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Transferring Educational Theories and Knowledge Using a Co- teaching Mentor Model: A Discipline-Appropriate Approach

Kent Turkich
University of Western Australia

Shane Greive
Curtin University, s.greive@curtin.edu.au

Paul M. Cozens
Curtin University, p.cozens@curtin.edu.au

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Five key educational theories underpin the substantive changes made to the way that classes were delivered. The applied relevance and transfer of these ideas can be demonstrated in the reflections from the participating staff through a pedagogical analysis of the before and after changes in their teaching practices, and in the improved student evaluation and retention results.

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Introduction

This study examines the effectiveness of a teaching mentor role that focused on improving motivation and retention rates among first-year undergraduate students in an Urban and Regional Planning (URP) degree course through enhancing their instructors' teaching practice. Lecturers who were responsible for first-year units were partnered with a co-teaching mentor to advise them how the content within the units could be delivered more effectively, with an emphasis on educational theory to foster student engagement and motivation. The co-teaching mentor also provided student support, and was the first-year coordinator.

The co-teaching mentor is identified as part of a broader first-year student retention initiative; this paper reflects on the model's capacity to transfer teaching skills and awareness to others, and to transform and improve their teaching practice. Importantly, the process of learning to teach using this model requires a relatively small investment of time and energy from participants, since most of the learning occurs actively as part of regular class timetabling, supplemented by some short planning and reflection sessions. Five key educational theories underpinned the substantive changes to the way classes were delivered. This paper identifies these concepts, and demonstrates their applied relevance and transferred application by an examination of the reflections from the participating staff, and by a pedagogical analysis of their teaching practices before and after the program.

This study is significant in that despite ample research confirming the validity of educational theory in a university setting, academics are sceptical towards and/or lack knowledge about educational theory. Kandlbinder (2013) identifies three common problems that arise in discussions about the teaching and learning literature with university staff (which our model seeks to address). A perplexing mix of teaching theories that draw upon the discipline being taught has arisen in different settings. Our model embraces these localised variations, contending that educational theory can be explained to academics using concepts from the subject they know best as metaphors for teaching concepts, and that educational theory should adapt depending on context. This also helps dissolve the second problem noted by Kandlbinder (2013): the potential impenetrability of educational jargon. The "jargon" in our model is demystified by equating it with familiar concepts (taken from the "home" discipline of planning). Thirdly, Kandlbinder (2013) states that even when academics understand educational concepts, they do not necessarily know how to use them. Our model provides an easy mechanism to convert the theory into practice. It does this by locating the "why" (the theory of teaching and learning) next to the "what" (the behaviour used in the classroom), which is demonstrated by the co-teaching mentor.

This study is also contextualised against the increasingly turbulent and internationalised landscape depicted by Knight (2013), in which university decision-making is dominated by commercialisation and the need to attain sound positioning amongst global league tables. Knight (2013) suggests that flexibility and innovation are required at a global level to address this rapidly changing landscape.

This paper presents a case-study approach in which two research-focused academics reflect upon their teaching practice and experiences following the trial of a co-teaching mentor model. Qualitative data is discussed in the form of narratives and student comments. Quantitative data is represented by student satisfaction results and retention rates. This evidence underpins the effectiveness of this method of transferring educational theories and knowledge.

The Co-teaching Mentor Role

Prior research on the role of the teaching mentor/coach in higher learning environments has established that it has a rich potential for training research-focused academics in applied teaching skills and pedagogical awareness (Angelique, Kyle & Taylor 2002; Huston & Weaver 2008). Although the teaching-mentor role is common among universities' teaching-support services (Postareff, Lindblom-Ylänne & Nevgi 2007), it remains contentious among academic faculties and their affiliated professions. Some are concerned at the prospect of diluting the academic and professional content with non-discipline-qualified teachers delivering the courses (Turkich, Greive & Cozens, 2012). Such tensions are not uncommon (Huston & Weaver 2008).

The counter-argument is that all teaching academics ought to have a teaching qualification. Education-based research supports this case (Postareff, Lindblom-Ylänne & Nevgi 2007), but academics resist the counter-argument as well. With many academics holding multiple degrees and professional accreditations, there is a tendency to resent the increasing layers of qualifications required to access and maintain their positions (Daloz 1999). The added burden of a teaching qualification also risks shifting the focus away from the research and professional activities that are central to many academics' standing and profile (Turkich, Greive & Cozens 2012).

The model this study describes appears to navigate a middle ground. With respect to concerns over non-discipline qualified teachers delivering academic courses, our model is focused on first-years, where most of the units taught focus mainly on basic research and communication skills. Moreover, because the broader objective was to improve student retention rates, a background in education and student support was more relevant than an advanced discipline-based qualification (Grayson 1998). The lecturer and the co-teaching mentor formed a co-teaching partnership to deliver the unit, with joint responsibility for the learning outcomes and the teaching evaluations. In this case, it is important to note that a discipline-based academic is co-teaching in the class, and remains the unit coordinator, largely defining the content. At our university, like many others, the allocation of academic versus research or teaching roles took on renewed relevance in light of reshaping initiatives being piloted in 2013 (Probert 2013).

