

Mapping Learning Lives: Final Report

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What binds one moment, one experience to another? We are accustomed to using the notion of 'memory' as our only answer to this question, but the idea of individual memory treats learning only from the viewpoint of the individual organism, and does not look at the activities in which we participate and all the people, places, and things around us that help make memory work (Jay Lemke)

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Executive Summary

This exploratory project is informed by two inter-related issues: the first is the increasing recognition of learning as lifelong and lifewide, in other words, as a practice that extends well beyond the boundaries of institutions such as universities and schools. The second is the growth of intentional, institutional and ambient data-collecting practices that together are producing a deluge of personal data which offers a potentially rich resource to support individuals to reflect upon their lives. The overarching question that drives this research is therefore:

How might the personal data gathered by the individual, by institutions and by increasingly 'intelligent' environments be used to support learning across the lifecourse?

The project was co-developed with the BBC in order to explore the complexity of people's learning lives and the potential role of rich personal data collation, curation and analysis tools in supporting such learning across the lifecourse. There were three overarching purposes:

- to explore the learning experiences and resources of a range of individuals at different stages in the lifecourse
- to explore how diverse individuals already collect, record and share information about themselves
- to conjecture about how individuals' data collecting and sharing strategies might be amplified by a rich personal data landscape in pursuit of a range of learning motivations.

The project comprised three phases: the first, was a series of concept mapping workshops with 96 people from a range of different backgrounds and ages, intended to elicit an understanding of the range and diversity of their learning experiences. The second involved 13 case studies, with individuals aged from 24 to 83, who were interviewed and asked to keep multi-media diaries of critical moments for future reflection over the course of a week. The third stage involved collaboration between researchers and a data visualisation specialist in order to produce a set of use-case scenarios that would capture a range of possible applications of rich personal data in support of learning across the lifecourse.

We observed four broad prompts or motives for learning amongst the participants in our concept workshops, these were: **personal events** (personal experiences and transitions that required emotional adjustment and personal development); **practicalities** (the development of skills and knowledge in pursuit of action in the world); **participation** (learning in pursuit of social engagement) and **pleasures** (learning prompted by curiosity and interest for its own sake).

We also observed that these individuals drew on 5 key types of learning resources: **cultural** (e.g. cultural repositories of knowledge and information such as museums, books, libraries); **people** (e.g. friends, families, educators, counselors); **commercial** (e.g. advertising, sales advice); **embodied** (working things out through bodily movement); **reflective** (e.g. reviewing, auditing and reflecting upon experiences). Finally, we also observed that these different learning resources can be recorded in different ways, in some cases, the resources are already available in digital format, in others, proxies are required - for example photographs of friends or experiences. We also noted that significant sources of data about the individual were not mentioned by these participants, in other words, the **institutional and environmental data** that is held about individuals but which tends to be owned and managed by institutions.

When we examined people's existing strategies for recording their life experiences, we observed the following:

First, that all cultural artefacts are and can be used as the basis for reconstructing experience. There is therefore no unique category of objects or artefacts that should be understood as having a privileged role as recording or learning tools.

Second, that for reflection purposes, the process of recording does not need to be faithful or detailed. Rather, a fragment suffices to prompt a rich process of narration.

Third, that as a record of learning, it is not necessarily a 'learning process' that can be captured or that might be desirable. Instead, images can be used to 'stand for' such processes. Photographs of friends, for example, stand for conversations or problems that were resolved.

When we look at the types of data people gathered to support reflection and recollection, it is clear that, if personal data might be used for learning it might not be necessary to produce systems that generate perfect recall of events and experiences, instead, it may be that it is proxy 'representative' data that crystallises experiences that may be most helpful.

Finally, it was clear that people's processes of using and reflecting on this data at present remain tied to linear and analogue practices. There were struggles to find ways to categorise and make sense of large digital records and to find ways to navigate around and manage them. The implications of this are ambiguous. It may mean that the process of organising experiences into narrative accounts is, itself, a valuable process. It may mean, also, that the mobilisation of personal data (which will by necessity be held in massive interconnected databases) will require the development of a new approach to thinking about generating meaning from memory. This will be a key area for future research to model and explore.

There were three important ways in which the people in our case studies used the artefacts, records and souvenirs they had gathered over the course of their daily lives and the ways in which they selected information to report back to us as researchers.

Collecting: in this case, the person is gathering together artefacts and records that give shape to one particular aspect of their identity and their experience. This process is about strengthening and elaborating one element of their lives or interests and in intensifying it.

Telling tales: An artefact or set of artefacts can be used to recount a history, shape a narrative, tell a story about the person. They are used as a way of consciously shaping an identity and, at times, are a way of building relationships with other people or presenting the person to the outside world. We might also describe this process as 'curating' a life. Moving beyond simply collecting artefacts, to the intentional selection of artefacts in a way that showcases a sequence of events and experiences.

Audit and reflection: artefacts, and the data and information that they offer about a life, can be used as a basis not only for telling tales, but for reflecting upon new tales that might be possible and new ways of having told that tale.

Our observations lead us to suggest the following in relation to BBC Learning's role in working with a future of rich personal data to support diverse learning priorities:

First, that today BBC learning already plays a role in the 4 key learning narratives:

1. **Pleasures:** Its traditional broadcast role makes the BBC an important prompt for pleasurable learning narratives, encouraging people to engage with new ideas and enabling people to pursue existing passions and interests.
2. **Practicalities & Personal Events:** In its hybrid broadcast and online role, it acts as a resource for people to turn to in order to address practical problems. This might include turning to online resources to develop skills (Webwise) or gaining access to advice; This might also include viewing programmes that simply represent painful/important personal events and which are complemented, afterwards, by help lines and further online advice.
3. **Participation:** In its hybrid broadcast and online role, BBC Learning is beginning to act as a 'place' for participation. Events such as the national lab, Springwatch and other collective contribution programmes, encourage people to 'get involved' in a shared activity – either at home participating in virtual social activity, or through local groups participating in face to face activity.

When we look at BBC Learning's role in a future of rich personal data, we can see that people might begin to use BBC materials and resources to collect, tell tales and audit their experiences in powerful ways to support these different learning narratives.

1. As people develop their own 'collections' of interests, passions and experiences:
 - a. BBC materials can be used to enhance and complement these collections. Someone with a passion for football, for example, might draw into their collection the matches, commentary and supplementary information associated with key games (pleasures)
 - b. Individuals may be able to upload and share their collections as exchange for accessing BBC materials, allowing the BBC to potentially make connections between people with similar passions and interests (participation)
2. As people tell tales of their own lives:
 - a. BBC materials can be used to enhance these narratives in the same way as collections, offering historic or interest-based material to elaborate experiences in people's lives (pleasures/ personal events)
 - b. BBC platforms can be used for people to share these narratives with each other, with the BBC adding and gaining value from aggregating these.
 - c. At the same time, people's participation in BBC-prompted activities (Springwatch, interactive TV quizzes, online browsing, local activities) might be collated in ways to allow the person to build their 'back-story' of BBC- related activities and allow the person to begin to gain credit and recognition for what they are doing. (practicalities/ participation)
3. As people reflect upon and audit their own lives:
 - a. BBC records and materials can be used to unsettle or throw new light on personal narratives. A review of each individual's viewing and BBC online use, for example, would tell a story of time spent, interests and possible connections between them. Creative visualisation of such records might allow people to see 'stories' of their experiences that they weren't aware of, and build connections between them. (practicalities/personal events)
 - b. Individuals might be able to compare their personal records with other people of similar age, gender, ethnicity or interest profiles – what are other people of similar age, interests, backgrounds, doing, browsing, navigating? (participation)
 - c. The BBC might begin to offer supports for people to reflect upon their narratives and suggest new trajectories and materials, encouraging people to explore the practical, pleasurable and participatory learning experiences associated with any issue; and connecting them to others experiencing the personal events. (pleasures)

As the capacity to collate and analyse massive amounts of data increases, and as the tools become available for individuals to curate their lives in ways that connect their mediatised lives with personal data from multiple other sources, there are also interesting choices opening up for BBC Learning – for example, will it begin to play a role in accrediting and validating the rich forms of informal learning that it provokes and sustains?

This is an early, exploratory project that is beginning to map the complexity of people's learning lives and the artefacts that they use to support their learning. There is, clearly, much more to explore. Possible next steps are as follows:

We need to develop a real insight into how BBC audiences would use these rich datasets to support their learning. One possibility would be to develop a range of personal use cases and work with various audience groups developing ways they could effectively work with these rich datasets. Some suggestions are looking at narrative or modelling approaches to the use of such data. The use cases should include the use of BBC media data, user tracking and personal data.

We need a greater understanding of learning patterns according to age/gender/socio-economic position/life experience and the ways these shape data use and the types of learning experiences people reflect upon. We could work with the British Household Survey and also the Learning Lives dataset – secondary research. Then test findings back with a qualitative survey. It might also be possible to link this with the Mozilla Foundation Open Badges programme to explore how the BBC and Mozilla might jointly promote and accredit such informal learning.

We hope that this project will also form the basis for further European collaboration, funding for which is being sought from the European Commission, with collaborators from universities in Zurich, Freiburg, Oslo, Nottingham, Ulster, Dublin and Bristol. The findings from the project to date should be presented at the European Conference on Education Research, Cadiz, September 2012 and may form the basis for an international symposium at the American Education Research Association Conference in 2013. Indicative questions these further explorations will seek to address are:

1. what are the most appropriate strategies for prompting reflection on personal data?
2. what are the key ethical, legal and privacy issues raised by the use of personal data for learning?
3. what relationship between modelling and narrative is appropriate to provide scaffolding for learning using personal data?
4. What technical challenges are presented by the incorporation of data from multiple datasets?
5. What visualisation strategies are most effective for different demographic groups?

Introduction

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The overarching question that drives this research is therefore:

How might the personal data gathered by the individual, by institutions and by increasingly 'intelligent' environments be used to support learning across the lifecourse?

a. Context for the Project

i. Assumptions about personal data proliferation

The ability to aggregate massive amounts of data from individuals' online activities (whether searching or social media), from individuals' interactions with institutions (whether banks or health providers), and from individuals' participation in public spaces and buildings (whether through Bluetooth scanners or environmental sensors), is expected to provide the basis for entirely new industries and services to be developed. Indeed, the World Economic Forum now describes personal data as a 'new economic asset class'ⁱ.

The potential of personal data to act as a resource for individuals themselves, however, is relatively under-developed. What we do know is that people are 'accreting' ever more data about themselves, from photographs posted on social media networks to hard drives full of recorded TV, music and radio; from bookmarked lists of websites visited, to a lifetime of bank statements. For some, the ability to capture ever-increasing amounts of personal data as a basis for personal development is a growing area of experimentation. 600 people will gather this year at the 'Quantified Self' conference at Stanford University, for example, to explore the possibilities of self-tracking for issues of health, personal development and learning.ⁱⁱ There are a number of commercial products available already that allow individuals to keep an automated record of physical activity, calorie consumption, sleep and other variables. In the research arena, developers are exploring the implications of ambient data collection for changing the nature of social encounters in city streets (for example, the BlueFish projectⁱⁱⁱ) or developing an understanding of the nature of human development. One researcher, for example, has set up video cameras and microphones in every room of his house and has documented every domestic moment of his child's first two years.^{iv} This process allows him to observe in detail how the toddler learns to speak.

