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Integrating threshold concepts: exploring innovations in the redesign of a problem-based learning curriculum

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An innovative new midwifery programme leading to midwifery registration with the Nursing and Midwifery Council (NMC) developing potential registrants at both BSc and MSc levels commenced in September 2016. The programme is delivered utilising problem-based learning (PBL) as both a content delivery method and a philosophical approach, underpinning student learning at the UK's University of Bradford, School of Midwifery. A requirement for NMC revalidation at a five-year juncture and institutional programme reapproval acted as a catalyst for change. The programme team embraced a new curriculum framework which emphasised a move to reviewing stage and programme outcomes rather than concentrating on the minutiae of module outcomes. This new approach suited the holistic nature of PBL ensuring an intellectually challenging and inclusive method of teaching and learning for midwifery practice. A further progression for the programme team was to develop an understanding of, and to integrate, 'threshold concepts' or 'troublesome knowledge'. These are defined as knowledge, principles or components which students find difficult to understand and therefore to utilise to improve practice and deliver high-quality care. This article explores the integration of threshold concepts into a problem-based midwifery curriculum.

Midwifery education at the University of Bradford (UoB), has been based on a curriculum designed around problem-based learning (PBL) for the last 17 years. The programme is one which leads to midwifery registration with the Nursing and Midwifery Council (NMC), and our current offering commenced in September 2016, developing potential registrants at both BSc and MSc level. Problem-based learning has continued to be central to the development of our contemporary approach to delivering traditional midwifery programme content. Re-approval and revalidation took place in 2005 and 2011, with each new iteration resulting in major developments based on feedback from stakeholders, the university teaching and learning strategy, national health policy and professional body requirements.

Problem-based learning as a teaching method is used in many health care programmes with examples of its first use being seen in medical schools in the 1960s. Problem-based learning has become the philosophical approach integrated into our education strategy in the School of Midwifery & Reproductive Health. This is underpinned by the critical pedagogy of Paolo Freire (Shor 1992) and progressive education of John Dewey (Reese 2001) and thus is a key attribute of our student-centred delivery.

A requirement for five year revalidation (by the NMC) in 2016 and institutional programme re-approval was the catalyst for engaging in evaluating existing programme provision. University curriculum framework emphasised a move to assessment of stage and programme outcomes rather than the existing minutiae of module outcomes, requiring a radical rethink of how provision would be organised. New NMC standards for pre-registration midwifery programmes were expected to be published in 2016 which would have implications for curriculum content; however the programme team considered that the time was right to commence planning. New standards have been delayed and are not now expected to be published by the NMC until 2019. The new programme using current midwifery standards gained revalidation by the NMC in 2016. A detailed evaluation of the curriculum served to reinforce our commitment to continue delivery which values active and collaborative student learning. Hence PBL was retained as the central tenet building on previous work (Porter & Meddings 2007). The programme team felt assured that they would maintain a curriculum which continued to be intellectually challenging whilst being inclusive for preparation of practitioners for contemporary midwifery practice.

The new midwifery programme is one of only three programmes in England, with a further university in Scotland, to offer previous graduates the opportunity to complete a pre-registration post graduate professional qualification in Midwifery Studies. This approach facilitates those with previous degrees to change careers, and to utilise the study skills gained in their first degree. This programme now offers prospective candidates two routes to gaining a registerable qualification with the NMC. In designing the programme the team identified that the clinical practice elements would need to be studied at the same level and pace as the undergraduate

students, as they had no midwifery practice experience. The structure of the programme is presented in Table 1.
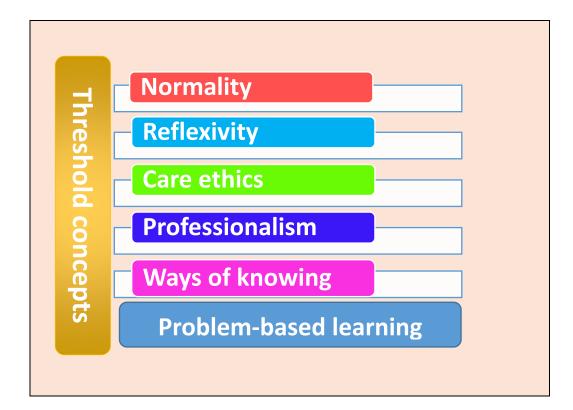
Table 1. Programme structure

