MOBIlearn

WP 4 – D4.4

[UOB]

A Study of Mobile Learning Practices

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Summary

A collection of mobile learning episodes is analysed in terms of the task model of mobile learning presented in D4.1. Characteristics of mobile learning are inferred.

Document History

Version History

Version	*Status*	*Date*	*Author(s)*
0.1	*First Draft*	*29/03/05*	*Giasemi N. Vavoula, UoB*
0.2	*Draft*	*29/03/05*	*Patrick McAndrew, OU*
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Summary of Changes

Version	*Section(s)*	*Synopsis of Change*
0.1	*Not Applicable*	*None - first draft*
0.2	*All*	*Minor edits before release*
1.0		*Document finalised*
[1.1] note		

Note
Reviews after final document delivery (Version 1.0) to the project may or may not result in modifications to the document. If modifications post review are necessary, then the first version of the resultant document is 1.1.

Contents

1. Object of this Document

The object of this document is to present the results of the study of mobile learning episodes that was carried out as part of the MOBIlearn project. The document presents the method that was adopted for the study, the theoretical framework that was the basis for the analysis of the results, and closes with the presentation of results.

2. Introduction

Mobile learning is often defined in terms of the use of technology, as learning that takes place while using mobile devices and services. In the MOBIlearn project we have taken a more holistic view of mobile learning, concentrating on the needs of the mobile learner as well as on the affordances and possibilities offered by the mobile technology. In line with this view, the present document presents a study of mobile learning as an activity of learners in a technology-enabled world as opposed to a technology-led practice.

Personal learning can be organised into a three-level hierarchical structure of learning activities, episodes, and projects (Tough, 1971; Vavoula & Sharples, 2002); the present study has focused on episodes of mobile learning. Tough (1971) defines a learning episode as a well-defined period of time that is held together by the similarity in intent, activity or place of the thoughts and actions that occur during it, and that is not interrupted much by other activities; it has a definite beginning and ending in time. A learning project is then defined as a series of clearly related episodes, usually spread over a period of time, adding up to at least seven hours. Learning activities include all of the person's experiences during an episode: what they do, think, feel, hear or see. In our definition (Vavoula & Sharples, 2002) learning activities are similarly defined as the distinct acts that the person carries out during learning: reading, discussing, listening, and making notes. Episodes are then defined as groups of learning activities, which are formed by virtue of their spatial, temporal, and thematic proximity. Learning projects are formed by grouping episodes together on the basis of their contingency in terms of purposes and outcomes: learning episodes that contribute to the achievement of a particular aim are likely to be grouped together under a single project. Learning activities and episodes may happen while the learner is on the move, away from their fixed learning environments. Learning projects can involve episodes that happen at different locations.

The object of this study has been to identify the sorts of activities that are performed on the go, and if and how they differ from activities performed in conventional settings, as well as to understand if and how existing mobile technologies and services are used for learning purposes. These are viewed in the richer context of an episode's social, educational, historical, etc., settings.

The study employed a diary method for data collection, details of which will be presented in section 3, with section 4 discussing problems and limitations of the method. The data were analysed with respect to the mobile learning task model introduced in D4.1 (also described in Taylor et al. (2005)). Section 5 presents a brief overview of the task model, while section 6 presents the results with respect to the task model. Finally, section 7 concludes the report with a summary of key findings.

3. Methods

A diary-based method was adopted for the purposes of the study. Participants were asked to keep a diary of their everyday learning episodes for a period of two weeks, and were subsequently asked to fill in a questionnaire regarding the diary experience.

The diary had a fixed format, requiring the participants to fill in, for each learning episode, information about the context of their learning and particularly:

Temporal context: the date; the time span during the day when the learning took place; and its duration.
Social context: the other people that were involved in the episode; and the roles they assumed.
Situational context: the location and the event during which the learning episode took place.
Educational context: the learning method that was employed, if any; the forms of assessment applied; the purpose, if there was an explicit purpose; what was learned in relation to what was originally intended to learn; and the area in life to which this episode relates (work, hobbies, community work).
Activity context: the learning topic; the kind of support that was available in terms of help from other people, printed or online manuals and other resources; the different activities that were performed; the different resources that were used; the problems that arose before, during or after the episode; and the greater learning project that this particular episode related to, if any.
Historical context: other activities, not directly related to the learning, that were performed just before, during, and immediately after the learning episode, to capture how learning interleaves with other, everyday activities.

Vavoula (2004) presents a similar, diary-based study of everyday learning experiences, and analyses the data in terms of a descriptive framework of everyday learning practice. We drew on that framework to structure the diary used in the present study as described above. More specifically, the options for the different fields in a learning episode entry came from the findings in Vavoula (2004); for example the categorisation of problems, the kinds of learning methods, the types of learning resources, etc. (see Appendix A for a sample diary entry).

The instructions encouraged the participants to report all their learning episodes, irrespective of whether they were mobile or not, to enable comparisons between mobile and non-mobile learning practice. To subsequently characterise a learning episode as mobile we utilise the situational and the activity context data: episodes are characterised as mobile if they involve the use of mobile computing or communication technologies, or if they take place away from a fixed environment such as a person's workplace or home whether or not mobile technologies are involved.

The diary was available to the participants in three formats: as a paper template, as a desktop application, and as a set of web-based forms. The participants were free to select whichever format they preferred and to use throughout the study. Figure 1 shows a sample screen shot from the desktop diary application. Participants using the paper templates were asked to return these by post upon completion; the web-based forms were directly submitted into a specially created email account; the desktop application had an option for collating the recorded data and preparing them as a zip file to send as email attachment to the experimenters.

The study took place between March and August 2004. Participants were recruited by 'call for participation' messages sent to various special interest lists and groups. All participants who responded to the call were included in the study. They were asked to keep a diary of their learning for two weeks, and encouraged to fill in the diary at the end of each day. Daily reminders were sent to those who asked for the service. The participants tended to fill in the diary once every 2 or 3 days.