The tools to gather and mine data are also rapidly diversifying and expected to grow significantly in sophistication over the next decade. As sensors become more sophisticated and miniaturised, we can expect the development of 'smart cities' able to produce massive amounts of data from the environment. As bio-sensing tools develop and real-time FMRI improves, personal ambient data collection tools may in future be able to capture information about brain waves and the development of neural networks.^v

There is also substantial recent progress in analytic tools for data. Discourse analysis and opinion mining tools, bringing together linguistics and computation, are making it ever easier to extract *meaning* from qualitative datasets. This opens up the potential for gathering personal data on the fly and it still being of relevance in the future, rather than relying on personal data being pre-tagged and defined by the user.

If data analysis and capture tools continue to develop in sophistication at this rate, it is highly likely that a highly diverse set of biological, environmental, institutional and social personal data will simply be recorded and captured about and by each one of us on an ongoing basis, and recalled at a later date for whatever purposes we might then imagine.

ii. Assumptions about learning

Proliferation and mining of personal data is likely to be particularly important for education. This is because we now understand that learning is not simply a process of ‘acquiring and banking’ knowledge in schools. Instead, we can understand learning as the lifelong development of the capacities and identities that allow us to participate successfully in a range of areas of human activity. Learning as a process operates on multiple timescales: from the micro-encounter of the conversation, the lesson or the watching of a demonstration, to the meso-level knitting together of these moments to create strategies to solve problems or develop a new area of understanding; to the macro-level narrative of the creation of sustained identities that allow the individual to act successfully in different areas of life.

An important challenge for individuals and for educators is therefore to understand how to knit together these moments of experience (for example, being shown how to do something, or a conversation) into sustained identities and practices over time. As Lemke argues, learning is only valuable if it ‘lasts long enough to be put to use’.^{vi}

Recent studies of learning across the lifecourse^{vii} have also begun to conjecture that the ability to tell reflective life stories is potentially emancipatory. In allowing individuals to reflect upon their choices and resources over their lives, it may enable them to create new narratives of their own rather than to inherit them from elsewhere. Through this process, ‘*individuals’ hidden possibilities are brought to the surface and developed, and [...] ‘unlived’ lives can be lived instead*’.^{viii} The second important challenge, for educators and individuals, therefore, is to explore how different experiences and encounters might form the basis for telling new life stories, for negotiating new identities and therefore opening up the potential for participation in new areas of life.

iii. Personal Data and Learning Lives

Taking this view of learning as a process of identity building, the careful knitting together of coherent narratives from multiple experiences over time, and of emancipatory learning as a process of reflection with others on the stories that we tell about and identities we produce for ourselves, the potential of personal data to play a powerful role in learning becomes clear. As Lemke and Wertsch have both argued, objects and artefacts play an important role in carrying and evoking cultural memory and, hence, narrative:

‘meaningful material objects shaped in one moment’s activity, can provide the link to another, related activity, in another moment of time. And the result is the construction of continuity on a longer timescale than that of each momentary activity’^{ix}

The ongoing collation of personal artefacts, ambient information, biological and environmental data, and institutional records creates a powerful resource of personal data for each individual. This resource brings with it the potential to create powerful cultural tools to support the evocation of memory; to tell stories and share them with others; to reflect upon and interrogate personal biographies; and to compare these narratives with those of friends, colleagues and others as a basis for exploring whether we have, within us, the potential for lives as yet unlived. Personal data has the potential, then, to support profoundly emancipatory educational practices. The challenge is to understand how best such data might be used to knit together a life and to support the social narration of experiences.

1. Project Design

This exploratory project was co-developed with the BBC in order to explore the complexity of people's learning lives and the potential role of rich personal data collation, curation and analysis tools in supporting such learning across the lifecourse.

The project therefore had three overarching purposes:

- To explore the learning experiences and resources of a range of individuals at different stages in the lifecourse
- To explore how diverse individuals already collect, record and share information about themselves
- To conjecture about how individuals' data collecting and sharing strategies might be amplified by a rich personal data landscape in pursuit of a range of learning motivations.

The project comprised three phases, each of which address these aims although with varying emphases. The first, was a series of concept mapping workshops with 96 people from a range of different backgrounds and ages, intended to elicit an understanding of the range and diversity of their learning experiences. The second involved 13 case studies, with individuals aged from 24 to 83, who were interviewed and asked to keep multi-media diaries of critical moments for future reflection over the course of a week. The third stage involved collaboration between researchers and a data visualisation specialist, to produce a set of use-case scenarios that would capture a range of possible applications of rich personal data in support of learning across the lifecourse.

a. Phase one: mapping workshops

The mapping workshops were designed to explore the motivations and resources for learning of a diverse range of individuals (see Appendix). They sought to elicit a broad overview of the types of experiences that different individuals might begin to recount when asked to describe their lives and the learning that has formed part of it.

Over 8 workshops, we invited 96 people to produce 'concept maps' of their learning lives. In itself, this process made it clear that collating and representing learning lives is a highly complex activity and that there may be different cultures and practices of representation and reflection upon both life and learning. Participants adopted a wide variety of approaches to the mapping activity. For instance, some people produced lists, others wrote 'stories of their lives', some wrote very personal reflections on particular experiences and others drew pictures and were able to link experiences together across periods of time, or through relationships. The way that people chose to approach the task could be understood as important data in its own right, enabling us to find out more about how different people understand and articulate learning in a range of ways at particular stages of their learning lives.

What was clear from this process, however, was that the workshop participants frequently enjoyed sharing their 'maps' and accounts with each other and that the talk around the maps, in the end, promoted reflection on these longer-term narratives. Audio recordings of the workshops consequently became an equally useful source of data for the project inquiry, as well as providing a useful reflective experience for participants.

b. Phase two: case studies

The case studies were designed to elicit a much richer understanding of a small number of individuals' current learning experiences and the extent to which they might wish (or resist) recording and reflecting upon their experiences. This involved recruiting 13 individuals, aged from their mid 20s to

their mid 80s, and asking them to keep a record of their 'learning experiences' over the course of a week (see Appendix) using interview and diary techniques.

Clearly, the recognition that learning and life experiences are profoundly interconnected brings methodological challenges in such a process: should the researcher ask the participant to simply document their lives, or to document their 'learning experiences' within their daily lives (which already implies a form of reflection and pre-categorisation of experience)? In this case we decided to treat the case studies as a means of eliciting the sorts of 'intentional' data collection that people might engage in to support their learning lives. In other words, we asked participants to take a note of anything that they might see as a 'learning' experience or that they might conceivably want to recall and think about later.

Unlike the concept mapping workshops where our focus was on the broad experience of learning throughout life, here we were interested in the potential for individuals to act as active authors of learning narratives curated from their life experiences. The participants were interviewed once about their life and recording processes at the beginning of the week, and again on completion of the week. Each person was given an iPod touch (or used their own phones) loaded with the Evernote application that allowed them to create a virtual 'notebook' over the week. They could take a photograph, make an audio or video recording, capture a webpage or make a note for each entry.

c. Phase three: Use case scenarios for personal data as a resource for reflecting on learning lives

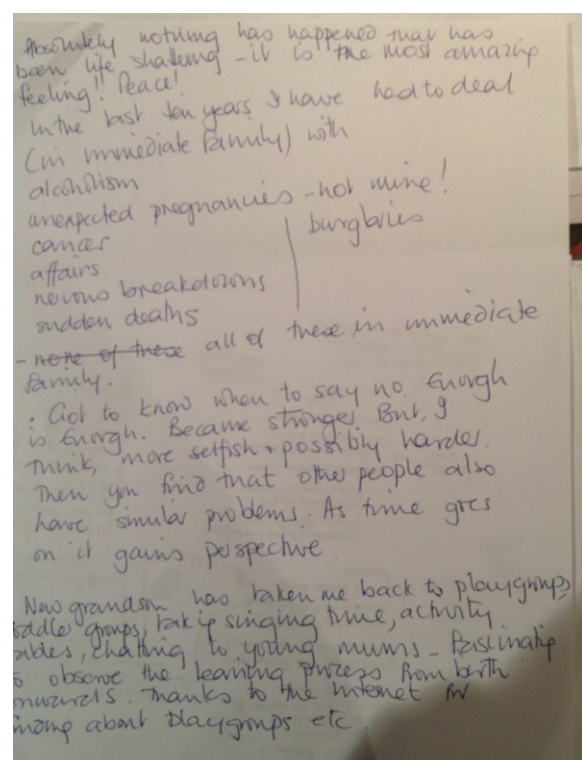
The preliminary data generated through the concept mapping workshops and case studies were used to draw out a set of use cases. These were realised by the research team working with Andy Littledale, a specialist in visualisation techniques. The aim of these use cases is to focus attention on the potential for developing new tools that might support individuals and groups to use personal data in their learning lives. Their design is purely speculative and intended to prompt debate about the ethical, technical and pedagogical challenges and opportunities that such developments may bring. In particular, they are designed to challenge educators working in media and formal education settings to think carefully about how personal data might be used to enhance learning experiences and how this might be integrated with existing structures and practices.

The use cases were developed by identifying a set of key prompts for learning identified in the analysis of the concept-mapping phase. These prompts for learning were turned into indicative narrative accounts and then formulated as data visualisation and navigation challenges. For example, it became clear that retrospective narration of a rich life was a high priority for some of the much older adults, while analytic reflection on resources and strengths was a high priority for adults confronting significant mid-life transitions. The data visualisation specialist was challenged with producing an indicative strategy by which personal data might be navigated, mobilised and represented to support these key purposes and transition points. These indicative strategies are presented separately from this report.

2. Findings: Prompts and Resources for Learning

Drawing on Goodson and Biesta's work on narrating learning lives and Lemke and Wertsch's argument that cultural tools have the potential to support that narration, we were interested in understanding whether there were typical 'plotlines' and cultural tools that the participants in our workshops reported in their accounts. Before describing the commonalities that emerged, however, it is worth making visible the highly divergent life and learning experiences that each individual in the workshops were able to make visible.

Consider, for example, Ruth, from one of the University of the Third Age groups (Fig. 1). When asked to 'map' her recent learning experiences, she responded with what could be seen as, instead, a highly personal linear narrative of adversity and personal development. The narrative structure suggests three phases to her learning – first, the unremitting series of difficulties faced; second, the personal development she had to go through to deal with these and the working through of this process; and finally, there is a third act implying a future and a new sense of interest and possibilities.



Absolutely nothing has happened [in the last week] that has been life shattering – it is the most amazing feeling!!
Peace!