The use of a staff mentoring system is not new in higher education, especially as a mechanism of general professional development for first-time staff (Angelique, Kyle & Taylor 2002). Traditional mentoring is based on the assumption that experienced staff will guide new staff through the tricky terrain to tenure. But this can prove problematic and ineffective (Daloz 1999). Peer mentoring offers hope by matching new staff of similar standing (Huston & Weaver 2008), but can be hampered by the inability of new staff to find each other or to avoid becoming wrapped up in the competitive culture of the university (Angelique, Kyle & Taylor 2002). Peer observation has also been seen as a means to improve teaching while meeting the wider demands of student diversity and international competition amongst universities, along with the suggestion that such innovations should be formalised by management (Carroll & O'Loughlin 2013).

In a historical examination about the relative receptiveness of academics to various modes of teacher training in New Zealand, Brailsford (2011) suggests that academics continue to resist attending dislocated teaching and learning meetings/workshops. Likewise, Cilliers and Herman (2010) point to positive results from well-designed educational development programs, notwithstanding the academics' varying willingness or availability as a confounding factor. Our approach removes the need for additional time or space in which to carry out professional (teaching) development, as it trains academics within the classroom. In fact, it serves the lecturer

by placing him/her in an *informal* co-teaching in-class situation with a colleague who is more knowledgeable in teaching and learning. Nicol (2006) shows this association to be an important component of successful teacher-training.

Kane, Sandretto and Heath (2004) investigate the attributes of excellent university science teachers, concluding that the ability to reflect is the “hub” of good teaching, and that reflection accelerates teaching competency amongst new academics. In our model, reflection took place as part of an ongoing conversation between the academic and the mentor. As well as being rich and situational, the model’s execution is punctuated by periods of dedicated collaborative reflection and evaluation about the practice of teaching and learning, and the theories that underpin it. MacKay and Tymon (2013) suggest that critical reflection should be both *taught to* and *taught by* university teachers, and that it is as much a part of good research as it is of good teaching and learning.

Our approach echoes that of the first-year student retention program examined by Lodge (2012) in the context of an accredited psychology course at Griffith University. That model arose in response to the problem of confronting a surging demand for trained health professionals. Similarly, the URP course that is the subject of our investigation was the main institution charged with supplying the growing need for trained planners associated with unprecedented growth in the mining and construction sectors in the state served by the university. Furthermore, the Griffith University study highlights the need to engage and retain first-year students, and it consciously addresses this by a pedagogical approach aimed at holistic teaching methods, purpose and connectedness, referred to as “transition pedagogy” (Kift et al. 2010 in Lodge 2012, p1.1). Lodge (2012) also describes the diverse background of psychology students in his study. Similarly, our URP course sits within the largest and most international university in the state, and receives students of a wide range of ages and backgrounds. These include those who have just completed year 12, and others looking to change professions or improve their qualifications for the planning jobs they already hold.

Most importantly for our study, the Griffith University example employs a “principal tutor” as the main mechanism of change. The role of the co-teaching mentor in our study accords in many ways with that of the principal tutor outlined by Lodge (2012). In both cases, the principal tutor carries out a number of roles within the broader objective of student engagement and retention. A number of our first-year URP units used the same co-teaching mentor, providing continuity for students. Assessment and feedback are rendered more consistent as the co-teaching mentor takes care of a significant portion of the marking (helping to alleviate academics’ workload). The co-teaching mentor also gives meaning to course material by positioning content in the context of real-world scenarios, post-graduate study and workforce examples. The mentor gives additional attention to students who are struggling with the workload, as well as to those who fail to socialise. The co-teaching mentor also performs a number of “soft” roles, including minor counselling, advice on career paths and how to behave in casual, classroom and professional settings. Kahn (2013) defines this vital role of the tutor as the “informal curriculum”. Lastly, the co-teaching mentor encourages positive emotions, shown by Abe (2011) to broaden thought patterns and promote successful experiential learning.

The person appointed to this role in our model was an educational-focused researcher, at master’s or PhD level, with a complementary knowledge base that included human geography, biology, environmental management and some planning. In practice, responsibilities involved organising orientation-day activities, coordinating first-years, tutoring and mentoring (student support), course/unit design, lesson planning, marking and teaching support (coaching lecturers on how to teach and assess).

In our model, the principal tutor had an additional role, which was crucial to addressing the goal of student engagement and retention: to develop academics' understanding of the conceptual basis of what we were doing in class. This is an important point of distinction between the roles of the principal tutor and the co-teaching mentor. This role was in line with the research interests of the co-teaching mentor, whose thesis focused on the question of university academics' conceptions of teaching and learning.

Links with Theory

During a post-class debriefing discussion, the co-teaching mentor reflected on his role, suggesting that it was

“... to teach the academics about good teaching concepts and how they can be enacted. I used those same concepts upon the students, which in this case were the academics”.

Although the concept of good teaching is contested (Skelton, 2004), the co-teaching model described in this paper strives to achieve many of the principles recently highlighted by Duarte (2013). The theoretical dimensions of these principles are discussed below.

The success of using educational theory to teach university students was demonstrated by our students consistently reporting high levels of understanding of URP; this can be attributed to the “deep approaches to learning” described by Donnison and Penn-Edwards (2012, p1). Student feedback reporting meaningful learning experiences also illustrated the success of the constructivist basis of our teaching. That is, we encouraged our students to build their own knowledge by engaging in a variety of content in a variety of ways, including discussion and collaboration.

