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Prof. Dr. Thomas Köhler
Prof. Dr. Nina Kahnwald
Prof. Dr. Eric Schoop
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Wissensmanagement II

1 Assessing Informal Social Learning at the Workplace – A Revalidation Case from Healthcare

Michael Steurer [1], Stefan Thalmann [1], Ronald Maier [1],
Tamsin Treasure-Jones [2], John Bibby [3], Micky Kerr [2]
[1] University of Innsbruck School of Management, Innsbruck, Austria
[2] Leeds Institute of Medical Education, University of Leeds, Leeds, UK
[3] NHS Yorkshire and Humber, UK

Abstract

This paper explores how informal learning can be assessed in the work environment which bears difficulties, as informal learning is largely invisible and people lack awareness of informal learning. We perform an exploratory case study involving 24 healthcare professionals representing small and medium sized enterprises (SME) in six healthcare networks in the UK. We use the existing revalidation procedure as implemented by the National Health Service (NHS) England to discuss our results. Our results comprise a description of six indicators, three of which can be used to assess informal learning activities and three of which can be used to assess informal learning outcomes. Our findings stress the importance of the social context of informal learning at the workplace. Finally, we discuss the implementation of these indicators to support informal social learning.

1 Introduction

Informal learning is seen as the most important way to acquire and develop skills and competencies within the workplace (Boud & Middleton, 2003). The field of informal learning is complex, though, and capturing the possibilities it creates and that emerge from it is difficult (Antonacopoulou, 2008), particularly assessing informal learning, as it is largely invisible, much of it is taken for granted or not recognized as learning. Consequently people lack awareness of informal learning (Eraut, 2004). Assessing informal learning is crucial for organisations as they primarily focus their efforts on concepts which can be assessed, furthermore informal learning is in danger of escaping the attention of managers and policy makers if it does not become subject to assessment (Skule, 2004). However, Marsick (2009) argues that informal learning is hard to "standardize, systemize and assess" and despite the rising attention on informal learning in adult education, research on outcomes of informal learning is limited (Eraut, 2004). There is a lack of indicators for assessing informal learning at work due to inadequacies in contemporary theories of workplace learning (Skule, 2004).

As the focus on informal learning is a recent phenomenon, theories are discordant on how to assess informal learning. As a result there are only a limited number of approaches for how to analyse and assess informal learning (e.g., Cheetham & Chivers, 2001; Eraut, 2004; Gola, 2009; Livingstone, 2000; Schugurensky et al., 2006). The present work contributes to closing this research gap on assessing informal learning by exploring the usage of indicators for assessing informal learning in six healthcare networks in the UK.

The remainder of this paper is structured as follows. In section 2, we lay out the background necessary for this research. In section 3, we describe the study design, the research methods and the performed procedure. In section 4, we present the results of this research. In section 5, we discuss results and limitations before concluding and providing an outlook in section 6.

2 Background

Learning has been a field of study throughout history. Over time the understanding of learning changed from learning as a product to learning as a process, or rather "a dialectical interplay of process and product" (Hager, 2004). Marsick (1987) supports this view on learning by defining learning as "the way in which individuals or groups acquire, interpret, reorganize, change or assimilate a related cluster of information, skills and feelings. It is also primary to the way in which people construct meaning in their personal and shared organisational lives". Having a process view on learning provides advantages, especially when focusing on workplace learning, as work practises can be seen as processes, too (Hager, 2004). Although informal learning is the main focus of the present work, formal learning or training is also an important component of workplace learning and therefore cannot be ignored. Formal learning is promoting informal learning in the workplace as informal learning is often observed taking place in or near formal education settings (Eraut, 2004; Svensson et al., 2004).

