

# Relationships between students' experiences of learning in an undergraduate internship programme and new graduates' experiences of professional practice

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**Abstract** Although educators believe that undergraduate internship programmes are a vital component of professional degrees, evidence of the relationship between students' experiences of learning during such programmes and the quality of new graduates' experiences of professional practice is limited. This research sought to investigate associations between veterinary students' experiences of *clinic-based learning* (CBL) during a final year internship programme and their experiences of *veterinary professional practice* (VPP) in the year following graduation. Phenomenographic analysis of semi-structured interview transcripts identified the qualitative variation present in final year interns' conceptions of and approaches to CBL ( $n = 41$ ). Quantitative statistics were used to explore relationships amongst the quality of these components of students' experiences of learning and performance during the internship programme. Additional quantitative analysis was used to link new graduates' conceptions of and approaches to VPP with their experiences of CBL as final year students ( $n = 22$ ). This illuminated crucial aspects of students' learning experiences associated with the extent of their transitions to independent practice as entry level veterinarians. The results have implications for the design and teaching of undergraduate internships in a range of professions.

**Keywords** Approaches to learning · Conceptions · New graduate · Placements · Professional practice · Veterinary education

## Abbreviations

CBL            Clinic-based learning  
VPP            Veterinary professional practice

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## Introduction

Educators believe that strong associations exist between students' participation in undergraduate internship programmes and the success of new graduates' transitions to practice (Billett 2009; Tynjälä et al. 2003). Complex and extensive *clinic-based learning* (CBL) programmes have been introduced to professional degrees internationally based on this premise (Cantillon and Macdermott 2008; Jaarsma et al. 2008; Tynjälä et al. 2003). These intensive curricula are designed to ease students' transitions to professional competence and confidence by incorporating authentic learning activities and assessment formats. However, uncertainty exists about the nature and extent of relationships between students' experiences of learning during comprehensive undergraduate internship programmes and their experiences of professional practice in the new graduate period.

*Phenomenography* can be used to investigate learners' perspectives of the world around them and make judgements about the quality of students' experiences of learning (Entwistle 1997; Marton and Booth 1997). This is achieved by asking students to describe their experiences of learning in their own words and analysing the variation that exists in the responses obtained from a group of learners (Marton and Booth 1997). Differences in the quality of students' *conceptions* of and *approaches* to learning can be used to evaluate the quality of students' experiences of learning (Entwistle 1997; Marton and Booth 1997). More complex conceptions of learning and more meaningful approaches to learning are indicative of richer quality learning experiences (Marton and Booth 1997; Prosser and Trigwell 1999). The quality of students' experiences of learning can be linked to variation in learning outcomes to identify ways in which students' learning experiences might be shaped to support attainment of high quality outcomes (Entwistle 1997; Marton and Säljö 1976; Prosser and Trigwell 1999).

This study seeks to provide evidence of associations between the quality of veterinary students' experiences of CBL and their experiences of *veterinary professional practice* (VPP) in the year following graduation. It forms part of a broader project by the authors where phenomenography was used to analyse graduates' experiences of VPP and investigate relationships to their experiences of learning during a final year undergraduate internship programme, including academic achievement during the year (Matthew et al. 2010; Matthew et al. 2011). While academic attainment forms an important measure of learning outcomes, additional insight can be gained by linking graduates' experiences of VPP with their descriptions of learning as final year students. Therefore, this study uses phenomenographic analysis of semi-structured student interview responses, followed by quantitative statistics, to link the quality of final year veterinary students' experiences of CBL with their experiences of professional practice as new graduate veterinarians. The result illuminates key relationships likely to contribute to the success of graduates' transitions to entry level professional autonomy in practice. The outcome has implications for the design and teaching of undergraduate student internships in a range of professional degree programmes.

## The role of CBL in preparing students for practice

Undergraduate internship programmes are designed to promote high quality learning outcomes that prepare students for independent practice as entry level professionals (Billett 2009). These learning outcomes can be described as professional expertise that enables individuals to make, apply and execute priorities (Dall'Alba and Sandberg 2006; Leinhardt

et al. 1995; Tynjälä et al. 2003). This is based not only on a sound understanding of disciplinary theory, but also on technical proficiency and the ability to make pragmatic decisions (Dall’Alba and Sandberg 2006; Leinhardt et al. 1995). Hence, learning outcomes include quantitative increase in theoretical knowledge and technical skills, together with qualitative development in the way in which these are applied in professional contexts (Dall’Alba 2004). Such applications range from performing individual skills and providing basic information on request, to the capacity for independent practice as an autonomous professional (Leinhardt et al. 1995). This is entwined with development of professional identity through the process of professional socialisation (Lindquist et al. 2006; Virtanen et al. 2008).