Crucially, we aligned course content with familiar and exciting practical experiences. The positive results yielded by experiential learning in university education are well-documented. The new academics who were learning to teach within the complexity of the classroom were learning using the same principles as those used to teach the planning students themselves. This was supplemented by explicit reference to teaching concepts, frameworks and content.

In allowing the academic to form knowledge via constructivism, experiential learning and other teaching and learning principles, the model was flavoured by the discipline being taught. We suggest that the discipline may provide an appropriate language and starting point for the discussion and progress of pedagogy in a discipline-based university setting.

In so doing, our model works from the ideas with which the academic is already most familiar; that is, by constructivism. URP shows many synergies between the concepts of urban planning and those of learning. To demonstrate, the planning ideal of accounting for diverse citizens in cities is similar to organising a classroom around the principle of Gardner's multiple intelligences. A democratic urban-planning system based on community participation is equivalent to a student-centred classroom. A city, like learning, builds on top of itself.

The five key educational theories that underpin the substantive changes to class delivery are outlined below. Links and parallels between education-based theory and discipline-based theory (relating to planning) are also identified.

Constructivism

In contrast with content-focussed pedagogy, constructivism is a cognitive learning theory that draws upon internal mental processes activated during learning. Teaching that is consistent with the theory of constructivism involves the construction of knowledge by social processes, interactions with the environment and self-reflection, accompanied by a growing complexity of linkages between information, experience and peer interaction (Krause, Bochner & Duchesne 2003). Vygotsky adds a social component; specifically, the zone of proximal development – the notion that a learner who is “pregnant” with an idea will “give birth” to that idea in a ripe social setting (Moll 1990). The principles and application of constructivism in tertiary education are the subject of a significant body of literature. Research frequently references constructivism as a means of giving a worthy theoretical basis to teaching in higher education (Yuen & Hau 2006; Zavala 2007), redefining teaching at university as “making learning possible” (Kandbinder 2013, p1). Constructivism has the strength to transform university teaching (Zheng & Wong 1997).

Multiple Intelligences

Gardner’s nine intelligences (1983) suggest that humans think and learn in many ways. Gardner describes these ways as linguistic (e.g. poetry), logical-mathematical (e.g. science/mathematics), musical-rhythmic (e.g. singing), spatial (e.g. navigation), bodily-kinesthetic (e.g. dancing), interpersonal (e.g. debate or discussion), intra-personal (e.g. knowledge of the self), naturalist (e.g. ecology) and existential (e.g. the ability to pose and ponder questions about life and death). Each intelligence has its own strengths and weaknesses, the levels of each vary within individuals. Ideally, the educational setting provides a multitude of learning situations to attain the best possible results for every student.

Experiential Learning

Based on ideas of Dewey (1940), experiential learning provides an achievable means of installing progressive pedagogy by the symbiosis formed between the abstract, such as texts, and the concrete, such the environment or profession being taught. It has proven successful at university level in several studies (e.g. Hyland 1994; O’Brien & Hart 1999; Zyngier 2002; Stepath & Whitehouse 2006). Problem-based learning is also popular (Mulcahy 2006; Kumar & Natarajan 2007). Experiential learning provides an achievable means of installing progressive pedagogy because of the symbiosis formed between the abstract, such as texts, and the concrete, such the environment or profession being taught. Guides such as *Using Experiential Learning in the Classroom* (Wurdinger 2005) are accessible, and the positive results in university education are described in a number of journal articles (Hyland 1994; Stepath & Whitehouse 2006; O’Brien & Hart 1999; Zyngier 2002). In our first-year URP units, experiential learning was achieved through classroom simulations and assessments that mimicked professional projects. It also involved field trips to immerse the students and to ground the concepts in diverse urban and regional settings. In URP, a landscape is perhaps best understood by being present in it.

Humanism/Emotional Learning

Rogers (1969) laid the foundations of humanism with *Freedom to Learn*. Rogers (1969, p188) offered a “revolutionary program for graduate education, outlining a rationale and practical actions, much of which is appropriate in apprehending the student at the level of first-year university, from

a potential trajectory of declining connection and motivation”. He called for a curriculum that “restores, stimulates and enhances the unquenchable curiosity that the student has as a small child” (ibid.). In our classes, students were made conscious of their own motivations and goals; for example, they were prompted on the first day of semester one with the question “Why are you here?”

Collaborative Learning

Collaborative learning is a general term for a range of approaches involving joint intellectual and active effort, where conversation is centralised. Its emphasis is on social and intellectual engagement and mutual responsibility. Collaborative learning attempts to counteract educational issues such as the distance between faculty and students, fragmented curricula, high rates of student attrition and a reward system that gives low priority to teaching (Goodsell, Maher & Tinto 1992).