Informal learning already took place a long time ago when apprentices learned their craft from their masters or when shop workers were advised to watch an experienced member (Marsick, 2009). Informal learning is increasingly promoted because of the changes in work organisations and the appearance of new types of management (Garrick, 1998). As a result organisations recognise that informal learning is the most pervasive type of learning in the workplace environment (Marsick & Volpe, 1999). Furthermore, informal learning provides a contrast to formal learning and has a stronger focus on the social significance of learning from others, as it takes place in a much wider variety of settings than more formal forms of learning or training (Eraut, 2004). The important interplay of both the informal and the social character is further emerging in research on learning in the workplace (Hart, 2011).

Therefore, informal learning is defined in this work in contrast to formal learning as learning that is often unintentional or opportunistic (Berg & Chyung, 2008; Marsick & Volpe, 1999), non-institutional and not highly structured (Eraut, 2004; Marsick & Volpe, 1999), experiential and primarily under the control of the learner (Marsick et al., 1999; Marsick & Watkins, 1990). Most informal learning occurs within social contexts (Eraut, 2004; Marsick, 2009), its outcomes are difficult to predict (Clarke, 2004; Marsick, 2009) and difficult to support by ICT (Maier & Thalmann, 2010).

There is an increasing interest in researching informal learning (Cunningham & Hillier, 2013; Eraut, 2004). The assessment of informal learning is seen as crucial, as activities that are not assessed are in danger of being overlooked in organisations (Skule, 2004). Researchers have claimed that there is a lack of methods and tools for assessing informal learning (Clarke, 2004; McCauley et al., 1994) due to the invisibility and complexity of informal learning when it comes to its description and the analysis of its outcomes (Clarke, 2004; Eraut, 2004). Furthermore, informal learning often takes place ad hoc as an unplanned activity; therefore no specific outcomes can be defined ex ante (Clarke, 2004). People lack awareness of their own learning and subsequently might not be able to report about their own learning (Eraut, 2004). Although informal learning "takes place along a continuum of conscious awareness" (Marsick & Watkins, 1990), the degree of conscious awareness of the learner still plays a key role when it comes to the clarity of learning. Learning is often an unintended consequence of a task conducted in the daily routine (Marsick & Watkins, 1990). Due to the pivotal role of contextual factors, we address the research gap on the assessment of informal learning by exploring the phenomenon of interest in the context of six healthcare networks in the UK.

3 Study Design

The goal of our study is to investigate how informal learning can be assessed in workplace settings. To achieve this goal, we conducted 24 semi-structured interviews, with members of six SME networks, within the English healthcare sector between March and September 2014. The networks and key informants were selected based on convenience sampling. We organised our investigation into two phases. First, we interviewed six key informants, second, we interviewed 18 informants. Key informants occupied a central role in the network, e.g., network manager, and had a good overview of the network members and activities. The key informant interviews took approximately two hours and were conducted face to face. The goal was to get a first overview of the networks and to identify promising candidates for the subsequent informant interviews. The informant interviews took approximately one hour each and were conducted via telephone. Focussing on practices of their daily work enabled us to identify and to investigate phenomena of informal learning at the workplace.

We interviewed between one and four informants in each of the six networks to gain a deeper understanding of each network and to create a multi-perspective view on our phenomenon of interest. We allowed for the interviews to build on each other, complement, challenge and extend intermediate findings from interview to interview to develop our understanding and theorizing. Table 1: Demographics and number of interviews in healthcare networks provides a description of our sample.

Table 1: Demographics and number of interviews in healthcare networks

	HC-N1	HC-N2	HC-N3	HC-N4	HC-N5	HC-N6
No. of members	41 GP1 practices	27 practice managers	511 GP practices	50 senior consultants and nurses	2600+ GPs	150 GPs
Foundation	2013	1997	2013	2014	2011	2013
No. of key agent interviews	1	1	1	1	1	1
No. of agent interviews	1	4	5	1	3	4

The audio-recorded interviews were transcribed verbatim, anonymized and cleansed. We checked the transcripts for accuracy and reliability and analysed them by an informed inductive coding procedure, carried out with Atlas.ti. We strived to identify categories (indicators of informal learning) from the material itself, not from theoretical considerations (Mayring, 2014). We discussed and revised the existing codes again and started with the interpretation of the data (Mayring, 2014).