Veterinary students currently participate in extensive and sophisticated CBL programmes intended to minimise the adjustment required for new graduates to be effective in practice. Active participation in authentic learning environments is seen as essential for students to meet registration requirements and prepare for autonomous practice as entry level veterinarians (Quality Assurance Agency for Higher Education 2000; Veterinary Schools Accreditation Advisory Committee 2007). Applying veterinary knowledge, skills and abilities to solve both simple and complex veterinary problems in real life environments is expected to develop students’ professional competence and confidence (Prescott et al. 2002; Schön 1987; Tynjälä et al. 2003). It is also expected to develop the attitudes, identity and capabilities associated with effective lifelong learning and practice as a veterinary professional (American Veterinary Medical Association 2010; Canfield and Taylor 2005).

Such programmes are resource intensive and extremely costly for veterinary education providers (Hubbell 2008; Quality Assurance Agency for Higher Education 2000). Although those who have participated in CBL programmes report positive learning outcomes from their experiences (Baguley 2006; Parkinson et al. 2006), evidence linking students’ experiences of CBL with graduates’ experiences of VPP is limited. Investigation of the relationships that exist between these phenomena could be used to guide resource allocations for undergraduate internship programmes in a range of professional degrees.

### The experience of learning

Phenomenography was considered the most appropriate theoretical framework for the research reported in this paper (Marton and Booth 1997; Prosser and Trigwell 1999). Researchers adopting this perspective focus on the way in which individuals report learning about phenomena in particular learning contexts as a way of identifying aspects of the learning experience associated with variation in learning outcomes (Prosser and Trigwell 1999). Similar descriptions given by students of their conceptions of and approaches to learning can be grouped into categories to reveal characteristics associated with higher quality and poorer quality learning outcomes. Learning outcomes include the quality of students’ conceptions of what they are learning, the development of their abilities as measured by academic achievement, and the way in which they address related situations in the future (Prosser and Trigwell 1999). This model was considered appropriate for exploring relationships between students’ experiences of CBL during final year and their experiences of VPP following graduation.

Students’ approaches to learning can be categorised as either *surface* or *deep* (Biggs and Tang 2007). Students adopting a surface approach to learning seek to meet the requirements of the task without an intention to understand the topic being studied, whereas

students adopting a deep approach to learning seek to understand what they are learning through completing the task (Biggs and Tang 2007; Prosser and Trigwell 1999). Conceptions of what is learned can be classified as *fragmented* or *cohesive* (Marton and Booth 1997; Prosser and Trigwell 1999). Fragmented conceptions demonstrate a limited awareness of the phenomenon being studied that encompasses individual elements and sparse relationships between these parts without linking these components into a coherent whole (Marton and Booth 1997). In contrast, cohesive conceptions demonstrate a rich and complex awareness of the phenomenon, its component parts and the relationships between them (Marton and Booth 1997). Cohesive conceptions and deep approaches are indicative of higher quality experiences of learning, while fragmented conceptions and surface approaches are indicative of poorer quality experiences of learning (Crawford et al. 1994; Marton and Booth 1997; Prosser and Trigwell 1999).

Quantitative statistics can be used to investigate associations between qualitative differences in students' learning experiences revealed using phenomenography (Crawford et al. 1994; Marton and Säljö 1976). Quantitative analyses can also be used to establish links between students' experiences of learning and academic achievement (Crawford et al. 1994; Ellis et al. 2006). The combination of these analyses provides researchers with a thorough understanding of students' experiences of learning and the relationships of these to measures of learning outcomes. The research reported in this paper used phenomenography and related statistical analyses to enable linkages to be identified between students' experiences of CBL during final year and their experiences of professional practice as new graduate veterinarians. It builds on related survey research by the authors that analysed students' experiences of CBL using phenomenography and linked this to achievement during a final year internship programme (Matthew et al. 2010).