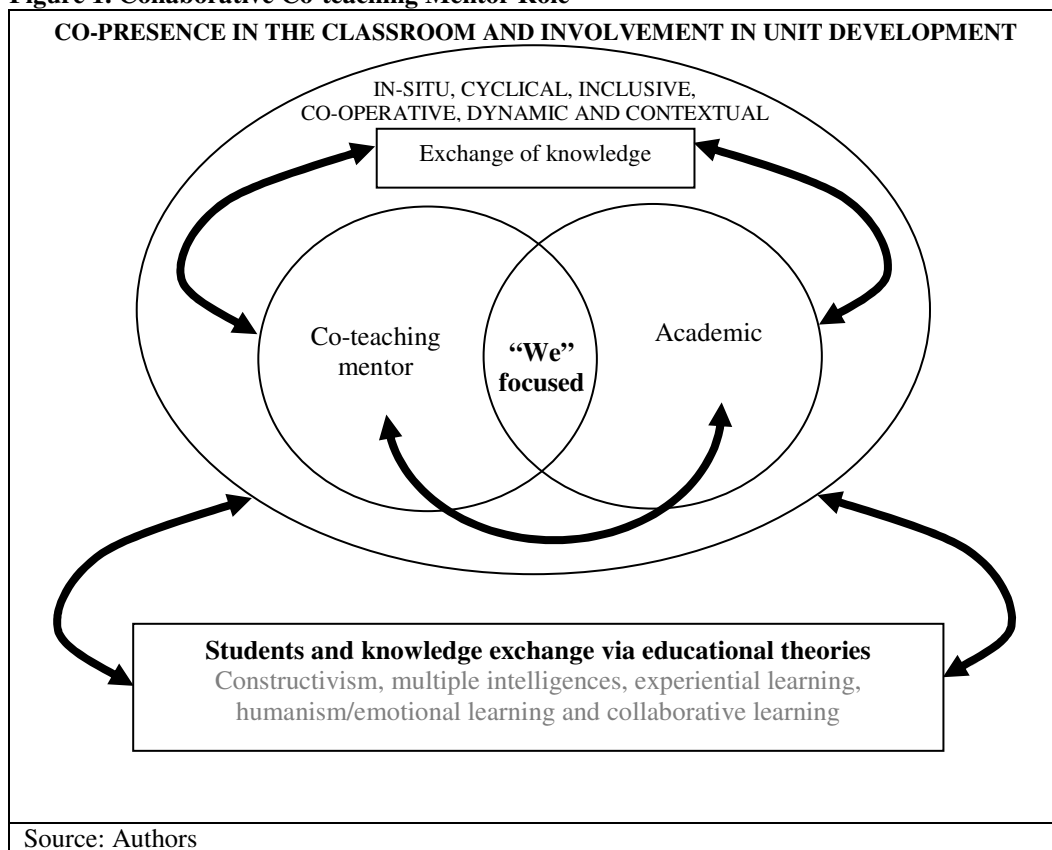
Urban and Regional Planning and Educational Theories

Teaching methods that match the requirements of the professional environment are important. Collaborative learning, for instance, mimics the basis by which most planning projects take place. Likewise, experiential learning confronts the richness of the planning profession (Kotval 2003). Khakee et al. (2000, p.1) defines planning as “the application of knowledge to action”, points to the contemporary post-positivist approach to planning and justifies constructivist and experiential techniques in the teaching and learning of URP.

There is some evidence that communities or collectives of staff may work best (Angelique et al. 2002). In our initiative, two lecturers and two sessional/contract support staff were regular participants in a teaching collective that worked together interchangeably to cover five of the eight first-year units delivered by the department.

Figure 1 illustrates the co-teaching mentor model, which uses the educational theories of constructivism, multiple intelligences, experiential learning, humanism/emotional learning and collaborative learning. Collaboration between academics and the co-teaching mentor was inclusive and cooperative and occurred cyclically within the dynamic context of the classroom. In class, the academic and the co-teaching mentor repeatedly referred to the different educational theories used and their relevance to urban and regional planning.

The following section sets out the methodological approach and key findings. Reflections from the two lecturers attempt to capture the inner workings of the approach, the transformations in their teaching practice and the links with theory.

Figure 1. Collaborative Co-teaching Mentor Role

The Study

Methodology

The rationale for the co-teaching mentor role, the description of the approach and its results were first presented at a teaching and learning conference hosted by Murdoch University (Perth, Western Australia) in February 2012 (Turkich, Greive & Cozens 2012). The questions and discussion from this peer-review process helped clarify the study's broader significance. The study is located at the core of the debate on how academics acquire teaching skills and qualifications, and whether discipline-based academics can learn to teach more effectively in class through working with a co-teaching mentor.

This paper presents a case-study approach that used a combination of qualitative and quantitative data. In qualitative terms, two lecturers provided insightful reflections on their experiences of teaching while working with a co-teaching mentor. The two cases were lecturers with no prior experience or training for teaching large classes of first-years. Between them, these lecturers have delivered up to five of the eight first-year units in URP since 2009. This paper presents their reflections on two of these units while working collaboratively with the co-teaching mentor across each unit. These units provide the most consistent data sets for the purposes of evaluating the lecturers' teaching.

The evidence is drawn from the experiences of the two lecturers and the co-teaching mentor in two units over several years (seven years for case study 1, and 4 for case study 2). The reflection in case study 1 explains the relationship between the co-teaching mentor and a discipline-based academic. Some of the links and parallels between education-based and discipline-based theory are also identified. Case study 2 describes the links between education theory, teaching practice and the planning content in more detail. It is estimated that there were around 60 hours of iterative reflection on experiences between the lecturer and the co-teaching mentor before, during and after each individual unit.

