



‘Once You Get the Threshold Concepts the World Is Changed Forever’: The Exploration of Threshold Concepts to Promote Work-ready Occupational Therapy Graduates

Kelli Nicola-Richmond
Deakin University, Australia

Geneviève Pépin
Deakin University, Australia

Helen Larkin
Deakin University, Australia

Abstract

In the current higher education environment, there is a growing expectation that universities ensure students graduate with skills and attributes that enable them to be work-ready, particularly within the health and social care disciplines. One curriculum design approach that has been proposed as facilitating this transformation from student to professional is the threshold concepts framework. A recent study identified ten threshold concepts within the discipline of occupational therapy. These were: *Understanding the models and theories of occupational therapy; Evidence-based practice; Clinical reasoning; Discipline-specific skills and knowledge; Practising in context; A client-centred approach; Occupation; The occupational therapist role; Reflective practice; and, A holistic approach.* This study aimed to explore whether these threshold concepts were taught within an Australian occupational therapy program. Twelve occupational therapy educators participated in focus groups, and five themes emerged from the data. These were: professional identity; time; the impact of the learning environment; explicit versus implicit content and language; and, the value and understanding of the threshold concepts framework. The study found that the integrated use of threshold concepts may make them unique to the discipline. Findings also indicated that using the threshold concepts framework facilitates the transformation from student to occupational therapist. However, students may not acquire all of the threshold concepts prior to graduation. Practice-based learning was considered pivotal for threshold concept acquisition. This study explores the application of the threshold concepts framework, providing insights for educators who are seeking to produce graduates who are well-equipped for employment in complex healthcare environments.

**Corresponding Author: Kelli Nicola-Richmond, School of Health and Social Development, Deakin University, Locked Bag 20000, Geelong 3220, Victoria, Australia. Email: k.nicolarichmond@deakin.edu.au*

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Keywords: curriculum design; occupational therapy; threshold concepts framework; transformation; work-readiness

Introduction

In the present day, universities are expected to ensure that students graduate with personal attributes and industry-relevant skills that will assist them to secure employment and allow them to work immediately and successfully in their field (Moore and Morton 2017, Yorke, 2006). This emphasis on work-readiness, prevalent within the health and social care disciplines is reinforced by The World Health Organisation recognising the need for a health workforce that can assist in 'mitigating the global health workforce crisis' and improve patient and health outcomes (World Health Organisation 2010: 7). It is expected that graduates will provide high quality care in increasingly complex healthcare environments (Rodger *et al.* 2008).

Since its inception, the threshold concepts framework (TCF) has attracted substantial scholarly interest, with a growing body of literature that has identified threshold concepts relevant to specific disciplines, and explored their use in curriculum review and development (Land, Rattray, and Vivian 2014). Threshold concepts (the concepts derived when applying the TCF) are described as 'portals' that open up new ways of thinking (Meyer and Land 2003: 1). They represent 'a transformed way of understanding or interpreting or viewing something without which the learner cannot progress' (Meyer and Land 2003: 1). Threshold concepts contribute to the development of professional identity (Eckerdal *et al.* 2006), and are required in order to become a competent graduate of a discipline (Meyer and Land 2003). Threshold concepts have been differentiated from other learning concepts (such as core and key concepts) by a set of eight characteristics (Baillie, Bowden, and Meyer 2012, Meyer and Land 2005). They are often considered to be the most **troublesome** or difficult concepts within the curriculum, that once grasped lead to a **transformed** way of seeing or interpreting knowledge. Once acquired, a threshold concept is **irreversible**, and therefore not likely to be forgotten or unlearned. Grasping a threshold concept allows **integration** of knowledge when connections that could not previously be seen, become visible. They may be **bounded**, delineating the boundaries of a discipline, involve **reconstitution** as the identity of the learner shifts, and will involve **discursion** as the learner develops new or enhanced use of language. A student's experience of the threshold may involve a **liminal** period where they move between previous and new understandings of the concept (Baillie, Bowden, and Meyer 2012, Meyer and Land 2005).