In the last ten years I have had to deal (in immediate family) with

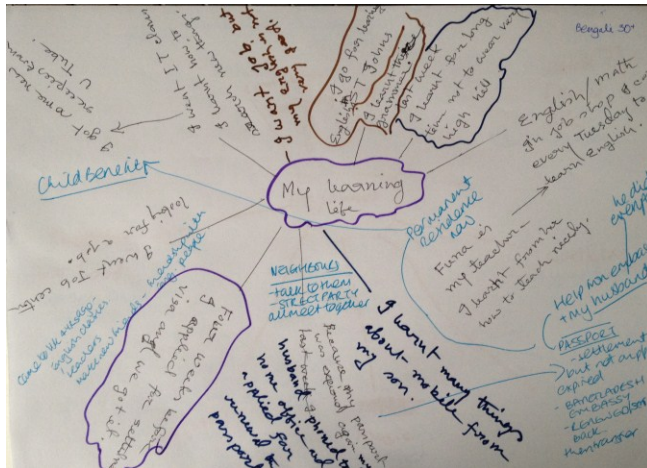
- Alcoholism
- Unexpected pregnancies – not mine!
- Cancer
- Nervous breakdowns
- Sudden deaths
- Burglaries

~~None of these~~ all of these in immediate family.

: Got to know when to say no. Enough is Enough. Become stronger. But, I think, more selfish and possibly harder. Then you find that other people also have similar problems. As time goes on it gains perspective.

Now grandson has taken me back to playgroups, toddler groups, taking singing time, activity tables, chatting to young mums – fascinating to observe the learning process from birth onwards. Thanks to the internet for finding out about playgroups etc.

In contrast, another participant in his early 50's working in a self employed capacity presented the following highly complex map of his learning experiences including the moments of reflection and development that they engendered. The map shows the rich interconnections between his use of cultural tools such as the internet, blogging and twitter and his personal development through coaching.



These four examples show the range and diversity of experience, challenge and emotion that goes into making up individual learning lives (see Appendix 2 for overarching map).

On analysis of the concept maps and discussions around learning in the workshops, a clear structure for how people talked about their learning lives emerged. They tended to talk about events and experiences that motivated particular learning processes. Our analysis, therefore, became an analysis that sought to understand whether there were a set of common ‘prompts’ for learning, that might, in time, help us to think about why and in what circumstances people might want or find it helpful to mobilise personal data to support them.

This analysis leads us to tentatively frame learning prompts in four broad categories:

Personal events, Practicalities, Pleasures and Participation.^x

This categorization does not imply that specific experiences will be associated with specific prompts, after all what for some may be a pain for others may be a pleasure. Take retirement, for example, which for some opened up the possibility of stretching unused mental muscles, while for others it required painful personal readjustment and changed identity. At the same time, we are not assigning specific ‘areas of knowledge’ to particular prompts – for some, for example, learning languages might be a practical requirement for some and for others a pleasure. What we are trying to do with this categorisation is to develop a learner-centred account of motivations for learning that gets beyond the tired historic categorisation along either process lines (formal/informal) or the instrumental account of learning that defines it in terms of outcomes (in knowledge, skills, personal development). Instead, because we are interested in how individuals themselves might mobilise personal data to support their learning, we are simply interested in the motives that might prompt this.

a. Learning Prompts

i. Personal Events

Participants of all ages in the workshops discussed learning events that were prompted by personal events that were often (but not exclusively) painful experiences. These ranged from having to deal with physical and mental illness (either their own or that of others), with intimidation, with bereavement and loss, with discrimination, with migration, with divorce and changing family relationships, and with retirement or movement to new surroundings. They also included the adjustments of new parenthood, new jobs and life changes.

The learning challenges that these presented involved a high level of emotional reflection, adjustment and pain and the search, often, for the creation of new narratives about their lives, their sense of self and their relationships. Often, this prompt for learning involved acting upon and thinking about personal development.

Consider, for example:

- the 69 year old woman whose daughter's husband suddenly left her with 3 children under 5. This resulted in our participant moving house to support her. This involved her leaving a city and learning to live in a more rural area, as well as learning to look after her small grandchildren.
- The 13 year old girl who describes 'feeling alone' when her mum and dad split up, learning to love her step mum but feeling let down by her mum who seems to continually put her down.
- The 68 year old man who describes how retirement has made him feel 'invisible' and unconnected after a working life in contact with both people and ideas. He describes feeling a 'loss of power, influence and updated information'. In order to overcome this (amongst other things) he has joined a local authority Older People's Forum and started an online course in economics.

ii. Practicalities

This category captures learning experiences prompted by routine life challenges. It was an outcome-oriented learning, focused on 'getting something done' and effecting change. A broad range of learning activities fall under this heading: For example, dealing with everyday life problems – from learning how to manage mobile phones or reprogramme digital TV sets to working out how to resolve damp problems, DIY and building issues. It also included, however, the outcome-oriented learning that occurs in response to life events – such as developing medical and legal knowledge to better understand illness, or developing new skills to cope with unemployment or promotion or change of work.

The learning challenges that these prompts triggered were related to developing new ways of acting in and on the world; in the main, people talked about having to develop new technical skills and areas of understanding (whether learning a new language to working out how to wire a plug.

Consider, for example

- the 40 year old woman who moved in with her mother when it was obvious she was becoming ill with Alzheimer's, she described the process of trying to get support for her mother and for herself as a carer. This resulted in her becoming active in the local carers' group, but at the same time having to give up a lot that she'd hoped to do in her own life
- the 70 year old woman who went to the garden centre to discover 'what was causing my pansies to wilt'?
- the 55 year old man who had to learn more about DIY to improve his new house so that he could attract a lodger
- the 48 year old man learning about a new work place through online searches, speaking to people in the organization and thinking back to previous work experiences that might help him

iii. Pleasures

The third category describes learning experiences that are prompted by the individuals' own sense of curiosity or perception of pleasure. It is concerned with participants' accounts of learning 'for its own sake'. The prompts for such learning may emerge from a conversation or a TV programme, or be

sparked by a daydream. Participants were not always clear where this desire for learning originated, and it resulted in a wide range of activities – from looking up family history, to travel, to learning musical instruments, to working out crossword puzzles.

The learning challenges that such pleasurable learning provoke are endless. Indeed, learning for pleasure will, as we know from research into games and learning, enable people to participate in activities that would otherwise be highly painful, dull and repetitive.

Consider, for example

- The 70 year old woman who ‘encountered juniper berries in a recipe’, went out and bought some and then used them in everything, eventually getting into researching gin making
- The 68 year old woman who went on regular hikes simply for the ‘sheer pleasure’ of being outdoors, observing the landscape, birds, flowers.
- The 8 year old girl who told us she ‘really likes gardening and making paper tissue flowers.’

iv. Participation

This final category describes the learning that is prompted by the desire to participate in social relationships. The purpose of the learning is not the development of particular skills or knowledge in its own right, or the development of the self; rather, it is directly concerned with the desire to be part of a culture or a practice. This might include, for example, the sorts of identity work that teenagers (or any of us) participate in when learning to love ‘the right kinds’ of music. It might include the sort of learning that comes out of joining social groups or the learning that emerges as a by-product of participating in civic society activities, church organisations, or a social sports club.

The learning challenges that the desire for participation present are endless. After all, the range of social experiences that humans participate in is limitless. What is distinctive about the challenges that this prompt presents, is that it requires learning that is interleaved with the learning, skills and knowledge of others. It is learning that is fundamentally interdependent with others, it is learning designed to be shared, used, depended upon.

Consider, for example,

- the 13 year old boy playing FIFA 12 on his Xbox with his friends but also with a global community online
- the 69 year old woman who became a member of Bury co-operative group and through this active in the Bury ‘Fairtrade town’ campaign
- The 73 year old woman who joined a bird watching club – attending presentations and going on bird watching days out with the group

v. The dynamism of learning across the lifecourse

An attention to these different prompts for learning makes visible the highly dynamic nature of learning lives. They show how individual encounters and experiences are stitched together to create interconnected chains of learning experiences that over time (as Goodson & Biesta have argued) come to form learning narratives and sustained identities. We found, for example, that people would tell a story of a practical problem that led to immersion in activities that became pleasurable and intrinsically valuable to the person in their own right. We found stories of an impulse to participate in social projects that, in turn, led to practical learning challenges and, at times, to painful experiences. Indeed, one of the interesting questions that such categorisation engenders is whether there is potential benefit in encouraging movement between these different types of narratives. Here, further research engaging with both therapeutic and narrative learning literature is required.

For the purposes of this project, however, these four types of motivation for learning are useful in helping us begin to envisage the reasons for which personal data might become valuable to individuals.

b. Learning Resources

So far we have discussed the prompts for learning. It is important also, if we are interested in thinking about how personal data might support these processes, to explore what sorts of resources individuals' drew upon to support their learning. These are clearly highly diverse, but we could categorise these resources as follows, and also begin to examine the types of 'traces' or data that such resources might generate:

i. Cultural resources

Cultural resources could be understood as that broad field of resources designed to capture and provide access to knowledge and information. They include the traditional learning institutions of libraries, museums and galleries. They include the traditional learning materials of encyclopedias and books (whether analogue or digital). They include the cultural and media institutions of broadcast media, print media and online resources.

In terms of their realisation as data, these cultural resources are usually, in themselves, designed as records for people to access. Since the 1990s, many of those only found in analogue form have also been digitised. Online and media resources are, by their nature, already digital. These resources also increasingly carry information about their use that can be connected with individual users.

ii. People resources

People resources were the most commonly cited learning resource, and also the category that had the greatest diversity. It was to people that our respondents most commonly turned first 'when stuck' or when confronting 'big issues' (this echoes studies dating back to the 1990s). People resources included everything from friends and family (a hugely important learning resource both in prompting learning challenges and in providing help and advice), to experts consulted in a professional capacity, to formal and informal educators such as teachers and life coaches. This category also includes interaction with people remotely, for example, people encountered through social media networks or specific online interest groups. It takes the form of conversations, requests for help, provision of moral support, guidance and advice, mentoring and explicit teaching.

In terms of their realisation as data, these sorts of learning resources are only rarely 'captured'. Conversations tend not to be recorded; similarly, coaching or mentoring activities tend to happen on the fly, and so recording is frequently difficult or inappropriate to achieve. Online interactions, however, are often available in archives (for example, archives of social media exchanges or postings to online help forums). Arguably, people resources are better understood as friendship or professional networks. Consequently, these might be captured in other ways – through photographs and videos that record not the encounter and the knowledge it provided, but the person themselves.

iii. Commercial resources

Consumption activities were identified as a prompt and support for learning by many participants. The teenagers, in particular, talked about shopping as an ongoing social activity, a way of learning to fit in (as well as, arguably, a source of all sorts of incidental learning activities from mathematics to textiles and electronics). Adults discussed the role of shop assistants and suppliers as sources of

advice and expertise, and advertising information as a research tool. This category arguably overlaps with both cultural and people resources. However, commercial information resources as well as commercial human interactions are designed and structured to promote purchasing patterns rather than learning, and therefore merit a distinct category of their own.

In terms of their realisation as data, the explicitly pedagogic elements of commercial exchanges are often available in digital format – through advertising materials, through online guidance and help lines, through the scripts and training materials for shop assistants. The actual exchanges that offer support may not be captured (for the same reasons as in the ‘people resources’ discussed above), but the potential for that support can be captured in brand awareness and branding materials.

iv. Embodied resources

This category refers to the ways in which people cited the body or participation in real activities as a learning resource. This includes everything from watching and copying dance and sports moves, to making and building in activities such as design and engineering. It also includes the sorts of embodied learning that respondents referred to when talking about volunteering activities or caring for pets and animals. Doodling, sketching, modeling and note taking could also be understood as ways of enabling individuals to work through ideas.