The following working definition of a learning episode was provided to the participants:

> *By learning episodes we mean occasions in the day where you feel you have learned something, some new knowledge or skill, or you have increased or deepened your understanding on a topic. This could be learning in any form: through formal classes and training sessions; during casual visits to places like museums, galleries and theatres; during informal meetings with friends; during traveling; etc. Please keep in mind that we are interested in all the different sorts of learning that you do in your everyday life and remember to put equal emphasis on both work-related learning, and learning that relates to hobby, leisure or community work.*

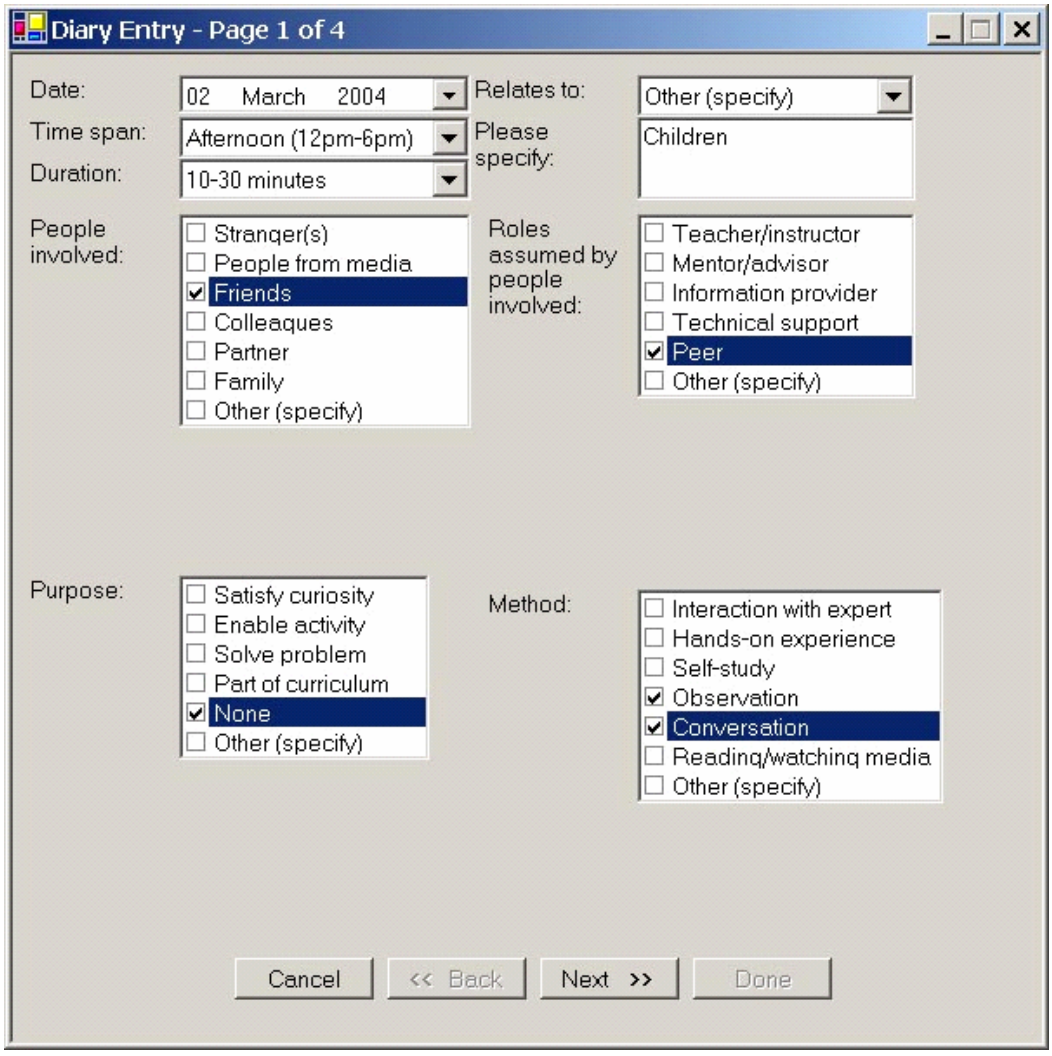

Figure 1: Sample screen shot from desktop diary application

A total of 44 people registered for the learning diary exercise. Of these, 15 kept the diary for two weeks regularly reporting learning episodes (a total of 161 learning episodes were reported); 15 only reported one to three episodes and did not complete the study; and 14 did not report any episodes at all. Section 4 discusses the difficulties of keeping a learning diary and contains possible explanations for the drop-out rates, based on comments that some of the drop-out participants provided. The results reported in the subsequent sections come from the 15 participants who completed the study as required. Of these, three were male and 12 female. Three participants were aged 20-29, four were 30-39, six were 40-49, and two were 50-59 (no participants were above 60). They all were either taking or had completed a graduate degree, and were working in education (as researchers, developers, educators, or students). Ten participants were native English speakers, and ten (not the same ten) were UK residents. All participants were employed. Most participants had access to a PC (14), a laptop (12), and a mobile phone (14). Four participants had access to a PDA, and three reported the use of an electronic diary, an iPOD and tablet computer, and a disk-on-key respectively. All participants considered themselves as learning very often or always.

4. How hard can it be to keep a learning diary?

Keeping a diary of learning as described in the above can be a very demanding task. Although the actual data entry does not take more than about 20 minutes each day, it requires a lot of effort to decide what to put in the diary. Two thirds of the participants who originally registered for the study dropped out, and some of the participants who continued did not report all their learning episodes for a number of reasons: (1) the diary was not filled in on the same day that the learning episode took place, which meant that the participants could not recall all the necessary details; (2) there were too many ‘small’ episodes to report and/or there was not enough time; (3) the participants found it hard to split into episodes the learning that spreads over long periods of time and requires complex cognitive processing, like for example working on a PhD, or to separate out discrete ‘learning episodes’ from everyday work and discussions with colleagues, summarised in the following quotes:

> *Working in an academic environment, I found it difficult to separate out discrete 'learning episodes' from everyday work and discussions with colleagues. More generally, I am not sure to what extent I would consciously define 'learning episodes' as such. One takes in so much information passively, by diffusion: at what point does learning become 'an episode' ?”*

> *“Everything I do is new, work scope is things never done before, continuous learning. The ways to collaborate and organization are being adjusted all the time, continuous learning. All in all to describe my learning I would have had to record everything”*

> *“Your diary has far too many forced choice answers that do not address the many ways I learn. I am a walker and urban cyclist and much of my learning comes at unlikely times.”*

The difficulties reported in this study are in line with difficulties reported in other studies of informal learning. For example, Tough (1971) reports that much of adults’ learning outside formal education is not realised as such by the learners themselves:

> *“Few people actually call their learning projects by that name; many do not even apply the term learning to their efforts. They simply regard the series of learning episodes as an interest or hobby, or as part of some responsibility. During the first*

few minutes of an interview, helping a person to identify his learning projects is often a challenging task. Few adults see their activities related in this way except when taking a course" (Tough 1971, pg. 14).

It is reasonable then to accept for this study that the data collected give a retrospective account of the ***identified*** learning episodes that the participants considered ***substantial enough*** to include in their reports. It is left to future research to identify suitable methods for collecting data on more routine or minute learning episodes that are diffused into everyday life.