The TCF has been used across a range of disciplines including economics (Davies and Mangan 2007), engineering (Kabo and Baillie 2009), and biological science (Taylor *et al.* 2011), to name just a few, with a wide range of threshold concepts identified. It has also been applied in the health and social care disciplines (Clouder 2005, Martindale *et al.* 2016, and Neve, Lloyd and Collett 2017). Within the discipline of occupational therapy (OT), a recent study by Nicola-Richmond, Pépin, and Larkin (2016) identified ten threshold concepts using the Delphi technique. Participant groups including final year OT students, practising OT clinicians, and OT educators responded to three surveys that contained a series of qualitative and quantitative questions. Using a consensus level set at 70%, ten threshold concepts and capabilities for the discipline were identified. These were: *Understanding and applying the models and theories of occupational therapy; Evidence-based practice; Clinical reasoning; Discipline-specific skills and knowledge; Practising in context; A client-centred approach; Occupation; The occupational therapist role; Reflective practice; and, A holistic approach.* Definitions for each of these ten threshold concepts and capabilities were also developed (See Table 1).

The context in which this study was undertaken is a four-year undergraduate OT program based in Victoria, Australia. The program is accredited by the World Federation of Occupational Therapists (WFOT 2015), and the curriculum draws upon the principles of constructive alignment (Biggs and Tang 2011).

Following the identification of the ten threshold concepts, the authors wanted to explore whether they were being taught in the program, and if so, how relevant and explicit these concepts were in the teaching. At the time of writing, there was no published literature that had explored the teaching of threshold concepts within a specific discipline and across a whole program of study.

The aims of this study were:

- To establish whether the ten threshold concepts previously identified for OT were taught within the four-year undergraduate OT program;
- If identified, to explore where and how these threshold concepts were taught; and,
- To investigate how teaching and learning activities support the acquisition of threshold concepts within the curriculum.

Method

A qualitative research paradigm was adopted for this study using a phenomenological approach where the common meanings for participants of a phenomenon were described (Creswell 2013). This approach was considered a good fit for this study as educators were describing their understanding and experience of the OT program in relation to the identified threshold concepts. Ethical approval for the study was granted by the University's Health Ethics Advisory Group.

Participants

All educators teaching within the OT program were invited to participate in focus groups. The second and third authors of this article also acted as participants in the study (as they were both educators teaching within the program). Potential participants were invited via an email sent by an administrative assistant independent of the study. Those who expressed an interest were sent a plain language statement along with proposed times for the focus groups. At the beginning of the focus group, written consent was obtained from all participants, and they provided demographic data including: gender; age; position held; number of years teaching; number of years teaching at the University; OT qualification; and, highest level of qualification.

Procedure

Two focus groups were held, each with six participants. Khan and Manderson support the use of focus groups as they facilitate collection of data relating to "perceptions, interpretations, and beliefs of a select population" in regard to a particular issue (Khan and Manderson, 1992: 57). Prior to attending, participants were provided with information about the TCF and a list of the ten, previously identified, threshold concepts. At the commencement of the focus group, they were also given time to review this material.

Before the focus groups, the first author mapped the ten threshold concepts against two documents: the University's curriculum outline and its 2011 report for external accreditation. This draft map was then discussed and checked by the second and third authors to ensure accuracy, and was given to all participants during the focus groups. Focus groups were led by an experienced convener who was external to the study and to the OT program. The first author acted as note taker but did not engage in dialogue during the groups. The focus group questions are provided in [Table 2](#). Each session was digitally recorded and subsequently transcribed verbatim.

Table 1: The threshold concepts and capabilities of occupational therapy

UNDERSTANDING AND APPLYING THE MODELS AND THEORIES OF OCCUPATIONAL

THERAPY -The understanding and use of models such as the Model of Human Occupation, the International Classification of Functioning and the Person Environment Occupational Performance model. The understanding and use of theory such as occupational science and a top down, bottom up approach.