In terms of their realisation as data, it is the products of this embodied action that tend to act as the record of embodied learning – the notes, the doodles, the models, the designs, the dances, the sports achievement. Although this wasn’t reported, these embodied records are often themselves amenable to digitisation – notes and doodles can be digitised, models can be rendered in CAD/CAM, dance and sports performance can be filmed for future analysis. Similarly information about the body and its movements in the course of this learning can also, in principle, be recorded – capturing movement, heart rate, galvanic responses, blood flow etc.

v. Reflective resources

The final category was only rarely cited by participants, although older participants were most likely to discuss it. Despite this, it is sufficiently distinctive to merit description. Reflective resources refers to the tactic described by some workshop participants, of responding to problems by thinking back over their lives and identifying what resources and strengths they might draw on. It also refers to the tactic described by some workshop participants of simply paying attention to their own actions and mindfully changing their behaviour, such as when confronted with difficulties in relating to or managing people. While such practices might be supported on occasion by people and cultural resources – for example, through counsellors or through religious activity – it was not the case that such activity was dependent upon such resources. As such, we feel that it merits its own category.

It is conceptually difficult to imagine how personal reflection might be captured as data. The process of thinking may not, in itself, be amenable to digitisation (although watch this space in terms of the claims neuroscientists are making). The externalisation of thinking as a practice of reflection through art, however, has a history as old as humanity. And arguably, the process of keeping diaries is a longstanding translation of reflection into data for later examination. Here, however, the process of reflecting and the process of embodied learning, may merge.

vi. Missing resources: institutional and environmental

The previous categories reflect those resources that the individuals in our concept workshops recalled having used to support their learning. What is interesting is the absence of some forms of personal and public data that might be used to support this sort of learning, but which were absent from these accounts. The first might be the institutional data that is gathered about each person – in other words, data such as the formal feedback provided by educators, doctors and any other professionals

that the individual encounters. The second might be the environmental data that is captured about our movements through public and institutional spaces, that records where and when we went to particular places and, at times, with whom. This absence in the accounts of learning resources reflects the fact that such data has usually been seen as the property of institutions rather than the person themselves. Thinking about how such data might be used to support learning, even though it is not being used at present, will be one of the longer term conceptual challenges to the assumptions we make about the use of data to support learning. It also raises a host of legal and ethical challenges that merit further investigation. We might call this category – institutional and environmental resources.

c. Summary

To summarise, we observed four broad prompts or motives for learning amongst the participants in our concept-mapping workshops, these were: personal events (personal experiences and transitions that required emotional adjustment and personal development); practicalities (the development of skills and knowledge in pursuit of action in the world); participation (learning in pursuit of social engagement) and pleasures (learning prompted by curiosity and interest for its own sake).

We also observed that these individuals drew on 5 key types of learning resources: cultural (e.g. cultural repositories of knowledge and information such as museums, books, libraries); people (e.g. friends, families, educators, counsellors); commercial (e.g. advertising, sales advice); embodied (working things out through bodily movement); reflective (e.g. reviewing, auditing and reflecting upon experiences).

Finally, we also observed that these different learning resources can be recorded in different ways, in some cases, the resources are already available in digital format, in others, proxies are required - for example photographs of friends or experiences. We also noted that significant sources of data about the individual were not mentioned by these participants, in other words, the institutional and environmental data that is held about individuals but which tends to be owned and managed by institutions.

3. Findings: How do individuals capture data about themselves and their learning today?

In seeking to explore the use of personal data for supporting learning narratives we are, in essence, asking how individuals might harness the myriad micro-interactions and experiences of their lives as a basis for analysis and reflection. We are seeking to understand, for example, how the conversation with a colleague, the encounter with the shop assistant, the sketches from the art class, the records from a health scare, the TV programme that triggered an internet search, the notes from schooldays, the CDs and magazines gathering dust in the corner – how all of these might be mobilised to support people's diverse learning aspirations and needs.

One aspect of this challenge, is to understand the prompts for learning and the sorts of learning resources that people might typically use, which we have already discussed.

The second aspect, is to reflect on how people already collate their learning resources and capture records of their learning experiences.

The 13 case studies that we have conducted complement the workshops to allow us to look at the minutiae of the processes of recording and reflecting upon learning experiences. This section describes first, the strategies that individuals use to support recollection and reflection. Second, it draws on the case studies and workshops to talk about three common uses of records and data in people's lives. Finally, it maps these strategies for using data against the four learning prompts described in section four and gives examples of where these strategies became visible in the lives of our case studies.

a. Documenting lives

Our interviews with the 13 case study participants made visible a highly diverse range of strategies for capturing experiences and supporting reflection. These included everything from the centuries old diary to the new strategy of revisiting a year's tweets to replay experiences. They captured everything from personal reflection to embodied activity, to commercial exchanges and cultural experiences. The following provides a summary list of the types of things that individuals used:

The box of souvenirs - Steve couldn't initially think about how he recorded his learning but began to talk about a collection of memorabilia 'in a box somewhere'. He then began to visualize the box and talk about the other things he kept in the box (but rarely looked at). This included old programmes of Rangers and Manchester City matches he'd been to, tickets for gigs and other memorabilia. When he talked about these items they evoked memories of events, of people and of times in his life. For instance, he told a story of attending a Rangers match and getting the autographs of the players, an opportunity his Scottish cousins had been highly envious of.

Handouts from class – Nora has a folder in which she keeps the overview of all the U3A courses that she is attending throughout the year. In the folder she keeps notes and handouts that she's bought back from the groups, as well as maps, articles cut out of magazines and other artefacts that remind her of the group activities that she is involved in. Chloe has a box containing all her university notes and papers that she returns to occasionally when something reminds her of a topic that she studied on her undergraduate course.

Online bookmarks – Many used online bookmarking to keep and then retrieve web pages that they'd visited and thought they might want to use or visit again. Some found this more useful than others and used apps to help them with this such as Quietread. Clare has bookmark folders for different aspects of her life in order to be 'properly organized'. She says if she didn't do this she would panic, she needs this order in her life. She has folders for job searching, training opportunities and also for 'stuff she's interested in'. This last folder might be sparked by a TV programme which encourages her

to find out more about an interest or topic. She will return to these if she's bored or looking for something to do. Others were still struggling to use bookmarking at all, even though they recognized its usefulness. Chloe would be more likely to print something off and write notes on a review as she is not confident about how to bookmark websites. As a result she often finds web searching quite frustrating as, 'a lot of time I'll find something and then that reminds me of something else and I'll go to something else and then I'll forget the original thing and I'll have no way of getting back to it unless I go through all the history of what I've looked at which is a bit of nightmare and very time consuming.'

Invitation to an event – Kam's place marker at a Chinese new year celebration was kept as a souvenir of an important and much looked forward to event in her year. This year she had persuaded her son who lives in Bristol to come up and attend the event with her – it was to be the first time in his life that he'd attended a 'real' Chinese Banquet and Kam was looking forward to sharing this important cultural experience with him.

Photographs – Many of our participants talked about photographs as important sources of memory. Mina, geographically distant from her mum back home in Algeria, used photographs to share and focus on the positive aspects of her life by recording her young child's learning and enjoyment of life. Photographs taken by Mina's mum on visits to the UK were also shared through the post and then formed the basis of discussion and chat on Skype. Many of our older participants discussed the loss of the photo album in their life and how difficult they found the move to digital in relation to reviewing and keeping photos to show to others. Dougald felt that the problem was that he no longer had instant access to these photos as well as the sheer number of photos we now create with digital cameras. He felt that this was a problem in leaving a 'legacy' for his children and grandchildren. Nora meanwhile worked with a friend to put several holiday albums onto a DVD, with place labels on each album and a musical accompaniment. She described the pleasure she got from being able to view the photos on her TV, bringing back happy memories and sharing them with her friends, neighbours and relatives.

Framed photos – Steve has framed a photo of himself and his brother at Wembley for the FA Cup final, this is a symbol of his allegiance to a football team as well as a memory of a special day with his brother and other team supporters. Clare has a framed photo on her wall that she took herself showing a stormy sea in Blackpool, this evokes memories of a period in her life when she lived in Blackpool and used to go to the promenade to watch the sea, especially on stormy days.

Sheet Music – Kam has various pieces of sheet music saved in her book case. These are important to her even though, or perhaps partly because she can no longer play the piano due to her arthritic fingers. The sheet music enables her to recapture and re-enact past 'performances'.

CDs – Steve has a collection of CDs that are too numerous and too often updated to keep in alphabetical or genre order (even though Steve is anally tidy and would love to do this). As a result he often finds the CD he wants difficult to find, although he has a filing system for those he's recently played or received. Even though record companies send him mp3s he prefers to download and copy these new tracks onto CDs – there is something about the physicality of the object that he still values.

Playlists (records of shows broadcast)- Steve has written down all the songs he has played on his radio shows over the last four years. He does this at the time in order to let the record companies know what he's played but he now has all of these records in a folder and will look back at this relatively frequently.

Running Orders – Chloe has kept all the running orders of her community radio shows broadcast so far. She will look back at these when planning her show each week to remember what she talked about in the previous show, to think about what worked and what didn't work and to help her make decisions about shows in the future.

Appointment Diaries - many of our older participants had appointment diaries that they kept updated assiduously so as not to forget anything as they began to struggle with their short term

memories. Many described the horror they would feel if they lost the diary and as a result several participants described copying appointments and events manually onto more than one calendar. Like Kam who carries one with her at all times but has another in the kitchen that she updates (as often as she remembers) – discrepancies cause some worry.

Songkick – an app which not only alerts you to gigs coming up in your local areas but also records all the gigs you have attended throughout the year, was used by Will as a way of conducting an ‘end of year review’ – What were the best gigs? Which bands should you look out for next year? In Will’s case these were then used to write a blog post for an online music magazine ‘My ten best gigs of the year’. Shared in this way the blog became a conduit for communicating his music taste to others.

Life stories – Bob has begun to write his own life story on the computer. After typing 7 pages he had unfortunately lost the file so was having to start again.

Twitter feed – several participants used their twitter feed as a way of looking back on their life and conversations. Some said they used this to look for recommendations for restaurants or bars, others as a reminder of the time or date they’d arranged to meet someone or a reminder of a link they needed for work or other interests.

Books – For many of our participants books were kept and seen as important markers of courses studied, times in their lives and for Martin as a kind of ‘aspirational’ tool signifying his desire for further study. Nora has an electronic device on which she can download and store books in a virtual library, she finds this helpful as she has so many books upstairs that she has no more room to store them. Interestingly the books she’s bought are stored and made visual as if they are on a shelf, making them easy to view, and enabling her to annotate and reflect on what she’s read at a later date.

Notes – Martin carries a notebook with him everywhere he goes particularly for taking notes of meetings. As his role involves personal and organizational development he will make notes about the behaviour of people in meetings and will revisit these notes in subsequent meetings to highlight aspects of organizational culture. Chloe also carries a notebook with her everywhere, in her case to note down interesting and perhaps embarrassing stories about herself that she can retell on the community radio show she presents.