This experiential evidence is supported by quantitative data, which included teaching-evaluation results since 2009 and student retention rates recorded over six years.

Findings

Case Study 1

The subject had 15 years of university teaching experience but no exposure to teacher training. His induction into teaching was via the tutoring experience with his PhD supervisor, in classes of 30 to 40 students, and leading smaller tutorial groups. The inadequacy of this experience showed once class sizes surged to 70 and more.

“The subject matter I was teaching (Urban Analysis and Central City Planning) usually holds interest for students, but in delivering the same content to larger classes, I found that I lost their attention. It worried me that after the first hour, the students would silently decant from my classes” (Lecturer 1).

The original teaching pattern included a one-hour lecture followed by a two-hour tutorial and a repeat two-hour tutorial session for an average class of 30-40 students. However, for classes of 80 or more students this translated to nine hours of teaching, rather than the three to five hours that had adequately serviced the smaller classes. Timetabling was problematic, with classes spread over different days. Students responded by trying to crowd into the earlier tutorial sessions, leaving the later sessions empty. This disrupted group work and rendered classes ineffective.

As Table 1 shows, the original teaching pattern served 30 to 40 students over five hours, while the new pattern served 80 to 100 students in three hours. Although the student numbers tripled, the new pattern required only six hours of staff time rather than nine. With the new teaching patterns and timetabling, class attendance improved markedly.

The lesson plans for each session were also significantly altered. For example, although lecture material was presented, it was often divided into two or three shorter commentaries, sometimes on site during field trips, but rarely as a 50-minute monologue. Since the feedback from some students was that they expected and preferred some content as a means to learn, these short commentaries remain signposted as lecture content in the unit outline and in class.

One of the stronger elements of the new approach involved the students reviewing and assessing their colleagues' work, either as a work in progress or as a finished product. Unlike architecture

and design studio classes, feedback on assignments in planning classes had previously tended to be a private affair, seen only by those who produced the assignment and the marker.

Table 1. Teaching Hours and Timetabling Efficiencies

Teaching Pattern	Class Size	Staff Hours Worked	Class Hours
Original Pattern 1-hour lecture 2-hour tutorial + 2-hour tutorial	30-40	5	5
Interim Pattern 1-hour lecture 2-hour tutorial + 2-hour tutorial 2-hour tutorial + 2-hour tutorial	80	9	9
Restructured Pattern 3-hour interactive workshop with 2 staff	80-100	6	3

Source: Authors

By contrast, the frameworks and forums now used by the students to assess their own work and that of their colleagues served to foster wider critical discussion. It also provided added motivation and discipline towards producing better work for all the class to see and appreciate. This collective accountability was an important aspect to the initiative. This approach also parallels theoretical perspectives aligned with the discipline of planning, specifically in relation to collaborative planning, deliberative democracy (Habermas 1984-87) and community participation (Forester 1989; Healey 1992). This was collaborative teaching and learning, and the analysis and motivations were underpinned by the same constructionist and humanist foundations that recognise, value, and build upon collective knowledge.

Initial changes began with rewriting the unit outlines in consultation with the co-teaching mentor. Each session was co-planned, and this process ensured that the same material was covered but with less direct input from the lecturer and more participation by the students. The discussions around lesson planning explicitly transferred education theories into teaching practice. For example, very specific education-based research was often on hand to substantiate the point being discussed. Through this experiential process, the teacher's traditional role as focal point was transformed into that of a teaching facilitator. As with the emphasis on collaborative planning theory, the teacher's role was redefined from "expert" to a "knowledge vessel" to be dipped into by communities as needed (Forester 1989) and a facilitator (Healey 1992). Instead of attending a training session to learn from an expert how to teach, the teacher could interact with someone who could respond to immediate teaching challenges by suggesting and rationalising new approaches specifically adapted to the impending lesson.

"I found this co-teaching approach comforting rather than intimidating. It would be our class that sank or swam, and we would both be taking responsibility for the process and the outcomes, including the students' evaluation of our teaching" (Lecturer 1).

In-situ or experiential learning is a key element of URP-focused teaching, with regular site visits and field trips. It is also in keeping with the philosophy underpinning the role of the co-teaching

mentor, whereby learning how to teach unfolds in context as needed, in designing the unit outlines, co-planning the lesson, thinking through the assessments and teaching in the classroom. In this model, the transfer of education theory into teaching practice is at the very centre of the zone of proximal learning (Wells 1999, p.57), exactly when and where it is needed. It is experiential learning, and in keeping with Gardner's principles *"it also speaks to my own preferences in respect to how I learn"* (Lecturer 1).

A time series of student evaluation results for the unit is presented in Table 2. The online evaluation survey used to collect this data has been nationally benchmarked (Shah & Nair 2013), and is outlined in more detail below. The results demonstrate the immediate beneficial impacts of the model and the introduction of interactive approaches to teaching and learning. The 2011 and 2012 results are significant because the co-teaching mentor was no longer in the class. Given that the replacement tutor had industry rather than teaching experience or training, these results suggest that the lecturer successfully acquired experience in applying the education theories and the awareness of the concepts behind these techniques through the mentoring process.

