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mobile learning cultures across education, work and leisure

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edited by Norbert Pachler and Judith Seipold

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Design
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mobile learning cultures across education, work and leisure

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Norbert Pachler
& Judith Seipold

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introduction

Introduction

Norbert Pachler on behalf of the organising committee

Research on mobile learning is currently making a shift from practice-orientated research to theory building, often focusing on theorising communicative and discursive practices. In this context, an emerging tendency in theory building is to consider experiences related to the learners' life worlds, agencies and cultural practices, in out-of-school, informal contexts.

To understand personalised, learner-centred learning from a cultural perspective, practitioners need to explore these life world contexts in terms of the learner's personal lifestyle, socio-economic status, experiences and interests. The challenge for practitioners is to learn from the learners' agencies, to critically reflect upon the changing cultural practices that emerge from the use of new technologies, and to integrate the assets that young people acquire in leisure contexts into successful learning experiences in formal contexts such as school, higher education and work.

One of the pedagogic aims of such a cultural ecology of mobile learning is to build new links, or to strengthen existing ones, between the different contexts in a learner's life with the aim to provide continuity for learning, to minimise the risk of failure, and to nurture lifelong learning.

As learning with mobile media is increasingly less bound by specific locations, occasions, contents and individuals, and as research on mobile learning can increasingly accommodate a growing diversity of experiences and findings, this symposium aims to address different audiences, with a focus on education professionals and practitioners from school, work and leisure. All are invited to participate in an exchange of experiences and ideas.

The symposium will focus on mobile learning theory and practice in education, work and leisure and will address the following themes:

- Learning across contexts
- Cultural approaches to mobile learning
- Status quo, visions and conjectures

Interdisciplinary approaches and thematic crossovers, both in theory and practice, are particularly welcome. Work in progress and international contributions are encouraged.

Symposium Organisers

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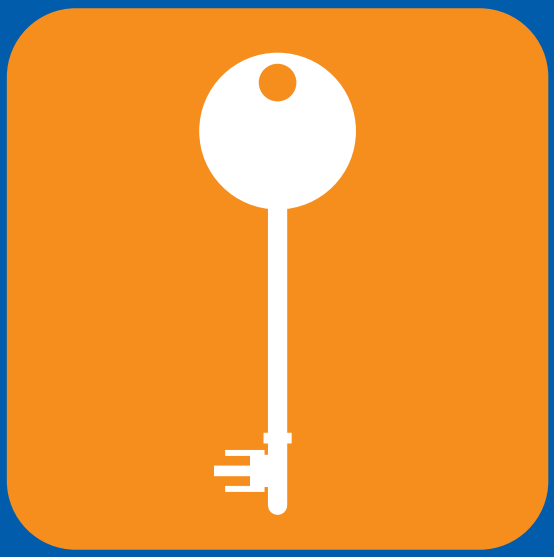

keynotes

Principles behind the mobile killer application in education

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Abstract

Designing effective mobile applications for education is challenging, especially when students are situated in remote locations or complex workplaces. Many research projects in this field report on the difficulties encountered by users. Our experience has been that research findings are often confusing and sometimes conflicting.
This paper attempts to move beyond the issues and to extract the principles behind the "mobile killer application" for education. These principles are based on existing killer applications and the research findings from our work at the Royal Veterinary College over the past three years. We believe that many of the principles are generic and we hope that they can help others to design effective applications that support student learning in complex environments. We welcome comments from researchers who are studying similar or contrasting environments with different groups of students, especially if they help to generate greater confidence in a set of widely applicable principles.

1. Introduction

Tomi Ahonen (2003) defines a Killer Application as one that "alone is reason enough to buy a device or sign up to a subscription." He uses the example of word processing as an early killer application that made it worth buying a personal computer and e-mail as a killer application for getting people to sign up for an internet connection.

In education we are not trying to get students to buy devices but we do want them to feel that signing up for our carefully designed courses is worth the investment and that they get a fair return for this. We would be delighted to provide applications that enhance a student's learning experience, making it both highly effective and enjoyable.

This paper is based on research carried out over three years at the Royal Veterinary College in London, some in collaboration with the London Knowledge Lab, and in large part sponsored by Orange Personal Communications Services Ltd.

2. Background to the research

Veterinary students, like many other vocational students, spend a large proportion of their five-year course learning in workplace environments. There is often little formal teaching or structured learning in these settings and although some students report that they take hand-written notes, it is clear that this recording is sporadic, difficult to organise effectively and almost impossible to share with peers in other locations. This reduces the ability of students to recall, connect and reflect upon their learning activities or those of their peers, thereby reducing the effectiveness of their study in this important part of the course.

Early in 2006 we started developing an electronic environment to allow students to record, organise, access, share and reflect on work-based learning experiences using a smartphone. The project was built with students at the centre, where their requirements were incorporated into the emerging design. Their responses to the developing system were regularly monitored through data logs, email requests for feedback, as well as by interview and focus groups (Whittlestone et al, 2008).