Alphabetic book – Nora plays word games online with friends. Whenever she learns new words she will make a note of the word and the definition in an alphabetic book. She refers back to the book whenever she plays the games.

Notepad (next to the phone) – Clare has a ‘huge’ pad next to her bed in which she records the date and time of more official telephone conversations she’s had as well as the name of the person she’s spoken to.

Mobile Phone – Clare uses the ‘notes’ feature on her phone, or takes photographs of things that she needs to remember. This has replaced yellow post it notes that she used to put around her flat. She finds using a phone much easier and as she has done each activity, or remembered to buy the item she will go through and delete the note. She takes photographs with an SLR camera but uses the phone to take photos of everyday events as it’s handy and she takes it everywhere she goes. She also has photo apps such as Incredibooth which she uses to take photos of herself with friends, to make collages and to share with friends.

Facebook – Chloe uploads photos to Facebook and will go back to these photos to remind her of interesting things that she’s seen or events she’s attended, places she’s visited. Clare takes almost daily photos of skylines and weather, which she uploads on Facebook to share with her friends in the global storm chasing community

Audio recordings and transcripts – Nora writes articles for the parish magazine, she interviews parishioners about their lives and then writes this into an article. She doesn't have a digital recorder but she listens back to the interview, transcribes it and then edits this to make a readable article.

Diaries as reflective journals – several women we interviewed talked about writing journal type diaries. For Clare this was partly advised by a doctor, so that she could look back over a week and see how she'd done in relation to her depression and anxiety disorder. She found the experience useful, for instance, often discovering her week had not been as bad as she'd thought. She enjoyed writing the diary and so when she got an iPhone she quickly discovered a diary app called Momento which allowed her to combine this writing with her love of photography and is also linked to her Facebook status updates. She will often go back to revisit days to see how she's been doing and would share this with health professionals. Chloe meanwhile explained that she had kept a diary for years but as she now has two jobs she has less time to do this and she misses it. Nora is considering starting a journal as an 'aide memoire' and in order to 'analyse' what she's done and whether it was really the best use of her time. She felt that if she put her thoughts and feelings into it she would probably not share it with others.

Blogs about interests or professional life – Will writes a blog about music and another for a local film festival he is involved with. The blog serves as a reminder of gigs he's attended, films coming up and the comments as a reminder of other people's interest and questions. Martin has just begun to write several blogs, partly because of a growing realization that he wants to write more and also to communicate learning he has accumulated in his personal and professional life over a period of several years.

Souvenirs – Dougald, an architect, has a collection of snow domes, they create a wonderfully quirky display in pride of place in his hallway. When he was working someone bought back a holiday souvenir for the office, an office collection began and when he retired Dougald was given the collection as a kind of memorial to the time he'd spent there. Since then Dougald has added to the collection, bringing back snow domes from the many places that he and his wife have visited, but, as if evoking the connection back to work, he searches for iconic buildings within the snowdomes, the Eiffel Tower, the Empire State Building. The souvenirs act as reminders of their visits.

Music – Will has a collection of music that includes vinyl, CDs and downloads he has bought throughout his life. Playing a certain piece of music can evoke, for him as for many of us, an occasion, a person, or a particular period in our lives. Music is itself a carrier for memory.

Presentations – through involvement in organizations such as the University of the Third Age and the Rotary club Dougald is regularly asked to do presentations to groups of interested adults. He described, for instance, getting together some material for a presentation about his snow dome collection which involved him finding out more about the history of snow domes, their manufacture and development, as well as introducing his collection and memories to others.

b. Intentional reflection on experience

Our request to case study participants to record 'anything they might want to return to' over the course of the week, led to the production of 13 records of experience. This section describes what they chose to collect in terms of data and the reflections that this prompted in discussion with the researcher about their experiences during the week. First, we summarise the actual data gathered by the individuals intentionally for the purpose of reflection later. Second, we present four vignettes of experience from our case studies and begin to explore how such experiences might be enhanced or developed using rich personal data as a tool for reflection.

Name	Biographical Info	Amount of data	Type of data
Will	44 year old male Very technologically literate Disabled – bad back so has to spend a lot of time lying down	30 notes uploaded	7 urls or clipped web pages, including urls of blogs written and then shared via twitter, film reviews read before seeing a film, webpage of singer heard on radio, film listings of films seen to jog memory 5 photos including a photo of a bunch of daffodils in his flat which he shared on twitter, a photo of a receipt from Apple store (in case it goes wrong), a photo of film notes from local cinema, a photo of a recipe cut out of a magazine. 13 + screenshots, including a group of tweets that he used as a calendar, several screenshots of apps that he used for book marking, searching and saving webpages (or other apps), creating histories of gigs attended and music listened to, on a range of devices.
Clare	40 year old woman anxiety disorder so doesn't go out much	10 notes uploaded 6 notes uploaded during the week, 4 notes uploaded when researcher visited prompted by interview	5 photos of people (and their pets) recording social events and events outside the flat including helping out at Brownies, going for local walks with friends and going to a friend's gig. 1 note about a phone call to a mobile phone company about a problem with payment 4 photos and screenshots of online game playing environment and apps associated with it, including a photo of the next spaceship she wanted to buy (prompted by end interview)
Roberto	30 year old Italian man, training to work in music production. Looking for work.	13 notes uploaded	4 photos of the recording studio and new equipment he is learning to use 2 screenshots, one of a live tutorial for the new software, another of job centre web search tool 1 audio note about a problem he encountered with his iPod and how he solved it. 3 photos including photos of books he's using to learn about parenting and a user guide for new software and a photo of a worksheet he's using to help him learn English
Steve	36 year old man, currently unemployed, lives in council estate on outskirts of large city, volunteers at a community radio station	12 notes uploaded	3 photos of people important in his life including staff and mates at the community radio station and a friend he went out with. 1 photo of an important place in his life – the park where he goes to walk his dog and look at birds. 3 photos of souvenirs – a trophy he won for a football quiz, a signed and framed Rangers top that means a lot to him, a framed picture of him and his brother watching Man City at Wembley. 2 audio notes recording what he was doing – preparing a radio show and coming back from a job interview. 2 text notes about what he was doing – listening to the match on the radio and going to the dentist. 1 text note explaining the significance of the Rangers top.
Chloe	24 year old woman, university graduate, currently working on two casual jobs	16 notes uploaded	4 photos, including a photo of a Hoover bag (to remind her of working out how to change a hover bag), a National Geographic magazine she read, a photo of the advert including Richard Branson and Usain Bolt that led her to research them, a photo of a brie wheel that sparked her interest in how to eat brie. 8 urls were recorded but often as part of a process eg search for what to do with a mouse in the house but also

			<p>recorded in a text note that she consulted friends and spoke to people in shops</p> <p>1 video of her learning the Cha Cha Cha from a housemate</p> <p>1 screenshot of a photo of Charlie Chaplin who she researched on the Internet</p> <p>2 audio notes of conversations she had with friends about new things she'd learnt or was thinking about.</p>
Dougald	66 year old retired man, architect. Chair of local Rotary and University of the third age groups.	46 notes	<p>Almost all photos with notes attached to explain significance of the photo.</p> <p>Many taken on weekend break to Bilbao – including photos of food, trips on different types of transport, places, friends, architecture, reminders of jokes and iconic features of Bilbao.</p> <p>Others of U3A groups attended such as the ukulele group, literature group</p> <p>1 photo of Dougald with flowers bought for wife to apologise for being out too much.</p> <p>Photo of rugby team he supports on TV</p> <p>Several photos of souvenirs from trip to Bilbao</p>
Kam	83 year old woman, Chinese Malay heritage, lived in UK many years	13 notes uploaded	<p>Photo of products in a shop when she went shopping for a raffle prize</p> <p>Many photos of a TV screen/ recording a programme that she watched – TV programmes as catalysts for memories of holidays/ places she's visited, cultural roots and stories, new learning/interest in architecture.</p> <p>1 Photo of people – memory of a visit</p> <p>Several Photos of an event – Wai Yin Chinese new year celebration.</p> <p>Photo of a souvenir – object – evoking memory of the event</p>
Bob	80 year old man, recent serious health problems	13 notes uploaded	<p>Photo of a souvenir – memory</p> <p>Photo of computer screen – typing his life story – process</p> <p>Photo of place and note reference to people – Marple garden centre, met some other U3A members</p> <p>Photo of a photo – memory – when in the RAF</p> <p>Photo of documents – evoking memories – how he drove a motorcycle without a license when in Germany on National Service, certificate of service when he finished his National Service</p> <p>Photo of an event – memory – on a German motorway</p> <p>Photos of people – evoking memories – friends in the RAF, his daughters when they were small, his wife at 15 - story of when they first met.</p>
Martin	54 year old man, recently had to reassess work role, works as a personal coach and organizational culture professional	15 notes uploaded	<p>Several urls saved referencing other people's blogs and websites that he follows for work/ professional development or to find something out</p> <p>Photo of notes in his work journal in order to reflect and replay to colleagues</p> <p>Photo of page in a book – Steve Jobs' biography – recording process of reading and thinking about the issues</p> <p>Several text notes recording learning processes including trying out a new piece of software, watching a TV programme –and how this might link to a blog post in the future, noted that he made a note of this on his iphone, saved two papers on laptop for further reading.</p> <p>Photos of old bits of learning that he returned to including his MSc notes/ folder – returning to previous learning and building on it, an old note he'd made that helped him to think about himself and possible career direction,</p>

			Text notes reflecting on learning including a note about what he's learnt from reading a book, a note about feedback from delegates at a meeting , a note recording process of reading a twitter link and reflecting on it, a note recording process of searching for information about a decision that he needed to make
Nora	64 year old woman, active member of the U3A	24 notes uploaded	<p>Photos of a text notes used to remember the characters in a complicated novel or notes recorded at the group to aid memory next time she attends</p> <p>Photos of people – friends, members of groups she attends, herself playing the ukulele, someone she interviewed for the parish magazine</p> <p>Audio recordings – what have I done today? What did we think of a film? Also processes of learning eg ukulele practice, conversation at a literature group meeting, learning to record audio</p> <p>Photo of an event – Candlemass service at her church- memory. Audio recording describing the service in more detail.</p> <p>Photo of a print out of a timeline of French history</p> <p>Diary like textual note – what did I do?</p> <p>Audio recording- someone gave her a DVD that they'd recorded for her- making connections between groups and people</p> <p>Photo of U3A group folder with meeting details</p> <p>Photo of puzzles etc that she does regularly</p>
Elizabeth	58 year old woman, volunteers and runs a family centre.	10 notes uploaded, several were 'practicing' with the technology	<p>An audio note reflecting on her busy day – what did she do, who did she see, what did they talk about?</p> <p>Text note: recording learning she did that day – learning to input data online</p> <p>Photos of advertising for a fund raising event for a festival she's involved in, of herself (dressed in traditional Nigerian dress) about to leave for a meeting, of the family centre annual report that she finished during the week.</p>
Mina	27 year old woman, Algerian muslim, lived in the UK for 4 years.	5 notes uploaded - 1 photo of Algerian cakes taken by the researcher as an example	<p>4 photos with text notes of her toddler, discussing his learning and interaction with others.</p> <p>Interview with researcher revealed that she had many worries and problems including needing to move home, an ongoing grievance procedure at work, choosing a school for her son, that she didn't record because she wanted to focus on 'positive' (as much for herself as for us)</p>
Howard	83 years old, 6 sons, ex teacher	Howard did not upload any notes but chose to write a learning diary for the week instead – he doesn't like technology generally and didn't want to learn to use the iPod and the app.	<p>His diary notes recorded his activities during the week and included: accounts of meetings with friends and the support they offer, more formal learning events such as U3A meetings and presentations, and his aquafit sessions that he attends on the advice of his doctor, trips to Manchester to the opticians, events such as a Probus club meeting and a U3A annual lunch.</p> <p>Also includes reflections on his faith, his son's troubles and the worry this causes and the death of a friend.</p>

The nature of the intentional recording and the subsequent conversation with the researcher provided an insight into how the intentional recording of experiences, as well as their narration to and with other people, might provide potential valuable experiences for individuals. These included examples in which one young man became more consciously aware of a pattern in his interests; and others were able to construct and elaborate tales of themselves, become aware of different identities, or make visible and give value to aspects of their life that they'd not previously felt would be valued by others.