Route	BSc	MSc
STAGE 1	Clinical Practice = Level 4 x2 Theory = Level 4	Clinical Practice = Level 4 x2 Theory = Level 7
STAGE 2	Clinical Practice = Level 5 x2 Theory = Level 5	Clinical Practice = Level 5 x2 Theory = Level 7
STAGE 3	Clinical Practice = Level 6 x2 Theory = Level 6	Clinical Practice = Level 6 x1; Level 7 x 1 Theory = Level 7

Threshold concepts and PBL

The next challenge was to implement the UoB (2012) curriculum framework and integrate 'threshold concepts'. These are viewed as necessary principles, which are difficult to understand and conceptualise, and according to Meyer & Land (2003) constitute 'troublesome knowledge'. The team identified components they considered to be threshold concepts, which constitute essential understanding without which students cannot sufficiently develop to self-actualise being a 'midwife', being 'with woman'. As students progress through the programme they will develop essential understanding facilitating utilisation and application of these threshold concepts. The remainder of this paper explores the integration of threshold concepts and assimilation of PBL including the use of technology and assessment for learning.

Early in the redevelopment and redesign process it became clear that in order for the programme team to integrate threshold concepts into the curriculum, a greater understanding of the nebulous definition had to be achieved. This came through discussion of aspects of the curriculum which students frequently found difficult to understand or interpret, resulting in the identification of five threshold concepts (Fig 1).

Figure 1: Threshold concepts

As work went on, a sixth concept was identified as PBL itself, as this constituted a different way of understanding learning for both students and teaching staff. Savin-Baden (2006) was the first to describe PBL in this way as it required a pedagogical shift by both staff and students to embrace this approach to education. Whilst there is much talk of student-centred learning (Baeten *et al* 2010) this is one approach which does truly place students not only centre stage but in the driving seat to a greater extent, setting the pace of their learning. The structure of this new PBL curriculum provides the scaffolding for students to learn core principles based around three curriculum themes of anatomy and physiology for midwifery practice, psychosocial aspects of maternal health, and lifelong learning and well-being. Academic staff do not escape the transition from traditional content delivery to a shift to PBL without experiencing the uncomfortableness of challenges to pre-held beliefs about teaching and learning. Many academics' own experiences as students have been through delivery by traditional lecture-based learning means, where the lecturer is held as the source of all knowledge, telling students everything they need to know. Having to adopt a new approach for the support of student learning sees academics needing to develop their facilitation rather than lecturing skills (Haith-Cooper 2000).

Utilisation of PBL facilitates the exploration of real world midwifery problems within a safe, not challenge-free environment, reducing the notion of a 'theory-practice gap'. Students are able to practise communication skills, enhanced through the group work that is necessitated by the PBL design, aiding development of social, collaborative and cooperative learning skills. Careful and skilled design of each scenario or 'Enigma' guides students through self-directed and cumulative learning in response to learning objectives they set. The team use a seven stage process as a structure to examine each Enigma (Wood 2003). Responsibility for learning is owned by individual students, as they contribute to group learning by sharing findings from research and review of literature in response to group objectives. Students who have traditionally required extrinsic motivation to direct learning become more intrinsically enthused by clearly seeing the links and application to midwifery practice. Graduates are practitioners who exit midwifery education able to problem solve, who are self-reliant, effective team members who know how to access information to support the delivery of contemporary practice.
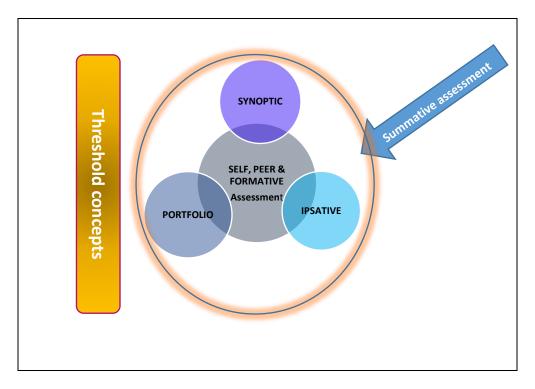
Holistic assessment of theory