5. Analysis Framework: A Task Model of Mobile Learning

Taylor et al. (2005) propose a task model for mobile learning. The model emphasises the dialectical relationship between the two dominant spaces of mobile learning: the technological space, and the semiotic learn-space. Learning is conceptually carried out in the semiotic space, and is physically carried out in the technological space:

"there are two spaces within which learners move – the mental [semiotic] space which consists of required, or preferred, functionalities, and the [technological] space of possible actual embodiments of those functionalities in the form of devices."

Taylor et al. (2005)

The task model includes a representation of Engeström's (1987) extended activity system in the two spaces. The main concepts remain, as in the original Vygotskian model (1978), the learner, the tools they use, and the object of learning, viewed both in the semiotic and the technological space; with Engeström's extensions of rules, community and division of labour identified as influencing factors and analysed in the two spaces as semiotic and technological control, context and communication respectively. Figure 2 illustrates the task model as an extended mobile learning activity system in the two spaces.

The subject of mobile learning exists as a learner (semiotic) and as a user of technology (technological). In the semiotic space, the object of learning is the construction of knowledge and the development of skills as the result of satisfying personal learning objectives and meeting personal targets; in the technological space this translates in identifying relevant resources and accessing information. The subject achieves the object through the use of tools. In the technological space, these are the employed mobile devices, services and applications. In the semiotic space, this is the learn-space that mediates directly between learners and their developing objectives (for example, the classroom environment for classroom learning, an online environment for web-based learning, the informal learning setting such as a library or gallery for informal learning). The learn-space will include everything that's needed to establish the mediation of learning (e.g. teacher, books, VLE, peers, museum artefacts...)

As mentioned earlier, Taylor et al. (2005) identify three factors that influence mobile learning: control, context and communication. Control refers, in the technological space, to the operating of the technological tools by the technology user and considers issues of human-technology interaction. In the semiotic space, control is equivalent to Engeström's 'Rules' and includes implicit and explicit social conventions (for example, rules of conduct or linguistic conventions) and factors regulating learning such as (prescriptive) revision guides, guidelines, etc.

Context in the technological space is conceptualised as the physical context where learning takes place, including the physical space complete with available artefacts. In the semiotic space, context is defined by the learning community, embracing all the active participants in the learning whether teachers, trainers, peers, learning support network, or even interactive technologies as conversational partners.

Communication in the technological space includes the communication channels and protocols that are employed. In the semiotic space, this involves the conversations and negotiations that the learner holds with their conversational partners or with themselves.

Although the model makes a distinction between the technological and semiotic mobile learning spaces, it acknowledges the close interplay of the two: technology shapes the semiotic space with its affordances and provisions. Furthermore, it does not only exist in the technological space as engineered artefacts, but can assume an (additional) active role as a partner in learning interactions[1]. And conversely, learning dictates and controls the employment and use of technology.

The aim of the mobile learning task model

> *"is to provide a coherent account of how the activities are performed, the people involved, their contexts, the tools and technologies they employ, the structure of the tasks and an account of their cognitive processes, management of knowledge, and social interactions … The task model is not itself prescriptive (e.g. what contexts are important for what types of learning) nor do the elements need to be explicitly modelled in the technology (e.g. whether the technology should contain a computational model of the learner, or of the context). But these lower level considerations can now be explored through case studies, and further empirical work, to illuminate the model further."*
>
> *(Taylor et al., 2005).*

The diary study attempts such an illumination: in the following subsections, the diary study data will be discussed with reference to the mobile learning task model.

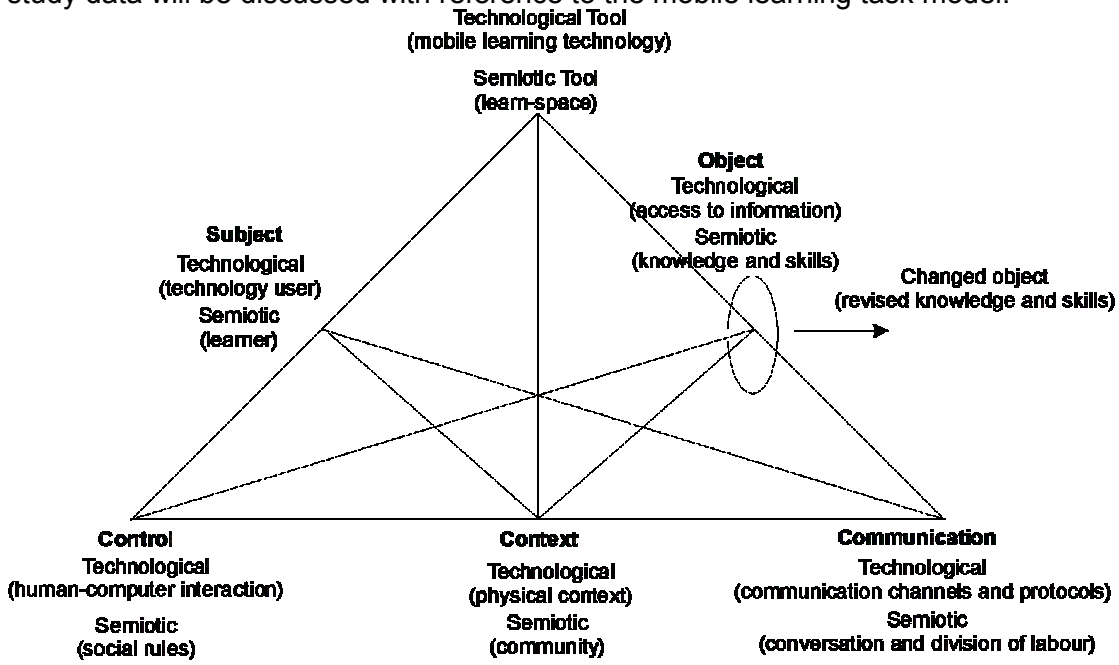

Figure 2: The task model for mobile learners (Taylor et al., 2005)

[1] In fact, seen from an AI point of view, technology can assume the role of a learner (machine learning) – but that goes beyond the scope of the present analysis.

6. Results

6.1 Mobile learning episodes in the technological space

Figure 3 represents the learning episodes in the technological space. The technology user uses devices and applications to access information. This use is influenced by the human-computer interaction, by the availability and functioning of the necessary communications infrastructures, and by the physical context, the course of use and interaction as it is historically shaped.