Steve – 'I like birds!' – learning pleasures – tools for prompting surfacing of patterns

Steve (36) is currently unemployed and claiming job seekers allowance. He lives in Wythenshawe. He has had several part time, casual jobs in the last couple of years. He volunteers at his local community radio station. He used to coach a boys football team and has a dog that he likes to walk. He cycles everywhere and has competed in running events to raise money for charity.

Steve describes, with real delight, his pleasure in walking through the local park. Until recently, when his car was stolen, he would drive out of the city to Lyme Park for 8 hour walks with his dog. Now, he walks through the local park where he is a keen observer of the birds, which he describes as 'bringing serenity'. As he talks of the birds there, he references all sorts of other memories, from a recollection of Martin Soprano in the TV series watching birds to get a break from the stresses of life as a mobster, to a moment when he observed two playful Falcons one day in Styal Park

I never realised I was into ornithology and stuff... I'd take a pair of binoculars, I'd take some sandwiches....go to Styal, there are some really steep steps, so steep there's a seat halfway up [I never use it,...] and I was on these steps and there were two falcons playing with each other, and it was amazing - I've never seen em since, and I realised 'I like birds!' (said with some emphasis) ...

During his walks through the park, Steve has observed that there are a number of different types of birds - he doesn't know their names other than ducks, mallards and Canada Geese (which he describes as vicious). He's observed two things that make him wonder – the first, that the swans seem to have disappeared over the last few years; the second, that there are some small black birds who, unlike the others, are present all year round

J *'there's these little birdies, on their own, black with red beaks, they're just on their own, walking like chickens, I don't know what they are, and they're always in the park'*
H *'and you've never looked them up?'*
J *'I should do, I should do yeah, they're the only ones out of all the birds in the park that never leave, you've got ducks, Canadian geese and other stuff... you look at them and you think, yeah, you're alright'.*

Steve, in the interview, constructs a rich narrative of experiences, ideas and wonder relating to his tentative interest in birds. Would he have made such an observation or reflected on the patterns in his experience without the interview? It is not clear.

Chloe – telling tales, learning pleasures and practicalities

Chloe is a 24 year old women who graduated from a media and performance degree from a large university in the North West a couple of years ago. Since leaving university she has worked in a variety of casual jobs such as waitressing and works on a freelance basis as a marketing events assistant for a consortium of commercial radio stations. She describes herself as a 'very busy person'. She lives with her boyfriend in a shared house in an area of the city where a lot of students live. She volunteers for a community radio station in another area of the city and talks about this experience as having 'found what she really enjoys'.

Chloe describes always carrying a little book around with her to record things that happen that might be 'a bit silly and embarrassing' as reminders for topics to talk about on her weekly radio show. She

says that she tends to tell lots of silly stories about herself 'because I'm like the sort of person who walks down the street and gets splashed by a massive car.'

As she talked about the entries she'd made during the week she referred to several amusing incidents that highlighted her quirky, slightly wacky personality that seems to be a key feature of her radio show. For instance, when her housemate bought a brie wheel into the house and she 'tried to grate it onto her spaghetti and it got all stuck in the cheese grater,' or when she cooked vegetable lasagne with her boyfriend watching over her, 'to check I had the right vegetable in my hand.'

Chloe talked a lot about her memory being 'a bit rubbish' which creates a need for her to record facts that she comes across and events that happen in her life. The iPod allowed Chloe to record conversations and videos of learning moments that she felt might have been otherwise lost. Whilst having a conversation with friends about Anne Frank and war she 'just pressed record because I was conscious of the fact that I was learning something, I was actually taking it in.' As we talked and listened to the recording it helped Chloe to remember this moment of learning. Likewise Chloe felt that playing back a video of her housemate teaching her the Cha Cha Cha, both in pyjamas, with morning sun streaming in the window behind them, would enable her to remember how to do this dance in the future. The delight Chloe experienced when watching the moment when they had clearly 'got it' was palpable.

Chloe tells a story about herself during the interviews as a quirky, slightly odd ball person who finds it difficult to remember things, gets things wrong and doesn't know much compared to her peers. This is the persona she also adopts when presenting her radio show. However another narrative emerges as she talks - of someone inherently aware and interested in learning and telling tales. The mobile learning device helps her to record these learning moments that can be played back for future use and then re-broadcast to the audience listening to her radio show.

We might imagine a time in the not too distance future when Chloe might be writing a job application or CV about what she has learnt/done whilst producing and presenting her own radio show. Also the data she collects intentionally, if collated and searchable, could help her to make decisions about her future, what she might need to collect in order to pursue her passions or what kinds of things she might be interested in learning about or experiencing, who might she connect with and why.

Mina – re-framing life and re-negotiating identity

Mina is from Algeria and is a practising Muslim. She is 27 years old and is currently 7 months pregnant, she has a little boy who is almost 3. She is a graduate from a University in Algeria where she studied graphic design. She left Algeria because she 'brought shame on her family' by refusing to accept the cultural positioning and role of women in her culture. She has little contact with her family back home – it is only her mother who is prepared to keep in contact with her. She has recently been 'dismissed' from a part time job in retail and is fighting her dismissal with union backing.

Mina mentioned that 'everything is confusing at the moment' in her life, the only constant in her life being her 3 year old and her partner. However she chooses not to record her difficulties and rather records her young son's learning in order to concentrate on the fun and discovery inherent to her child's life. As she suggests:

You know sometimes we are thinking about all the problems and things we have to do and the things we don't have to forget and we feel like we are like robots, like machines and with kids its not like this it's always something new... When we start working like machines we don't really focus we just do usual things and in the end when you have fun with your kids and you see how imaginative and creative they are and you are helping them and explaining to them a lot.

Compare this recording with Mina talking about her difficulties:

Now I am having a very difficult time – I am having a grievance with my work, my husband is not working, I need to move soon, we need to buy a new car, we have a lot of pressure in the same time. I feel very uncomfortable for sleeping I can't get comfortable whilst I'm pregnant.

Through recording the positive elements in her life Mina was able to remember and focus on,

The good things in this life – we are still healthy, I've got hope I see some blue sky, I have hope even though it's the worst time. For me the most important thing is to keep myself healthy and make sure that my kids are healthy and will have a good education, especially at home. To make sure that they have all the support they need from me and their father. I would like to see them enjoying their life and having fun.

Though she acknowledges that this is often hard it was clear when she looked back at the photos of her son playing, and was able to share them via Skype with her mother back in Algeria, that these records helped her to remain positive. As she eloquently explains,

Now he is my only enjoyment – my son is my best friend he is here with me in my best and my worse moments. This last times I did sometimes lose my smile – sometimes I'm watching TV or cooking and thinking about all the bad things happening around and he's just in his corner playing and then he comes to me and he's excited to tell me something or asking for something. Then I'm thinking oh my god what am I doing, in my corner thinking about these bad people, bad things...

The day we don't have love everything is lost. If I didn't have him I think I would be now be very depressed, in my bed thinking about all the bad things...

Mina is living moment to moment with her young child and it is hard for her to look back over her life so far as she has few connections with people back home – a situation true of many people living diasporic lives. We might conjecture that if Mina had a tool that enabled her to look back on her life so far, remembering events and her actions, and linking them to other global events and stories, she would have the material resources, at least, to begin to rewrite her identity. She might be able to recast her role in her story, not looking through the eyes of those who have been critical of her actions, but instead linking her story to those of others who have fought against injustice and questioned taken-for-granted assumptions in the world. She might also benefit from making connections with others who have been through similar life experiences or involved in similar struggles. It is interesting to consider what kind of resources or alternative narratives she might need to link to in order to help her to do this.

Clare – valuing and making another life visible

Clare is not currently working as she has an anxiety disorder and is prone to depression. This means she also doesn't go out much as she finds travelling on buses and other public transport very difficult and doesn't have a car. She helps out at the local Brownies once a week. She is a trained sound engineer and HGV driver and is also interested in storm chasing and gaming.

All of the notes that Clare recorded during the week were about events that had occurred outside of her flat. It was only when asked directly during the interview about her experiences in the flat that it became apparent that a large part of her life was being recorded (unintentionally) online within an online gaming environment.

H: you know what I find surprising is that it's all stuff that you've done but it isn't any of it stuff that you've done in the flat.

S: yeah (pause) cause I haven't really done anything

H: cause you've just thought that's boring, going online and stuff? Or do you record that in a different way?

S: I suppose (longish pause) because I've just spent all my time on Eve online and I didn't think to record that, it's all logged online.

As she talked about her life when in her flat the richness of her online experiences, her knowledge of the environment and the importance of this aspect of her life became clear. As she talked she was able to question her assertion that, *'I've not really done anything, just spent all my time on Eve.'* Despite the fact that she has a different 'persona' in the online game it became obvious how her behaviours in the online space echo her behaviour offline. So, for instance, despite having played for two years she is 'too frightened' to join a 'corporation' as she doesn't want to be shot at and so stays in a place where she feels she's 'safe'. In the online world she connects with people she knows in the real world, sharing chat with them and getting advice about how to improve. She also connects with a wider community of users through the Eve Wikipedia and through tuning in to the yearly 'fanfest' event in Iceland which is streamed over the Internet.

Talking about her rich online life made it visible to her in a way that enabled her to question the assumption that she was *'not really doing anything'* when she was engaging in an online gaming environment. Awareness too that a whole sphere of her activity was logged and recorded online could provide her with another set of data on which to reflect, audit and tell stories about her life.

c. Summary

The process of documenting recording strategies led to a number of observations about the nature of the objects or data used for recollection and reflection:

First, that all cultural artefacts are and can be used as the basis for reconstructing experience. There is therefore no unique category of objects or artefacts that should be privileged as recording or learning tools. Indeed, the long history of the 'souvenir' that helps its owner to recollect everything from a wild night in Marbella to the history of the Ottoman empire, demonstrates the infinitely creative capacity of the human mind to create and ascribe meaning to objects.