### The experience of professional practice

Some new graduate veterinarians rapidly adjust to the demands of professional life. Others fail to readily demonstrate the full spectrum of knowledge, skills and attitudes required for successful professional practice (Heath 1997; Routly et al. 2002). Prolonged transitions to independent entry level practice are a major issue of concern to veterinary education stakeholders (Heath and Mills 1999; Routly et al. 2002). The consequences of a difficult transition to practice include low quality case management, poor client outcomes, heightened personal stress and increased dissatisfaction on the part of new graduates during the immediate post graduation period (Heath 1997; Hubbell 2008). Negative initial career experiences have also been linked to professional wastage and premature exit from the veterinary profession (Heath 2001).

The authors' previous research indicates that this variation in outcomes is likely to be linked to qualitative variation in graduates' experiences of VPP (Matthew et al. 2011). Graduates' understandings of VPP range from *multi-structural* to *relational*, and their approaches to VPP can be described as either *formulaic* or *reflective*. Multi-structural conceptions of VPP indicate awareness of limited separate elements of customer service, patient care and professional relationships, whereas relational conceptions encompass complex and interrelated factors relevant to effective veterinary case management and practice. Formulaic approaches to VPP seek defined methods and protocols to meet performance expectations expediently in practice, whereas reflective approaches describe thoughtful and progressive development of veterinary abilities to enhance professional longevity and autonomy. Multi-structural conceptions of VPP tend to be associated with

formulaic approaches to VPP, and relational conceptions of VPP tend to be linked with reflective approaches to VPP. Graduates with multi-structural understandings of and formulaic approaches to VPP are unlikely to meet the full range of societal expectations for performance during the year following graduation. In contrast, graduates with relational conceptions of and reflective approaches to VPP have the potential to perform high quality professional practice, even as new graduate veterinarians. This is likely to be associated with a successful transition to autonomous practice in the year following graduation.

## Aims

This study seeks to reveal aspects of students' learning experiences in clinics likely to be associated with a successful transition to professional autonomy for new graduate veterinarians. The hypothesis of this research is that variation in students' experiences of CBL is related to variation in their experiences of VPP after graduation. This project builds on previous research by the authors investigating students' experiences of CBL (Matthew et al. 2010) and graduates' experiences of VPP (Matthew et al. 2011). Data from the same sample of graduates interviewed in previous stages of this project was used for the graduate quantitative analyses reported in this paper. The sample of students interviewed for this paper was a subset of those surveyed in earlier stages of the research. The following specific research questions are addressed in this study:

1. What relationships exist between conceptions of and approaches to CBL revealed in semi-structured interviews of final year veterinary students?
2. How does variation in students' conceptions of and approaches to CBL revealed in semi-structured interviews relate to achievement during the internship programme?
3. What associations exist between students' experiences of CBL during final year and their experiences of professional practice as new graduate veterinarians?

It is in this last question that the issues considered in this research connect with the perspectives of educators involved in designing, teaching and evaluating professional degree programmes worldwide.

## Method

### Context

The educational context for this research is the final year of an undergraduate veterinary science degree offered by a large, research intensive Australian university. The final year of the degree is comprised of 10 months of veterinary workplace placements. This authentic learning and assessment environment is intended to develop interns' capabilities to an extent compatible with early attainment of entry level professional autonomy. The student cohort progressing towards graduation in 2005 ( $N = 100$ ) formed the sample population for this research. Just under half of these students ( $n = 41$ ) participated in semi-structured interviews during final year, and just over half of the student interviewees ( $n = 22$ ) participated in subsequent interviews when employed as new graduate veterinarians in Australian veterinary practices (Matthew et al. 2011). Potential interviewees were identified based on their participation in prior survey research by the authors ( $n = 93$ ; Matthew et al. 2010) and availability for being interviewed.

## Conceptions of and approaches to CBL

A semi-structured interview format was used to elicit interns' conceptions of and approaches to CBL ( $n = 41$ ). The starting questions were: 'When you're in clinics, what are you learning?' and 'How do you approach your learning in clinics? What do you do and why do you do it?' Follow up questions probed any ambiguities in interviewees' responses. The number of interviews was selected to enable a thorough understanding of participants' experiences, with similar phenomenographic studies demonstrating convincing findings based on approximately 20 interviews (Martin et al. 2000; Paakkari et al. 2010).

