Learning to become an online editor: the editathon as a learning environment

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Learning to become an online editor: the editathon as a learning environment

Abstract

This study explores Wikipedia as a site for learning. In particular it traces how people learn to become Wikipedia editors through engagement in an editathon, a training event for people who want to become a volunteer editor. The study is original in its emphasis on the various types of knowledge editors acquire as they develop expertise. Determining the knowledge needed to contribute to Wikipedia is significant in terms of understanding Wikipedia as a site for learning. Data was gathered from nine participants who took part in an 'editathon' event on the theme of the Edinburgh Seven. The study used a rigorous methodology, combining quantitative social network analysis, documenting the online activity of participants as they created and edited Wikipedia pages, with qualitative interviews, which recorded participants reflections on their participation in the editathon. A key finding is that conceptual and procedural knowledge are representative of the foundational knowledge needed to contribute to Wikipedia actively as an editor. However, this knowledge on its own is not sufficient. Editors also develop socio-cultural and relational knowledge forms of knowledge to enable them to operate and problem-solve effectively. The relationship between the physical and the digital is important, since socio-cultural and relational knowledge are developed through active experimentation as the editathon engage with physical objects to create the online wiki pages.

Keywords; professional learning; social network; social media; online editing; Wikipedia environment

Introduction

In 1869 Sophia Jex-Blake applied to the University of Edinburgh to study Medicine. Before then no British university had enrolled a woman as a student since women were not considered appropriate for admission to university, irrespective of ability. The application was rejected on the grounds that the university could not admit women into class with men and could not spend resources on a single student. Jex-Blake submitted a

second application along with a group of other women which was accepted by the University Court, paving the way for women's entry to university education in Britain. Although this story represents a landmark moment for British universities, it was not widely known. In response, staff from the University's Learning, Teaching and Web Services Division decided in 2015 this event should be documented in Wikipedia under an entry termed the 'Edinburgh Seven'. (Edinburgh Seven, n.d.).

Wikipedia is one of the frontline, "go to" sources of information that influences and informs contemporary life. Unlike conventional encyclopedias, Wikipedia is continually edited through the unseen actions of millions of volunteer editors (Sundin, 2011). Over twenty nine million volunteer editors worldwide have contributed directly to over five million articles in the English version of Wikipedia alone (Wikipedia Community, n.d.). It is estimated that over sixty thousand routinely spend on average one hour per day working on Wikipedia pages in English. Almost anyone with internet access can volunteer to edit, yet people are seldom financially compensated for their work. Rewards are focused around the complex motivations to contribute, which range from an altruistic belief in open knowledge to having the ability to project internal self-concepts (Kuznetsov, 2006; Yang, 2010). These emerging ways of working raise questions about the different ways knowledge can be generated, who contributes and how they develop the ability to become contributors (Cetina, 2007; Fenwick, Nerland & Jensen, 2012).

Wikipedia editing is a social activity where editors shape articles by engaging with other people around the world. This engagement may be online through the wiki pages, communicating through other digital tools or offline, or working with physical artefacts and people in similar ways to conventional writers and reporters. As they create the Wikipedia articles, they will become more expert in the collaborative activity associated

with online knowledge production and distribution (Chui, Manyika, Bughin, Dobbs, Roxburgh, Sarrazin, Sands & Westergren ., 2012; Dede, 2000). However, not every editor will view an article in the same way, and their diverse perspectives can lead to conflicts about the knowledge produced (Kittur, Suh, Pendleton & Chi, 2007). Wikipedia editors routinely remove or add text produced by others (Halfaker, Kittur & Riedl, 2011). The stakes are high: Wikipedia is read every day by millions of people worldwide and articles can influence social perception. Disputes over text occasionally create interaction orders where "power editors", who continually (and sometimes aggressively) remove text and replace it with their own views, overly-influence articles, impacting the quality and quantity of contributions (Panciera, Halfaker & Terveen, 2009). Biases governing the presentation and production of Wikipedia pages can lead to the marginalisation of under-represented social groups, including women (Antin, Yee, Cheshire & Nov, 2011; Collier & Bear, 2012; Littlejohn & Hood, 2018). For social media sites, like Wikipedia, to represent the views of a wide section of the population, it is important that everyone has an opportunity to act as an editor.