4 Revalidation Scheme in Healthcare

The already existing approach of assessing the doctors' (informal) learning is presented, namely the revalidation scheme as implemented by the NHS England (NHS England, 2014). This scheme has been followed by the NHS since November 2012 for all doctors in every organisation throughout the country. Appointed Appraisers, who are typically practising physicians themselves, appraise about ten other doctors annually as an extra part of their job. The outcomes of these successive annual appraisals are summarised for revalidation every five years by the GMC to then be combined with further clinical governance information in order to develop a holistic view on each doctor's practice. The primary goal of this revalidation process is the assurance that licensed doctors are up-to-date and fit to practise. In order to ensure the attainment of this goal, Appraisal Leads do train and oversee the quality of the Appraisers in the respective regions. For the appraisal process itself, six different

categories are considered which are basically introduced in the following and will be explicated in more detail in section 4 (Results): (1) The continuing professional development; (2) the involvement in any quality improvement activities in a doctor's work; (3) the reflection on all significant events that occurred throughout the year (the term "significant events" is defined in the section below); (4) every five years a doctor obtains feedback from colleagues using a formal collated tool which are then discussed with the Appraiser; (5) feedback is not only obtained by colleagues but also by patients; (6) review of complaints and compliments as a type of patients' feedback.

Additionally, every appraisal starts with a review of a doctor's previous personal development plan in order to discuss the goals a doctor has achieved and those not achieved. Approximately two weeks before the appraisal takes place, the doctor sends his portfolio of evidence to the respective Appraiser. For the revalidation itself the doctor and the Appraiser meet face to face to be able to discuss the doctor's learning. On the basis of five successive appraisals the Responsible Officer then makes a recommendation to the GMC on whether the GMC should revalidate the doctor or not. The final decision rests with the GMC.

5 Results

Our analysis of the study interviews led us to identify categories which we believed can be seen as indicators of informal learning. We found that several of the categories (indicators of informal learning) are supported and already applied within the revalidation scheme, but further categories are also proposed (based on the study data). Thus, a categorisation system has been developed and is now brought together with the existing categories from the revalidation scheme (see Table 2: Categories to assess informal learning). Although we indicate a distinction between the categories focusing either on an informal learning activity or an informal learning outcome, the categories should be seen as complementing each other. Informal learning activities are expected to have an outcome (this expectation is built into the revalidation scheme, since doctors are asked to describe the outcome or impact on practice of all learning activities reported). However, within our proposed scheme we are also interested in capturing a wide set of learning activities separate from outcomes as well. We recognise that it is not realistic to expect that professionals can reflect on every informal learning activity and report its specific impact on practice. So the approach we are proposing would give us a larger set of quantitative data (the learning activities indicators) to analyse as well as the richer, qualitative data that links some of the specific learning activities to outcomes.

Table 2: Categories to assess informal learning

Category	Informal learning		Derived from the Study	Present in the Revalidation scheme
	Activity	Outcome		
Time invested	x		x	x
Significant event analyses (SEA)	x		x	x
Active engagement in work-related networks	x		x	
Applying and sharing knowledge		x	x	x
Feedback		x	x	x
Change in behaviour		x	x	x
Quality improvement activities				x

5.1 Informal Learning Activity

In regard to the informal learning activity itself, in both cases the **Time invested** in informal learning activities is seen as being an indicator for assessing informal learning. We recognise that this indicator may not be significant (e.g. simply turning up at a meeting or reading a paper does not in itself necessarily lead to learning). However, it has the advantage that it can be easily measured and reported; and taken together with other indicators we feel it will be useful.