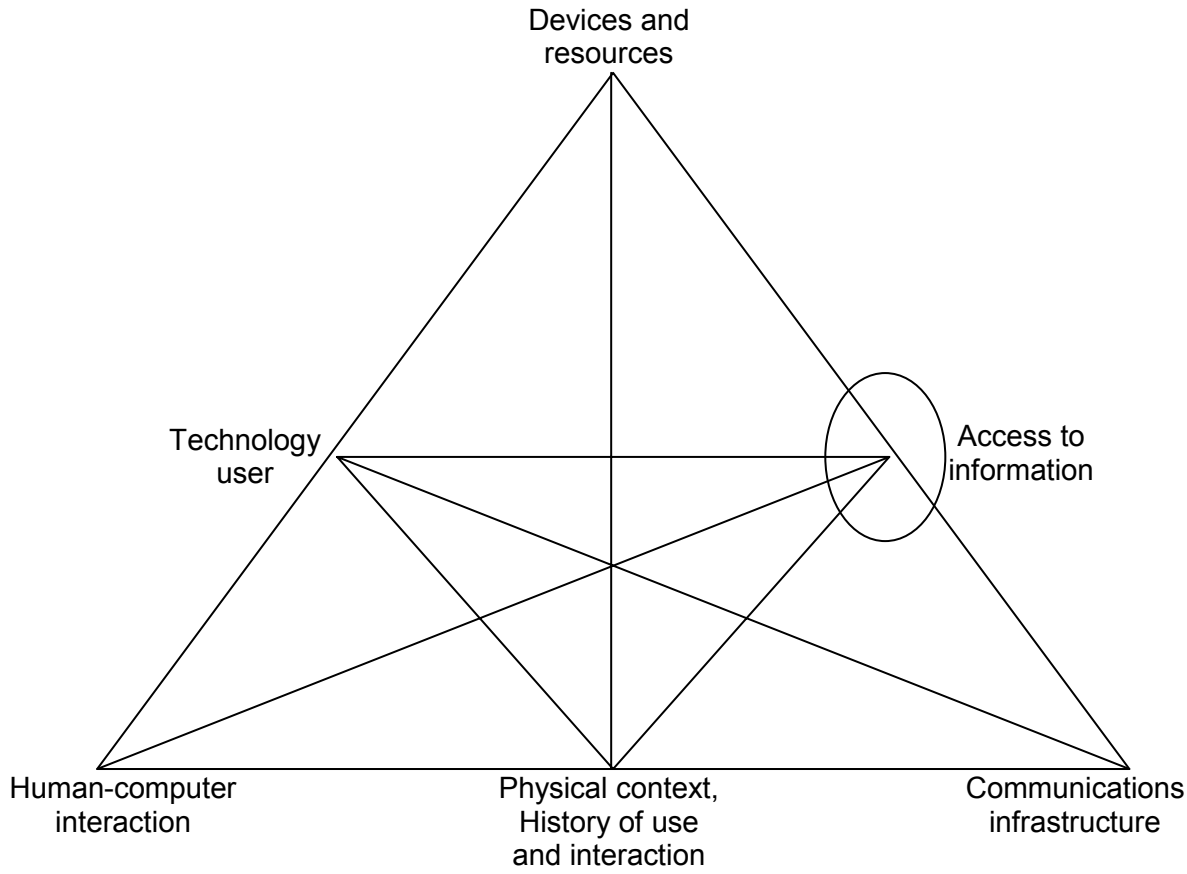

Figure 3: Mobile learning episodes in the technological space

With regard to the physical context, the learning diary study captured episodes of learning taking place in learners' usual learning environments (home, workplace) as well as in other locations, 'on the go'. Of the total 161 learning episodes that were reported, 82 took place in the learner's home or own office at the workplace, and 79 took place outdoors (8), in other locations in the workplace (34), at places of leisure (10), at friends' houses (3), and on public transport (1). Other locations that were reported include places of worship, at the doctors', cafes, hobby stores, in cars, etc. (total 23). Thus 49% of the learning episodes happened outside the normal daily environment of home or office.

The reported episodes involved the use of traditional technologies (like desktop PCs and pen and paper) as well as mobile technologies (like mobile phones). Our definition of mobile learning in D4.1 stated that mobile learning is:

"Any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies."

We are therefore also defining as mobile those episodes that took place in the learner's usual environment (home or own office at work), but involved the use of mobile devices. It has been debated whether laptops qualify as mobile learning devices or not. Although many have come to replace desktop PCs with laptops, our data show that laptops are indeed used in diverse locations. For example, one of the participants has reported learning episodes that involved the use of a laptop and took place at the workplace (both in own office and other location), at friends' houses, at home, and outdoors, and most participants who used laptops reported their use in equally diverse locations. We therefore characterised episodes that involved the use of laptops as mobile episodes. The same is true for episodes that involved the use of mobile phones[2]. In light of this extended mobile learning definition, 95 of the reported episodes were mobile and 66 were non-mobile (59% mobile vs. 41% non-mobile).

The participants reported the use of a number of different objects (tools). These can be classified as *devices* (such as PCs, laptops, fixed and mobile phones, PDAs) or as *resources* (such as paper and electronic documents, diaries, music, the contents of conversations, etc.). The differentiation between devices and resources is important: the use of a laptop or a mobile phone does not apply directly to the learning experience; it is the access to information *via* the laptop or phone, for example to email documents, web pages, conversations, etc., that is the actual learning resource. In this sense, carrying mobile devices is not of interest until the learner uses them to access learning applications and content. Unless a device is the object of learning, it is merely a bridge to information and content. In the diaries, the median of the number of resources that were reported per mobile episode is 2, whereas per non-mobile episode it is 1 (the averages are 1.92 and 1.61 respectively). For devices both medians are 1 (averages are 1.29 devices per mobile episode and 1.00 device per non-mobile episode).