This study explores how a group of volunteers transformed into Wikipedia editors. Data was gathered from participants who took part in an 'editathon' event on the theme of the Edinburgh Seven. The study focuses on the knowledge participants needed to become Wikipedia editors. The study utilised mixed methods, rigorously combining quantitative social network analysis to document the online activity of participants as they created and edited Wikipedia pages, with qualitative interviews that allowed participants to explain the behaviour in the editathon and the reasons why they behaved in specific ways. The study was original in tracing and linking online and offline interactions of people as they became editors, giving unique insight into Wikipedia as a site to support learning.

Becoming a Wikipedia editor

Wikipedia, in partnership with organisations, such as national libraries and universities, has taken action to actively encourage more people to become Wikipedia editors. These organisations run events known as editathons to train and support people in becoming editors. An editathon is an organised event where people come together at a scheduled time to create or edit Wikipedia entries on a specific topic (Wikipedia: How to run an edit-a-thon, n.d.). Participants engage in all kinds of collaborative activity around the creation of wiki pages often aided by information specialists including librarians, archivists and 'Wikimedians in residence', professionals employed to carry out all sorts of tasks associated with Wikipedia. Editathons are underpinned by two broad intentions; first to contribute to Wikipedia by creating or editing content, and second, to support people in developing the knowledge and expertise needed to act as Wikipedia editors. Participation is voluntary, with individuals determining the nature and level of their engagement, and activities include offline and online actions. To date there has been little understanding of the types of knowledge participants construct or the conditions – individual, social, or contextual – that support participants in developing the knowledge needed to act as Wikipedia editors.

Wikipedia as a form of network

Wikis have been conceptualised as social networks where people develop knowledge as they interact through editing activities (Hood & Lirrlejohn, 2018). Wenger and colleagues (2011, p.9) define a network as a "set of nodes and links with affordances for learning, such as information flows, helpful linkages, joint problem solving and knowledge creation", which does not hinge on the development of a collective identity or purpose between members. As people join a network they can contribute content, in

the form of information or resources, which then becomes part of the network's collective knowledge. Networks retain a focus on the individual whilst allowing for the accumulation of diverse resources and skills through interactions with others in the network (Harasim, 1995a; Harasim, 1995b). Information and expertise are embedded within the network and the connections established between users, and between users and knowledge artefacts, are pivotal for each individual's learning as well as for the success of the network as a whole. Social network studies, therefore, tend to focus on unpacking and interpreting the interactions that develop between users as a means of explaining the new knowledge order mediated through online platforms (Dede, 2000; Hew and Hara, 2007; Schlager, Farooq, Fusco, Schank & Dwyer, 2008; Schlager and Fusco, 2003).

The concept of networked individualism (Castells, 2004 and 2005; Wellman, 2002) describes the ways that digital tools and social media allow individuals to engage with a range of self-selected communication networks. In this conception, society is comprised of networked individuals with "each person separately operate[ing] his networks to obtain information, collaboration, orders, support, sociability, and a sense of belonging" (Wellman, 2002,p.13). Wellman and Castells' concept of the networked individual imbues individuals with the power and flexibility to navigate development opportunities and resources independently by drawing on a range of resources within their various networks of operation. However, an individual's ability to engage in new activity is influenced by their self-efficacy (an individual's belief in his or her ability to complete tasks and reach goals) and agency (the capacity of an individual to take action) and is mediated by the social, material and informational context in which the activity is occurring (Billett, 2001; Kyndt, Dochy, & Nijs, 2009; Tynjälä, 2008). Further, to effectively contribute new content to Wikipedia and to become an active

member within the social network of Wikipedia editors, individuals require particular types and forms of knowledge that extend beyond the social capital required to participate in a social network.

Developing knowledge in the Wikipedia network

Wikipedia editors utilize different types of knowledge at both the individual and interpersonal levels (Hood & Littlejohn, 2018). For example, each individual editor needs to develop knowledge about the topic of the article they are editing, but they also need knowledge about the editing process and how they should interact with others. This development of editing knowledge through interpersonal interactions can be viewed as a form of problem-solving, where individuals draw upon mediating tools (wiki pages, media resources) to support them in transferring and combining formal knowledge into flexible, situated tacit knowledge that is structured around a particular editing activity.

