventions that focus on explicit epistemological reflections should help students to see that evidence based analysis is needed to arrive at rational perspectives (Kardash & Scholes, 1996) rather than simply trying to push students into a new "stage of thinking". The basis for this explicit consideration of beliefs is the reflective process. We argue that one key element of developing a sophisticated personal epistemology is the capacity to critically consider available evidence.

Journal and interview reflections promote this reflective process. Through the process of having to read widely for journal writing and supporting personal beliefs with such readings, students may be encouraged to think in more evaluativistic ways. It is, we argue, crucial that reflections on practice are encouraged, particularly during field experiences. Clinchy (1995, cited in Stanton, 1996) described a teaching intervention designed to help students to construct rather than reproduce knowledge. She used journal entries as part of this process, and used students' reflections in journals to present to other students for further reflection. Another powerful way to help students reflect explicitly on personal epistemology is to engage them in interview methodology (see Brownlee et al., 2001). When students are confronted with questions such as "What is learning? What is truth? Are there any right answers in early childhood?" they can begin the process of reflecting on and possibly reconstructing such beliefs.

### **Focussing on Situational Presage Factors to Facilitate Belief Change**

Apart from changes in beliefs occurring through explicit reflection on personal presage factors, focussing on the situational presage factors in the learning environment may also facilitate changes. That is, a focus on changing environmental factors such as assessment and teaching strategies so that students are required to engage in constructivist ways of learning may influence their personal epistemologies (cf. Bem, 1970; cf. Hofer & Pintrich, 1997). If an individual is encouraged to engage in behaviour that is not consistent with his or her beliefs (e.g., constructivist learning strategies that conflict with a transmissive view of learning), that individual may experience cognitive discomfort or disequilibrium and may attempt to seek equilibrium (Piaget, 1954, 1963 cited in Woolfolk, 1998). Therefore, that individual may be motivated to reconstruct conflicting beliefs or attitudes over time.

There are many ways in which a teaching program may address situational presage factors to promote belief change. These include teacher educators explicitly reflecting on their own beliefs, the use of constructivist teaching strategies and constructivist aligned assessment. Each will be discussed in turn.

#### *Teacher educators' explicit reflection on beliefs*

In order to engage in successful teaching interventions teacher educators' may need to reflect on and possibly reconstruct their own personal epistemologies (see Baxter Magolda, 1996b). If teacher educators hold naïve beliefs then it is highly unlikely that they will be able to successfully implement teaching programs that help their students to develop more sophisticated beliefs. This explicit reflection may be supported by the teacher educator verbalising or being explicit about their own reflective processes and epistemological beliefs in order to model more sophisticated beliefs (cf. Schommer & Walker, 1997).

### Constructivist teaching strategies

Constructivist teaching strategies are those approaches to teaching that require students to engage actively in the process of constructing knowledge or learning for meaning. Such approaches have a strong focus on reflection and promote a view of knowing and learning as evaluativistic.

Construction and reconstruction of beliefs may be facilitated by having the opportunity to collaborate with their peers (Baxter Magolda, 1993a, 1993b, 1996a) and lecturers (Baxter Magolda, 1996a). Tarule (1996) commented that collaborative learning ensures that single perspectives do not dominate. Baxter Magolda (1988) noted that epistemological development was more likely to occur in undergraduate students who had experienced discussion formats in tutorials rather than lecture-based learning environments. Reconstructions are more likely to occur if students are challenged through discussion with others (cognitive conflict model) to see the inadequacy of their beliefs.

Peer discussion may have both a direct and indirect influence on epistemological beliefs. It may directly help students to reflect on their epistemological beliefs when asked to read and respond to their own and others' beliefs. Kloss (1994) believed that collaborative learning helps students to gain access to other people's viewpoints, which is an important feature of helping students to consider multiple views of truth in a move toward relativism. Therefore a teaching program that promotes peer discussion, particularly in relation to personal epistemology, is likely to help students to reconstruct their beliefs.

In order for peer collaboration to be successful, teachers need to relinquish some of their control over the learning process, allowing students to become co-learners in a process of joint construction of meaning. This means, effectively, a shift from an authority with the right knowledge to joint ownership of authority in the classroom.

### Constructivist alignment of assessment

Constructivist teaching strategies should also include a focus on constructivist assessment to promote the development of epistemological beliefs. Biggs (1996b) described how assessment should be aligned with constructivist beliefs about teaching and learning. That is, a constructivist view of teaching and learning and related learning objectives need to be matched with approaches to assessment that encourage students to engage meaningfully with the task. Journal reflections are a form of constructivist assessment that enables the investigation of changes in students' understanding over time and the application of theory to real situations (cf. Biggs, 1996a). Students need to be encouraged to reflect using a balance of theory and personal modes in all forms of assessment. The direct influence of such assessment should assist students to re-evaluate their own epistemological beliefs and engage in evidence based learning and practice.