EVIDENCE-BASED PRACTICE - The use of research evidence, along with clinical experience, information from the practice context and the circumstances of the individual, to inform practice.

CLINICAL REASONING -The way that therapists think in practice. Clinical reasoning provides a framework for therapist thinking, actions and outcomes and helps to justify interventions.

DISCIPLINE-SPECIFIC SKILLS AND KNOWLEDGE -The occupational therapy specific skills and knowledge that are necessary for practice. These include, but are not limited to, OT assessments, OT interventions, knowledge of specialist clinical areas, equipment prescription and home modifications and task analysis.

PRACTISING IN CONTEXT- Developing an understanding of practising in the real world. This includes negotiating the gap between theory and practice, understanding funding systems, managing the differences in social and medical models, negotiating service systems, and fitting service provision around economic constraints.

A CLIENT-CENTRED APPROACH- Understanding that the client is the expert in their own life, and that the role of the OT is to provide information and to support empowerment rather than make decisions for others. Understanding the unique nature of individuals and appreciating diversity.

OCCUPATION- Understanding that occupation as defined by occupational therapists is broad, and that humans are occupational beings. Understanding the importance of occupation being personally meaningful and using occupation as the focus of intervention. Recognising that meaningful occupation is linked with health and well-being.

THE OCCUPATIONAL THERAPIST ROLE- Understanding and being able to define the role of the OT within a team, the health setting, and society. Understanding the diversity and breadth of the role, and the complexities of OT practice.

REFLECTIVE PRACTICE- Undertaking critical reflection of one's own performance and all of the elements of the OT role. Understanding the role that critical reflection plays in professional practice and clinical reasoning.

A HOLISTIC APPROACH- Seeing and working with the client in a holistic manner. Seeing the client in a broader context. All elements of the client's life and circumstances are taken into account including their environment, social situation and beliefs.

Methodological rigour

Triangulation of data was used to ensure methodological rigour. The first author kept both a reflective journal and field notes throughout the study and these were used in the data analysis. To further establish trustworthiness, member checking was also implemented. All participants were sent a complete transcript from the focus group that they attended to verify that it was an accurate, verbatim account of the discussion. Four participants from the first focus group, and three participants from the second focus group, verified that the transcripts were accurate.

Table 2: Focus group questions

Question	Prompts
1. What is your understanding of threshold concepts (TC)?	<ul style="list-style-type: none"> • What do you think about TC and occupational therapy (OT)? • What can you say about the relevance of these concepts in OT (practice and education)?
2. You have been provided with a list of the TC identified as being important in OT. How do you think they are addressed (or taught) in the curriculum?	<ul style="list-style-type: none"> • Do you think they are covered? • Are they clearly identified and taught explicitly? • Are there any that are not taught explicitly? • Are they embedded throughout the curriculum?
3. This draft map of the TC in the OT curriculum was developed following the identification of threshold concepts in Stage 1 of this study. Looking at this now, would you change your answers about how TC are covered in the curriculum?	
4. In your experience, how are these TC taught in the curriculum?	<ul style="list-style-type: none"> • What strategies do you think are in place? • Are the threshold concepts named within the curriculum, • Is there curriculum content that links directly to TC?
5. How well does the Deakin University OT program support the acquisition of threshold concepts?	<ul style="list-style-type: none"> • What is done? Who does it? What else could be done?
6. Is there anything else you would like to say about TC and the Deakin OT program?	

Data analysis

Participant responses were de-identified, with each participant assigned an identification number. The de-identified data were analysed thematically by the first author, and either the second or third author (with each analysing the data from the focus group that they did not attend to limit bias). All authors used bracketing to limit the influence of their prior knowledge during data analysis. Bracketing occurs when researchers actively set aside their prior knowledge and understandings during research (Finlay 2002). Thematic analysis included: reading data to gain a general understanding of the information; detailed analysis and coding using segments of text; generating a description of themes; and, interpreting meanings in the data (Creswell 2013). The three authors initially undertook the analysis individually, and then met to discuss the themes identified. Discussions continued until agreement was reached.