Phenomenography was used to analyse the experiences of learning revealed in interviewees' responses. This process involved three researchers with backgrounds in veterinary science and/or higher education. Interns' conceptions of and approaches to CBL were initially tentatively categorised against the outcomes of prior survey research involving similar open ended questions (Matthew et al. 2010). These outcomes had been established through iterative consultation amongst the researchers to develop a set of categories for students' conceptions of and approaches to CBL (Matthew et al. 2010). Although the researchers remained aware that additional variation in experience could be revealed through the interview process compared to that afforded by open ended surveys, no significant variation from the categories identified through survey responses was identified during analysis of student interview transcripts.

## Associations between CBL and student achievement

Quantitative statistics were used to investigate associations amongst the qualitative differences in interns' experiences of CBL and performance during the final year programme ( $n = 41$ ). Student achievement was evaluated using results from Supervisor Report Forms (SRFs) that placement supervisors had submitted at the end of each placement during final year. The forms are designed to assess interns' performance against authentic criteria relevant to success in practice as a new graduate veterinarian, including: basic knowledge and understanding; history taking and data gathering; communication and observational skills; procedural skills; clinical problem solving and case assessment; case reports and patient management plans; professional attitudes and interest in learning; reliability, work ethic and humanistic values; and overall clinical performance (Matthew et al. 2010). An overall measure of achievement during the year was created by combining these results to create an *aggregate SRF mark* (Matthew et al. 2010). A Fisher exact procedure was used to explore associations between the quality of students' conceptions of and approaches to CBL. Independent samples *t* tests and measures of effect size (ES) were used to explore relationships between these aspects of students' CBL experiences and performance during final year.

## Associations between CBL and VPP

Quantitative analysis was used to evaluate linkages between qualitative differences in graduates' experiences of VPP and their experiences of CBL during final year ( $n = 22$ ). The distribution of graduates' conceptions of and approaches to VPP has been previously reported in Matthew et al. (2011). Fisher exact procedures were now used to investigate relationships between graduates' conceptions of and approaches to VPP, and their conceptions of and approaches to CBL respectively. This revealed crucial relationships between the quality of interns' experiences of CBL during final year and elements of

graduates' experiences of VPP likely to be related to a successful transition to professional autonomy as a new graduate veterinarian.

## Results

This section presents the results of phenomenographic analysis of students' interview responses, followed by quantitative analysis of relationships amongst conceptions of CBL, approaches to CBL and performance during final year. Relationships between the quality of graduates' conceptions of and approaches to VPP and their experiences of CBL as final year students are then investigated.

### Conceptions of and approaches to CBL

The qualitative differences identified in students' experiences of CBL based on semi-structured interview responses are displayed in Table 1 and illustrated with sample quotations from different students. The qualitative differences identified parallel those reported in the authors' previous survey research with the same cohort of students (Matthew et al. 2010). *Cohesive* conceptions of and *deep* approaches to CBL align with educators' intentions for interns' learning in clinics. Students reporting these experiences seek to understand the range of factors influencing veterinary case management and demonstrate a comprehensive awareness of the contextual variation that exists in real life practice. Conversely, *fragmented* conceptions of and *surface* approaches to CBL provide insight into why some students might not demonstrate the full spectrum of intended learning outcomes associated with comprehensive CBL programmes. Responses included in these categories indicate that students are seeking to meet external performance requirements with minimum effort and demonstrate a focus on only individual components of veterinary case management and practice.

A strong and statistically significant relationship existed between the quality of conceptions of and approaches to CBL reported in student interviews ( $\varphi = 0.70$ ,  $p < 0.001$ ). This is portrayed in Table 2. 93% of interns ( $n = 29$ ) who described cohesive conceptions of CBL also reported deep approaches to learning in clinics. 82% of interns ( $n = 11$ ) who reported surface approaches to learning during final year described understandings of CBL that were classified as fragmented. These results indicate that the quality of students' conceptions of CBL during final year is closely related to the approach they adopt to learning in clinics.