Study: First and foremost time is in focus when agents are facing high workload, work pressure and consequently perceive stress. Although time is believed to be precious in the healthcare sector, agents are valuing the investment of time in informal learning in order to keep up to date and learn successfully. The expectation of the agents is that time invested in informal learning and the performance of informal learning are correlating positively. In this regard an agent pointed out the positive correlation between time invested and the success of informal learning [HC-N5-2]: “It has to be picked off learning in the sense of the more time you read things the more you’re learning for yourself.” Another agent highlighted the importance of making time for informal learning in order to keep up to date by mentioning [HC-N2-1]: “You have to make time for [meetings]. I can’t see how we would improve how it is currently without a lot of change and a lot of effort really.”

Revalidation scheme: This category is also supported by the already existing revalidation scheme in the NHS England and is labelled: ‘Continuing professional development’. In the revalidation guidance it is stated: “Good medical practice requires you to keep your knowledge and skills up to date and encourages you to ‘take part in educational activities that maintain and further develop your competence

and performance" (NHS England, 2014). For the appraisal the doctors are asked to reflect on these learning activities, highlighting the main learning points and the way their practice changed based on this learning. Also in the interviews in the study it was mentioned that time invested in the professional development is already a relevant category [HC-N6-2]: "So [doctors] have to show that they're keeping up to date […] by demonstrating they've [spent an appropriate amount of time] each year of recognised continuing professional development."

Consequently, agents from the healthcare sector expect informal learning to be successful the more time is invested as they are consequently better able to handle daily challenges and improve services. Although time invested in informal learning is commonly included as an indicator, its significance in isolation is limited and thus it should be interpreted in connection with the other categories.

The **SEA** is another category mentioned in the empirical study by several interview participants as well as the revalidation scheme. As defined by the NHS, a significant event *"is any unintended or unexpected [event] which could have or did lead to harm for one or more patients receiving NHS care"* (National Patient Safety Agency, 2014). According to the revalidation guidelines this includes also events *"which did not cause harm but could have done or where the event should have been prevented"* (NHS England, 2014).

Study: It is possible that an increase in the percentage of significant events a person reflects upon correlates positively with the performance of informal learning as these analyses facilitate learning. An agent backed up this expectation arguing that he regularly analyses these events [HC-N3-3]: "You know, […] to take time out to look at those problems and say: 'Alright, why did that happen […] and what can I learn from that?'" A similar argument is brought up by another agent, who talked about how these can be seen as learning opportunities [HC-N6-3]: "And sometimes you learn more when something doesn't go so well than when it does go well, clearly you don't want things to go badly for your personal development." Thus at one level the organisation wants to reduce the number of significant events that occur, but it is important that when these events do occur they are recognised and learned from, so that practice can be improved.

Revalidation scheme: This second category is as well supported and already implemented in the revalidation scheme in the NHS and is labelled: 'Significant events'. The NHS wants the doctors to collect the occurred significant events either by their employer, or in case they are self-employed, by themselves (NHS England, 2014). For the appraisal the doctors are then asked to reflect these situations in which

they experienced a significant event and also highlight main learning points and the changes they made to their practice. For the appraisal process it is important that (1) doctors participate in the reporting process within their organisation, (2) they reflect explicitly on the event and document the main learning points or their lessons learnt, and (3) they infer conclusions and adapt their practice accordingly to prevent a similar significant event occurring in future (NHS England, 2014).

Agents see significant events as learning opportunities and a way to improve their practice in the future. This future improvement is ensured by regularly conducted SEAs which facilitate successful informal learning.

Active involvement in work-related networks is described throughout the interviews as an important **trigger** for the informal learning activity, but is not yet implemented as a category in the revalidation scheme in the NHS England.