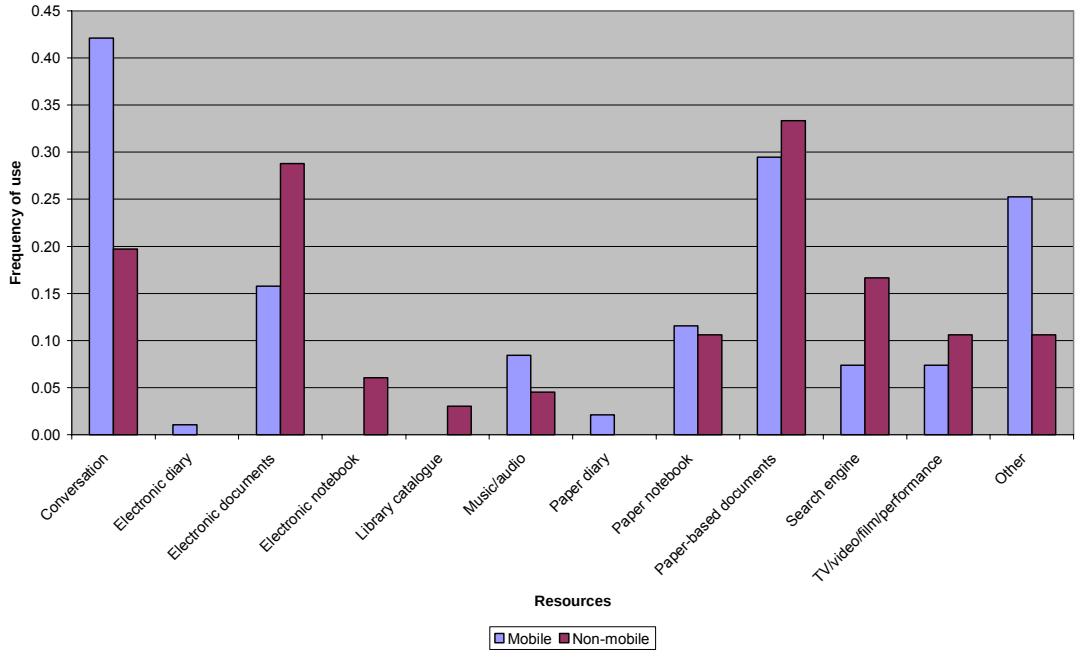

Figure 4: Frequency of use of different kinds of resources in mobile and non-mobile episodes.

[2] It is perhaps interesting to note that although four participants had access to a PDA, none of them reported a learning episode that involved one.

Figure 4 above illustrates the frequency of use of different kinds of resources in mobile and non-mobile episodes. Most kinds of resources are used equally frequently in both mobile and non-mobile episodes, with the exception of conversations, which are used twice as often in mobile episodes, and electronic documents and search engines, which are used twice as often in non-mobile episodes. Interestingly, paper-based documents are equally popular in both settings.

Other resources that were reported include slides and projectors, other people and their resources, maps, spatial awareness, advertisings, etc. Figure 4 shows that 'other' resources are used more than twice as often in mobile episodes than in non-mobile. This, in combination with the diversity in 'other' resources used, may indicate that, whilst on the move, people appropriate all sorts of objects in their surrounding environments as learning resources without having pre-planned for this. This is also more likely to happen on the go, as there are increased opportunities for encountering new, unexpected candidate learning tools.

The concepts presented in Figure 3 are common in most types of technology-based learning (and in fact, in most types of other technology-based activities). However, the following make it specific to mobile learning:

1. Physical context flux: mobile learning takes place in diverse, and often unpredictable locations: learners move from home to work, from their own office to other locations in the workplace, from there to places of leisure, outdoors, etc., within a single day. This calls for a communications infrastructure capable of providing for mobility, and for information access on the go.
2. Context-dependent content: the access to information is tied to the specific physical context. Examples in the reported episodes include learning the names of various beers at a party in a pub, learning a new area of a city by walking it, learning about the paintings of El Greco in an art gallery. The home and office host learning episodes on more diverse topics, however, mobile contexts seem to provide a more focused, specific learning experience.
3. Often, the devices and applications are not pre-planned; the learner has to make do with whatever is available.
4. An instantiation of the structure presented in Figure 3 should not be taken as a static representation of a mobile learning episode: more likely, a series of instantiations will be relevant, as the user-learner moves in different contexts, with changing communications networks and infrastructures, with different devices and resources available.

6.2 Mobile learning episodes in the semiotic space

Figure 5 represents the mobile learning episodes in the semiotic space. The mobile learner moves in the semiotic space carrying personal objectives, purposes, intentions, and a personal framework formed by the ongoing learning projects in their life at any given moment in time. The learn-space provides the cognitive environment for carrying out learning activities. Unlike conventional learning, and more like informal learning, mobile learning takes place during various events, with the employment of a variety of learning methods, in various social settings.

In mobile episodes, the participants reported an average of 3.33 (median 3) activities per episode, and 2.35 (median 2) activities per non-mobile episode. We saw earlier that they also made use of more resources per mobile episode than non-mobile: it appears that there is greater 'bustle' while on the move.

