

How research students at The Open University conduct research: insights from cognitive mapping



David Jenkins
Research Support Librarian
Library Services
The Open University
david.jenkins@open.ac.uk

There are currently 818 research students (496 full-time and 322 part-time) at The Open University. They are one of the core groups served by the Library Services Research Support Team. A number of factors have led us to focus on developing the services we offer this group: recommendations made in an external appraisal of the library (published in January 2016); user needs identified in the library's draft research support strategy; a history of limited communication with this group.

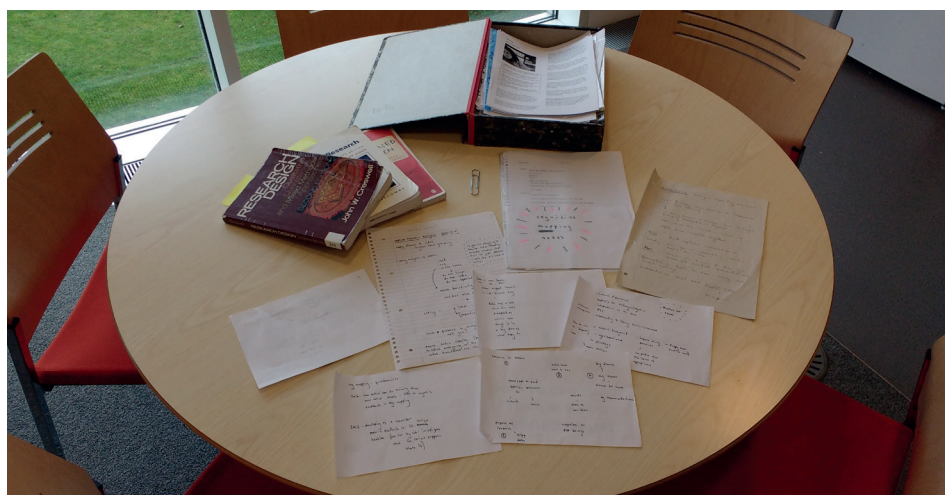
We undertook a small-scale research project to inform the development of services for research students. We wanted insights into how research students conduct research: the processes they go through, the people they work with, the resources they use and the places they go to. In particular, the project aimed to identify any 'unknown unknowns' – that is, aspects of their processes that we were previously unaware of. It was designed as a starting point for ongoing engagement with research students and, as such, was exploratory in nature. Its purpose was not to generalise about a wider population but to identify themes for further investigation and inform future research, which would aim for generalisability.

In generating rich data on a small sample of users, we planned for this project to complement data we get from the Postgraduate Research Experience Survey (PRES), which generates less in-depth data on a larger sample.

To achieve this we used cognitive mapping, one of the ethnography-inspired user experience (UX) methods outlined at the first UXLibs conference (UX in libraries, n.d.) Cognitive mapping involves asking people to draw maps from memory and it is particularly suited to giving insights into peoples' behaviour and perceptions. It has been used as a research method in libraries to map physical spaces (Asher, 2013, and Lanclos, 2013) can also be used to map processes (Lanclos 2015). We based our map template on that used by Lanclos (2013), which itself is based on a toolkit from the Ethnographic Research in Illinois Academic Libraries (ERIAL) Project (Asher & Miller, 2011). The template was a plain sheet of A4 paper with the following instruction at the top:

You will be given 9 minutes to draw from memory a map of how you undertook the last piece of research you completed – please include the processes, people, resources etc. that you worked with/used. Every three minutes you will be asked to change the colour of your pen in the following order: 1. Blue, 2. Red, 3. Black. After the 9 minutes is complete, please label the features on your map. Please try to be as complete as possible but don't worry about the quality of the drawing!

The changing of coloured pens at timed intervals is designed to capture what participants write on the map first, which is assumed to be what's most important to them.



The research process – field notes and background reading

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A brief, unstructured interview followed the mapping in order to pursue any themes or ideas that emerged. This method was identified as appropriate because it allows interviewees to speak their minds and facilitates discovery (Denscombe, 2003). Interview data were captured in the form of field notes, based on best practice identified by Mills and Morton (Mills & Morton, 2013). This method limited the amount of data captured but reduced how long it took to transcribe the interviews. The choice of this method reflects efforts to manage the amount of staff time spent on the project.

Cognitive mapping can be undertaken relatively quickly. We hoped this would make recruiting participants easier, as we would require less of their time, as well as saving staff time. We undertook the mapping and interviewed one participant at a time and face to face, spending approximately thirty minutes with each person.

There were thirteen participants, who were all based on campus. In terms of the faculty they belong to, seven were from Science, Technology, Engineering and Mathematics (STEM), three were from Wellbeing, Education and Language Studies (WELS) and three were from the Institute of Educational Technology (IET). The Faculty of Arts and Social Sciences (FASS) and the Faculty of Business and Law (FBL) were not represented.

We were aware of the limits of such a small sample in terms of generalisability, but this was in keeping with the purpose of the research. Furthermore, it may be appropriate to compare data gathered with that from other research (be it existing research or future research) to corroborate identified themes.

All participants were offered a voucher for an online retailer on completion of the mapping and interview.

Data from the maps and interviews were segmented, typed up, coded and thematically analysed based on the simple approaches propounded by Denscombe (2003) and Creswell (2003), with techniques adapted from Guest *et al.* (Guest *et al.* 2012). This approach was adopted in an attempt to balance methodological rigour with the time constraints of day-to-day work commitments. Additionally, a simple quantitative analysis of the codes gave insight into their frequency, which fed into evaluation of their significance and development of themes.

Our findings were as follows:

- Literature reviews were the most mentioned part of the research process:
 - Eight participants experienced difficulties relating to their literature review, including not being able to access literature they needed, not having good search skills and feeling overwhelmed by the amount of literature.
 - Four participants reported that they had no problem with the mechanics of finding literature. However, it has to be remembered this is only one part of the literature review process - one of these participants still struggled to process the literature they had found.
 - Interestingly, the STEM students did not usually mention literature searching without being prompted even though they were amongst the most extensive users of it – they focused more on their lab or fieldwork.
- Support from supervisors is really important and encompasses numerous areas:
 - All participants mentioned the support they got from their supervisor.
 - There were more mentions of positive experiences with supervisors

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than negative, but it is undoubtedly a mixed picture – some students reported significant differences of opinion with their supervisors, which adversely affected their research.

- Research students received supervisor support regarding various issues, including research methods, research data, fieldwork and literature reviews.
- There were more instances of negative feedback about the library than positive:
 - Negative feedback focused on perceived lack of access to required e-resources, library e-resources having complicated interfaces, out-of-date print stock, problems with our document delivery and inter-library loans service, the fact that there are no recalls on print materials and that library training is too generic and not hands-on.
 - Positive feedback focused on problem-free access to e-resources, staff manner and communication and good experiences of our document delivery and inter-library loans service.
 - Interestingly, participants had a good understanding of what services we provide, why we provide them and what factors restrict our services.
- Library print resources were mentioned almost as much as electronic resources:
 - This suggests that print still has a significant role for these students.
 - Mentions of both e-resources and print resources were very mixed, with no significant themes emerging beyond those mentioned above.
- Most participants use Google Scholar as their primary (or one of their primary) means of finding literature:
 - Reasons for using Google Scholar included the fact that it provides a good user experience, allows them to find and access articles.
 - There was some negative comparison of library resources to Google Scholar in terms of usability.
- There is some significant use of non-Library Services resources:
 - Six participants talked about how they used information services provided by other sources, including sourcing literature via peers, using other libraries and using methods that might violate copyright and licensing agreements (Sci-Hub, peer-to-peer file-sharing systems and sharing via Facebook).
 - Some of this was by chance or from personal preference, but a significant amount was prompted by dissatisfaction with Library Services (e.g. not being able to find material they need or being unhappy with the time required for document delivery and inter-library loans).

As a result of these findings, we

- have begun communicating findings to library staff via a senior managers' meeting, an open staff development session and meetings with relevant teams. This is being done in order to engage colleagues with the findings and to inform discussions about how Library Services as a whole can meet research students' needs.
- have founded a research student forum and used findings to inform the first meeting.
 - We did an activity to learn more about their literature search/review processes.

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- shall continue our investigations into:
 - developing a print collection of research methods books
 - reviewing recalls on print books.
- shall develop a plan for raising awareness of library resources and helping students overcome any access issues.
- shall develop a plan for liaising with supervisors.
- shall use identified themes to inform future research on and engagement with research students.

We found that cognitive mapping was easy to undertake and led to insightful data. One participant fed back that the timed element made it feel like an exam but that changing coloured pens at timed intervals helped them talk through their map afterwards. Otherwise, the changing of pens was of limited use in this project, because most of our participants mapped their research projects chronologically, so the colours capture what happened first in their project rather than what was most important.

There were issues with one participant's handwriting, which was illegible in some parts and reduced the usefulness of their map. We shall investigate whether there is any appropriate means of addressing this, or whether it just has to be treated as an inherent risk of the method.

We also learned that incentives were important to the students – a number were very keen to get their vouchers – as was anonymity. The guarantee of anonymity was communicated in the consent process, but we shall emphasise it at the beginning of any future interviews.

Segmentation of data was challenging in terms of deciding what constituted a unit of meaning, and coding data was time-consuming, but these issues are normal, and guidance from research methods literature helped resolve them. What's more, the application of these methods increased the value of the data and our understanding of research students.

One of the biggest lessons learned relates to consent for the sharing and re-use of the research data. We are unable to share any text or images from the research data outside The Open University as we did not originally intend to disseminate the research more widely and did not factor it in to our consent forms. We are very keen to be able to share our data more widely in future and shall adapt our approach accordingly.

Notes

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