Table 2. Student Evaluation Results – Time Series

Evaluation Criteria	Urban Analysis 112 Results % ¹							University Avg %
	2006 ²	2007	2008 ³	2009	2010	2011	2012	
Feedback	80	100		95	97	95	100	78
Teaching	89	96		95	97	90	96	83
Overall	80	100		82	97	100	96	84.4

Source: Authors

¹The years with the shaded columns were influenced by the co-teaching mentor model.

²2006 results were from the same lecturer prior to the model's influence.

³2008 results were from a different lecturer with the same large-class format and are not currently available.

Case Study 2

The second case study involved a lecturer who had recently transitioned from a research fellowship into a teaching/research academic role. He had 12 years of university teaching experience with class sizes of 15 to 20 students. Like Case 1, he had had no exposure to any teacher training. In the past, teaching had been a chore for this academic, who considered it something that "got in the way" of research.

"Largely, it involved regurgitating information behind a lectern and bland ineffective tutorials with diminishing numbers. I asked myself, what was I going to do with a large (80+) and daunting class of first-years, beyond a traditional lecture and some tutorial discussion around some readings?" (Lecturer 2).

The initial theory underpinning the restructuring of the unit was Gardner's (1983) multiple intelligences. We introduced a diversity of methods and media to these sessions. For example, we redesigned the unit around a field trip that would allow students to explore a range of suburban

contexts. This also involved ways of measuring and analysing suburbs, which went beyond the traditional use of the census and literature. They were encouraged to make observations and to think about their suburb before using the census. The census training sessions were moved to later in the semester to facilitate this reflection process. The students were more equipped and eager to engage with the census once they had observed and reflected on their own experiences within their own environments. Lectures focused on key pieces of literature, which students discussed and peer-reviewed in small groups.

In class, we also tried to be more animated. We moved tables and chairs to improve the effectiveness of varying tutorial activities. We also moved from behind the lectern, walking among the students and around the classroom during lectures. We used several simultaneous means of communication, including PowerPoint presentations, overhead projectors, whiteboards and butcher's paper.

Both the lecturer and the co-teaching mentor were musicians, and decided to use their skills in the classroom. We selected songs appropriate for each lecture or tutorial theme from YouTube to highlight streetscapes, ideas and perspectives on suburbia and how to analyse it. We also showed excerpts from films about suburbia or showing suburban scenes to underpin some of the literature and encourage thinking. The lecturer reflected on these changes:

“Extensive collaboration with the teaching mentor opened my eyes to some of the alternative methods to transfer information and knowledge. In its very simplest terms, it seemed possible to design and plan the teaching of large classes to improve their effectiveness and impact. They could also be made more engaging and enjoyable for the students and for me” (Lecturer 2).

A one-day field trip provided valuable experiential and observational data for the students, but also represented a chance to socialise and bond. The day ended with a barbeque near the beach. This event promoted some relaxation and socialising. Staff and students worked together to shop for, cook, prepare and distribute food to the class. Many students engaged in a variety of sporting activities in and around the barbeque area and joined staff for a swim in the Indian Ocean. We registered that the social bonds fostered by common and shared experiences could be a social glue that helps retain the students.

In delivering the material, we attempted to link the diversity of educational approaches explicitly with the class plans for suburban analysis. For example, we designed a workbook in which students could record their weekly reviews of literature and films and observations of their own suburbs and those visited on the field trip. This was a component of their assessment and ensured higher levels of attendance. Table 3 gives some examples of how educational theories underpin the structure and delivery of the learning exercise in practice.

Table 3. Co-teaching Model: Theory and Practice

Why (theory)	What (practice)
Constructivism Vygotsky (1978)	We began the unit suburban with an analysis in the student's own street: "What is your suburb like?"
Multiple Intelligences Gardner (1983)	Lessons were delivered using a variety of media options (overheads, whiteboard, PowerPoint, paper). Approaches included songs linked to academic literature and excerpts from films and census data. Diversity was crucial and facilitated change at short intervals after the manner of Facebook posts.
Experiential Learning Kotval (2003)	Field-based observations to give meaning to theory.
Humanism/Emotion Rogers (1969)	Efforts to foster friendships and camaraderie among students and staff. The assessments initially drew on students' experiences of their suburbs. Conversations were designed to illicit the background, passion, ambitions of students.
Collaborative Learning Goodsell et al. (1992)	Handouts of frameworks that committed all students to discussions, usually about good literature; these discussions were recorded.

Source: Authors

In the four years since this approach was adopted, the lecturer and the co-teaching mentor have received commendation awards for the Suburban Analysis unit for achieving higher than the university's targets against all criteria. A description of the university's online evaluation system and how it works to improve the student experience is published in Tucker (in press).

Table 4 shows the percentage of students who agreed with 11 statements about the quality of their learning experience in the study unit, and compares the results from four of these with university averages. Three of the four statements relate to key indicators identified in the university's Strategic Plan 2013-2017 for Teaching and Learning. The feedback statement was included because the results for the university overall suggest some sensitivity among students in this regard.