Tynjäla's (2008) Integrative Pedagogies Model [Figure 1] for developing professional expertise emphasises the importance of combining both situated, specific knowledge with generic knowledge for expertise development. The model identifies three types of knowledge: (1) conceptual knowledge, which is formal and explicit in nature; (2) procedural or practical knowledge; and (3) self-regulative knowledge which incorporates the knowledge and behaviours that enable individuals to monitor and make sense of their activity and to apply the knowledge they are creating in their contexts of action.
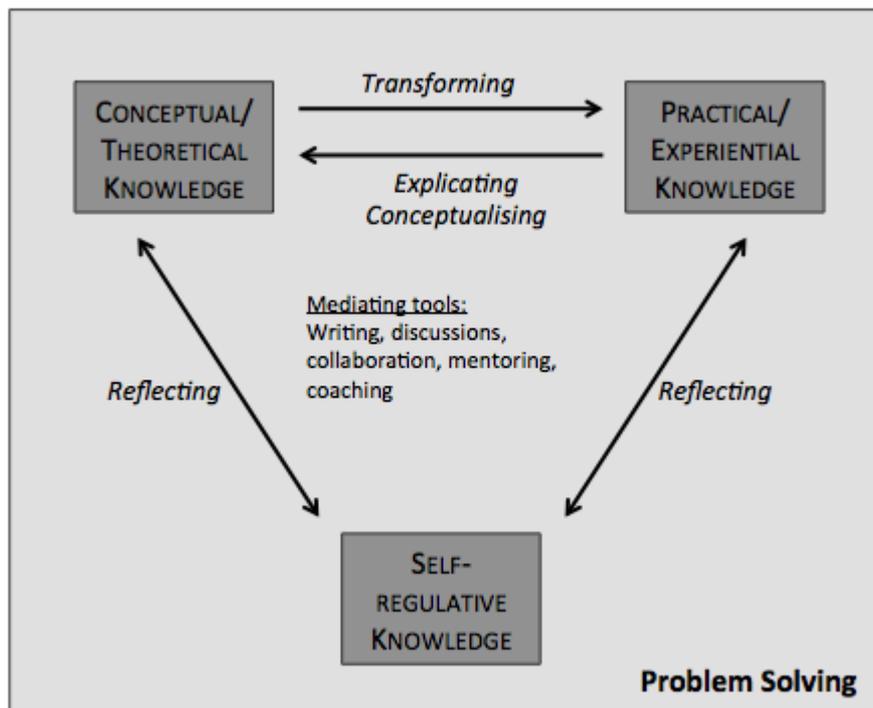
Figure 1: Integrative pedagogies model for developing professional expertise (Tynjälä, 2008)

Conceptual knowledge (knowing what and knowing why) refers to the declarative understanding of facts, concepts and propositions (Anderson, 1982). Conceptual knowledge can be characterized at different levels (Greeno, 1989), from simple factual knowledge (e.g. knowing what a citation is) to understanding how the process of citations works in practice in Wikipedia. It allows complex problem solving by enabling an individual to understand the nature of the problem, and its relationship with associated concepts. In general conceptual knowledge is often codified for dissemination across boundaries and contexts (Tynjälä, 2008). However, the way conceptual knowledge is used may vary, depending on the context of application.

Procedural knowledge (know-how) refers to the skills and techniques that enable an individual to use conceptual knowledge (Anderson, 1982). This type of knowledge tends to be more personal and tacit in nature than conceptual knowledge, and is

typically constructed through engagement in practice, hence it is sometimes referred to as practical or experiential knowledge (Tynjälä, 2008). Procedural knowledge is operationalised at various levels (Stevenson, 1991); first-order knowledge is automatically enacted without conscious thought (for example, how to use keyboard commands to cut and paste text). First-order procedures are specific to particular tasks and might not help in unfamiliar situations (familiar keyboard shortcuts are not useful when using a computer with a different operating system). In unfamiliar situations, second-order procedural knowledge allows individuals to anticipate what might be required and what steps have to be taken to complete a task without causing problems (an editor who understands that different operating systems require different keyboard shortcuts will apply the commands relevant to the system he or she is using). Third-level procedural knowledge is required to plan activities, particularly in situations where individuals are faced with novel problems in new situations.

Self-regulative knowledge encompasses elements of both relational knowledge and socio-cultural knowledge, recognising the importance of an individual's attitudes, motivations and behaviour in negotiating the distributed tools, resources, and people within a particular learning context. The application of procedural and conceptual knowledge is mediated by each individual's attitudes, values, emotions, interests and personal motivations (Perkins, 2006) and by the community or network of application. The Wikipedia network relies on thousands of interlinked communities, with diverse dispositions (values and beliefs about identity). This has deep implications for the ways editors engage in collaborative activity within Wikipedia. Cultural values can lead to explicit or tacit bias, leading to disagreements about the ways knowledge is presented. For example, editors with a specific epistemological view may prefer to represent knowledge in a specific way that conflicts with the preferred forms of

representation in another discipline. These dispositions are enacted in distinctive ways in different epistemic communities, with each having their own specific socio-cultural traits and characteristics. In Wikipedia these types of knowledge are developed through interpersonal interactions as contributors engage in editing activities.

Tynjälä's (2008) model provides a means for investigating the knowledge aspiring Wikipedia editors develop during an editathon event. Conceptualisation of expertise development as a form of problem solving, where individuals draw upon mediating tools to support them in transferring and combining different knowledge types, emphasises the importance of participation and active construction to knowledge generation. The model can be used to map the journey of aspiring editors as they move from building their conceptual and procedural knowledge as editathon participations, to actively utilizing and applying this knowledge as they adopt the role of Wikipedia editors.

This study uses the Tynjälä model to explore the different types of knowledge participants adopted as they engaged in an editathon. Selwyn (2010, p.69) suggests that studies of the use of digital technologies should concentrate on developing interpretative "thick descriptions of the present uses of technologies in situ" (69), in order to develop research designs and analyses that are "context-rich" rather than "context-free". The interpretative approach (Bakardjieva, 2011) is a method which provides a means for contextualising knowledge construction within the broader contexts of the editathon participants' workplaces and professional practices. Bakardjieva (2011) explains that examining users' experiences with the internet through the use of qualitative methods enables an examination of how online activity and the internet is construed in participants' "everyday lifeworlds". The following section describes this method in detail.

Method

Context: the Edinburgh Seven Wikipedia editathon

The study is situated within an editathon event that took place at the University of Edinburgh. The theme of the editathon was the Edinburgh Seven. Information about the event, which took place in February 2015 over four afternoons, is available on a Wikimedia site Women, science and Scottish history editathon series, n.d.) The event was led by the University's Information Services in association with the School of Literature, Languages and Cultures, the Moray House School of Education, EDINA centre for digital expertise, and the National Library of Scotland. The editathon was open to everyone, but particularly targeted university students, staff and faculty as well as members of the public who had an interest in becoming Wikipedia editors. A total of 47 participants were active during one day or across multiple days. Participants determined how much of the event they attended as well as their level of engagement.

The event took place in a large classroom on the Edinburgh University campus. The room was organised such that each participant could select a specific topic of interest and volunteer to lead or contribute to the creation and editing of the wiki page. Flip charts were made available in the physical space to support the participants in organising their activity. The participants were purposefully co-located with and had access to a range of participating experts including local archivists who supported access to original materials, media specialists who helped with documenting relevant locations, academic colleagues with specialist knowledge on women's history and Wikimedia experts, including a Wikimedian trainer in residence, who provided training on how to edit Wikipedia and participate in an open knowledge community. Participants also had access to a range of physical artefacts - including archived materials such as newspaper reports and photographs and books – to help them write the

articles. Following the editathon event nine participants were invited to participate in an interview to discuss their involvement in and experience of the event.

Participant selection and interviews

The findings reported here formed part of a larger study exploring social capital development of participants during the editathon event. A Social Network Analysis of the online interactions of the editathon participants has previously been reported (REMOVED FOR BLIND REVIEW). The interview participants were selected according to their online activity in Wikipedia. All nine had exhibited different editing behaviours. Two people were central editors in the online network, two had been active in terms of minor changes to wiki pages initiated by other editors, two had created wiki pages not co-edited by others, one had not made any edits. Of these nine participants, two were co-ordinators of the event (Table 1).

Table 1

SNA profiles of interview participants

Pseudonym	Participation and Connection in network
Anita	Central, high degree of connection
Jessica	Central, high degree of connection
Carolyn	Minor changes to multiple pages
Greg	Edited pages not covered by others
Melanie	Organiser
Margaux	Organiser
Natalie	Minor changes to multiple pages
Elizabeth	Edited pages not covered by others
Sarah	No edits

Prior to data collection, the researchers followed the ethical approval procedures of the university leading the study. One-hour interviews were conducted via Skype using a

semi-structured instrument, structured around how they self-regulated their engagement in the editathon. During the interview participants were asked to comment on what they did during the event, their engagement with other participants, and their behaviour and activity since the editathon. The interviews were audio-recorded and transcribed verbatim.

Data analysis

Each narrative account of the participant's activity in the editathon was analysed. The data analysis process involved four successive rounds of analysis. The first stage of analysis involved coding the data into initial content areas, what Miles and Huberman (1994) have termed the descriptive, interpretive stage. The second stage moved from descriptive to thematic coding and focused on the different types of knowledge participants were constructing. Initially five types of knowledge were identified: procedural knowledge; conceptual knowledge; self-regulative knowledge; socio-cultural knowledge; and professional knowledge. However, in the third round of analysis coded data was analysed to identify connections between the codes and the coding schemes were reduced to two overarching categories: (1) the knowledge needed to work as editors, which incorporates both conceptual and procedural knowledge, and relational and socio-cultural knowledge, and (2) knowledge of self as editor developed as the participants applied their new knowledge in practice.

There are some limitations associated with the methodology. First, the qualitative study uses self-report data, which may be influenced by honesty and image management as well as inconsistencies between perception and reality. Second, the data was reported retrospectively, which is likely to increase data inconsistency since memory recall could be impaired.

Findings

Despite significant differences in the number of wiki edits and social network positions, the narrative accounts of all nine participants described the knowledge developed through engaging in editathon activities. The following sections outline the knowledge the participants needed as they took on the role as editors, and the ways they self regulated their journey through their emerging responsibilities associated with these roles.

The knowledge utilised to work as Wikipedia editors

Conceptual and procedural knowledge

Editathon activities focused on supporting participants to learn the conceptual knowledge (knowing what and knowing why) and procedural knowledge (knowing how) needed to create and edit a Wikipedia page. At a basic level, procedural and conceptual knowledge are crucial for enabling participants to begin acting as editors and contributing actively to wiki pages. These types of knowledge encompass Wikipedia procedural norms (e.g. how to cite sources of information) underpinned by critical conceptual knowledge (e.g. who is allowed to contribute to a Wikipedia page) that underpin the rules of engagement within the Wikipedia community.

All of the editors who were interviewed expected that participating in the editathon would enhance their procedural knowledge (know-how). A typical response to what participants hoped to learn is illustrated by the following quote: "I just expected to come away with the ability to edit Wikipedia. So the ability to create new articles." Seven of the interviewees, however, commented that their participation had exposed them to a far broader understanding of Wikipedia than they had anticipated. For example Anita, who had a high degree of connection within the social network of editathon participants, had

some prior experience and knowledge of contributing to Wikipedia. She was confident with her procedural knowledge before the event. However she had not anticipated how greater conceptual knowledge might enhance her procedural knowledge commenting:

> I had completely failed to think about the community and the editing guidelines, the mechanics of how to cite, but what sources to use, how to write, you know when you're writing about a person that first sentence, making it clear that this is a notable person rather than just a person who happens to be interesting and how to engage people and how to follow the community guidelines.

Anita's observations demonstrate the interconnectedness of different knowledge types, and how conceptual and procedural knowledge are integrated and co-constructed in the development of particular expertise. Tynjäla (2008) suggests that this co-construction and translation of conceptual and procedural knowledge develops through three learning processes: transforming; explicating; and conceptualising.

Conceptual knowledge was predominantly explicit and systematic in nature. Participants described how they developed conceptual knowledge by engaging in formal editathon activities, in particular the preliminary session activities run by the Wikimedian (trainer in residence) at the start of each of the five sessions. These activities provided participants with technical skills or procedural knowledge related to the process of editing Wikipedia as well as conceptual knowledge of rules governing and structuring the Wikipedia community, and how to construct and write a Wikipedia article. Participants also had the opportunity following these sessions to experiment with and to apply their new knowledge and skills in the sandbox, an online practice space.

From the narrative accounts of how people engaged in editing activity, we know that to become an editor it was important to develop an understanding of procedural and

conceptual knowledge about the formal requirements of contributing to Wikipedia and the rules that govern its use. Greg explained the importance of these knowledge types:

> to be able to create an article from scratch and all the processes through that including using images, linking to other Wikipedia pages or to external pages, adding in kind of multimedia and then getting it published and live on the site.

This foundational knowledge not only gave participants the confidence to edit wiki pages, but also provoked them to reflect on how they engage with Wikipedia in other contexts, such as their professional lives. The knowledge participants were constructing related to their broader contexts of action and their professional roles, as exemplified by Carolyn's story. Carolyn had no prior knowledge or experience of editing Wikipedia, and during the editathon made minor changes to multiple pages. Although she was a regular user of the site as a passive consumer of content, she had not previously understood or appreciated the rules and regulations that govern Wikipedia:

> We often refer to Wikipedia to our students, but actually thinking about how it's created, how it's put together is part of the whole digital education change, it's part of how everybody is coming into a more open form of learning and engagement, more democratic perhaps, although immediately when I went to my first meeting I learned a lot about how it's not as democratic as it looks.

The observation that Wikipedia may not be as "democratic" as it seems requires an understanding of the relationships within the network. Carolyn's response illustrates that, at a basic level, procedural and conceptual knowledge are crucial for enabling participants to begin acting as editors, contributing actively to wiki pages. It is through the act of utilising the knowledge in a specific context to create something new, in this case new content on Wikipedia, that the knowledge becomes fully realised.

Carolyn's response also indicates how the construction of procedural and conceptual knowledge is mediated by the individual's dispositions, values and beliefs and that the

intertwining of knowledge with individual dispositions influences the ways editors engage in collaborative activity within Wikipedia, including who they work with and where they source knowledge. These actions in turn may prompt the development of other types of knowledge, including self-regulative and socio-cultural knowledge.

Self-regulative and socio-cultural knowledge of Wikipedia editors

The collaborations of editors often extended across the physical and digital spaces in which the editathon took place. The physical space where the editathon was hosted at Edinburgh University influenced the way some participants worked as they developed as editors. Five participants referred to the physical arrangement of the room as playing a part in their knowledge development. Elizabeth had spent her time editing pages not covered by other people. She discussed how the socio-spatial component of the editathon contributed to her development:

> I mean actually the space was probably pretty conducive to it as well. ... There were a series of round tables with I would say maybe 4 or 5 seats around each one and a big screen for each. Then a screen at the front where someone could present .... and then when we went to do our own editing we mostly brought our own laptops, but we could bring some things up on the communal screens as well and it's easy to kind of…and the biscuits were at a different side. So it was quite easy to meander around. It would not have been the same in a lecture theatre or just a normal tutorial room. It was lovely.

The informality of the physical space mirrored the informality of the online editing activities and allowed individuals to decide how they wanted to engage with resources and people both in the physical space and online.

Participants' interactions often began in the physical space and then continued online, sometimes through co-editing. Margaux, one of the organisers of the editathon

observed:

> The collaboration wasn't necessarily article level, it was at the level of the seam [Wikipedia site] overall. Yes people were working in busy little clustered groups and I remember people saying 'How do you do this?' and 'I wonder how you do that?' so although they were working on different actual articles there was certainly collaborating in getting it done.

This point was reaffirmed by Natalie. Natalie did not make any edits to Wikipedia, but she described how many of the interactions with others during the editathon took place in the physical space:

> Although I think one thing, in terms of helping each other, understand how to edit and help each other with skills, there was lots of that going on at the Editathon. There wasn't a huge amount of collaboratively working on the same page.

The inter-relationship between physical and digital artefacts used also influenced knowledge development. During the editathon participants worked extensively with books and archival material to develop the content for the online Wikipedia articles. The relationship between these physical and digital artefacts became an important influencing factor shaping the ways in which participants engaged in editing activities. All nine of the participants discussed activities where they engaged with different information sources, and highlighted their enjoyment of working with physical, non-digital informal sources and artefacts. Six participants described their developing knowledge of how physical artefacts might be represented in the digital domain and how the editathon caused them to reflect on the materiality of information in a digital world. They viewed their collective activity as a powerful means of digitizing information and media that previously had been confined to archives and books. As Carolyn reflected:

I'm very interested in that as well in how we take old forms of print and even pre-print and even things from the oral tradition as well, how we take them forward into new media and incorporate them and change them in the process.

For three participants, this interest in bridging the divide between non-digital and digital artefacts and knowledge took on a more activist agenda, with these participants describing their imperative and responsibility to digitise and open access to previously hidden content. As Melanie explained, "there's information in these books that needs to get online and [we] need to put it there".

During the editathon some participants developed a growing appreciation of the act of re-presenting archival material as digital artefacts as a form of activism. Participants acknowledge the importance of collaborating with others to discuss the relationship between the physical and digital artefacts. Jessica, who was central to the network with a high level of participation, described her experience:

So it was really a really great opportunity to collaborate with colleagues where one would look at one aspect of the Scotsman archive and one would look somewhere else and bring it together, so it was fantastic from that perspective.

The relationships between the physical objects and the digital representations were sometimes troubling and tended to be resolved through in-person, offline collaboration. Within the narrative accounts, there is evidence of a high degree of in-person, offline networking to support the creation of the Wikipedia pages.

One participant, Greg, described a different form of relationship building. Despite making edits to multiple Wikipedia pages, he had limited direct engagement with other participants in the physical space. He described indirect engagement through physical and digital artefacts:

There was a small group of people who I was kind of on the periphery of, I wasn't a core member of that group that were very excited about it. So I suppose they were probably more collaborative, I just more turned up and did my editing and left. I wasn't really involved in sharing, but there was collaboration in terms of, I mean I brought some of the digital collections and got the archivist he brought lots of books and manuscripts and physical things. So there was lots of collaboration across the university in terms of different teams and different areas working together.

In summary, as participants engaged in the editathon, they became aware of the Wikipedia as a constructed artefact. Some participants perceived their role as editors as taking on responsibility for ensuring accurate representation of offline, physical resources in an online form. Their perceptions of their new role had impact on the responsibilities they assumed as editors.

Motivations and shifting responsibilities

The narrative accounts of how participants became editors illustrate examples of deliberate self-regulation, triggered by a variety of motivations. Over the course of the event participants become more and more invested in the theme of the editathon. Originally only two participants cited the theme as the motivator for their initial engagement in the editathon. For the remainder, the opportunity to participate in an editathon and collaborate with others to develop skills to contribute new Wikipedia content was more important than the theme itself. Participants described their increasing interest in the theme over the course of the editathon as they engaged more with the content and recognised the importance of ensuring that the Edinburgh Seven had a presence on Wikipedia. This growing interest in the theme may have contributed to participants' continued contribution to wiki pages in the months following the event. Anita described how her interest in the theme evolved:

I didn't have any strong personal interest in the subject matter. My personal interest I think comes from relationship with a close colleague who had a very personal interest in the subject matter. Well initially it was more about supporting her ... but actually then once I got into the thing on the day I continued to edit pages that I started on that day and I feel quite closely…there was one woman who didn't have a page at all and I put her page in there and so now I feel quite motivated to keep going and feel I do have strong ownership.

This sense of responsibility to (re)construct history on Wikipedia and the emerging feeling of ownership over the content knowledge became an important part in the editathon journeys of six of the participants. Despite only making minor editing contributions, Carolyn described her progression in developing editing knowledge in relation to the increasing interest in the subject matter:

I think on the day that I did lots of editing I got really into finding more about the person I was looking up and really interested in the subject.... So there's a certain amount of ownership of the subject then that became quite interesting and did make me think I should go and do more kind of digging into particular individuals, but I think that's partly because I don't do a lot of…I was doing this about historical stuff on Wednesday but that's normally what I focus, I don't normally do a lot of historical stuff.

Carolyn also referenced the opportunity the editathon provided for allowing her to engage in activities beyond the scope of her day-to-day job. By extending participants beyond the typical boundaries of their professional roles and stimulating interest-driven activity and enjoyment in creating new types of knowledge, Wikipedia editing has a potentially powerful role to play in editors' everyday lives.

The responsibility the participants experienced extended beyond the immediate theme. In their narrative accounts, all nine participants described how their involvement in the editathon had prompted a change in mindset and developed new understandings that

would influence other areas of their lives. As Carolyn, who had no previous experience of editing Wikipedia, reflected: "So I think it [knowledge gained] will probably, it will definitely, come into my repertoire of teaching and writing, but I haven't formally done anything yet, it's just maybe more informally, but it definitely influences me."

Six other interviewees similarly reflected on how their participation prompted them to reimagine their own professional practice. Anita explained:

> I think what it has done is given me additional professional skills. So it hadn't changed my practice so much as my competencies. .... It does, though it pushes it in a different direction. So up until that point a lot of my work had been running our eLearning services, but we were interested to explore this kind of event to understand whether it was a non IT sort of service that we should be facilitating with our academic staff.

Greg, who did not actively collaborate with others when editing Wiki pages during the editathon, described the impact that the new connections he made have had on him professionally:

> Possibly one of the bigger impacts that it's had is … it kind of puts me on the map as somebody in the library who's involved and interested in this sort of stuff, which has then meant I've been invited to stuff about talking about creative maker spaces in the library and crowd sourcing and all sorts of other things that I or the library may have been bypassed. So it feels to me that I've been able to be involved in a lot more stuff as a result of being involved in this.

Several participants continued editing the Wikipedia pages after the editathon event. Seven of the interviewees described how they continued working with others, both in the digital domain on Wikipedia and through their offline networks. Anita, who emerged as a central editor in the network, emphasised the importance of these relationships:

> The personal relationships evolved and we have a 'Wiki hour of power' every month, that's sort of kept some of those personal relationships going as well … It's much about cementing social bonds that we've made, but we have drawn new people in, started editing by being part of that little community that we've got .... we have a sort of come and buddy up with somebody if you want to go and see what somebody else is working on and talk about what you want to work on and how you might approach it.

Anita's quote demonstrates the long-term role socio-cultural knowledge plays in becoming a Wikipedia editor. The embryonic socio-cultural knowledge Anita developed during the editathon event continued to grow after the event, as she continued to engage with new people involved in editing.

These data illustrate how expertise development is a fluid and iterative process that requires individuals to undertake different types of activity in order to concurrently construct and to form links between multiple types of knowledge. Expertise, such as editing Wikipedia, incorporates multiple dimensions and consequently requires individuals to move from and between general, abstract knowledge to focused, embedded knowledge.

Expertise development: the need to consider a wide range of knowledge

These findings validate Tynjälä's (2008) model that contends that expertise development extends beyond an individual's development of conceptual and procedural knowledge. For editathon participants, conceptual and procedural knowledge are representative of the foundational knowledge that they required in order to be able to contribute actively as editors to Wikipedia. However, this knowledge on its own was not enough to enable participants to become editors. In the process of interacting and collaborating with others, participants developed important socio-cultural knowledge to

enable them to operate and problem-solve effectively. Also critical was the construction of relational knowledge, which participants developed through their active experimentation as they engaged with physical materials, wiki pages.

While theoretical and procedural knowledge provides a foundation for the editors' role, the development of socio-cultural and relational knowledge enables editors to challenge societal views of past events and how these relate to current realities. They develop an awareness of their responsibility in representing people and events within the historical context in which they happened while, at the same time, recognising how this depiction might be interpreted within contemporary society. Therefore, those providing structured training for social media editing should consider how to support the development of socio-cultural and self-regulative knowledge as well as the sorts of theoretical and practical knowledge normally associated with editing.They should also consider that, while aspects of the knowledge can be taught using a didactic approach, it is through navigating and engaging with distributed network resources, tools and people, and engaging in active experimentation and reflection on action that expertise is developed. This active experimentation and application of conceptual and procedural knowledge necessitates the development of socio-cultural and self-regulative knowledge.

As well as the online space, the socio-contextual space of the editathon, where activity was distributed across a physical space, the participants, physical materials and objects and the online setting, influenced knowledge development. Participants became aware of the materiality of the network and its significance as a constructed artefact. As they developed wiki pages, they used physical artefacts, interacted with people and with material resources. Working at the intersection of the physical with the digital, participants became aware of the significance of the relationship of these varied contexts.

Implications of this research

This study offers a unique critique of how individuals become Wikipedia editors as they engage in structured training events. Appreciating how individuals learn to actively contribute to Wikipedia is significant in terms of understanding Wikipedia as a site for learning. The primary purpose of the editathon training event is to encourage more people to develop the theoretical and practical knowledge needed to contribute to Wikipedia. This narrow view of the editathon provides only partial insight into how people develop as editors and aim to influence society as a form of social activism.

The study provides evidence of a complex relationship between the physical resources (such as archived news reports, photographs and historical buildings) and (re)constructed digital artefacts (such as wikipages). The interplay of the digital and physical spaces editors work within plays a role in shaping the ways editors use Wikipedia to influence social opinion. Editors develop a range of theoretical and procedural knowledge as they construct Wikipedia pages, finding ways to represent physical artefacts in digital form.

The knowledge participants constructed during the editathon not only provided them with the expertise to adopt and perform new roles as Wikipedia editors but also facilitated them to reposition themselves and to develop more critical understandings of content and information in the digital age. Engagement within the editathon left some participants with a sense of responsibility that they can shape societal agendas through simple editing actions.

Limitations of the study and future research

The key limitations of this study are associated with the methodology and sampling.

This qualitative study uses self-report data, which may be influenced by honesty and image management as well as inconsistencies between perception and reality. The data was reported retrospectively, which is likely to increase data inconsistency since memory recall could be impaired. However, even data that are automatically generated can be challenging to interpret. Although the sample represents over one fifth of the participants, the number of people interviewed may not be fully representative.

Future research could be improved through an expanded methodological repertoire, bringing together methods that measure online and offline data to support more holistic and multidimensional analyses of new professional learning processes and practices.

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Table 1. Type your title here.

Figure 1. Integrative pedagogies model for developing professional expertise (based on the model by Tynjälä, 2008)