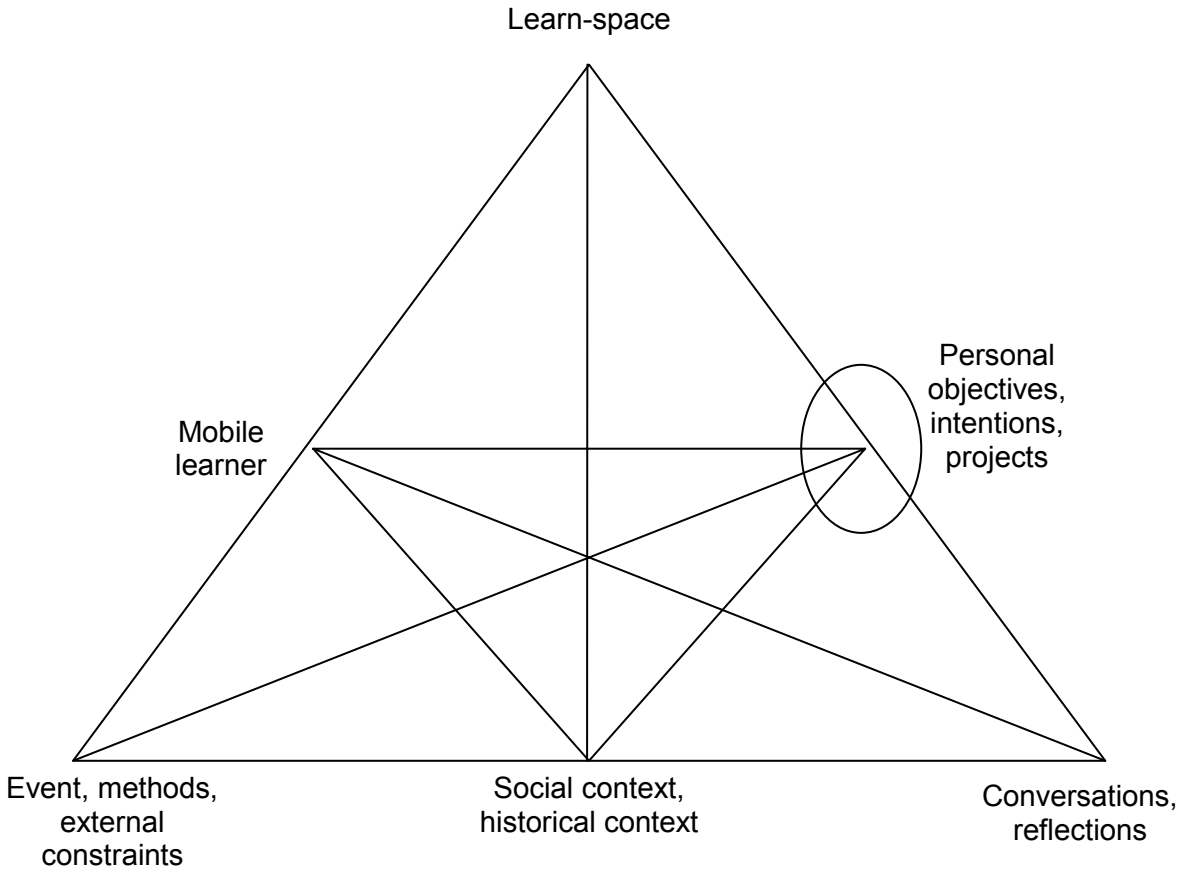

Figure 5: Mobile learning episodes in the semiotic space

Figure 6 presents the frequency of performance of various activities in mobile and non-mobile episodes. All activities are performed in both mobile and non-mobile settings. Collaboration, discussion, memorisation, note-taking, observation and problem-solving are performed more than twice as frequently during mobile episodes than non-mobile ones. In fact, most activities are performed more often in mobile settings, with the exception of reading, which is performed more frequently in non-mobile settings.

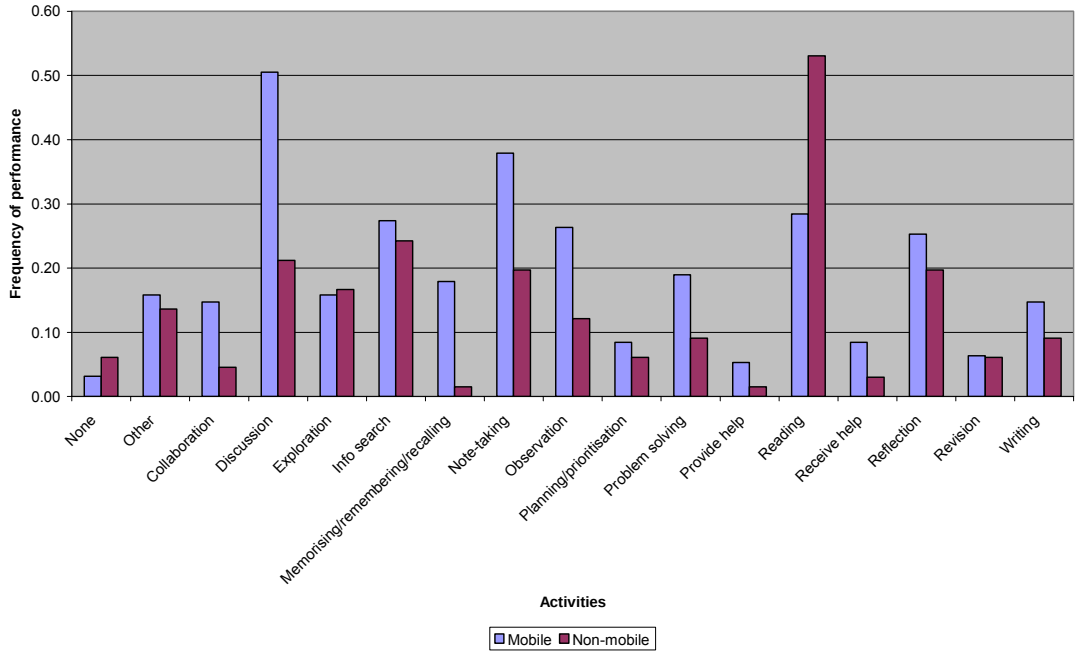

Figure 6: Frequency of performance of different activities in mobile and non-mobile episodes.

The learner approaches learning episodes with various, often multiple, purposes. More than half of both mobile and non-mobile episodes take place to enable an activity (40%) and/or to solve a problem (15%). In only about 5% of mobile, and 10% of non-mobile episodes, do purposes relate to a curriculum. Satisfying curiosity is a frequently reported purpose in mobile (45%) and non-mobile (30%) episodes. Other reported purposes include the willingness to deepen understanding and develop skills, enjoyment, and externally imposed purposes (as in 'part of my job'). Finally, 8% of mobile and 15% of non-mobile episodes have no purpose at all.

The learner may approach a learning episode with an intention to learn something particular. In 30% of mobile episodes and 40% of non-mobile the learning outcome is what the learner intended. In 50% mobile and 35% non-mobile episodes the outcome is what the learner intended but they also learned other things. In about 20% of both mobile and non-mobile episodes the learner learned only other things (this includes cases where the learner had no initial intention to learn something specific).

Looking at learning purposes and intentions, it appears that mobile learning episodes are more 'open' than non-mobile ones: the learner explores more to satisfy their curiosity and end up learning more than anticipated or planned.

There were no instances where the learner indicated that they learned nothing. This is expected, as the instructions asked participants to report episodes where they felt that they learned something or that they deepened their understanding. However, it is also unlikely that a learning experience will leave a person completely untouched: cognitive involvement and processing that leads to reflection (especially when reflecting on the experience later through a diary keeping exercise) will at least provide the learner with the knowledge that something, an idea, does not work and at best with an understanding of how, why, and when it works.

Learning episodes relate to various, and often multiple, areas of life. 41% of non-mobile and 48% of mobile episodes were associated with work (mobile locations for

learning are often locations in the workplace other than the person's own office, so relevance to work is expected). The second most popular area that learning relates to is hobbies, at 17% for both mobile and non-mobile episodes. Other areas that equally frequent (each around 5%) cited as learning areas in both mobile and non-mobile episodes include formal courses, leisure and self-improvement. Housework and family-related learning is more frequent in non-mobile settings, whereas community work and social life-related learning is more frequent in mobile settings.

Approximately 45% of both mobile and non-mobile episodes do not relate to a specific learning project; rather, they appear to be single instances of learning specific knowledge/skills on a particular subject area. The other 55% are part of some work project, language learning, religion pursuit, etc.