### Associations between CBL and student achievement

Statistically significant relationships were found between achievement during final year and better quality experiences of learning in clinics (Table 3). Aggregate SRF marks were higher for students who described a cohesive conception of CBL ( $t = 2.6$ ,  $p < 0.05$ ,  $ES = 0.75$ ) or deep approach to CBL ( $t = 2.0$ ,  $p < 0.05$ ,  $ES = 0.55$ ) than for interns who reported poorer quality learning experiences. These are medium to large effect sizes for differences between means (Cohen 1988; Crawford et al. 1994; Ellis et al. 2006). These findings demonstrate that the quality of students' conceptions of and approaches to CBL during the internship programme is reflected in supervisors' perceptions of their performance throughout final year.

**Table 1** Qualitative differences in students' conceptions of and approaches to CBL

Aspect of CBL	Summary	Illustrative quotes
<i>Conception</i>		
Fragmented	Focus on isolated elements of veterinary case management and practice without awareness of how they fit into a cohesive whole	<p>"I think probably the main difference between lectures and doing this year is the prac stuff, we get to do practical things. ... Probably client communication skills, I suppose, being able to conduct yourself talking to clients. ... we had tutes on topics and things like that, so I learnt a bit more theory as well."</p> <p>"I'm trying to learn just the basics of large or small animal medicine. How things present, how to recognise, how to do proper physical exams to find the signs that you need, diagnostic tests that you perform. Just basically how to work up each case as it comes along."</p>
Cohesive	Encompass awareness of the contextual variation in real life veterinary case management and practice	<p>"We're learning to interact with clients ... to understand exactly what they want to get out of the consult. Sometimes they come asking for one thing and you don't know whether you should introduce another idea or whether they really want to stick to the one thing."</p> <p>"The reality of veterinary practice. ... What's involved. Many more dimensions and facets of veterinary practice rather than purely treating animals. ... learning everyone's different perspectives on their career and our place in society, and their satisfaction or dissatisfaction. In a sense it's a very rounded, multi-factorial type of learning."</p>
<i>Approach</i>		
Surface	Seek to reproduce rote learned knowledge and skills to satisfy performance expectations with a minimum of effort	<p>"... if they tell you that you have to make a speech in primary care, or write a report for something, then you obviously will go away and do your own research. ... And for rounds, quite often when I've had to present in rounds ... That night go off and look it up, so that you can give a decent list of differentials, and sound like you comprehend."</p> <p>"Also looking back at different cases, the same type of cases on practice records, how they've been treated, what veterinary signs they came in with, that kind of thing. ... so you know what to do and what not to do. And what will work and what won't."</p>



**Table 1** continued

Aspect of CBL	Summary	Illustrative quotes
Deep	Describe an intention to understand the factors that influence decisions in veterinary case management and practice	<p>“If I’m going to treat a condition, I’ve got to at least know how it works ... And once you’ve actually figured out what’s going on, just seeing the difference in the animals and stuff, it’s really rewarding to think ‘Oh wow, I really understand and I really know what’s going on.’”</p> <p>“But every case I deal with, every medical or surgical case, I’ll just read it up, just when I’ve got some time. ... perhaps you want to read up and see how you’d do it. And also just to check. Sometimes you think ‘Oh, I don’t know if I’d do it like that.’, so you just want to read up and see whether your way would be right.”</p>

**Table 2** Relationships between CBL conceptions and approaches based on semi-structured interview responses

$n = 41, \phi = 0.70, p < 0.001$

CBL conception	CBL approach		Total
	Surface	Deep	
Fragmented	9 (22%)	3 (7%)	12
Cohesive	2 (5%)	27 (66%)	29
Total	11 (27%)	30 (73%)	41

**Table 3** Relationships between CBL conceptions, approaches and achievement based on semi-structured interview responses

$n = 41, * p < 0.05,$   
 a = aggregate SRF mark out of 100

Aspect of CBL	Aggregate SRF mark		
	Mean <sup>a</sup>	SD	ES
<i>Conception</i>			
Fragmented ( $n = 12$ )	66.1	4.0	0.75
Cohesive ( $n = 29$ )	70.6	6.6	
<i>T</i> test: $t =$	2.6*		
<i>Approach</i>			
Surface ( $n = 11$ )	66.8	3.6	0.55
Deep ( $n = 30$ )	70.2	6.8	
<i>T</i> test: $t =$	2.0*		