The notion of threshold concepts does not start and stop with elements of the curriculum knowledge which students are required to learn. Indeed this theme continues into the evaluation of the modes in which students have learned. Assessment is positioned as troublesome knowledge for students, whilst it is a taken for granted activity by academic staff. Assessment language, assessment tasks and the ways in which what is produced is to be evaluated are difficult for students to conceptualise and appreciate. Students therefore need to be provided with opportunities to develop their understanding. A number of assessment moments have been designed into the programme to facilitate students gaining as wide an exposure as possible to the language of assessment from early on in the curriculum journey. Self-assessment is seen as key to student development; research found it enhanced learning and exam performance (McDonald & Boud 2003), providing scaffolding for learning, increasing assessment literacy along with an understanding of the assessment criteria. However, Dearnley & Meddings (2007) identified in a study that students need to develop an understanding of the purpose and practical aspects of

self-assessment. Difficulties in understanding the application of assessment criteria are acknowledged by authors such as Sadler (1989, 2009) who describe them as 'sharp' or 'fuzzy'. Expert assessors employ 'meta criteria', effectively discriminating from a range of generic criteria identifying which to apply in order to evaluate the product for assessment. The task therefore is to develop students into assessment experts so that they can identify and then close their own performance gaps.

The integration of formal opportunities for formative assessment have been integrated into the curriculum at the bequest of the institutional curriculum framework policy (UoB 2012). Formative assessment enhances student progress by constructing openings for rehearsal and practice along with engagement in feedback on their progress. All of this increases student assessment competence and assessment resilience. Students are encouraged to seek support from their personal academic tutor with timetabled tutorial sessions and formative assessment as a requirement rather than an optional extra. Traditional approaches to tutorial support result in a system akin to *The inverse care law* (Hart 1971). Students with limited insight into their academic abilities, including the skills development trajectory needed to negotiate assessment successfully, find conventional personal academic tutor support most ineffective. However those possessing well-developed academic skills, who need the least support, will regularly access their personal academic tutor for assistance.

Further enhancements to the holistic assessment strategy in this curriculum redesign have resulted in the inclusion of formative peer review and assessment tasks. These are included as another strand to increase student assessment literacy, writing agility including written assignments or coursework. Multiple Choice Question (MCQ) papers, critical writing blogs and presentations all mirror summative assessments in year 1 and year 2, and become a key element of student revision. These enable the student to demonstrate the acquisition of knowledge including reflecting on the context of practice. The threshold concepts are integrated into formative and summative assessment enabling students to see the links between theory and practice.
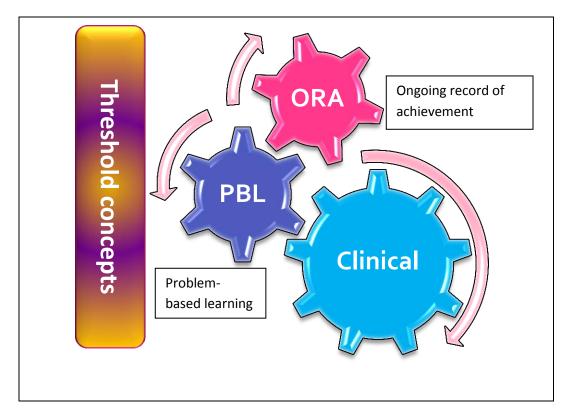
Figure 2: Holistic assessment of theory