Various combinations of learning methods are employed in learning episodes. Conversation as a method appears in 45% of mobile and 21% of non-mobile episodes. Interaction with experts is another popular method in mobile episodes (39%), but less popular in non-mobile episodes (8%). Similarly, observation is used in 16% of mobile and only 3% of non-mobile episodes. In contrast, non-mobile episodes employ more often reading and watching media (39%) and self study (39%) in comparison to mobile episodes (31% and 17% respectively). Hands on experience (15%) and listening (5%) are equally frequent in both settings. It appears then that mobile episodes employ interactive and practical learning methods more frequently than non-mobile episodes.

Learning episodes take place in the course of various events. Formal meetings, formal education, social events, and travelling are events that are reported more frequently for mobile than non-mobile episodes. Non-mobile episodes take place very frequently (42%) during no event, whereas for mobile episodes the equivalent frequency is 21%. 36% of non-mobile and 11% of mobile episodes take place in the course of other events such as carrying out work, studying, reading emails, and surfing the Internet. It seems that mobile learning episodes take place more frequently during 'noisy', 'crowded' events than non-mobile episodes do.

47% of non-mobile episodes take place with no other people present/involved, whereas the equivalent frequency for mobile episodes is only 15%. Colleagues (46%) and strangers (17%) appear more frequently in mobile episodes, whereas family (18%), people from media (11%), friends (9%), strangers (8%) and partners (8%) appear more frequently in non-mobile episodes. Mobile episodes are a lot more 'social' than non-mobile episodes, with frequent contacts with people that the learner is more likely to have less intimate relationships (colleagues, strangers).

In summary, *mobile episodes in the semiotic space involve more (vigorous) activities and more interaction with other people, employing more 'active' learning methods. They relate to various areas of life in same proportions as non-mobile learning does. They happen in a rich social context consisted primarily of colleagues but also strangers.*

6.3 Problems during mobile learning episodes

It would be tempting to categorise the problems that occur during mobile learning in terms of the technological and the semiotic spaces. However, the effect of a problem is to break down the flow of the activity system and to temporarily merge the two spaces: when I encounter a technical problem in the use of a tool, when there are flaws in the human-computer interaction, when the communications infrastructure

fails, when I encounter some piece of information that is too high level for me to process, when I have to interact with 'difficult' people, then I have to turn my cognitive and physical efforts from both spaces to this problem to eliminate it.

Figure 7 presents the types of problems that can be encountered in mobile learning episodes, in a structure equivalent to that describing the technological and semiotic spaces.

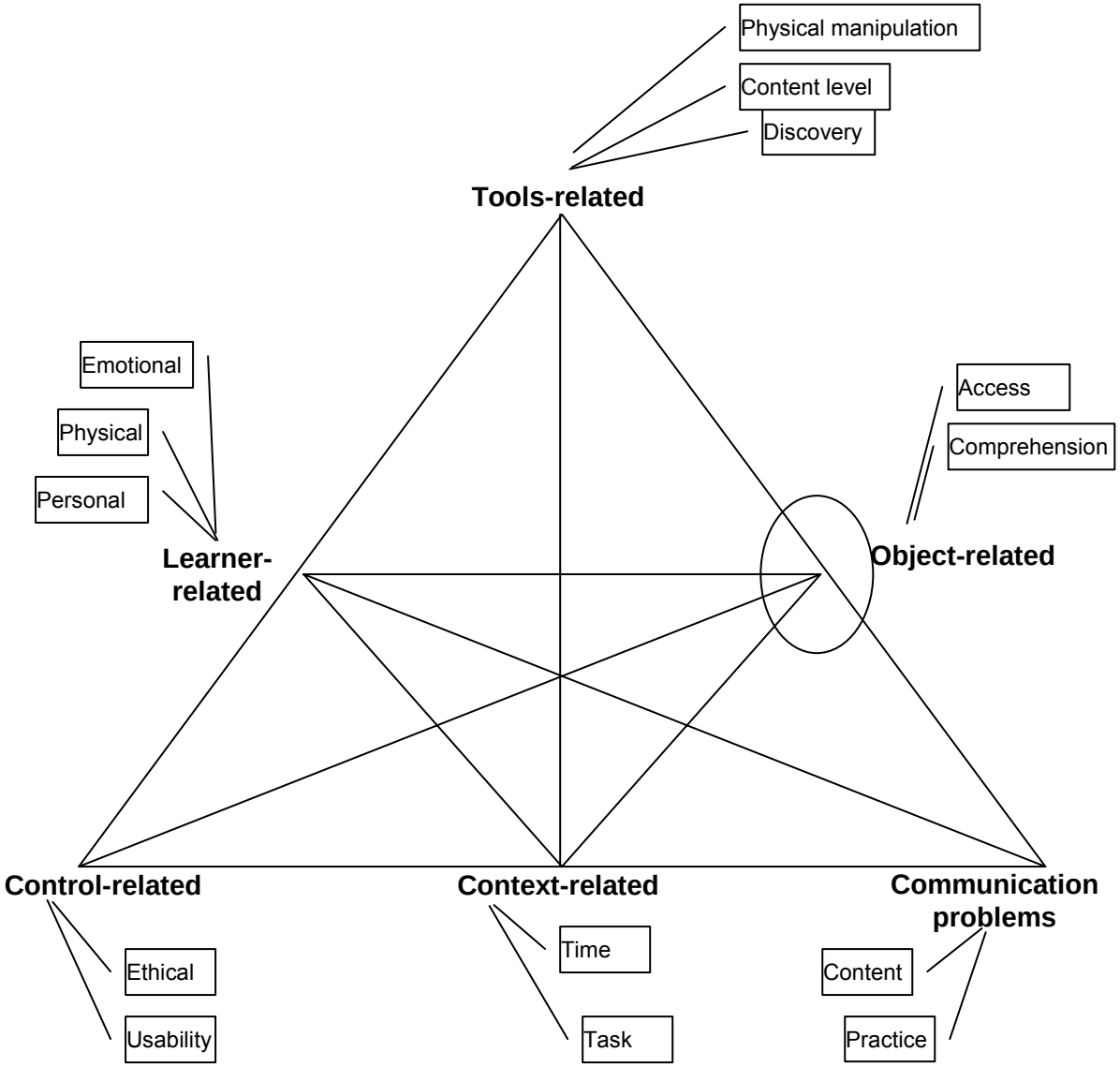

Figure 7: Problems in mobile learning

Figure 8 presents the frequency with which problems occur in mobile and non-mobile learning episodes[3].