Associations between CBL and VPP

A statistically significant relationship was revealed between the quality of graduates’ conceptions of VPP and the conceptions of CBL that they reported in semi-structured interviews as final year students (Table 4). All of the graduates ( $n = 10$ ) who reported relational conceptions of VPP described cohesive conceptions of CBL during final year. All of the graduates ( $n = 7$ ) who reported fragmented conceptions of CBL during the internship programme described multi-structural conceptions of VPP in the year following

**Table 4** Relationships between conceptions of CBL and conceptions of VPP reported in semi-structured interviews

CBL conception	VPP conception		Total
	Multi-structural	Relational	
Fragmented	7 (31%)	0 (0%)	7
Cohesive	5 (23%)	10 (46%)	15
Total	12 (54%)	10 (46%)	22

$n = 22$ ,  $\varphi = 0.62$ ,  $p < 0.05$

**Table 5** Relationships between approaches to CBL and approaches to VPP reported in semi-structured interviews

CBL approach	VPP approach		Total
	Formulaic	Reflective	
Fragmented	6 (27%)	1 (5%)	7
Cohesive	1 (5%)	14 (63%)	15
Total	7 (32%)	15 (68%)	22

$n = 22$ ,  $\varphi = 0.79$ ,  $p < 0.05$

graduation. These results indicate that the quality of new graduates' professional practice as evaluated by conceptions of VPP is closely related to the quality of their conceptions of CBL during final year ( $\varphi = 0.62$ ,  $p < 0.05$ ). Both of these conceptions can be used to evaluate the quality of learning outcomes associated with participation in a comprehensive CBL programme.

Table 5 shows that a statistically significant relationship existed between the quality of graduates' approaches to VPP and their approaches to CBL as final year students ( $\varphi = 0.79$ ,  $p < 0.05$ ). 93% of graduates ( $n = 15$ ) who reported adopting a reflective approach to VPP also described a deep approach to CBL during final year. 86% of the graduates ( $n = 7$ ) who reported adopting a surface approach to CBL during the internship programme described an approach to VPP that was classified as formulaic. These results indicate that the quality of approach that graduates adopt to their professional practice in the year following graduation is closely linked to the quality of their approach to learning during an undergraduate internship programme.

## Discussion

This study has revealed key relationships between crucial aspects of students' learning experiences related to the extent of their transitions to entry level professional autonomy after participating in a final year undergraduate internship programme. The quality of students' approach to CBL is related to their conception of CBL, achievement during final year and approach to VPP after graduation. The quality of students' conception of CBL is related to their achievement during final year and conception of VPP after graduation. In conjunction with the relationships between conceptions of and approaches to VPP revealed through prior analysis of graduates' experiences of professional practice (Matthew et al. 2011), these trends suggest that multi-structural conceptions of VPP and formulaic approaches to VPP tend to be associated with fragmented conceptions of CBL, surface approaches to CBL and lower achievement during final year. Similarly, relational conceptions of VPP and reflective approaches to VPP tend to be associated with cohesive conceptions of CBL, deep approaches to CBL and higher achievement during final year. Although not conclusive evidence, it can be inferred from this that higher quality

**Table 6** Associations between key aspects of students' experiences of CBL and graduates' experiences of VPP, and their likely relationships with the success of students' transitions to entry level professional autonomy in the year following graduation

Transition to professional autonomy	Experience during final year			Experience after graduation	
	Approach to CBL	Conception of CBL	Achievement	Approach to VPP	Conception of VPP
Less successful	Surface	Fragmented	Lower	Formulaic	Multi-structural
More successful	Deep	Cohesive	Higher	Reflective	Relational

experiences of CBL are likely to be associated with a smoother transition to entry level professional autonomy after graduation, while lower quality experiences of CBL are likely to be associated with a delayed transition to independent practice in the year following graduation. These associations and inferences, summarised in Table 6, illustrate consistency between the quality of students' experiences of learning, achievement against assessment criteria relevant to successful workplace performance and professional outcomes associated with an intensive undergraduate internship programme.