## Conclusion

Undergraduate teacher education students rarely hold evaluative beliefs about knowing and learning yet these are key factors underlying quality reflective practice in the field. The role of the teacher educator is, therefore, to challenge and develop personal epistemological beliefs by focussing on both the personal and situational presage factors that encourage reflection and evidence based practice. Given the links between education and quality in early childhood practice, these principles should underlay the development of courses for all early childhood teacher education students, and indeed all teacher education students.

## References

- Arredondo, D. E., & Rucinski, T. T. (1996, November). Epistemological beliefs of Chilean educators and school reform efforts. Paper presented at the *Tercer Encuentro Nacional de Enfoques Cognitivos Actuales en Educacion in Santiago, Chile*.
- Baxter Magolda, M. B. (1986). Experiential learning and student development theory as guides to developing instructional approaches. *Journal of Social Education*, 1, 3, 28-40.
- Baxter Magolda, M. B. (1988, April). The impact of the freshman year on epistemological development: Gender differences. Paper presented at the *Annual Meeting of the American Educational Research Association*, New Orleans, LA.
- Baxter Magolda, M. B. (1993a, April). The convergence of rational and interpersonal knowing in young adults' epistemological development. Paper presented at the Annual meeting of the *American Research Association*, Atlanta.
- Baxter Magolda, M. B. (1993b, November). The development of contextual knowing in graduate and professional education settings. Paper presented at the *Annual Meeting of the Association for the Study of Higher Education (8th)*, Pittsburgh.
- Baxter Magolda, M. B. (1994). Post-college experiences and epistemology. *The Review of Higher Education*, 18, 1, 25-44.
- Baxter Magolda, M. B. (1996a). Epistemological development in graduate and professional education. *The Review of Higher Education*, 19, 3, 283-304.
- Baxter Magolda, M. B. (1996b). Cognitive learning and personal development: A false dichotomy. *About Campus*, 16-21.
- Baxter Magolda, M. B. (2004). Evolution of a constructivist conceptualisation of epistemological reflection. *Educational Psychologist*, 39, 1, 31-42.
- Baxter Magolda, M. & Terenzini, P. (2004). Learning and Teaching in the 21st Century: Trends and Implications for Practice. *American College Personnel Association*. Date retrieved 5/10/04. [http://www.acpa.nche.edu/srsch/magolda\\_terenzini.html](http://www.acpa.nche.edu/srsch/magolda_terenzini.html).
- Belenky, M. F., Clinchy, B. M., Goldberger, N. R., & Tarule, J. M. (1986). *Womens' ways of knowing: The development of self, voice and mind*. USA: Basic Books.
- Bem, D. J. (1970). *Beliefs, attitudes, and human affairs*. California: Brooks/Cole.
- Biggs, J. B. (1993). From theory to practice: A cognitive systems approach. *Higher Education Research and Development*, 12, 73-85.
- Biggs, J. B. (1996a). Assessing learning quality: Reconciling institutional, staff and educational demands. *Assessment and Evaluation in Higher Education*, 21, 1, 5-15.
- Biggs, J. B. (1996b). Enhancing teaching through constructivist alignment. *Higher Education*, 32, 347-364.
- Brownlee, J. (2001). Knowing and learning in teacher education: A theoretical framework of core and peripheral epistemological beliefs. *Asia Pacific Journal of Teacher Education & Development*, 4 (1), 167-190.
- Brownlee, J., Berthelsen, D., & Boulton-Lewis, G. (2004). Caregivers' personal epistemologies and practice: implications for working with toddlers in long day care. *European Early Childhood Education Research Journal*, 4 (1). 55 -70.
- Brownlee, J., Purdie, N., & Boulton-Lewis, G. (2001). Changing epistemological beliefs in pre-service teacher education students. *Teaching in Higher Education*, 6(2), 247-267.
- Devlin, M. (2002). Taking responsibility for learning isn't everything: A case for developing tertiary students' conceptions of learning. *Teaching in Higher Education*, 7(2), 125-138.
- Fitzgerald, J. & Cunningham, J. (2002). Mapping basic issues for identifying epistemological outlooks. In B. Hofer & P. Pintrich (Eds.) *Personal Epistemology: The psychological beliefs about knowledge and knowing*. New Jersey: Lawrence Erlbaum. (pp 209-228).
- Hofer, B. (1994, August). Epistemological beliefs and first year college students: Motivation and cognition in different instructional contexts. Paper presented at the *Annual Meeting of the American Psychological Association*, 102nd. Los Angeles.
- Hofer, B. (2002). Personal epistemology as a psychological and educational construct: An introduction. In B. Hofer & P. Pintrich (Eds.) *Personal Epistemology: The psychological beliefs about knowledge and knowing* (pp3-14). New Jersey: Lawrence Erlbaum.
- Hofer, B., & Pintrich, P. R. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. *Review of Educational Research*, 67, 1, 88-144.
- Kardash, C. M., & Scholes, R. J. (1996). Effects of preexisting beliefs, epistemological beliefs and need for cognition on interpretation of controversial issues. *Journal of Educational Psychology*, 88, 2, 260-271.
- Kitchener, K. (2002). Skills, tasks, and definitions: discrepancies in the understanding and data on the development of folk epistemology. *New Ideas in Psychology*, 20, 309-328.
- Kitchener, K. S., & King, P. M. (1981). Reflective judgement: concepts of justification and their relationships to age and education. *Journal of Applied Developmental Psychology*, 2, 89-116.