The university requires a minimum 35% response rate to validate the results. That the response rate for the unit is over 20 percentage points higher than this minimum is typical for the university, and may be indicative of the participatory and constructivist ethos within the unit's design and delivery. The students also had the opportunity to reflect and comment on the strengths and weaknesses of the unit. In Table 5, a selection of the student comments has been thematically arranged under the five educational theories underpinning the way the study unit was delivered. Student comments were analysed systematically, with "unit design" and the "methods of learning and teaching" identified as the most frequently cited domains or sub-domains (Oliver, Tucker & Pegden 2007, p.104). We suggest that the comments in Table 5 are as much an indication of student perspectives as they are integral to the reflective practice developed within the co-teaching mentor model.

Table 4. Student Evaluation – A Comparative Perspective

Criterion Statement	University Average % (2012)	% 2010 83 students	% 2011 74 students	% 2012 80 students	% 2013 74 students
Feedback on my work in this unit helps me to achieve the learning outcomes.	78	95	93	94	100
The quality of teaching in this unit helps me to achieve the learning outcomes.	83	90	98	100	100
I am motivated to achieve the learning outcomes in this unit.	85	95	100	92	98
Overall, I am satisfied with this unit.	83	100	100	98	100
% Response Rates	43-46	51	61	61	67

Source: Adapted from Curtin University's Evaluate Summary Report for Suburban Analysis 111 in Semester 1, for 2010-2013

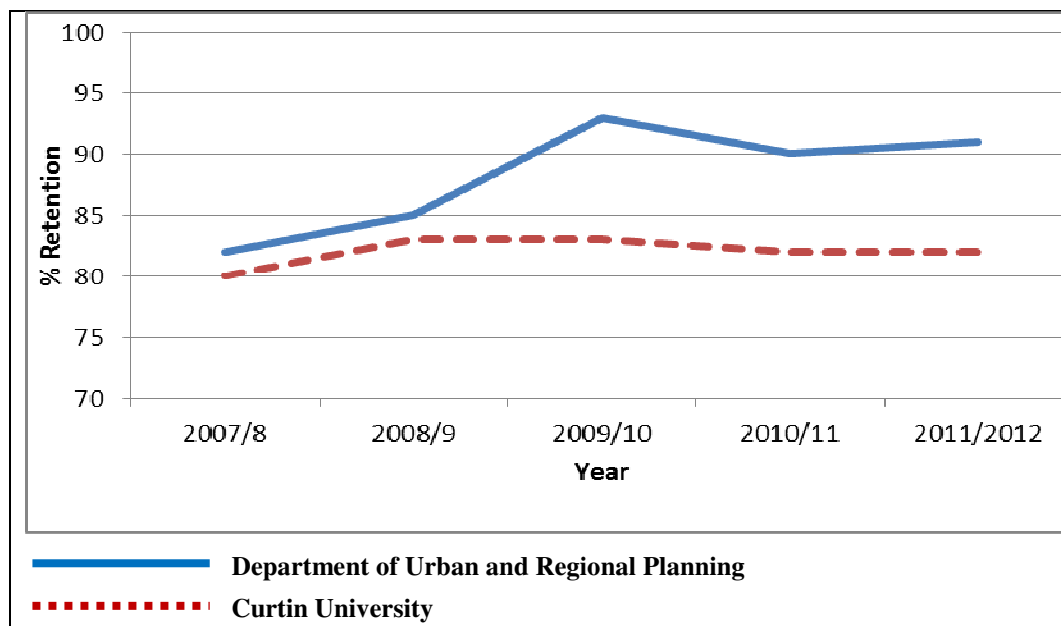
Table 5. Thematic Student Comments on Suburban Analysis Unit
Constructivism <i>"The field trip was really eye-opening and helped with learning in the practical sense" (2011).</i> <i>"They teach in [a] way which is stimulating and engages all the students, they help motivate you and you want to do well in this unit.... I loved...the way they encouraged us to think, to question things and look at things another way!" (2013).</i>
Multiple Intelligences <i>"I found the field trip to be particularly interesting...and I found all the lectures, tutorials, articles and videos to be engaging, relevant and useful" (2011).</i> <i>"I like how the lecturers have tried to make this unit more interesting by incorporating more videos, excursions and other practical, "hands-on" things to engage students" (2013).</i>
Experiential Learning <i>"I only realised how much I learned from this unit when I started sub-consciously evaluating the suburbs I walk through" (2013).</i> <i>"I liked the way we applied what we were learning to actual situations" (2013).</i>
Humanistic <i>"a new way to discuss and interact with the class and the literature...and being able to easily raise questions about any topic regarding the unit was good" (2010).</i> <i>"They did a great job to bring me into the first year at Curtin University" (2013).</i>
Collaborative <i>"They praise people without being patronising, it's participation they appreciate" (2013).</i> <i>"Having knowledgeable, enthusiastic and approachable lecturers/tutors really helped me with learning this unit. Suburban analysis was the only unit I always attended" (2013).</i>

Source: Adapted from Curtin University's Evaluate Summary Report for Suburban Analysis 111 in Semester 1, for 2010-2013

Having the teaching advice available when and where it was needed in planning the lessons and in the classroom also helped remove the stress for less experienced staff and build their confidence in approaching specific challenges such as organising a field trip or instilling accountability into group-work assignments. In this way, discipline-appropriate teaching practices and the reflective experience could be developed around the specific content and orientation of each of the study units covered the co-teaching arrangement; this acknowledges that different sets of learning objectives require a different emphasis in teaching delivery.