Study: In the healthcare sector, several network activities start off informal learning activities. Informal learning might take place based on a) meetings and workshops, b) newsletters and new guidelines, c) informal discussions either online or face to face, d) non-routine situations, or e) significant events occurring as already described above. There might exist plenty of other triggers, therefore this list is far from being complete. Thus, it can be expected that informal learning activities take place regularly over the course of a working day. One motivation for taking part in these activities, is that it reduces doubt or insecurity in applying practices in the daily routine. PUNS and DENS (**P**atient's **U**nmet **N**eed triggering the recognition of a **D**octor's **E**ducational **N**eed, see also Royal College of General Practitioners (2010)) is one recognised way in which doctors recognise such a doubt or insecurity about their practice and thus identify and address a learning need. Doctors, who actively engage in these network activities appear to value the support and advice of other doctors to help address their learning need and improve their practice. An agent stated in this regard [HC-N5-2]: "If people do have complicated cases through the social network group they often post a case and people talk about it, they say: 'Well I would have done this' or 'Did you try doing that?' or 'Have you thought about diagnosis x?' And you can often get up to, you know, 50 or 60 other doctors in different parts of the country giving you a, not even a second or third opinion but a 40th or 50th opinion about a clinical case and it's through asking questions that we often learn, so the questions someone else asks triggers something that you might have thought and, you know, we build upon that." That insecurities in applying a practice are reduced is stated by the same agent [HC-N5-2]: "And so what we're now doing is that we're all tacitly either learning that so next time we have a phone call from a worried mother it will in some way influence your judgement whether you give an appointment or not because of this

thing that you read and you know that 50 of your colleagues are all going to do, give that appointment in the same situation." Another agent backed the notion up that if a person feels comfortable within a network a discussion might be more productive as he stated [HC-N6-3]: "Because those people are comfortable and confident with each other they will be far more open and often as a consequence a conversation, the discussion becomes far more constructive."

Although this category is not supported by the current revalidation scheme, our study provides evidence that active engagement in a network may be an important indicator for informal learning. The indicator also highlights the importance of social interaction in informal learning.

5.2 Informal Learning Outcome

Regarding the outcome of informal learning, our interviewees reported they feel they learned well informally if they were able to engage in **Applying and sharing knowledge.**

Study: Applying and sharing knowledge was reported by several agents throughout the interviews as an indicator showing that they learned successfully. As an agent stated [HC-N6-1]: "I think I've got much better at writing reports quickly, […] at answering emails succinctly, at arranging face to face meetings when they're necessary and you need to go and visit people sometimes, you know, and supporting […] new doctors I think is really important too, so […] it's been fascinating". This agent therefore improved his knowledge and skills as a result of informal learning which was reflected in his daily routine as he was able to carry out his tasks in less time and feeling more comfortable doing it. The same agent reported a further informal learning episode [HC-N6-1]: "[A healthcare professional] helped me a lot with the IT systems at the practice that we use, so you know, and I'm now going to write that down after this phone call and I will present it at a meeting on Thursday". In this case the agent felt confident in his acquired knowledge so that he was willing to present and share it at the upcoming meeting to other healthcare professionals. Another agent reported the publishing of a paper after several discussions within a social media network [HC-N5-3]: "It was a fascinating process […] I certainly hasn't published a paper like that before […] and afterwards I got asked to lead discussions on it and in conferences and stuff, I mean I don't set myself up as a great expert on it but it was interesting, I got a television interview off it well, which is another interesting experience". This agent was able to attract professional attention based on his published informal learning episode.

Revalidation scheme: This category is partly supported. The development and application of knowledge and skills is at the heart of the revalidation scheme. However, the sharing of knowledge, as it is proposed by our study, is not explicitly focused on in the revalidation scheme.

We consider Applying and sharing knowledge to be a relevant category in order to assess the performance of informal learning which once again stresses the importance of social interaction in informal learning. During our analysis of the interview data we identified the following subcategories of Applying and sharing of knowledge.

Feedback obtained from other persons (e.g. colleagues) is supported by both the study and the revalidation scheme. However, there is a difference, between the study and the revalidation scheme, in the type of feedback, regarding the timeframe in which feedback is obtained as well as who might provide feedback within the work environment.