- Kitchener, R. (2002). Folk epistemology: An introduction. *New Ideas in Psychology*, 20, 89-105.
- Kloss, R. (1994). A nudge is best: Helping students through the Perry scheme. *College Teaching*, 42, 4, 151-158.
- Kuhn, D. & Weinstock, M. (2002). What is epistemological thinking and why does it matter? In B. Hofer & P. Pintrich (Eds.) *Personal Epistemology: The psychological beliefs about knowledge and knowing*. New Jersey: Lawrence Erlbaum.
- Lyons, N. (1990). Dilemmas of knowing: Ethical and epistemological dimensions of teacher's work and development. *Harvard Educational Review*, 60, 2, 159-180.
- McLean, M. (2001). Can we relate conceptions of learning to student academic achievement. *Teaching in Higher Education*, 6(3), 399-413.
- Moore, W.S. (2002) Understanding learning in a postmodern world: Reconsidering the Perry scheme of intellectual and ethical development. In B. Hofer & P. Pintrich (Eds.) *Personal Epistemology: The psychological beliefs about knowledge and knowing* (pp17-36). New Jersey: Lawrence Erlbaum.
- Perry, W. G. (1970). *Forms of intellectual and ethical development in the college years*. New York: Holt, Rinehart and Winston.
- Perry, W. G. J. (1981). Cognitive and ethical growth: The making of meaning. In A. W. Chickering (Ed.), *The modern American college* (pp. 76-116). San Francisco: Jossey-Boss.
- Phillips, F. (2001). A research note on accounting students' epistemological beliefs, study strategies, and unstructured problem-solving performance. *Issues in Accounting Education*, 16, 1, 21-39.
- Pintrich, P. (2002). Future challenges and directions for theory. In B. Hofer & P. Pintrich (Eds.) *Personal Epistemology: The psychological beliefs about knowledge and knowing*. New Jersey: Lawrence Erlbaum. (pp 389-414).
- Schommer, M. A. (1993). Comparisons of beliefs about the nature of knowledge and learning among postsecondary students. *Research in Higher Education*, 34 (3), 355-370.
- Schommer, M. A. (1994). Synthesising epistemological belief research: Tentative understandings and provocative confusions. *Educational Psychology Review*, 6, 4, 293-319.
- Schommer, M. A., & Walker, K. (1997). Epistemological beliefs and valuing school: Considerations for college admissions and retention. *Research in Higher Education*, 38, 2, 173-185.
- Schommer-Aikens, M. (2002). An evolving theoretical framework for an epistemological beliefs system. In B. Hofer & P. Pintrich (Eds.) *Personal Epistemology: The psychological beliefs about knowledge and knowing*. New Jersey: Lawrence Erlbaum. (pp 103-118).
- Schommer-Aikens, M. (2004). Explaining the epistemological belief system: introducing the embedded systemic model and coordinated research approach. *Educational Psychologist*, 39,1, 19-29.
- Schraw, G. & Sinatra, G. (2004). Epistemological development and its impact on cognition in academic domains. *Contemporary Educational Psychology*, 29, 2,95-102.
- Stanton, A. (1996). Reconfiguring teaching and knowing in the college classroom. In N. Goldberger, J. Tarule, B. Clinchy, & M. Belenky (Eds.), *Knowledge, difference and power* (pp. 25-56). New York: Basic Books.
- Tarule, J. M. (1996). Voices in dialogue: Collaborative ways of knowing. In N. Goldberger, J. Tarule, B. Clinchy, & M. Belenky (Eds.), *Knowledge, difference and power* (pp. 274-304). New York: Basic Books.
- Walker, B., & Roskos, K. (1994). Preservice teachers' epistemology of diagnostic reading instruction: Observations of shifts during coursework experience. In E. G. Sturtevant & W. M. Linek (Eds.), *Pathways for literacy: Learners teach and teachers learn* (16th ed.) (pp. 59-71). Kansas: College Reading Association.
- Whitebook, M. (2003). *Early education quality: Higher teacher qualifications for better learning environments – a review of the literature*. Berkeley, CA: Center for the Study of Child Care employment, Institute of Industrial Relations.
- Woolfolk, A. (1998). *Educational psychology* (7th ed.). Toronto: Allyn and Bacon.

Copyright © 2005 Joanne Brownlee, Karen Thorpe, Phillip Stacey: The authors assign to HERDSA and educational non-profit institutions a non-exclusive license to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive license to HERDSA to publish this document in full on the World Wide Web (prime sites and mirrors) on CD-ROM and in printed form within HERDSA 2005 conference proceedings. Any other usage is prohibited without the express permission of the authors.