[3] System usability problems were not captured in this study

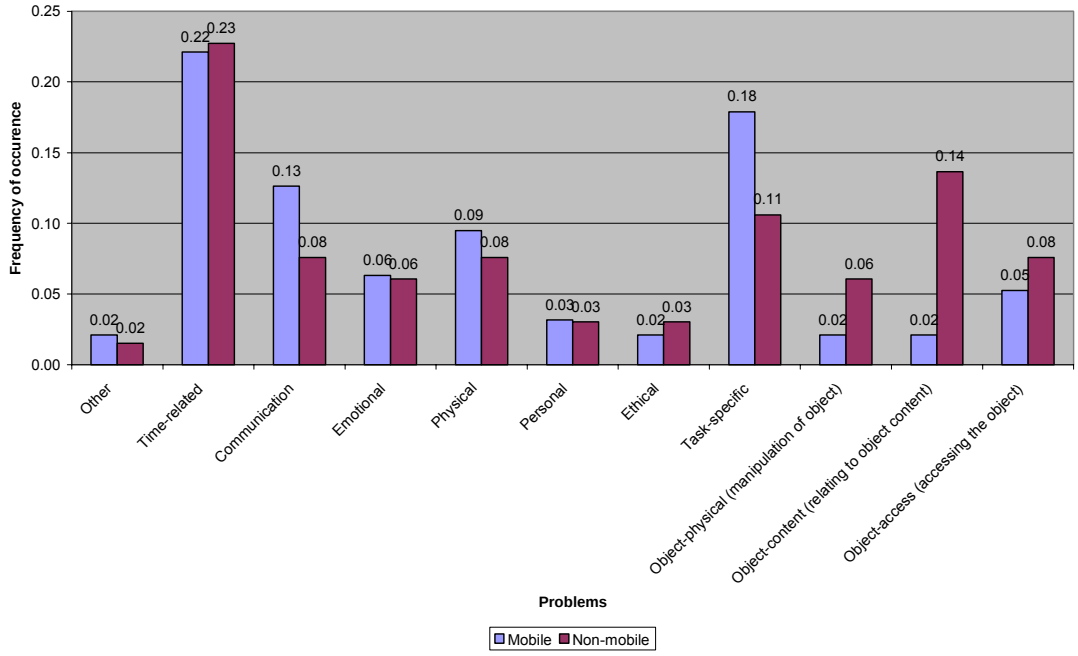

Figure 8: Problems in mobile learning

All types of problems appear in both mobile and non-mobile learning episodes with similar frequency. The exception perhaps are communication and task-specific problems, which are a lot more frequent in mobile episodes, and object-related problems, which are a lot more frequent in non-mobile episodes (especially problems related to object content).

7. Conclusions

The diary study of learning episodes presented in this report is not optimum: the group of participants is small and consists primarily of people with a special interest in education and (technology-based) learning, who are likely to be particularly aware of their learning practices. The structure and design of the diary has captured most, but not all the variances of a learning episode's elements. The very fact that there was a structure to the diary was considered by some participants as a weakness, and has indeed proved a hindrance in identifying the interconnections between the elements of a learning episode (compared to, for example, a free-text log).

Nevertheless, the study has provided some useful insights into the practice of mobile learning and how it compares to non-mobile learning. We have indications that mobile learning is more interactive, involves more 'bustle', more contact, communication and collaboration with people.

8. References

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9. Appendix A: Sample Diary Entry

Date:

M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

Time:

- [ ] Morning (6am-12pm)
- [ ] Afternoon (12pm-6pm)
- [ ] Evening (6pm-12am)
- [ ] Night (12am-6am)

Duration:

- [ ] Less than 10min
- [ ] 10-30 minutes
- [ ] 30-60 minutes
- [ ] 1-2 hours
- [ ] More than 2 hours

Relates to:

- [ ] Work-related
- [ ] Housework
- [ ] Formal course-related
- [ ] Hobbies
- [ ] Community work
- [ ] Other (specify):

People:

- [ ] Stranger(s)
- [ ] People from media (TV, film, newspaper personalities)
- [ ] Friends
- [ ] Colleagues
- [ ] Partner
- [ ] Family
- [ ] Other (specify):

Roles assumed by other people involved (tick as many as necessary):

- [ ] Teacher/ instructor
- [ ] Mentor/advisor
- [ ] Information provider
- [ ] Technical support
- [ ] Peer
- [ ] Other (specify):

Purpose:

- [ ] Satisfy curiosity
- [ ] Enable activity
- [ ] Solve problem
- [ ] None
- [ ] Part of curriculum
- [ ] Other (specify):

Activities:

- [ ] Note-taking
- [ ] Discussion
- [ ] Info search
- [ ] Reading
- [ ] Writing
- [ ] Observation
- [ ] Receive help
- [ ] Exploration
- [ ] Memorising/ remembering/ recalling
- [ ] Planning/ prioritisation
- [ ] Problem solving
- [ ] Collaboration
- [ ] Reflection
- [ ] Revision
- [ ] Provide help
- [ ] Other (specify):

Resources:

- [ ] PC
- [ ] Laptop
- [ ] Fixed phone
- [ ] Paper diary
- [ ] PDA
- [ ] Paper-based documents
- [ ] Mobile phone
- [ ] Electronic diary
- [ ] Electronic documents
- [ ] TV/video/film/ performance
- [ ] Library catalogue
- [ ] Music/audio
- [ ] Search engine
- [ ] Paper notebook
- [ ] Electronic notebook
- [ ] Conversation
- [ ] Other (specify):

Method of learning:

- [ ] Interaction with expert (teacher, master, etc.)
- [ ] Hands-on experience
- [ ] Self-study
- [ ] Observation
- [ ] Conversation
- [ ] Reading/watching media
- [ ] Other (specify):

Event:

	Formal meeting
	Informal meeting
	Conference
	Class/lecture/ seminar
	Social group meeting
	Travelling
	Social event
	Chance encounter
	None
	Other (specify):

Place:

	Home
	Friend's house
	Workplace – own office
	Workplace – other location
	Place of leisure
	Public transport
	Outdoors
	Other (specify):

If you intended to learn, did you learn:

	Only what you intended to learn
	What you intended plus other things
	Only other things
	Nothing

Problems before, during or after learning (please mark with 'b', 'd' or 'a' next to category as needed):

	Time-related	
	Emotional	
	Physical	
	Personal	
	Ethical	
	Task-specific	
	Object-physical (physical manipulation of object)	
	Object content (relating to object content)	
	Object access (relating to accessing object)	
	Communication	
	Other (specify):	

Please explain the kind of problems briefly:

Assessment:

	Self-assessed
	External, formal assessment
	External, informal assessment
	No assessment

Please outline what the topic of learning was:

What learning project (if any) did this experience relate to?

What support (if any) did you have during learning?

Please list other activities that you did *before* learning:

Please list other activities that you did *during* learning:

Please list other activities that you did *after* learning: