Chapter 2
Professional Learning in Open Networks: How Midwives Self-Regulate their Learning in Massive Open Online Courses

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Abstract This chapter reports on how midwives self-regulate their learning in an open, online network which was constituted as a massive open online course (MOOC). A validated survey instrument measuring self-regulated learning in MOOCs was distributed as a post-course online survey to 2039 enrolled participants. Two hundred seventeen participants completed the questionnaire, equivalent to a response rate of 11%. This rate is higher than the normal response rate to post-course surveys reported in MOOCs. The analysis identified seven specific factors that influence the ways midwives learn in the MOOC. There is strong evidence that midwives' approach to networked learning is aligned to their practice, with findings suggesting that the midwives' learning in the MOOC was characterised through self-reflection and expansive critical thinking. These findings will be of interest to those who plan for and design online, networked learning for health professionals, offering design guidelines; to midwife educators, identifying key learning characteristics of midwives; and to professional bodies, pointing to models for future networked professional learning.

Background: Professional Learning

A midwife is the first and main contact in maternity care. The midwife has responsibility for providing care and support to parents to enable them to make informed choices during pregnancy, throughout labour and during the early postnatal period. Globally, the midwives' responsibility has broadened as maternity care expands. Midwifery practice is changing rapidly, and midwives have to learn continuously throughout their

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career to maintain their knowledge base and their competence to provide contemporary evidence-based care (International Confederation of Midwives, 2011).

Through ongoing and regular continuing professional development (CPD), midwives expand their expertise, professional competence and individual well-being (Collin, Van der Heijden, & Lewis, 2012). Generally, midwives value the opportunity to engage in CPD activities to help them improve the quality of their patient care, to meet professional obligations and to meet personal and professional developmental goals (Casey et al., 2016). Besides giving midwives an opportunity to update their professional knowledge and competences, CPD events and activities act as occasions when midwives can share knowledge and experiences with other, like-minded colleagues (Stirling & Monaghan, 2005).

Midwives often are constrained from engaging in CPD activities because of understaffing, work shifts, family commitments, geographical distance and financial constraints (Katsikitis et al., 2013; Patterson & Davis, 2007). Consequently, there has been a growth in online and networked CPD for midwives to provide opportunities that are flexible, easy accessible and more cost-effective (Carroll, Booth, Papaioannou, Sutton, & Wong, 2009; Gresty, Skirton, & Evenden, 2007; Sidebotham, Dalsgaard, Davis, & Stewart, 2015). It has been argued that there is limited value in online learning for midwives, since online education often is designed for individuals to study alone, with few opportunities to engage within social networks (Gould, Papadopoulos, & Kelly, 2014). However, open, online networked learning environments, such as massive open online courses (MOOCs), offer potential to support midwives in CPD.

Networked learning is defined as:

> learning in which information and communication technology (ICT) is used to promote connections: between one learner and other learners; between learners and tutors: between a learning community and its learning resources. (Goodyear, Banks, Hodgson, & McConnell, 2004, p. 1).

According to Goodyear et al. (2004), networked learning is characterised from connections with interactions between humans and learning resources; interactions with materials alone are not sufficient for learning. According to Jones and Dirckinck-Holmfield (2009), the nature of the networked learning environment is socially and physically networked and is distributed over time and space. Networked learning is mediated by technologies, and ideally technology tools are utilised to support the creation of connections in the networked learning environment (ibid).

A massive open online course (MOOC) is a course that is openly available to large numbers of people, free of charge and regardless of qualifications or prior experience. Some MOOCs are designed to support interaction and peer-to-peer learning across networks of participants (Margaryan, Bianco, & Littlejohn, 2015). Although MOOCs tend to have low completion rates (some courses have fewer than 10% of participants completing the course [Jordan, 2014]), the so-called "invisible" participants appear to use networked learning activities in a MOOC as an extension of their own professional practices (see Chap. 3 by Dalsgaard & Gislev, this volume). As such, MOOCs provide a mechanism for the transfer and sharing of professional knowledge across a network of distributed professionals (Milligan & Littlejohn, 2016). They can be designed to offer networked professional learning that is aimed towards informal sharing in networks, rather than formal training.

Despite the potential of MOOCs as a form of networked professional learning, many MOOCs are designed to support individuals to learn on their own, rather than offering opportunities to exchange knowledge with others within a network (Margaryan et al., 2015). Another problem with MOOCs is that they tend to be designed around a self-guided format that assumes learners can regulate their own learning (Littlejohn, Hood, Milligan, & Mustain, 2016). MOOCs attract a diverse spectrum of learners, with different backgrounds and ability to manage their own learning. Not all learners are able to self-regulate and to learn independently without the guidance of a teacher (Littlejohn & Hood, 2018).

Through self-regulated learning (SRL), learners attain their learning goals through self-generated thoughts, feelings and actions (Zimmerman, 2001). Self-regulated learners are aware of their strengths and limitations and proactively plan their learning through personal learning goals and task-related strategies. Zimmermann's theory views SRL in three cyclical phases: *Forethought Phase*, *Performance Phase* and *Self-Reflection Phase*. The Forethought Phase involves a number of stages including *Task Analysis*, where the learner carries out goal setting and strategic planning, and *Self-Motivation Beliefs* which impinges on self-efficacy, outcome expectation, intrinsic interest and the perceived value of learning and learning goal orientation. The Performance Phase comprises a number of stages such as *Self-Control* which includes imagery, self-instruction, attention focusing and task strategies and *Self-Observation* which is concerned with self-recording and self-experimentation. The Self-Reflection Phase is focused around stages such as *Self-Judgement* where the learner engages in self-evaluation and causal attribution and *Self-Reaction*, encompassing self-satisfaction and adaptive or defensive reactions (Zimmerman, 2000).

Recent research explored how health professionals self-regulate their learning in MOOCs. Those learners who reported high and low levels of self-regulation may be motivated by the same goal (e.g. gaining the certificate of completion in a MOOC), yet they describe qualitatively different self-regulation strategies around how they plan their learning and follow the course pathway, how they self-evaluate their progress and how they perceive their own development (Milligan, Littlejohn, & Hood, 2016). Health professionals who report low degrees of self-regulation tend to follow the pathway planned by the course designers and may become overwhelmed by the volume of course materials and the time required to complete all the tasks (Littlejohn et al., 2016). This often negatively influences their self-perception and how they feel about their progress and learning. Health professionals who report a high degree of self-regulation are inclined to follow their own learning pathways. Consequently, they self-evaluate their progress against their own goals, rather than the goals set by the course designers, and are more likely to view their progress positively (ibid.).

These findings illustrate the sorts of self-regulated learning strategies professionals apply while learning in a MOOC. However, the findings are based on a detailed study in one MOOC. More insight into how professionals plan and perform their learning in open networks is needed, particularly when employers and professional bodies are looking to MOOCs to scale up modes of continuous professional development (Radford et al., 2014).

This chapter expands on these insights into the ways health professionals self-regulate their learning in open, networked learning environments by reporting how midwife practitioners learned in the Evidence-Based Midwifery Practice MOOC.

The Learning Design: An International MOOC for Midwives

The Evidence-Based Midwifery Practice MOOC (EBMP MOOC) was offered over a 6-week period, during April and May 2015. The MOOC was designed as a form of networked continuing professional development (CPD) to midwives and midwifery educators engaged in clinical practice in countries around the world. The course was open to anyone with an interest in evidence-based practice and midwifery and attracted 2098 participants. The aim was to develop introductory knowledge of evidence-based practice, and the learning outcomes specified that on completion of the course, each participant could:

- Search for evidence-based research articles related to midwifery practice
- Analyse research articles and critique the findings at a basic level
- Interpret evidence-based research results in the global context of midwifery
- Critically appraise research literature and understand the politics that underpin research
- Translate and implement research findings into clinical practice

The EBPM MOOC was developed and implemented by three experienced midwifery academics and educators based in Denmark and Australia. The course was hosted on a platform developed from WordPress blogging technology (www.mooc-formidwives.com). All participants were required to register using an email address, so collective messages could regularly be disseminated to encourage participant engagement and interaction. A simple course design structure was used to guide the learners as they navigated their way through the course. There was evidence that this design could effectively support midwives in open online CPD, even those with limited digital literacy (Dalsgaard, forthcoming; Sidebotham et al., 2015; Stewart, Sidebotham, & Davis, 2012a; Stewart, Sidebotham, & Davis, 2012b).

The course was designed around six modules each requiring 4–6 hours study time. Course materials were provided as open educational resources under a Creative Commons license. These resources included Web-based articles, scientific articles, videos and voice-over PowerPoint videos. In ten synchronous, online lectures, eminent international midwifery professors and researchers presented on subjects related to the themes in the modules, with question and answer sessions that allowed the participants to discuss core concepts with the academics. To facilitate networking and communication, the course design utilised a broad range of educational technology tools and learning resource types that supported networked interaction amongst the participants and between learners and tutors. The participants engaged in sequenced learning activities that encouraged them to create and share knowledge, particularly around forms of midwifery practice. Since the participants were

based in different countries around the world, they had opportunity to compare and discuss issues related to practice. Communication was supported through online discussion fora mediated by the tutors and through asynchronous discussions. The participants also requested that additional discussion fora be set up to support learner-directed discussions; one forum—the "MOOC café"—was used to share knowledge and experiences of midwifery practice, while a second collaboration forum was used to support participants sharing and expanding ideas around development projects for midwifery practice. Social media sites such as Facebook and Twitter were also used to support communication and interactions outside of the course platform.

Most healthcare services around the world require midwives to engage in regular CPD; therefore participants were motivated to gain a certificate of completion to demonstrate to their employers that they had participated in the course. To attain this certificate, course participants were required to complete a multiple-choice assignment.

The remainder of this chapter reports on a study examining how the midwives self-regulated their learning as they engaged within the MOOC. The research reported here focuses on a quantitative analysis of participants' survey responses on self-regulated learning. This work is part of a bigger study exploring the design, implementation and learning in the MOOC (Dalsgaard, forthcoming).

Methodology: Survey of Self-Regulated Learning

Survey Instrument

A self-regulated learning survey questionnaire instrument was circulated in July 2015. The survey was a slightly modified version of a published, validated instrument designed to measure self-regulated learning in adult learners in informal learning contexts. The validated Self-Regulated Learning in the Workplace Questionnaire (SRLWQ) measures self-regulatory learning behaviours in informal learning contexts at work (Fontana, Milligan, Littlejohn, & Margaryan, 2015). The questionnaire was adapted to MOOC context as the SRL MOOC questionnaire (SRLMQ) (Hood, Littlejohn & Milligan, 2015). The SRLMQ questionnaire was slightly modified for this study to fit the learning context for midwives in the EBMP MOOC.

The instrument has three sections reflecting Zimmerman's (2000) three phases of self-regulated learning—Forethought, Performance and Self-reflection. Each section measures a range of SRL subprocesses (see Table 2.1).

These subprocesses were drawn from the work of both Zimmerman (2000) and Pintrich, Smith, Garcia, and McKeachie (1991) and were selected for their relevance to a more informal learning context. The instrument consisted of a total of 38 items: 14 items measuring forethought, 18 items measuring performance and 6 items measuring self-reflection. The questionnaire had a further ten quantitative questions: four socio-demographic questions and six questions related to course engagement.

Table 2.1 Phases and subprocesses included in the SRL instrument for non-formal learning in MOOCs (Hood, Littlejohn, & Milligan, 2015)

Forethought	Performance	Self-reflection
Goal setting	Learning and task strategies	Self-satisfaction
Self-efficacy	Help seeking	Self-evaluation
Task interest/value		

A further four open-ended, qualitative questions asked about participants' learning strategies and behaviours.

The survey was circulated to 2039 of the 2098 participants who had enrolled in the Evidence-Based Practice Midwifery MOOC (EBPM MOOC). These participants were made aware that their participation in the survey was completely voluntary and that the data collected would be treated in accordance with the data protection policy. Fifty-nine participants did not receive an invitation to complete the questionnaire because their email addresses were returned as invalid. A total of 217 learners fully completed the survey. Self-report responses were measured using a Likert scale ranging from 1 = "not at all true for me" and 5 = "very true for me". Quantitative responses were analysed using SPSS software (IBM Corporation, 2015). Of the 2039 participants invited to participate in the survey, 217 responded, yielding a response rate of approximately 11%. This response rate is much higher than the average MOOC post-course survey response rate of 2% (Whitehill, Williams, Lopez, Coleman, & Reich, 2015). Exploratory factor analysis was undertaken to determine the latent structure of the midwifery MOOC dataset, to identify the SRL subprocesses that are significant for midwives.

Participant Demographics

The age range of the respondents was normally distributed with 4% of the participants below 25 years of age, 19% between 26 and 35 years of age, 28% between 36 and 45 years of age, 33% between 46 and 55 years of age, 15% between 56 and 65 years of age and 1% aged 66 years or above. As expected with the midwifery context of the MOOC, 95% of the participants were females, while only 5% were males. Around 42% of the respondents were from clinical midwifery practice, 23% were midwifery educators and 23% were from other midwifery-related roles such as researchers, managers or students, while 12% were from other health-related professions. This shows that the sample is representative of the midwifery and healthcare practice. The respondents resided in 46 different countries from, respectively, Africa, Asia, Australia and Oceania, Europe, North America and South America including under-resourced countries such as Bhutan, Myanmar, Nepal, Papua New Guinea and South Sudan. The international distribution of the respondents suggests that the survey participants are representative of the wider population of MOOC participants. Next, the factorability of the 38 SRL items was examined.

Exploratory Factor Analysis

An exploratory factor analysis was carried out, and all factor correlations were tested. The lowest accepted absolute value for factor loadings is 0.3, and each of the SRL items correlated 0.3 with at least one other item, indicating reasonable factorability. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.93, above the recommended value of 0.6, and Bartlett's test of sphericity was significant (c^2 (703) = 6120.370.26, $p < 0.05$). The diagonals of the anti-image correlation matrix were each over 0.5, supporting the inclusion of each item in the factor analysis. Finally, the communalities were all above 0.3 (see Table 2.2), further confirming that each item shared common variance with other items. Given these overall indicators, exploratory factor analysis was conducted with all 38 items.

Principal components analysis (PCA) was used to identify and compute composite SRL scores for each of the factors within the questionnaire. Initial eigenvalues indicated that the *Self-Reflection* factor explained 42.60% of the variance, the *Expansive Critical Thinking* factor 7.16% of the variance and the *Readiness* factor 4.92% of the variance. The *Goal Setting*, *Help Seeking*, *Task Strategies* and *Strategic Planning* factors had eigenvalues of just over one, each of them explaining 4.00%, 3.68%, 3.07% and 2.77% of the variances, respectively. The seven-factor solution, which explained 68.23% of the variance, was preferred because of its previous theoretical support.

Some of the factor labels proposed by Hood et al. (2015) (Table 2.1) described the extracted, for example, *Goal Setting* and *Help Seeking*, and were retained. However, some of the remaining factors comprised a mixture of items from two or more SRL subprocesses and were, therefore, given a more appropriate name. Renamed factors include *Strategic Planning*, *Readiness* and *Expansive Critical Thinking*. *Self-Reflection* emerged as one factor that brings together two distinct factors from earlier analyses (Hood et al., 2015): self-satisfaction and self-evaluation. Internal consistency for each of the scales was examined using Cronbach's alpha. No substantial increases in alpha for any of the scales could have been achieved by eliminating more items.

Composite scores were created for each of the seven factors, based on the mean of the items which had their primary loadings on each factor. Higher scores indicated greater use of the SRL strategy. *Self-Reflection* was the SRL factor that participants reported most frequently, with a negatively skewed distribution, while *Strategic Planning* was the least reported factor. Descriptive statistics are presented in Table 2.3. The skewness and kurtosis are well within a tolerable range, indicating a normal distribution. Examination of the histograms suggested that the distributions appeared approximately normal (see Figs. 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, and 2.7).

Overall, these analyses indicated seven distinct factors with high internal consistency. An approximately normal distribution was evident for the composite score data in this study; thus these data were well suited for parametric statistical analyses.

Table 2.2 Rotated component matrix: exploratory factor analysis for modified SRLWQ scale

Items	Self-reflection	Expansive critical thinking	Readiness	Goal setting	Help seeking	Task strategies	Strategic planning
I often thought about how my learning fitted into the "bigger picture" of my work/practice	0.774						
I considered how what I have learned related to my colleagues or peer learners	0.739						
I tried to understand how what I have learned might impact my work/practice	0.728						
I thought about what I have learned after I finished	0.720						
I knew how well I have learned once I had finished a task	0.644						
I preferred learning that aroused my interest, even if it was challenging	0.638						
I liked opportunities to engage in tasks that I could learn from	0.581						
I asked myself if there were other ways to do things after I finished learning	0.545						
A satisfying thing for me in this course was trying to understand the things I learned as thoroughly as possible	0.506						

Table 2.2 (continued)

Items	Self-reflection	Expansive critical thinking	Readiness	Goal setting	Help seeking	Task strategies	Strategic planning
During learning, I treated the resources I found as a starting point and tried to develop my own ideas from them		0.688					
I tried to play around with ideas of my own related to what I was learning in this course		0.688					
Whenever I read or heard a statement in this course, I thought about possible alternatives		0.653					
When I was learning, I combined different sources of information (e.g. people, web sites, printed material)		0.638					
When I was learning, I tried to relate new information I found to what I already knew		0.603					
I tried to apply my previous experience when learning		0.599					
I read beyond the core course materials to improve my understanding		0.589					
When I studied for this course, I made notes to help me organise my thoughts		0.480					

Table 2.2 (continued)

Items	Self-reflection	Expansive critical thinking	Readiness	Goal setting	Help seeking	Task strategies	Strategic planning
I felt that whatever I was asked to learn, I could handle it			0.763				
I have felt prepared for the demands of this course			0.678				
My past experiences have prepared me well for new learning			0.671				
I think I will be able to use what I have learned from this course in the future			0.510				
I am interested in the topics that were offered in the course			0.506				
The learning that I have undertaken is very important to me			0.461				
When confronted with a challenge, I could think of different ways to overcome it			0.421				
I have set goals to help me manage studying for my learning				0.758			
I have set short-term (daily or weekly) goals as well as long-term goals (for the whole course)				0.748			
I have set realistic deadlines for my learning				0.699			
I have met the goals I set for myself in this course				0.545			

(continued)

Table 2.2 (continued)

| Items	Self-reflection	Expansive critical thinking	Readiness	Goal setting	Help seeking	Task strategies	Strategic planning
I tried to identify others whom I could ask for help if necessary					0.881		
I asked others for more information when I needed it					0.879		
When I did not understand something, I asked others for help					0.868		
I have asked myself questions about what I was going to study before I begin to learn					0.449		
I tried to translate new information into my own words						0.627	
I asked myself how what I was learning was related to what I already know						0.626	
I changed strategies if I did not make progress while learning						0.520	
Even if I was having trouble learning, I preferred to do the work on my own							0.644
When planning my learning, I have used and adapted strategies that have worked in the past							0.419
I thought of alternative ways to solve a problem and chose the best one							0.419

Note: Extraction method: principal component analysis for SRLWQ scale.
Rotation method: varimax with Kaiser normalisation (rotation converged in 14 iterations)
Total explained variance: 68.23%

Table 2.3 Descriptive statistics for the seven SRL factors ($N = 217$)

	No. of items	Mean (SD)	Skewness	Kurtosis	Cronbach's α
Self-reflection	9	3.61 (0.91)	−0.647	−0.166	0.929
Expansive critical thinking	8	3.27 (0.94)	−0.310	−0.472	0.904
Readiness	7	3.77 (0.84)	−0.858	0.566	0.878
Goal setting	4	2.90 (1.02)	−0.033	−0.814	0.842
Help seeking	4	2.57 (1.10)	0.432	−0.702	0.870
Task strategies	3	3.30 (0.93)	−0.216	−0.532	0.758
Strategic planning	3	3.09 (0.90)	−0.164	−0.447	0.583
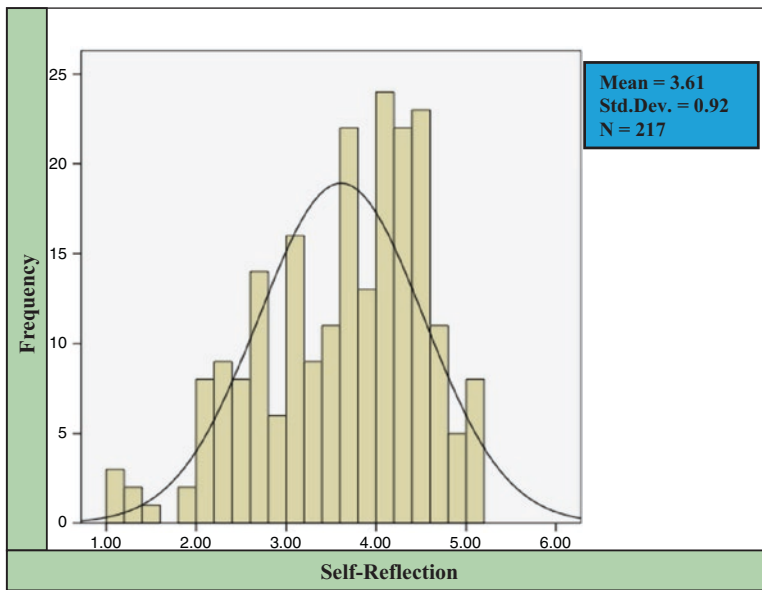
Fig. 2.1 Frequency distribution for self-reflection

Key Components of Midwives' Self-Regulated Learning

Seven factors characterise midwives' self-regulated learning in the MOOC:

- F1: Self-Reflection ($\alpha = 0.929$ for nine items; total variance explained, 42.60%)
- F2: Expansive Critical Thinking ($\alpha = 0.904$ for eight items; total variance explained, 7.16%)
- F3: Readiness ($\alpha = 0.878$ for seven items; total variance explained, 4.92%)
- F4: Goal Setting ($\alpha = 0.842$ for four items; total variance explained, 4.00%)
- F5: Help Seeking ($\alpha = 0.870$ for four items; total variance explained, 3.68%)
- F6: Task Strategies ($\alpha = 0.758$ for three items; total variance explained, 3.07%)
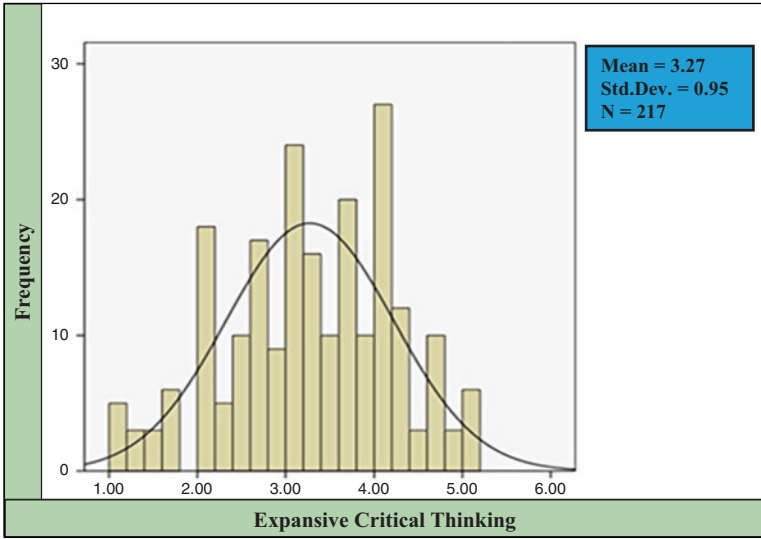- F7: Strategic Planning ($\alpha = 0.583$ for three items; total variance explained, 2.77%)

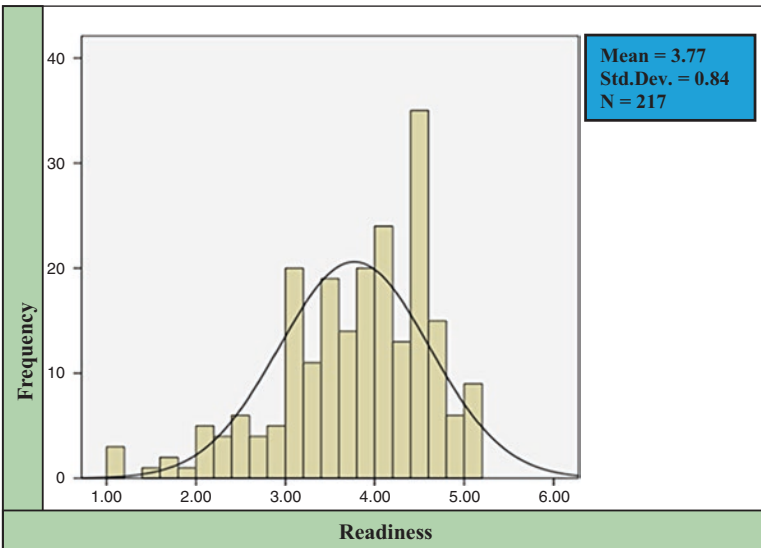**Fig. 2.2** Frequency distribution for expansive critical thinking

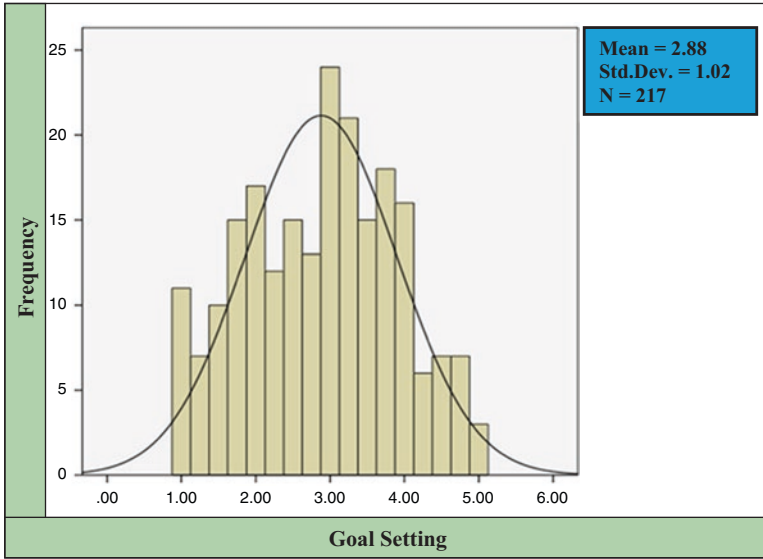
Fig. 2.3 Frequency distribution for Readiness