The limited number of educators teaching in the program meant that only two focus groups were held. However, data saturation was reached. Furthermore, the data obtained were both rich (containing high quality insights from participants) and thick (a large quantity of data was collected) (Dibley 2011). Rich and thick data have been identified by Fusch and Ness (2015) as the priority when considering data saturation in qualitative research, rather than sample size.

Results

All 14 educators teaching in the OT program were invited to participate, with 12 providing consent. A summary of the demographic data for each group is outlined in [Table 3](#) and [Table 4](#). A coincidental notable difference in age and experience level of the two groups was evident with the participants in the first focus group being younger, holding less senior positions, and having worked for less time in higher education.

When data were analysed, five themes emerged. These were: professional identity; time; the impact of the learning environment; explicit versus implicit content and language; and, the value and understanding of the TCF. These themes and their relevant sub-themes are described below.

Table 3: Demographic data focus group 1

Focus Group 1 Demographic Data						
Gender	Age	Position Held	Teaching Years	Years at Current University	OT Qualification	Highest Qualification
F	37	Lecturer	<5 yrs	<5 yrs	Undergrad	Masters
F	46	Snr Lecturer	15+ yrs	5-10 yrs	Postgrad	PhD
F	40	Lecturer	5-10 yrs	5-10 yrs	Undergrad	Undergrad
F	61	Lecturer	5-10 yrs	5-10 yrs	Postgrad	Masters
F	34	Lecturer	<5 yrs	<5 yrs	Postgrad	Masters
M	32	Lecturer	<5 yrs	<5 yrs	Undergrad	Undergrad
Summary						
	Mean 41.6 yrs	5 Lecturers	3, <5 yrs	3, < 5 yrs	3 Undergrad	1 PhD
	Range 32-61	1 Snr Lecture	2, 5-10 yrs	3, 5-10 yrs	3 Postgrad	2 Undergrad
			1, 15+ yrs			3 Masters

Table 4: Demographic data focus group 2.

Focus Group 2 Demographic Data						
Gender	Age	Position Held	Teaching Years	Years at Current University	OT Qualification	Highest Qualification
F	58	Ass. Professor	15+ yrs	< 5 yrs	Undergrad	Masters
F	38	Lecturer	5-10 yrs	5-10 yrs	Undergrad	PhD
F	58	Professor	10-15 yrs	10-15 yrs	Postgrad	PhD
F	58	Ass Professor	15+ yrs	5-10 yrs	Postgrad	PhD
F	57	Snr Lecturer	5-10 yrs	5-10 yrs	Undergrad	Masters
F	43	Lecturer	5-10 yrs	5-10 yrs	Undergrad	Undergrad
Summary						
	Mean 52 yrs	1 Professor	3, 5-10 yrs	1, <5 yrs	4 Undergrad	3 PhD
	Range 43-58	2 Ass Professors	1, 10-15 yrs	4, 5-10 yrs	2 Postgrad	2 Masters
		2 Lecturers	2, 15+ yrs	1, 10-15 yrs		1 Undergrad
		1 Snr Lecture				

Professional identity

There was a strong focus on the transformation associated with threshold concepts and the ontological change that leads to professional identity and an OT world view. For example, a participant stated;

It's very difficult to separate your professional thinking from everyday life thinking, I don't think you can once it's embedded and it's part of you (participant 1).

Another participant further emphasised the resonance between the TCF and professional identity when they added;

For me it's about the glasses that we wear, threshold concepts for me is about how you see the world and so once you get the threshold concepts, the world is changed forever. (participant 10).

Both groups expressed that the majority of the threshold concepts were not discipline-specific, and could typically be shared by one or more health disciplines. Participants proposed that it is the use of these ten threshold concepts in combination that make them unique to the discipline of OT thus contributing to developing and strengthening professional identity, as expressed by this participant.