Students develop a web-based platform which is used for the e-portfolio assessment and is designed to include evidence of engagement with learning, including reflection on learning activities and action on feedback acquired on formative tasks. Whilst there is no set word count for the completed portfolio, an indicative word count is included in the assessment brief in order that the students begin to develop their writing and evidence skills. The assessment strategy includes a synoptic assessment (Patrick 2005), which is designed to facilitate the holistic assessment of a range of module learning outcomes, incorporating formative opportunities and summative assessment. Formative assessment provides the opportunity to engage in structured or scaffolded peer assessment by using a specifically constructed assessment rubric. Students are therefore introduced to the language and application of assessment criteria.

A further new assessment method introduced to the midwifery assessment portfolio is the use of ipsative assessment. Students are able to monitor their progress towards a specific goal by comparing their current achievement with a past assessment attempt. The approach taken in this programme is for students to undertake two formative assessment attempts at a MCQ for anatomy and physiology during a single

academic year. These formative attempts provide the student with the look and feel of engaging in a high stakes assessment prior to completing a final summative assessment attempt at the end of each stage of the programme. Rehearsal and practice are seen as key to student development, along with the ability to utilise formative feedback by way of the mark gained for their assessment attempt. Traditionally formative feedback is poorly used by students because the developmental element is unclear or perceived unusable as they can no longer see its usefulness after the assessment event has passed. However, feedback provided at a summative assessment point usually contains elements of feed-forward advice and the team hope that the use of formative ipsative assessment will assist the students in improving their academic performance over time (Hughes 2011).

The assessment itself is a MCQ completed under exam conditions which includes questions which span the knowledge required for midwifery practice. At the end of each stage the same exam will be completed, with an increasing number of correct responses required to record a pass mark. Whilst the formative assessment opportunities constitute a true ipsative assessment, the final summative element facilitates a record of achievement against set standards and the awarding of module credit. The goal of the academic team is to increase student intrinsic motivation, provide opportunity for autonomous learning (Nicol & Macfarlane-Dick 2006), as well as using the feedback from formative assessment to raise their level of attainment. Summative success in the 60 credit theory module is linked with curriculum themes rather than to the module itself. This approach ensures that if a student is unsuccessful at one assessment task this will not impact upon them being able to proceed into the next element of study prior to a resubmission opportunity.

Holistic assessment of practice

Students completing their programme at the UoB experience a programme that has been at the forefront of innovative developments. For example, clinical practice has been graded since 1995 with this approach now becoming a standard requirement for pre-registration midwifery programmes (NMC 2009). Achievement in the clinical practice environment makes a significant contribution towards their final degree outcome and classification. The midwifery programme at Bradford was also one of

the first in the country to move the clinical assessment documentation to be held on a web-based platform being completed electronically via a clinical e-portfolio: ongoing record of achievement (ORA). This enables an authentic real time review of a student's progress by clinicians, academics and students themselves at any time during their practice placement experience. All elements required to undertake a holistic assessment of student progress in practice are available to practice mentors. In line with contemporaneous record keeping, students are required to detail EC numbers completed, evidence of progress towards meeting Essential Skills Clusters and a record of hours completed in practice. During their time on placement students will observe that many of the PBL Enigmas they have explored in the classroom environments mirror what is seen in clinical practice. There is opportunity for students to reflect on such cases including the learning achieved in their ORA. An indication for which threshold concepts students should to give particular focus to in each stage is provided. This will ensure that students all will have had the chance to increase their familiarity with each of them and their meaning to midwifery practice. Figure 3 highlights the intricate links between these concepts.

Figure 3: Clinical assessment

Students are encouraged to develop a range of attributes and skills including enhanced communication, team working, problem solving, autonomy and self-efficacy which are all valuable for employability in a wide range of roles. Our core aim is to prepare midwives who can provide safe and effective care for women and their families.