Study: Our interviewees reported they receive feedback regarding other members' satisfaction on the success of their own informal learning either in informal conversations, through newsletters or in the course of meetings or workshops. If knowledge is shared via IT the absence of feedback or response is often seen as an indicator that everything worked out fine. This was argued as follows by an agent [HC-N5-2]: "If I've had no negative comments for a month or two months that means good things are happening." However, in face to face situations, e.g., after meetings or workshops, people rather expect and welcome feedback on how people perceive the knowledge which is shared. An agent mentioned in this regard [HC-N1-1]: "[We] asked our members to confirm, you know, how useful they found the [meeting] sessions. […] So it can help us to shape agendas in the future." Another agent backed this up [HC-N6-1]: "Well you hear people telling you how useful a piece of advice has been." Thus, positive feedback on shared contents indicates that the person sharing knowledge is able to explain it and therefore has learned well and that the person acquiring shared knowledge perceives that he has understood and that the knowledge is useful. As such this feedback is actually an indicator of successful informal learning for the advice giver as much as for the advice seeker.

Revalidation scheme: As stated in the revalidation guidelines (NHS England, 2014), feedback is obtained via a standard questionnaire. One objective of this category is inferring direct conclusions from the feedback in order to enable further professional development as well as to reflect on professional skills and the behaviour of a doctor. The doctors use a standard questionnaire to elicit feedback from their colleagues and another standard questionnaire to elicit feedback from patients. The feedback from both colleagues and patients is discussed with the respective Appraiser in the course of the revalidation process.

The category Feedback we derived from the study focuses mostly on the developed knowledge that is then applied and shared, Feedback as defined in the revalidation scheme focuses on the doctor's performance and is evaluated by both colleagues and patients. Therefore, we suggest enhancing the Feedback category to include the feedback on shared knowledge by colleagues. This category is especially important considering the social significance of informal learning as it is discussed below.

Change in behaviour or change in practice as the second subcategory of Applying and sharing knowledge is another outcome of informal learning.

Study: The change in behaviour of agents might be based on the development of knowledge, on a significant event, on feedback or on knowledge provided by other agents. As one agent stated [HC-N3-3]: "I have regular sessions, where I reflect on my own personal performance and whether I'm working as well as I can or whether I need to think about maybe changing the way I've done something". Another agent mentioned (informal) learning based on having discussions which then trigger a change in their practice [HC-N2-4]: "Because sometimes some of the steps that you've made either don't work very well or […] you know, they might need changing […] we do review everything […] all the time and make improvements […] we only discuss things that are tricky or you don't know the answer to." Agents seem to expect learning to lead to changes in their behaviour (improvements in practice); this is considered to be successful (informal) learning.

Revalidation scheme: Doctors are asked throughout the revalidation process to reflect on and to document how their (informal) learning affected their practice. Consequently, based on our study and supported by the revalidation scheme, we propose this category for the assessment of the informal learning outcome.

We found one category which is supported by the revalidation scheme but not by the study. This category **quality improvement activities** was hardly mentioned by the agents throughout the interviews and was not mentioned directly related to the performance of any informal learning episode. Certainly doctors are focusing on quality improvement activities but as we found in our study they do not directly connect the changes they make to their practice (based on learning) to the quality improvement of their services. The quality improvement activities are not specifically defined by the national guidance and are up for interpretation to the respective Appraisers, although examples such as clinical audits or case reviews are mentioned in the revalidation guidelines (NHS England, 2014).

6 Discussion and Limitations

The informal learning concept as it is defined for this work helped identifying indicators of successful informal learning in the working environment. We found the social aspect to be an important characteristic in several indicators of informal learning. Our interviewees highlighted this particular in relation to social software, which is more and more used in organisations as social knowledge environments (Pawlowski et al., 2014). The examples of informal learning activities we found in our study lead us to label this as informal *social* learning. The social aspect is also present in the PUNS & DENS approach discussed earlier. In this approach the social environment contains at least one doctor and the respective patient, giving rise to the doctor's educational need. Additionally our findings suggest that doctors will often address their learning need in a social context, by engaging with others.