These are all concepts that can be applicable to any profession but I think what makes our profession unique is how we relate these concepts to one another and the relationships that are built. (participant 5)

Time

Both groups discussed the concept of time, with particular emphasis on three subthemes: the time required to teach and learn; the time required to reflect; and, when threshold concepts are acquired.

The time required to teach and learn

Participants shared the view that both time and opportunity are required to allow the acquisition of threshold concepts. They discussed this in relation to the pressures of the current Australian higher education environment trend towards having less time to teach and the advent of e-learning environments, both of which have resulted in less face-to-face contact time with students. The challenges of teaching complex content in shorter time frames was highlighted. A participant explained;

But I appreciate that we now teach within two very short trimesters and there is a very long break between end of trimester two and trimester one beginning. We also don't have a large amount of on-campus contact time and students, I think, you could consider the fact that they're not completely immersed in occupational therapy. (participant 6)

Another discussed the complexity of the content that students needed to learn and highlighted the importance time plays in the learning process;

We're being squeezed, I feel like a lemon and there's no juice anymore. We have less and less time to teach complex multi-layered, not always easy to explain, concepts, and complex skills. (participant 4)

The time required to reflect

Time required for student reflection and the teaching of reflective practice to facilitate the acquisition of threshold concepts was also identified. One participant stated;

There's that connecting the dots and intellectual 'ah ha' moments, how it all fits together, but I think with reflective practice, and this only happened to me after I left uni, and probably years later, that you start reflecting on how you're interacting with clients and how you're impacting on them and, to me, that was a whole other level of understanding what I was doing. (participant 9)

Whereas another queried whether a threshold concept could be grasped in the absence of time taken for reflection;

Can you achieve a threshold concept in the absence of reflection? (participant 10)

When are threshold concepts acquired?

There was agreement amongst participants that some threshold concepts may not be acquired until after graduation. It was proposed that immersion in the profession may be necessary for acquisition, and that perhaps students leave the academic arena still in the liminal space for some threshold concepts. A participant expanded on this, proposing a time frame for threshold concept acquisition;

And I'm lucky enough to see new grads and actually have students (who have graduated) coming back to talk to fourth years. I found, when they're totally immersed in a role for six months these things aren't a struggle anymore. (participant 2)

The impact of the learning environment

The impact of the learning environment, and the methods used for teaching and learning, were also a focus in the data with two subthemes identified: where threshold concepts are acquired; and, constraints and opportunities.

Where threshold concepts are acquired

The need for variation in learning opportunities and learning environments was discussed by participants. A participant illustrated this in the following way;

It's all about actually how we're doing it (teaching), and how we're assessing it so that everyone has a chance to get it (the threshold concept) in a few different ways because the threshold concept is probably pretty important, so you'd want to get the student to use a chance to show it probably a few ways and on a few occasions. (participant 12)

Both groups also highlighted the importance of practice-based learning in the form of clinical placement experiences for acquiring threshold concepts. Accredited OT programs are required to include a minimum of 1000 hours of placement, and this was acknowledged by participants as critical in supporting the acquisition of threshold concepts.

I think the one that caught my eye was clinical reasoning. I kind of do teaching around clinical reasoning, we do quite a lot of it, but the primary share of that teaching was the clinical (placement) supervisors out on placement because they show the students how it's actually done in practice. I think we share it (the responsibility) with people who are outside of the course because of fieldwork (clinical placement). (participant 12)

Constraints and opportunities

Participants also raised concerns in regard to the vast variation that exists between placement experiences and also in relation to the ability or inability of clinical placement supervisors to make threshold concepts explicit for students. One participant described;

...my observation is a lot of students get stuff when they go out on fieldwork (clinical placement) and that, for me, is the area that's most out of our control and it's the most inconsistent experience that students have, so we know what they get in their units, but we have no quality control (over placement experiences). (participant 11)

Another also expressed concern regarding the differences between placement experiences;

...for some practice educators (placement supervisors) it's (using threshold concepts) become so subsumed into their subconscious that they don't easily or readily verbalise that to students....they have to be reminded or supported to actually drag up from the subconscious why they're doing itand actually make them explicit for students. (participant 10)

Explicit versus implicit content and language

This theme related to the need for explicit teaching of threshold concepts and the use of clear and consistent language throughout a program. Three subthemes emerged being: the need for explicit use of language; the need for content to be explicit; and, the need for assessment of threshold concepts.

The need for explicit use of language

In both groups the value of using explicit language that was aligned with threshold concepts, and used consistently across units and year levels was identified. For example one participant stated;

...I think it (threshold concepts) becomes part of us but I'm not sure that we're really good at actually articulating and talking about it in a way that makes sense for others (students). (participant 4)

Another added;

Maybe (it's) because we've crossed that threshold that we don't structure it and say it in a sentence. We need to teach it like this (or it is) very confusing (for students). (participant 2)

The need for content to be explicit

Participants discussed the need for content to be made explicit to students and staff within subjects and across the program. Whilst it was identified that this was done to some degree, both groups reported that improving the explicitness of content would be beneficial. It was suggested that the threshold concepts would be useful to introduce to first year students in the form of a map documenting the relationship of each threshold concept to each unit in the OT program. A participant stated;

... I can't imagine that any of us would teach a unit (subject) without actually teaching some elements of this (the threshold concepts). We could be making them more explicit and we could be including these terms very explicitly in the unit (subject) guide so that students will see that in every unit (subject) that they do, they will learn about clinical reasoning in one way or another way. (participant 6)

However another described the potential negative impact of being highly explicit with students;

It's always a challenge, particularly around reflective practice as an example. We try to make

reflective practice explicit, but if you make it so explicit by giving lots of different examples of different language and reflection, then you're not actually teaching them to reflect and interpret that in their own reflections. (participant 10)

The need for assessment of threshold concepts

The deliberate and explicit assessment of threshold concepts was also identified as important in order to support threshold concept acquisition. Alongside this, variation in assessment techniques was highlighted in order to allow students more than one opportunity, using different assessment formats, to demonstrate their competence. One participant discussed the need for linking learning content and assessment;

I think that's where it has to be linked with assessment...if we consider that these are important things that should be scaffolded throughout the learning, we have to assess it, assessment for learning and as learning. I think it's really important to make that connection between what we teach and what we assess, and requiring evidence of it in some form or another. (participant 10)

Another queried how prevalent assessments that examined threshold concepts were within the curriculum;

...it raises for me an interesting question about the assessments. We assess all on the same thing, which is more a performance, a behavioural kind of assessment, I think. Do we assess against these concepts and I think it would be interesting to me. In fact, might we want to do that? (participant 7)

The value and understanding of the threshold concepts framework (TCF)

Participants discussed the value and utility of the TCF. Although the framework was new to many participants, they engaged with it during the focus groups, and there was agreement that it was a useful lens through which to view the academic program. Three sub-themes emerged: the value of the TCF; linking things together; and, the 'aha!' or 'light bulb' moment.

The value of the TCF

Participants reported that the TCF was meaningful to them and felt there was a benefit in using it for curriculum development. A participant proposed the incorporation of the framework into the OT curriculum;

I think the next conversation to have is: do we want to use them (threshold concepts) more explicitly, and how do they fit with the other things that are taking place at a university level, how does that actually all meld together? I think we all see it as extremely valuable. (participant 6)

Linking things together

The capacity of the TCF to help students integrate or connect knowledge emerged as a sub-theme. Participants described the ability of threshold concepts, once acquired, to assist students to see the bigger picture. Using or referring to threshold concepts was considered especially useful for graduate occupational therapists as they move into a new environment and learn to be more independent. A participant illustrated how threshold concepts can be integrated in practice.