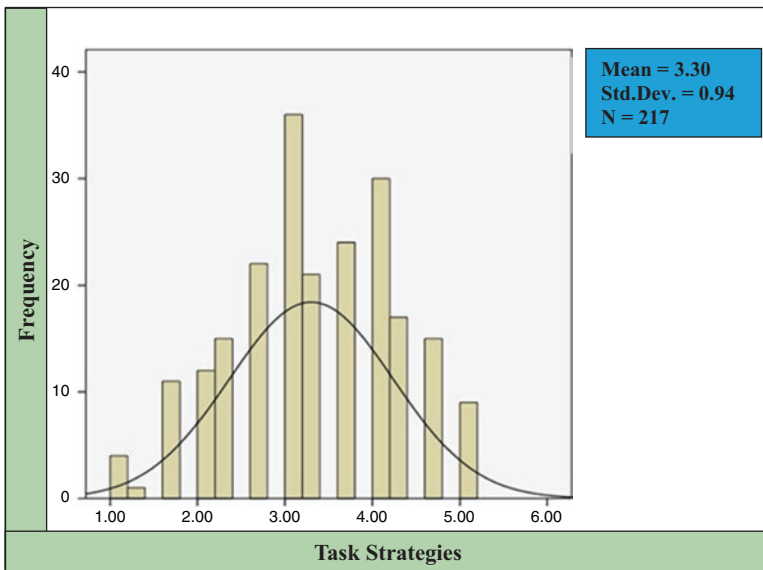**Fig. 2.4** Frequency distribution for goal setting

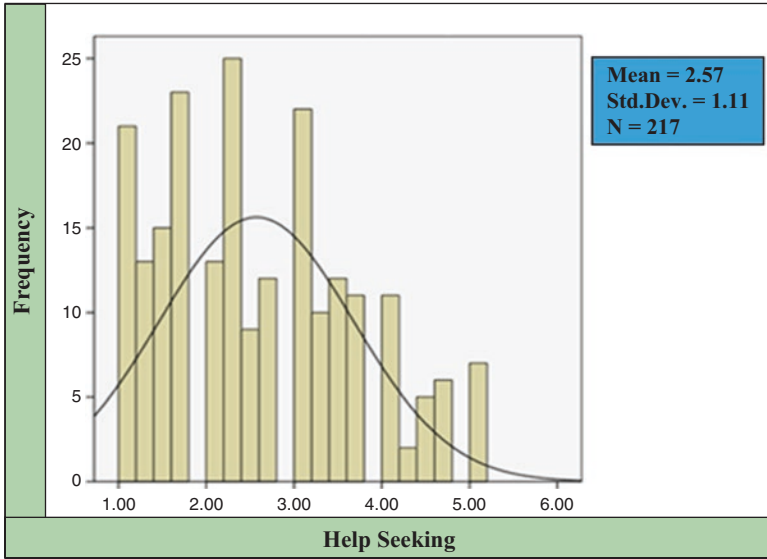**Fig. 2.5** Frequency distribution for task strategies
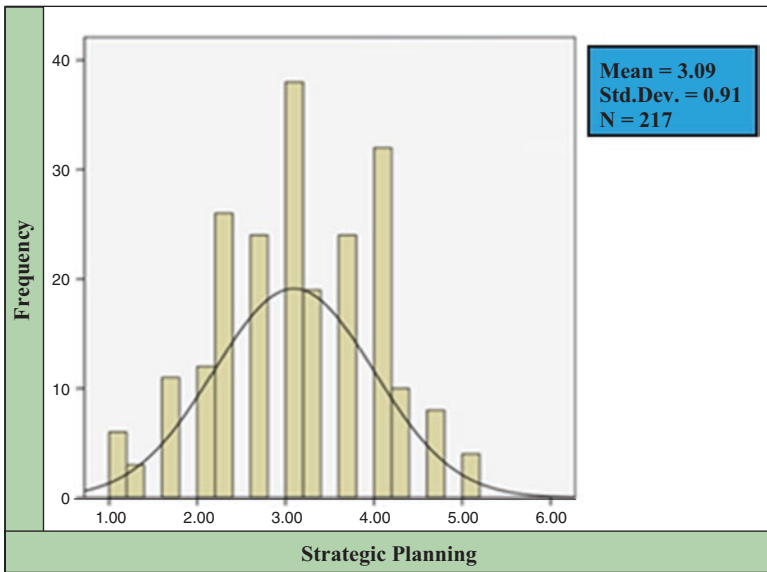
Fig. 2.6 Frequency distribution for Help Seeking

Fig. 2.7 Frequency distribution for strategic planning

Table 2.4 The subprocesses for midwives' self-regulated learning in a MOOC

Forethought	Performance	Self-reflection
Goal setting	Task strategies	Self-reflection
Readiness	Help seeking	
Strategic planning	Expansive critical thinking	

The seven factors have been identified as representing the following subprocesses in the three phases of self-regulated learning described by Zimmerman (2000). The Forethought Phase is represented by the subprocesses F4, *Goal Setting*; F3, *Readiness*; and F7, *Strategic Planning*. The Performance Phase is signified by F6: *Task Strategies*, F5: *Help Seeking* and F2: *Expansive Critical Thinking*. The Self-Reflection Phase comprises one subprocess F1: *Self-Reflection* (see Table 2.4). However, previous studies suggest that Zimmerman's (2000) three phases occur iteratively rather than sequentially (Fontana et al., 2015; Hood et al., 2015), so these three phases may not be distinct.

Self-Reflection refers to the ways learners reflect on and self-evaluate their learning and their satisfaction with their progress. It signifies how learners reflect on their learning in relation to their work. It reflects the learners' understanding of how their learning impacts on their work and practice. It also represents the ways learners evaluate their learning. This factor includes how each learner prefers to learn, for example, do they respond positively to being challenged, engaging in multiple tasks and understanding concepts as thoroughly as possible.

Expansive Critical Thinking relates to the learners' ability to play around with their own ideas as they learn and to think about alternatives to increase their learning. It also indicates the learners' capability to elaborate on their learning through combining different sources of information and relate this to what they already know. Furthermore, this factor reflects that there is an association between critical thinking and elaboration and the strategies the learners have in order to organise and improve their learning.