The two-fold student support/teaching mentor role gave some sense of continuity and presence. This became increasingly important as student numbers grew. There were more students but they came to know each other and the first-year teaching staff much better than had students in classes prior to the initiative. Figure 2 illustrates the student retention rates for Curtin University as compared with the rates for the Department of URP. This departmental-level data also includes three first-year units that had not been included in the initiative. However, most of the total number of retained first-year students would have experienced the co-teaching model, as the two lecturers in this study taught most of the first-year units (five of the eight). Furthermore, both of the units reported in this study were compulsory core units. Thus the retention rates provide some indication of potential improvement as a result of this collaborative co-teaching model for first-year students.

Figure 2. Comparative First-Year Student Retention Rates



Source: Curtin University

First-year retention rates for the Urban and Regional Planning (URP) course at Curtin University had traditionally been marginally higher than the University's average (80-83%); however, the introduction of two new accredited planning courses at competing universities in 2008 meant that professional accreditation could no longer be relied upon to either attract or retain students. Under

these conditions, the improvement in retention rates after 2008 may have indicated a stronger positive shift. The retention rates among first-years for URP (90-93%) has exceeded the average rate for Curtin University by around 10 percentage points since the co-teaching mentor model began in earnest in 2009. These results indicate that this collaborative co-teaching mentor program for first-year students has improved retention. The decline in the results from 2009/10 may reflect that the co-teaching mentor role shifted from a part-time contract position to a sessional arrangement, with less overall exposure for the students.

Discussion and Conclusion

Significantly, the teaching-evaluation results generated by the two case-study lecturers in collaboration with the co-teaching mentor have consistently rated as the highest in the Department of URP and in the School of Built Environment (which generally scores well). This is evidence of the effectiveness of the transfer of knowledge in respect to both teaching and learning. The model's success in improving student retention rates among first-years also suggests that it is worthy of replication. The evidence points to the model's cost savings in respect to timetabling, staffing levels and staff stress as intrinsic efficiencies that can come with effective teaching in larger classes.

In respect to the debate over the need for discipline-based academics to have a teaching qualification, our results suggest that there is another way to effectively insert education theory and practice into discipline-appropriate academic course design and delivery. The facts that the lecturers enlisted in this study had no prior teacher training, the changes to their teaching practice were fairly immediate, the pedagogical links were readily identifiable with the framework enlisted and teaching-evaluation results and student retention rates both improved corroborate the model's impact. Furthermore, given that this research paper has been jointly written, it is clear that the model we have described also has the capacity to stimulate, inform and enable education-focused reflection from hitherto untrained educators.

There are also implications for educators seeking to instil educational theory into discipline-based teaching practice. If a student-centred approach is an appropriate starting point for such an endeavour, then in this case, where the students are discipline-based lecturers, the pedagogical emphasis would be to focus on their particular needs. What lecturers with heavy teaching loads and active research agendas desperately need is immediate, rather than mid- or long-term, solutions to better cope with their teaching challenges. Put another way, for these students (the lecturers), Vygotsky's "zone of proximal development" (1978) is to be found in an overcrowded and under-staffed discipline-focused studio, or in a team meeting two weeks before a planned field trip.

Accordingly, it is pedagogically consistent for an educator to join a discipline-based teaching team to introduce and insert education-based theory directly into practice. Our research and experiences suggest that there is both the scope and the merit for discipline-based teaching teams to provide for such opportunities, and within existing budgets. Tinto (2012) examines the year-long series of instructional activities in which academic staff in the United States are required to participate – referred to as a "learning community" (2012, p.7). He outlines the superiority of such programs, in that they produce change more effectively and efficiently than voluntary initiatives that might be ill-conceived.

The association forged between academics, the co-teaching mentor and the students in our study shows the attributes of such a learning community. This co-teaching mentor model also goes some way towards addressing the problems associated with academic staff engaging with the teaching and learning literature, as highlighted by Kandbinder (2013). However, it requires little extra work, as the mentoring occurs in the same time and place as the teaching program. It is also conceptually thrifty: the same or equivalent concepts pop up in different contexts. The students are taught within a constructivist paradigm; the academics are taught within a constructivist paradigm; and constructivism and other educational theories fit well within the tenets of URP. The model is experiential for all parties. It doesn't just remotely tell academics about teaching concepts, but demonstrates associated behaviours in the classroom, and also in terms of the discipline being taught.

Our findings suggest that the use of a teaching mentor is an effective means of enhancing academics' teaching, while simultaneously freeing up more time for mentees to meet growing research and administrative demands. The process of programming, planning and delivering lessons is made easier and more meaningful, while teaching outcomes and student retention are heightened. Crucially, the use of educational theory in improving university students' learning outcomes is based on evidence from the literature. This study builds on previous research by providing a model to convert educational theory into practice. However, while creativity and innovation characterise the rhetoric of university policy and management globally, current reforms, restructuring and managerial behaviours restrict innovation in practice. The fact that this initiative was delivered within an environment of such structural resistance underlines its effectiveness. It also highlights an avenue for further investigation.

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