These relationships are likely to influence the way in which graduates address the range of situations that arise in veterinary practice. For new graduate veterinarians, limited prior experience and extensive 'grey areas' in veterinary case management interact to create a myriad of situations where a reflective approach to VPP is indicated (Schön 1987). This research indicates that the quality of graduates' professional practice in this type of context is related to their experiences of CBL during final year. Graduates whose experiences of CBL during final year were of fragmented conceptions and surface approaches are unlikely to perceive the situation as affording a reflective approach to professional practice (Prosser and Trigwell 1999). In contrast, graduates whose experiences of CBL during final year were of cohesive conceptions and deep approaches are more likely to adopt a reflective approach to practice and attain higher quality standards of VPP based on relational conceptions of professional practice (Dall'Alba 2004).

These outcomes highlight the importance of shaping final year placements in ways that support cohesive conceptions of and deep approaches to CBL. Eliciting interns' considered opinions about veterinary case management and practice, as well as prompting students to share professional responsibility for cases during final year, is likely to improve interns' approaches to learning and the quality of their approach to practice after graduation (Billett 2009; Cantillon and Macdermott 2008; Matthew et al. 2010). Providing experience with a variety of case material, applying authentic assessment methods and introducing interns to a range of professional careers while clearly explaining the intended purpose of this course design can also be used to develop cohesive conceptions of CBL likely to be associated with relational conceptions of VPP after graduation (Biggs and Tang 2007; Lane and Strand 2008; Matthew et al. 2010). Finally, an explicit focus on developing a comprehensive understanding of VPP and the opportunities afforded by CBL could be used to aid development of high quality professional practice (Billett 2009; Dall'Alba 2004). Implementation of these strategies is likely to foster a rapid transition to entry level professional autonomy after graduation.

The research presented in this study could be repeated nationally and globally to evaluate similarities and differences between veterinary students' and graduates' experiences worldwide (Matthew et al. 2010). Similar studies could also be conducted in closely

related healthcare professions such as medicine, dentistry, physiotherapy and speech pathology (Dall'Alba 2004). This would help to reveal whether similar experiences of learning are associated with the quality of students' transitions to practice in a range of healthcare professions.

Teaching quality is a vital element of the context in which students learn. Relationships have been demonstrated between the quality of academics' approaches to teaching and students' approaches to learning in a range of tertiary education disciplines (Gibbs and Coffey 2004; Trigwell et al. 1999). Academics' approaches to teaching have also been linked with the quality of their conceptions of teaching (Martin et al. 2000; Prosser et al. 2005). In the context of undergraduate internship programmes, this suggests that the quality of students' CBL experiences is likely to be related to placement supervisors' conceptions of and approaches to clinical teaching.

Medical educators report a variety of conceptions about what it means to be an effective placement supervisor (Stenfors-Hayes et al. 2011). The most complex of these conceptions encompass stimulating student growth, being a professional role model and showing how things are done in clinical contexts. The least well developed conceptions encompass only the last of these components. Student learning principles and methodologies could be used in a variety of clinical disciplines to link the results of similar explorations of placement supervisors' experiences of teaching with the ease of interns' transitions to independent practice after graduation. This would help to identify ways in which placement supervisors could conceptualise and approach their clinical teaching to help students develop conceptions of and approaches to CBL likely to be associated with a smooth transition to professional autonomy in the year following graduation. This information would be of value to placement supervisors seeking to improve their teaching by expanding their awareness of peers' conceptions of and approaches to clinical teaching. Degree providers could also incorporate this information into training seminars provided for placement supervisors to help improve the quality of clinical teaching provided during internship programmes (Stenfors-Hayes et al. 2011). The results of this research would contribute to the current debate about how much training clinical supervisors need to be effective, and how much undergraduate clinical training can reasonably be outsourced to extramural practices while maintaining educational standards (Hubbell 2008; Kilminster and Cottrell 2007).

In concluding this study it is important to note the limitations of this research. The results of phenomenographic analyses need to be understood in relation to the specific context, researchers and participants involved (Marton and Booth 1997). The specific learning and work environments that formed the context for this research need to be taken into account when applying the results to other professions. The proximity to graduation for participants also needs to be considered when applying the results of this study in other educational and professional contexts.

These limitations do not detract, however, from the insight this study gives into relationships between students' and graduates' experiences of learning and working in veterinary practice environments. The results indicate that the quality of students' CBL experiences during final year has a consistent and meaningful association with the quality of graduates' professional practice in the year following graduation.

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