Conclusion

This curriculum design is intended to enable the students to understand threshold concepts or troublesome knowledge (Meyer & Land 2003). The threshold concepts are conceptual shifts which allow the students to transform their way of viewing essential knowledge. This is important as without this change in perspective, students find it hard to progress. The threshold concepts should be introduced to the students as early as possible, recognising that understanding develops at varying rates and different students will internalise and understand them at different stages. The threshold concepts are integrated into the teaching of the programme, through the module-learning outcomes which are carefully devised by the experienced programme team. The threshold concepts are used throughout the assessment strategy; however summative assessment is only undertaken once the students have had the opportunity to develop appropriate levels of knowledge and assessment skills. This includes an understanding of what is required of them and what success looks like, which is achieved through participation in and receiving and providing feedback on formative assessment.

The overall programme aim is to develop students and thus practitioners who possess flexible knowledge for problem resolution and critical thinking in the ever changing contexts of professional practice.

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References

Baeten M, Kyndt E, Struyven K *et al* (2010). Using student-centred learning environments to stimulate deep approaches to learning: factors encouraging or discouraging their effectiveness. *Educational Research Review* 5(3):243-60.

Dearnley CA, Meddings FS (2007). Student self-assessment and its impact on learning – a pilot study. *Nurse Education Today* 27(4):333-40.

Haith-Cooper M (2000). Problem-based learning within health professional education. What is the role of the lecturer? A review of the literature. *Nurse Education Today* 20(4):267-72.

Hart JT (1971). The inverse care law. *Lancet* 1(7696):405-12.

Hughes G (2011). Towards a personal best: a case for introducing ipsative assessment in higher education. *Studies in Higher Education* 36(3):353-67.

McDonald B, Boud D (2003). The impact of self-assessment on achievement: the effects of self-assessment training on performance in external examinations. *Assessment in Education: Principles, Policy & Practice* 10(2):209-20.

Meyer J, Land R (2003). *Threshold concepts and troublesome knowledge: linkages to ways of thinking and practising within the disciplines.* Edinburgh: University of Edinburgh. http://www.leeds.ac.uk/educol/documents/142206.pdf [Accessed 21 June 2017].

Nicol DJ, Macfarlane-Dick D (2006). Formative assessment and selfregulated learning: a model and seven principles of good feedback practice. *Studies in Higher Education* 31(2):199-218.

Nursing and Midwifery Council (2009). *Standards for pre-registration midwifery education.* London: NMC. https://www.nmc.org.uk/standards/additional-standards/standards-for-pre-registration-midwifery-education/ [Accessed 21 June 2017].

Patrick H (2005). *Synoptic assessment: report for QCA*. Cambridge: University of Cambridge.

Porter J, Meddings F (2007). Innovative changes in a UK midwifery education programme. *British Journal of Midwifery* 15(9):556-9.

Reese WJ (2001). The origins of progressive education. *History of Education Quarterly* 41(1):1-24.

Sadler DR (1989). Formative assessment and the design of instructional systems. *Instructional Science* 18(2):119-44.

Sadler DR (2009). Indeterminacy in the use of preset criteria for assessment and grading. *Assessment & Evaluation in Higher Education* 34(2):159-79.

Savin-Baden M (2006). Disjunction as a form of troublesome knowledge in problem-based learning. In: Meyer JHF, Land R *eds*. *Overcoming barriers to student understanding: threshold concepts and troublesome knowledge.* Abingdon: Routledge:160-72.

Shor I (1992). Education is politics: Paulo Freire's critical pedagogy. In: McLaren P, Leonard P *eds*. *Paulo Freire: a critical encounter*:25-35.

University of Bradford (2012). *Programme Design and Development*. University of Bradford: Centre for Educational Development. http://www.bradford.ac.uk/educational-development/programme-design-and-development/ [Accessed 21 June 2017].

Wood DF (2003). Problem based learning. *BMJ* 326(7384):328-30.

Meddings FS, Nesbitt R. MIDIRS Midwifery Digest, vol 27, no 3, September 2017, pp ??.