Readiness describes being feeling prepared for learning. The influence of self-efficacy is apparent, and the relationship between self-efficacy/confidence and interest and value in learning seems important. It also highlights the importance of drawing on past experiences when preparing for new learning. The preparedness seems to be connected to the learners' interests in what they are learning, and it also entails the value and importance of the learning.

Goal Setting is the ability to manage learning time and deadlines, setting both short-term and long-term goals. It reflects the need to be realistic about planning adequate time for learning. Central to goal setting is the idea of meeting goals and adapting ways of learning that have previously been successful. It is about the learners' investment in their own learning.

Help Seeking illustrates the different ways people seek help, including identifying other people who could help them learn, actively asking for information when needed and proactively asking for help when he or she does not understand something. An element of strategic planning, through reflecting upon what is going to be learned, is also important.

Task Strategies is about relating current learning to prior knowledge. It is also about asking oneself what is about to be learned and changing strategies if progress is not made. This factor has the strongest loading of the items.

Strategic Planning refers to the way the learner wishes to address learning challenges. When problems in learning are encountered, people prefer to work alone to select from a range of previously successful strategies for learning and adapt these. This factor has the lowest loading of items.

These processes of self-regulated learning and their implications for professional, networked learning are discussed in the next section.

Discussion: Implications for Networked Professional Learning

This analysis has identified how midwives engage in networked professional learning, specifically focusing on how they self-regulate their learning. A striking feature of the data is the importance of *Self-Reflection*. The mean score for self-reflection reported by the learners was 3.61, with a standard deviation of 0.92 (see Fig. 2.1). It could be argued that this finding signals that learning practice mirrors work practice, since a key feature of working as a midwife is using reflection as a form of critical thinking that enables integration of theory and practice. Midwifery is characterised as an autonomous profession, where midwives continuously have to make critical decisions that have life-and-death implications for birthing women and unborn babies. Therefore, self-reflection is an important and integral way of ensuring that each midwife makes the right decisions based on the best available evidence and clinical experiences (Wain, 2017).

Self-Reflection is about the ways learners reflect on and self-evaluate their learning and their satisfaction with learning. Self-Reflection is a critical form of practice for many health professionals, including midwives, so it may not be surprising that midwives reflect upon how they will learn in the MOOC network. One respondent described how she "spent time when walking thinking about it [learning in the MOOC]" (Respondent 214). To aid self-reflection of their learning, some respondents "took notes during sessions and while reading resources reviewed at the end and wrote a reflection on my own learning and thoughts" (Respondent 32) and "I took the info given in each module, read it, listened to the lectures, then wrote a synopsis of the info" (Respondent 189). Several respondents reported that they took notes to help them reflect on what they were studying in the course.

Another important factor is *Expansive Critical Thinking* which has a mean perceived score of 3.27 and a standard deviation of 0.95 (see Fig. 2.2) This factor is related to critical self-reflection: as learners self-reflect, they gain an understanding of the ways the concepts they learn could be applied to other areas of their practice. The approach of midwives to learning through expansive critical thinking reinforces the idea that they integrate learning with practice. Their responses indicated that midwives want to pinpoint where and how specific concepts they are learning might help them in the future, hence "expansive" critical thinking. This combination of

reflective and *expansive learning* characterises how midwives learn within the network. This finding reflects the approach to practice of midwives and other health professionals who tend to learn through thinking about alternative forms of practice that could be used to achieve specific outcomes. In maternity care and healthcare, professionals need to be able to offer the best available treatment for patients. Sometimes the best treatment might not be the most obvious solution, so midwives need to be able to think critically to find solutions.

Expansive Critical Thinking is about being able to elaborate on one's own learning and extend it across different contexts. Some of the respondents reported that they expanded their learning by looking for extra information. Typical responses included "each module took a lot longer […] as I looked for more information, or clicked on all the links" (Respondent 22) and "I do my own independent study and added the course into my routine. It mainly involved me reading before starting a module then reading about specific things I had learned in the module afterwards" (Respondent 5).

Another important factor is *Readiness* to learn, which has a mean perceived score of 3.77 and standard deviation of 0.84 (see Fig. 2.3). *Readiness* to learn is important for professionals learning in a MOOC, because they need to have the confidence and ability to be proactive in scaffolding their own learning. This factor connects the learners' interests in what they are learning with the value they place in what they are learning.

Readiness is about feeling prepared to learn. It relates to learners' self-efficacy, confidence, interests and values. Respondents reported that they felt prepared to be able to learn from the course: "I studied basically from the availed materials, articles and videos, which seemed very interesting and actually simple in terms of language and precision" (Respondent 169), and "I really wanted to do the assessment at the end so worked quite hard for the last weeks to finish of[f]" (Respondent 212). Some of the respondents did not feel prepared to complete all the course learning activities due to time constraints, professional workload or technological issues.

Readiness for learning and *Goal Setting* is part of planning, which has a lower mean score of 2.88 and a standard deviation of 1.02 (see Fig. 2.4). Goal setting involves setting short-term and long-term goals and managing time. Goal setting is particularly important when learning in a MOOC, since the participants have to allow time to interact with others, connecting and responding to feedback. The combination of setting goals to optimise readiness for learning is particularly important when learning in open networks. For some midwives, goal setting means defining personal goals. For example, Respondent 75 said "I had weekly goals". For many of the midwives, *Goal Setting* focused on managing how they spent time engaging in the course. Working in shifts and family demands (e.g. caring for young children) constrained the time many of the midwives had available for learning. Some organised themselves by allocating a specific amount of time as regular times slots for the course on a weekly basis: "I put a note in my calendar and found a quiet hour or two each week to look a[t] the material" (Respondent 165), and "I tried to give 2–4 hours daily" (Respondent 107). Others found time to engage at work during lunch breaks, or late evenings, weekends or off-duty time at home: "I would try and do the readings

et cetera during the week and then listen to presentation when I was sure I would have time undisturbed" (Respondent 209). Some midwives found it difficult to plan time for studying, and they had to find the time when it was possible: "Spasmodically as had to fit it in with a lot of other commitments" (Respondent 41).

Help Seeking and *Task Strategies* are two other important factors. *Task Strategies* has a mean score of 3.30 and standard deviation of 0.94 (see Fig. 2.5). This factor represents all the different strategies learners use while learning in a MOOC. It is important that if a specific way of learning does not support the learner, then he or she has to be able to find other ways to learn in the MOOC.

Task Strategies is about the ways learners personalise their learning through translating the information into their own words and relate to prior knowledge. The respondents reported that they engaged in the learning resources and activities by reading articles, watching videos and participating in the synchronous online presentations such as: "I did look at the relevant documents of the modules, listen to sermons downloaded and tried to understand the information given" (Respondent 137), and "I would try to review things weekly, but missed some weeks and caught up at other times" (Respondent 196). Many of the respondents stated that they went back to learning resources and downloaded the learning resources and activities to be able to revisit the resources for a deeper engagement on a later occasion: "I took time to download materials that I read afterwards" (Respondent 63) and "downloaded and read later" (Respondent 69).

Help Seeking is a specific type of learning task strategy. This factor had a slightly lower mean score of 2.57 and standard deviation of 1.11 (see Fig. 2.6) and is an important strategy for learning in a MOOC. It involves identifying and connecting with others who can offer relevant information and help learning. Help seeking is about to seek help when learners do not understand something.

Some respondents reported that they participated in the discussions in the synchronous online sessions and the forum discussions and "asked questions online when confronted with doubts" (Respondent 111). Some of the respondents were also seeking for help from and discussed their learning with others such as "discussing some of the research and citrate information with another midwife" (Respondent 11) or "discussions with colleagues and the forums" (Respondent 140). Not all learners did seek for help through interactions with other learners, but they got the information they were looking for by watching the dialogue between other learners in the discussions fora or chat rooms without interacting: "Read what others had written in the chat rooms" (Respondent 89).

Strategic Planning has a mean score of 3.09 and standard deviation of 0.91 (see Fig. 2.7). This factor refers to the way learners plan to use the various task strategies and forms of help seeking as they perform their learning. Strategic Planning is about the ways learners would like to address the learning tasks in the course and to be able to change these strategies if needed.

Many of the respondents emphasised the importance of how they planned their engagement in the course as "being systematic, read the intro, listen to recordings, watch video clips, download recommended resources, make notes, review feedback from others" (Respondent 4), and "while I try to modify my daily activities to fit in

with the time for the live presentations. Sometimes I had to wake up at midnight to participate in the live presentations" (Respondent 186). When the strategies are not possible to maintain, then learners are able to select from other successful strategies for learning they may have used previously. Respondents said, "I intended to go through the entire course (watch all videos and read all readings), but … I found myself not having enough time in my schedule. So I eventually ended up seeing the videos not in their entirety" (Respondent 115) and "[I] tried to complete each week within each week. This didn't always go to plan. Would settle down for several h[ou]r blocks at a time" (Respondent 167).

One of the most interesting findings is that Task Strategies, Help Seeking and Strategic Planning all represent the ways that midwives plan and perform different ways of learning within the MOOC.

It is important to consider some limitations of the study. The survey instrument used was a slightly modified version of a validated survey instrument (Fontana et al., 2015; Hood et al., 2015) to measure the subprocesses of SRL. A total of 217 respondents completing the survey with 38 items meant the sample size was sufficient for conducting an exploratory factor analysis (Henson & Roberts, 2006). The free text from the survey has added to the understanding of the seven subprocesses for midwives' self-regulated learning in a MOOC that emerged in the exploratory factor analysis in this study. However, more research is needed focusing on the learners' experiences of professional networked learning in online learning contexts such as MOOCs to expand the understanding of how professionals self-regulate their learning in open networks.

Conclusion

This study gives insight into the ways professionals engage in networked learning, as they draw on the available resources, experts and peers within the network. Midwives use a number of approaches to networked professional learning, through a combination of learning task strategies—of which help seeking is a specific case—and strategic planning. Planning largely is through goal setting and is aligned with an appreciation of each individual's readiness to learn. What is clear is that there is not a discreet delineation across the phases of planning, performing learning and reflecting on learning. These phases appear to be fluid and dynamic, rather sequenced than ordered in time.

This study provides clear evidence that professionals' tactics for networked learning are aligned to their approach to practice. We have strong evidence that the way midwives self-regulate their learning in a MOOC largely is characterised through self-reflection, as they reflect on what they have learned and what they need to learn next, and expansive critical thinking, as they learn and plan how they will apply this learning across different areas of practice. The intertwining of work and learning is a known phenomenon in professional learning (see, e.g. Billett, 2001; Fuller & Unwin, 2011). However, this study offers substantial empirical evidence

that professional networked learning is characterised and shaped by the approach to professional practice. This finding is important for HR professionals and those who design professional development, since it gives confirmatory evidence that professional development activity should be designed in ways that align with professional practice in different disciplines. The finding also highlights the complexity of designing professional learning where people from diverse professions are expected to learn together.

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