Second, that for reflection purposes, the process of recording does not need to be faithful or detailed. Rather, a fragment suffices to prompt a rich process of narration. One example makes this clear: Kam, an 83 year old Chinese Malay woman, living in Manchester, began a very detailed description of the symbolism of Cranes in Chinese heritage, their purposes, their meaning and also her own experience of learning about this. The artefact that prompted this was an out of focus photograph taken of a television screen that was showing a documentary about wildlife. Interestingly, the photograph wasn't of a crane, but of a swan, as she had not been quick enough to take the photograph while the cranes were on the screen.

Third, that as a record of learning, it is not necessarily a 'learning process' that can be captured or that might be desirable. Instead, images can be used to 'stand for' such processes. Photographs of friends, for example, stand for conversations and problems that were resolved. Photographs of buildings stand for experiences of learning from museums and libraries. Just because a particular learning process itself may not be amenable to digitisation, therefore, doesn't mean that a digital proxy record cannot be captured to support recollection and reflection on that process.

Finally, it was clear that people's processes of using and reflecting on this data at present remain tied to linear and analogue practices. There were struggles to find ways to categorise and make sense of large digital records and to find ways to navigate around and manage them. Many of the older participants reflected with regret on the loss of the physical photo album as a means of prompting the organisation of their memories into an easily accessible form for future reflection. The implications of this are ambiguous. It may mean that the process of organising experiences into narrative accounts is, itself, a valuable process. It may mean, also, that the mobilisation of personal data (which will by necessity be held in massive interconnected databases) will require the development of a new approach to thinking about generating meaning from memory. This will be a key area for future research to model and explore.

When we look at the types of data people gathered to support reflection and recollection, it is clear that, if personal data is to be used for learning it might not be necessary to produce systems that

generate perfect recall of events and experiences, instead, it may be that it is proxy 'representative' data that crystallises experiences that may be most helpful. This means that any device intended to support reflection on learning lives does not need to be seen as a full representation of a learning life, but instead, a prompt for attention, an element of a narrative from which others can be produced. We aren't, in other words, trying to record a life, we are trying to pull out the salient elements of that representation that would allow the person to think about and work with it.

It is also clear that there are numerous 'levels' of use of such data: There is the initial process of collecting and capturing records that may or may not ever be used for other purposes. There is the process of using data and records as a resource for narrative. And finally, there is the use of such artefacts as a basis for reflecting upon and reframing narratives and exploring alternative forms of narration and decision-making. We describe these levels as: collecting, telling tales, and auditing. We have not, in this exploratory study, had time to deeply understand the reasons for these different processes or even whether they are meaningfully distinct. For the purposes of exploring the potential use of personal data for learning in the next section, however, they become helpful. Before turning to this, it is worth elaborating on these three uses of data:

Collecting: in this case, the person is gathering together artefacts and records that give shape to one particular aspect of their identity and their experience. This process is about strengthening and elaborating one element of their lives or interests and in intensifying it.

Telling tales: An artefact or set of artefacts can be used to recount a history, shape a narrative, tell a story about the person. They are used as a way of consciously shaping an identity and, at times, are a way of building relationships with other people or presenting the person to the outside world. We might also describe this process as 'curating' a life. Moving beyond simply collecting artefacts, to the intentional selection of artefacts in a way that showcases a sequence of events and experiences.

Audit and Reflection: Finally, we suggest that there is a use of artefacts as tools for audit and reflection. This might be understood as using data and information about a life as a basis not only for telling tales, but for reflecting upon the new tales that might be possible or the new ways of telling that tale. This might include the process, in fact, of participating in research such as this, in which recording for the purposes of narration becomes an opportunity for reflection on the resources and experiences that the individual might draw upon.

4. Future possibilities - Mobilising data for learning

So far we have discussed key prompts for learning and the types of resources people draw on to support their learning. We have also discussed the ways in which people currently record their lives, and the ways in which such 'recordings' are used in the process of constructing identity and experience.

This next section consists of a more speculative phase to the study. It explores how the three different strategies for mobilising data to make sense of a life (collecting, telling tales and auditing) might overlap with the four different prompts for learning (personal events, pleasures, practicalities and participation).

In the table below, we offer a number of examples of the ways in which individuals might draw upon their personal archives to support different learning activities. In so doing we draw, in particular, upon the experiences of our case study participants. In some cases, we are able to draw directly upon examples that the individuals recounted to us. In others, we conjecture that a particular problem or issue that one of our participants faced might usefully be addressed through the future use of personal data. The following provides a frame for thinking not only about how artefacts and data might be used to support learning now, but for beginning to think of a range of ways (not yet realised) for mobilising personal data in future. These framings were used to prompt the design of the use cases by the visualisation expert.

	Personal Events	Pleasures	Participation	Practicalities
Collecting/ gathering / recording (for self and others)	<p>Collecting as an important element of documenting important events and keeping records. For example: Mina is involved in making a grievance complaint against her dismissal from work. She collects the correspondence she has had with her workplace and the union – including minutes of meetings, letters she’s sent and received and evidence from</p> <p>We could also conjecture that collecting could be used for a way of remembering or overcoming loss – with a memorial function.</p>	<p>Collecting to remember pleasurable events or just for the joy or intrinsic pleasure of having a collection. For example: Dougald collects souvenirs from his many travels – he bought his wife a necklace with a small golden elephant on it to remind them of one of their trips to India when she spent a lot of time riding elephants. His snow dome collection also reminds him of places he’s visited or, in the case of those given to him by others, of the person who gave it to him.</p>	<p>Collecting as a form of membership of a club. For example: Steve collects football shirts, photographs of his attendance at important matches and other memorabilia to signify his support for a couple of football teams and his participation with others as a supporter of the club.</p> <p>An 11 year old boy collects Warhammer models in order to participate in real time gaming with friends and with others who share this interest. He meets up with and plays with them at the shop where they sell it.</p>	<p>Collecting as a way of recording activity, for example: Nora keeps an appointment diary that she takes everywhere with her so that she doesn’t forget where she’s supposed to be that day/week/month.</p> <p>Will uses twitter as a way of recording what he has done and to remember arrangements he has made with friends.</p>
Telling tales (interpersonal)	<p>Using data to tell tales might be useful when people are moving into hospital or a care home or any other situation when they might want to tell people about their lives, portraying more than can be shared through a focus on their current situation or physical appearance. For example: we might imagine the advantages for Will if when he attended a medical to assess his right to incapacity benefit he had had access to records of the day to day reality of his life which he could share with the medical examiner.</p> <p>Hitting retirement David stated that he felt ‘invisible’ and suddenly out of touch. How could he use records of his life to tell people about his interests and passions?</p>	<p>Telling tales through data might be useful to enrich and deepen narrative accounts of passions and pleasures. For example, we could speculate that for Steve, a tool of some sort which, over the course of a year of simply noting such experiences in his life, might support him to notice, in the same way that the interview prompted him to notice, his pattern of interest in birds. Such experiences might be knitted together by one or two fragments of data – a TV show, a photograph or two. Such fragments of data, if combined with intelligent data mining</p>	<p>Telling tales through data might function as a way of finding people who share your interests or to help overcome loneliness. For example: Will has a disability and has just come through a period of extreme ill health. Through communicating with others on twitter and on music blogging sites he can become a part of this culture, build relationships, meet new people and tell different stories about himself.</p>	<p>Telling tales about your life with other people – can help you to find practical strategies for solving problems. This might include anecdotes about how you did something or listening to how others approached a practical problem. For example, when Clare wanted advice about where her parents might get financial help with their bathroom redesign as her dad became more disabled she told the story to, and asked for advice from a friend who works for social services locally.</p> <p>Chloe’s entire radio programme is about telling tales to support</p>

		systems, might make connections with the media resources available on the birds he is watching and encourage him, whenever he wants to, to follow-up on that curiosity that makes him wonder about those little black birds in the park.		learning in an engaging way. She collects stories about her life to share with her listeners as a way of entertaining them as well as projecting a presenter identity.
Auditing/reflecting (for yourself)	<p>Using data as a means of reflecting on how to adapt to difficult situations, or identify new resources in yourself, is already something people are doing. For example, Clare keeps a diary, reflecting on her progress in relation to her mental ill health. Through her diary she is able to compare ‘what she thought with what she’d done’ – often finding her assessment was negatively inaccurate.</p> <p>Similarly, When Martin wanted to move out of the corporate world and change the direction of his working life he created ‘vision boards’ of things he enjoyed in order to help him make decisions about a future career.</p> <p>Using data for audit purposes might also involve actively seeking out untold tales in people’s lives, or exploring whether there are other ways of recounting these stories. E.g. Mina could retell the story of her experience as one of strength and resistance.</p> <p>Or the 13 year old girl who felt ‘alone’ because of her difficulties with her mother might be able to mobilise her friends and grow her other resources to help her?</p>	<p>‘Counting your blessings’ is a familiar way of auditing and reflecting upon life’s pleasures. One way in which people are using data for this is in putting old photo albums together, reflecting on ‘what you’ve got’ and what you’ve done as a basis for deepening pleasures. For example: Mina takes photos of her son and her mum shares photos of relatives back home. This is pleasurable in its own right as well as helping Mina to focus on the more positive aspects of her life.</p>	<p>Audit is often important if individuals want to gain entry to a group. For instance, Will might look back at his record collection and consider how he could utilize this resource to gain entry into a community of music fans and bloggers online.</p> <p>Reflection might take place in a group learning situation. For instance, Nora’s U3A literature group sit and consider their next book choice by looking back at what they have already enjoyed and discussed – either deciding to select something very different or similar to books they have already read.</p> <p>This might occur when groups come together with other groups to share their learning – eg when all the U3A groups meet to report on their activity or when one class in a school reports on their recent class activities in an assembly</p>	<p>Audit is often an important first step in reviewing how to deal with problems – it is often intuitive and undocumented, working on questions such as: who can help with this issue? What have I done before that I could use to help me?</p> <p>There was little use of data to support this in the case studies, but we could conjecture that this is one area in which rich data mining tools could help individuals with this process by making visible ‘hidden’ resources and networks.</p>

5. Discussion: Personal data, Learning lives and BBC Learning

The research observed four broad prompts for learning, these were: personal events (experiences and transitions that required emotional adjustment and personal development); practicalities (the development of skills and knowledge in pursuit of action in the world); participation (learning in pursuit of social engagement) and pleasures (learning prompted by curiosity and interest for its own sake). To support this learning, people draw on resources that include: cultural repositories, people, commercial sources, the use of their own body, and reflection.

People are already recording their life experiences in a number of different ways, they are using photograph albums, souvenirs, note taking, dairies that have been around for hundreds of years. They are also using newer forms of recording – such as online bookmarking, twitter feeds and social networks. This data, from multiple sources, is used in three common ways: for collecting, for telling tales and for auditing and reflecting.

What we have seen is that there are a number of ways in which such collecting, narrating and auditing processes are being and might in future be used to support the four learning goals of dealing with personal events, tackling practicalities, wanting to participate in social activities and learning for its own, pleasurable, sake.