In the following, we will discuss the implementation of these indicators, to ensure the proposals are practical. There are several tools being developed by the Learning Layers' (LL) project[1] context which support the documentation of the proposed categories and therefore could support the assessment of informal learning. These tools heavily rely on the social context which is represented in a semantic layer that connects the tools with each other. Table 3: Implementation of proposed categories with LL tools shows which LL tools can support collecting indicators under each category.

Table 3: Implementation of proposed categories with LL tools

Category	Learning Layers' Tool
Time invested	Bits & Pieces (reflections and time recorded)
SEA	Living Documents (authorship of SEA report) Bits & Pieces´(personal reflections on SEA)
Active engagement in work-related networks	Help Seeking Tool (discussions and Q&A) Bits & Pieces (contributions to shared sense making) Living Documents (contributions to knowledge development)
Applying & sharing Knowledge (Feedback)	Help Seeking (answers given and feedback/rating of answers) Living Documents (documents shared and commented) Bits and Pieces (learning episodes shared and commented)
Applying & Sharing Knowledge (Change in behaviour)	Living Documents (change in practice planned and documented) Bits & Pieces (personal reflections and change in practice recorded)

1 http://learning-layers.eu/; detailed information about the tools can be found in deliverables D1.2, D2.2, D3.2, D4.2 and D5.2 at http://learning-layers.eu/deliverables/.

In order to establish the doctor's time invested in learning and his continuous professional development, a proper way to document the hours spent on informal learning is required. For this, the LL Tool "Bits & Pieces" is being developed to support the recording and sense-making of (informal) learning experiences on a regular basis. This tool allows the easy collection of, organisation of and reflection upon (informal) learning experiences which than can be shared with (or further developed with) colleagues or be exported in order to use them as evidence in the revalidation process. The reflection about significant events and consequently the documentation of the learning and actions to be taken is supported by the LL tool "Living Documents". This specific tool enables the collaborative development of knowledge by a group writing and commenting on a document (such as the SEA report) together. Therefore, the tool can record who was involved with an SEA and what their contribution was. Personal reflections on an SEA may be captured within Bits and Pieces. Active engagement in work-related networks can be supported and documented by the LL tool "Help Seeking Tool". The main aim of this tool is the support of individuals moving beyond local learning and support connecting with wider professional networks. People have the possibility to ask questions, share knowledge and exchange opinions more widely as the tool intends to provide pedagogic scaffolding to support this. The other LL tools can also record network activities within the smaller working groups that are contributing to the "Living Document" or the sense making of a learning episode ("Bits and Pieces"). As the "Help Seeking Tool" supports the sharing of knowledge and simultaneously provides the possibility of obtaining feedback, it can be also used to record the sharing of knowledge and Feedback on this sharing. "Living Documents" and "Bits and Pieces" can also be used in a similar way. Regarding the subcategory Change in behaviour, "Bits & Pieces" is helpful for the personal documentation and reflection process. Changes at an organisational level can be captured within a Living Document and again the tool can record who was involved in developing this change. Hence, in the context of our study and its results, we consider the LL tools as mentioned above as potential facilitators and supporters for the documentation, reflection and evaluation of the identified indicators.

It should be mentioned that this study is subject to the limitations of explorative case research in terms of generalizability. Instead, it offers a context-rich appropriation of generic indicators for informal learning for the case of healthcare professionals.

7 Conclusion and Outlook

As interest has increased in understanding informal learning (Eraut, 2004), not only researchers (Cunningham & Hillier, 2013) but also organisations (Skule, 2004) are focusing their attention on this highly complex concept. In this article, we contrast the revalidation scheme of the healthcare sector in England with the findings of an exploratory case study with healthcare professionals regarding the assessment of informal learning.

In total, we identified six categories. Five of these categories are already implemented in the revalidation scheme although they might be interpreted in a slightly different way. One other category was developed based on our study and was not focused on in the revalidation scheme but is proposed by us to implement with the help of developed LL tools in order to assess the performance of informal learning. Besides that, we highlighted the importance of the social context and its significance for informal learning. Future research could focus on the further development of the concept of informal learning by taking up on the social context of informal learning in the working environment.

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