...it's that depth of knowledge, to me it's like (threshold concepts) get right down to the base of what's important, and that underpins a lot of the things that you're going to do from then on, but it gives you a whole other understanding of what you're doing. (participant 3)

The 'aha!' or 'light bulb' moment

Participants discussed the 'aha!' or 'light bulb' moment: "a sudden insight" ([Eckerdal et al. 2007: 1](#)) that is often associated with threshold concepts, querying the immediacy of the event. It was acknowledged that this acquisition may not always be sudden, and may come in the form of a slower enlightenment.

Yes and sometimes it's (acquiring the threshold concept) a light bulb, and sometimes it's not quite shiny, but it's just oh okay, yeah and they may or may not like it, whereas light bulb to me always feels a bit invigorating. (participant 11)

The need for depth of understanding as part of acquiring a threshold concept was also identified.

I have the same thought about that aha moment, but the aha moment might not be instantaneous ... It's something else other than just an aha moment, it's something about a depth of understanding. (participant 8).

Discussion

This study explored the relevance of discipline-specific threshold concepts for an Australian undergraduate occupational therapy curriculum, and yielded a number of findings. The threshold concepts of OT, though not taught explicitly in the program, were present in the teaching and learning philosophy of the course, its underpinnings, and activities. Teaching and learning activities appeared to support the acquisition of threshold concepts, although not always in a conscious or explicit way. Practice-based learning (discussed here primarily in the form of clinical placement) was considered pivotal in facilitating threshold concept acquisition.

The professional identity of the participants as occupational therapists, and the emphasis in fostering professional identity in students was very strong. Participants in both focus groups spoke of how becoming an occupational therapist had changed who they were, and this was linked with the transformative characteristic of the TCF and with the ability to practice competently in the field. There is some evidence to suggest that OT is a profession that lacks strong professional identity ([Fortune 2000](#), and [Mackey 2007](#)) however, this was not evident in the educators who participated in this study. They described the importance of developing professional identity in their students, and saw the teaching of threshold concepts as a way to facilitate this outcome. This finding is supported by the previous work of [Rodger and Turpin \(2011\)](#) where one of the initial drivers for the redesigning the OT curriculum at University of Queensland using the TCF, was a perceived lack of strong professional identity in their graduates. [Åkerlind, McKenzie and Lupton \(2011: 2\)](#), in their work with Physics and Law students, stated that "it is only through coming to understand the threshold concepts in a discipline that students can come to think like a subject specialist and adopt a disciplinary way of thinking about the world". Thus the threshold concepts approach may provide a range of disciplines, not just occupational therapy, with strategies and guidance when professional identity of graduates is highly valued.

Participants acknowledged that a number of the threshold concepts identified for the discipline of OT may also be threshold concepts for other health disciplines. This is interesting, considering that the threshold concepts used in this study had been identified by occupational therapists who had received clear instruction about determining occupational therapy specific threshold concepts. Nevertheless, these ten threshold concepts were identified as essential to occupational therapy practice. This also raises an interesting matter given the characteristic of boundedness which is used to help define threshold concepts. [Fortune and Kennedy-Jones \(2014\)](#) have suggested that if threshold concepts are to meet this characteristic then they should not exist in any other discipline, and they proposed *occupation* as the only threshold concept in OT. However, recent publications suggest that there are only two non-negotiable threshold concept characteristics, being transformation and integration ([Quinlan et al. 2013](#), [Rountree, Robins, and Rountree 2013](#)). In this study, participants suggested that although a number of the ten threshold concepts discussed may be shared with other disciplines, it is perhaps the integrated use of the

threshold concepts, in an occupation-based context that defines the discipline of OT and differentiates it from other professions. This finding has synergies with the work of [Davies and Mangan \(2007\)](#) who described a web of concepts in their work in economics, and suggested that it is when students use a number of threshold concepts together to solve a problem that they realise the full power of threshold concepts.

As other studies have reported ([Cousin 2010](#), [Barradell 2013](#)), the TCF resonated with participants of this study. The potential value of using the TCF in combination with other curriculum design approaches was evidenced in both focus groups. Although this was the first exposure to TCF for most participants, they expressed enthusiasm and positivity in relation to the framework. Authors in the field ([Cousin 2010](#), [Meyer and Land, 2005](#)) have discussed the advantages the TCF provides over and above other approaches to curriculum design, such as constructive alignment. Indeed, [Meyer and Land \(2005: 378\)](#) described constructive alignment as a “simplistic schematic attempt to overcome troublesome knowledge by technicist redesign of curricula alone”. [Kinchin \(2010\)](#) argued that strong evidence supports student learning as being punctuated and non-linear rather than a steady or gradual process. He advocated an approach that focused on thresholds to be crossed rather than content to be learned. Rather than viewing curriculum design choices as a dichotomy, the responses of participants in this study indicated that the TCF could be used to complement other pedagogical approaches. This begs the question of whether blended curriculum development approaches could lead to improved student learning. There is limited information in the literature regarding the use of the TCF in combination with other approaches to curriculum design, and further investigation in this area is required.

The need for threshold concepts to be explicitly identified for students, both in the language that educators use and in the content that is taught, was evident in the data. The threshold concept literature, however, suggests that it is often a challenge for educators to look back and identify threshold concepts given the ontological and epistemological changes that the transformative element of threshold concepts effects ([Barradell 2013](#)). This may contribute to the challenges described by participants in explicitly naming what is being taught, when it comes to these concepts.

There is an assumption in much of the threshold concept literature to date, that students leave university having acquired the threshold concepts of their discipline, however very few authors have actually explored this ([Allan *et al.* 2015](#), [Evans and Kevern 2014](#), [Wright and Hibbert 2015](#)). In this study, participants believed that it was unlikely that all graduating students would have acquired all of the threshold concepts of the discipline. They proposed that some students may still be within the liminal space for some threshold concepts, and that immersion in the workforce was required for acquisition. However, with an emphasis on lifelong learning where health professionals need to continually critically reflect and be evidence-based in order to be effective practitioners ([Larkin and Pépin 2013](#)), one could perhaps argue that the acquisition of discipline-based threshold concepts occurs over many years and may need to respond to changing health care environments. Given this, it may be erroneous to assume that threshold concepts will be acquired at graduation given the pivotal role clinical practice following graduation may play in this process.

The findings of this study have relevance to both health professionals and threshold concept researchers, although the study has some limitations. Participant numbers in the focus groups were small, and all participants were recruited from a single university, limiting the generalisability of the findings. However, including people from beyond this OT program was considered inappropriate given that in-depth knowledge of the curriculum was required. Due to the relatively small numbers making up the academic team at the university in question, the second and third authors of this article each participated in one of the focus groups. This meant that they had prior knowledge of the TCF, and may have previously considered its application within the curriculum. Attempts were made to limit the effect of this by having authors two and three monitor and control their contributions in the focus groups, using bracketing, and by having each analyse the data from the focus group in which they were not involved. The research base would benefit from replicating this study within other disciplines or across other OT programs.

Conclusion

There is a clear expectation from tertiary education institutions and industry partners to ensure that graduates of health and social care programs are work-ready upon graduation. This highlights the importance of using curriculum design approaches that assist in the transformation from student to professional, with the TCF an example of such an approach. This study sought to identify the factors surrounding the teaching of the 10 threshold concepts and capabilities of OT within an undergraduate OT curriculum. Key findings included; that it may be the integrated use of threshold concepts (supported by time, reflective practice, explicit and varied teaching, and practice-based learning) that defines or differentiates the discipline; that a threshold concepts approach may facilitate student-to-professional transformation; that students may not acquire all of the threshold concepts prior to graduation; and, that practice-based learning opportunities are an important component of threshold concept acquisition.

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