We now want to conclude by reflecting on the implications of these observations for BBC Learning. Our conjecture is that these observations make visible both the range of ways in which BBC Learning already contributes to the rich learning lives of individuals and also, the potential sites for development of BBC Learning's contribution to these lives as individuals are able, increasingly, to wrap a rich resource of personal data around them.

Our observations lead us to suggest the following:

First, that today BBC learning already plays a role in the 4 key learning narratives:

1. Pleasures: Its traditional broadcast role makes the BBC an important prompt for pleasurable learning narratives, encouraging people to engage with new ideas and enabling people to pursue existing passions and interests.
2. Practicalities & Personal Events: In its hybrid broadcast and online role, it acts as a resource for people to turn to in order to address practical problems. This might include turning to online resources to develop skills (Webwise) or gaining access to advice; This might also include viewing programmes that simply represent painful/important personal events and which are complemented, afterwards, by help lines and further online advice.
3. Participation: In its hybrid broadcast and online role, BBC Learning is beginning to act as a 'place' for participation. Events such as the national lab, Springwatch and other collective contribution programmes, encourage people to 'get involved' in a shared activity – either at home participating in virtual social activity, or through local groups participating in face to face activity.

When we look at BBC Learning's role in a future of rich personal data, we can see that people might begin to use BBC materials and resources to collect, tell tales and audit their experiences in powerful ways to support these different learning narratives.

1. As people develop their own 'collections' of interests, passions and experiences:
 - a. BBC materials can be used to enhance and complement these collections. Someone with a passion for football, for example, might draw into their collection the matches, commentary and supplementary information associated with key games (pleasures)

- b. Individuals may be able to upload and share their collections as exchange for accessing BBC materials, allowing the BBC to potentially make connections between people with similar passions and interests (participation)
- 2. As people tell tales of their own lives:
 - a. BBC materials can be used to enhance these narratives in the same way as collections, offering historic or interest-based material to elaborate experiences in people's lives (pleasures/ personal events)
 - b. BBC platforms can be used for people to share these narratives with each other, with the BBC adding and gaining value from aggregating these.
 - c. At the same time, people's participation in BBC-prompted activities (Springwatch, interactive TV quizzes, online browsing, local activities) might be collated in ways to allow the person to build their 'back-story' of BBC- related activities and allow the person to begin to gain credit and recognition for what they are doing. (practicalities/ participation)
- 3. As people reflect upon and audit their own lives:
 - a. BBC records and materials can be used to unsettle or throw new light on personal narratives. A review of each individual's viewing and BBC online use, for example, would tell a story of time spent, interests and possible connections between them. Creative visualisation of such records might allow people to see 'stories' of their experiences that they weren't aware of, and build connections between them. (practicalities/personal events)
 - b. Individuals might be able to compare their personal records with other people of similar age, gender, ethnicity or interest profiles – what are other people of similar age, interests, backgrounds, doing, browsing, navigating? (participation)
 - c. The BBC might begin to offer supports for people to reflect upon their narratives and suggest new trajectories and materials, encouraging people to explore the practical, pleasurable and participatory learning experiences associated with any issue; and connecting them to others experiencing the personal events. (pleasures)

These possibilities open up a complex future role for BBC Learning which includes not only its familiar roles as producer of materials to support learning, and its more recent role as a site for participation and collective activity, but a new role as an active, engaged prompt for personal reflection. As the capacity to collate and analyse massive amounts of data increases, and as the tools become available for individuals to curate their lives in ways that connect their mediated lives with personal data from multiple other sources, there are interesting choices opening up for BBC Learning – for example, will it begin to play a role in accrediting and validating the rich forms of informal learning that it provokes and sustains?

6. Next steps

This is an early, exploratory project that is beginning to map the complexity of people's learning lives and the artefacts that they use to support their learning. There is, clearly, much more to explore. Possible next steps are as follows:

We need to develop a real insight into how BBC audiences would use these rich datasets to support their learning. One possibility would be to develop a range of personal use cases and work with various audience groups developing ways they could effectively work with these rich datasets. Some suggestions are looking at narrative or modelling approaches to the use of such data. The use cases should include the use of BBC media data, user tracking and personal data.

We need a greater understanding of learning patterns according to age/gender/socio-economic position/life experience and the ways these shape data use and the types of learning experiences people reflect upon. We could work with the British Household Survey and also the Learning Lives dataset – secondary research. Then test findings back with a qualitative survey. It might also be possible to link this with the Mozilla Foundation Open Badges programme to explore how the BBC and Mozilla might jointly promote and accredit such informal learning.

We hope that this project will also form the basis for further European collaboration, funding for which is being sought from the European Commission, with collaborators from universities in Zurich, Freiburg, Oslo, Nottingham, Ulster, Dublin and Bristol. The findings from the project to date should be presented at the European Conference on Education Research, Cadiz, September 2012 and may form the basis for an international symposium at the American Education Research Association Conference in 2013. Indicative questions these further explorations will seek to address are:

1. what are the most appropriate strategies for prompting reflection on personal data?
2. what are the key ethical, legal and privacy issues raised by the use of personal data for learning?
3. what relationship between modelling and narrative is appropriate to provide scaffolding for learning using personal data?
4. What technical challenges are presented by the incorporation of data from multiple datasets?
5. What visualisation strategies are most effective for different demographic groups?

7. Appendices

a. Appendix 1: Project Participants

Phase one workshop participants comprised:

- Eleven 8 year olds recruited via a local school
- Twenty five 13 year olds recruited via a local school
- Twenty eight University of the Third Age (U3A) members across 3 different local groups
- Four University employees (lecturers/researchers) recruited via university email
- Fifteen BBC employees recruited via organisational email
- Six members of an ESOL class at a local 'Job Shop' recruited via existing links with the Big Life organization running the training
- Eight people active on an older peoples forum recruited via email connections

In total, the sample included 28 men, 68 women, 36 people aged 8-16, 9 aged 17-35, 15 aged 36-55, 36 aged 56+. The majority were white British, however 10 were from minority ethnic communities.

Phase two participants were:

Name	Age	Personal information
Chloe	24	Chloe is a graduate who completed her degree in media and performance several years ago. She lives in Fallowfield. She volunteers at a community radio station on which she has a drive time show once a week. She currently also has two jobs – working as a waitress and working on a freelance basis for marketing for commercial radio stations. She hopes to develop a career in the media industry, preferably in radio.
Roberto	30	Roberto is Italian and has, until recently, been working long hours as a waiter since arriving in the UK several years ago. He has recently given up work in order to develop a career in music production. He is currently taking ESOL and numeracy classes and is about to start a music production course. He lives in Salford and has a girlfriend with a 6 year old daughter. He is trying to learn how to be a good step dad.
Steve	36	Steve is currently unemployed and claiming job seekers allowance. He lives in an estate on the outskirts of a large Northern city. He has had several part time, casual jobs in the last couple of years. He volunteers at his local community radio station. He used to coach a boys football team and has a dog that he likes to walk. He cycles everywhere and has competed in running events to raise money for charity.
Mina	27	Mina is from Algeria and is a practising Muslim. She is currently 7 months pregnant. She has a little boy who is almost 3. She is a graduate from a university in Algeria where she studied graphic design. She left Algeria because she 'brought shame on her family' over there and therefore has little contact with her family back home. She has recently been 'dismissed' from a part time job in retail and is fighting her dismissal with union backing.
Will	43	Will is a graduate who has a disability that means he can't work. He lives in Bristol. He does some social media work on a voluntary basis for arts events and festivals in his city. He is passionate about music and technology – using blogs and twitter on a regular basis.
Clare	40	Clare is not currently working as she has anxiety disorder. This means she also doesn't go out much as she finds travelling on buses and other public transport very difficult and doesn't have a car. She helps out at the local Brownies once a week. She is a trained sound engineer and HGV driver and is also interested in storm chasing and gaming.
Martin	55	Martin is an independent consultant and blogger in personal coaching and organisational culture. He lives in Wilmslow with his current partner. He is divorced and has two children from his previous marriage – one is now a teenager. Martin studied for a Masters in organisational learning several years ago.
Elizabeth	57	Elizabeth is a Nigerian woman who works on a voluntary basis for a family centre in Moss Side where she also lives. She works 7 days a week for no wage and is also an active member of the local rotary group. She is an active member of her local community, sitting on various steering

		groups and helping to organise festivals and fund raising events. She has organised several projects that raised money and took resources to communities in Nigerian and other African countries.
Dougald	62	Dougald is chair of his local U3A and of the local Rotary club. Hi is a very keen traveller, and ex architect. He runs various U3A groups.
Nora	66	Nora is a retired school teacher who lives in Heaton Mersey. She is very active in her local U3A, and writes regularly for the parish magazine.
Bob	80	Bob has been a self employed plumber, pipe fitter. He now has various ailments to contend with. He lives with his wife. Both are U3A members and have been active in running groups until Bob's double heart by pass last year.
Kam	83	Kam is of Chinese Malay heritage. She attends some U3A groups eg music. She also has a lot of appointments with doctors and physios due to her arthritis. She is on the board of a thriving Chinese women's centre. She has a brother who lives in Malaysia and another in USA who she sometimes visits. Her son and his family live in Bristol.
Howard	82	Howard is a former plasterer and teacher. He lives with his wife. He plays bowls in the summer, and does aqua fit. He has 6 boys, many who live nearby. He also has arthritis but keeps active doing DIY and other jobs for his sons and their families.

b. Appendix 2: Collated Map of all Workshop Participants

Endnotes

ⁱ World Economic Forum (2011) Personal Data: The Emergence of a New Asset Class, Geneva: World Economic Forum

ⁱⁱ <http://quantifiedself.com/>

ⁱⁱⁱ www.cityware.org.uk

^{iv} http://www.ted.com/talks/deb_roy_the_birth_of_a_word.html

^v <http://ceeds-project.eu/>

^{vi} Jay Lemke (2002) Becoming the Village: Education across Lives in G. Wells and G. Claxton, Eds. Learning for Life in the 21st Century: Sociocultural Perspectives on The Future of Education. London: Blackwell.

^{vii} Biesta, G., Field, J., Hodkinson, P., Macleod, F., Goodson, I (2011) Improving Learning through the Lifecourse: Learning Lives, London: Routledge

^{viii} Alheit, P. (1995). Biographical learning: Theoretical outline, challenges and contradictions of a new approach in adult education. In Alheit, P., Bron-Wojciechowska, A., Brugger, E. and Dominicé, P. (eds), The Biographical Approach in European Adult Education (57-74). Wien: Verband Wiener Volksbildung

^{ix} Jay Lemke (2002) Becoming the Village: Education across Lives in G. Wells and G. Claxton, Eds. Learning for Life in the 21st Century: Sociocultural Perspectives on The Future of Education. London: Blackwell. Wertsch, J (2001) Mind As Mediated Action,

^x In this analysis, we find some overlap with Biesta and colleague's argument that there are a five different ways in which people value learning:

Learning can help people with the processes of routine living

Learning can help people adjust to changed circumstances

Learning can help provide valuable knowledge or skills for particular purposes, which can include employment and career change, as well as other activities – which may or may not influence their experiences in the labour market

Learning can contribute to the development of one's self

Learning can contribute to the achievement of agency (Biesta et al, 2011, p104)