This research exposed the complex decision-making process that veterinary students undertake (mainly subconsciously) when selecting whether to adopt a particular technology, application or system. We believe that many of their processes are applicable to other student groups and so we have formulated principles that we hope will help others in designing mobile killer applications for education. We would also welcome comment and criticism from researchers who would like to refine or extend these principles.

3. From Mobile Killer Application to Educational Killer Application

In attempting to define the criteria for an educational killer application, it is worth initially considering existing mobile killer applications. The standard mobile phone comes equipped with two: the phone and a short messaging service (SMS). More recently, further applications have widened the net of potential customers who would purchase a device just for that application; for example access to email or global positioning and maps. Each application has a "user-base" who considers that this specific application (and the learning curve) is worth the investment in the device and/or the subscription.

It is also worth noting that successful mobile applications tend to fit into one of two categories: they are either about making contact with others (phone, email, social networking) or about accessing information (email, news, web, maps). In education, although access to information is useful, we are often trying to encourage students to develop a deeper approach to their study. The basic premise of the deep approach starts with the intention to form a personal understanding and involves processes such as thinking for oneself, relating ideas, questioning and using evidence critically, drawing conclusions and monitoring and regulating one's own understanding and learning strategies (see McCune & Entwistle, 2000 for a summary). These goals align quite well with a community of inquiry model (Garrison et al 1999) encompassing the use of exploration and conversation for meaning making (Sharples et al., 2007).

By combining our educational goals with lessons learnt from successful mobile applications and our own research projects, we are able to define several principles to help inform future developments:

- The "Reference Point": this is probably the most influential principle. When first using an application, an individual will compare its attributes with perceived alternative options. Their reference point for this comparison is personal and often depends upon the individual's very specific needs, wants, abilities, disabilities, circumstances, and previous choices. If there is no easier (or comparable) way of carrying out the task, the application will meet the first criterion for "Killer Application" status.
- Return on investment: how much effort is required to obtain and maintain the capabilities that the application provides? This is related to principle one but goes beyond it, as a large return for a small investment can make an application compelling, even if it doesn't meet a perceived need and visa versa. Games make use of the positive aspect of this principle, as do social networking applications that provide contact with an expert or a more capable peer.

- Balancing simplicity and challenge: Access to information needs to be as simple as possible (taking into account the first two principles) but to encourage the educational aims of developing skills and synthesis of knowledge the next hurdle is to provide just enough challenge. Too little and the application fails to meet its objective; too much and the individual is discouraged. Both can result in application failure. Unfortunately, technical issues often contribute to the challenge of using an application (see Kukulka-Hulme, 2007 for a summary). Careful design of sequenced activities is needed to address this principle.
- The learning ecosystem: a learning environment has similar complexities to an ecosystem, especially when situated in a workplace (Brown & Duguid, 1991). An application that is integrated or embedded in the learning ecosystem (and ideally develops with it) is much more likely to be sustained by users. This requires a detailed understanding of the complex, social inter-relationships in the specific environment where the application will be used; a concept that Lave & Wenger (1991) explore in detail in their term "Legitimate Peripheral Participation".

4. Conclusion

Creating killer applications is clearly not easy. Designing mobile killer applications is probably even more difficult. We regard the "Reference Point" as a key principle in designing successful applications. A mismatch between designer and consumer reference points can lead to failure once an application is released. In evaluating an application, feedback can be misinterpreted if researcher-assumed reference points are incorrect. However, if we make every effort to understand the complexity of the environments we are studying and take into account the principles outlined above, we stand a much better chance of delivering the educational killer applications for mobile devices of the future; arguably the most difficult challenge of all.

5. Acknowledgements

We are very grateful to all the students who so willingly participated in this project, filled in questionnaires, attended focus groups and interviews and responded to our many requests. We would also like to thank Orange Personal Communications Services Ltd. (http://www.orange.co.uk/) for providing the devices, data contracts and technical training and Niall Winters and Yishay Mor, London Knowledge Lab for choosing our students to carry out their Collaborative Mobile (CoMo) project funded by the Centre for Distance Education.

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What will the future of scientific publishing look like?

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Abstract

Physically-based content-centred publishers, such as in music, books, film, and news have been struggling to adjust to radical changes brought on by digitisation of content, the spread of the Web, and the decentralisation of the creation and distribution of content. The publishers of scientific journals are just one more traditional print-based business built around the scarcity of access and distribution and editorial control. Top scientific journals have mirrored their physical scarcity online, despite a strong trend to open up access to their content. Open access publishers have alternate business models that are not based on scarcity, but are still operating within the authority and processes of traditional publishing. Yet, observations of online social networks that are based around shared content suggest that there might be a different way for scientists to find, navigate, recombine, and publish scientific knowledge. Guided by examples from different online social networks and information services, and analysis of trends in online behaviours and expectations, one can chart a path for the future of scientific publishing, without disrupting the dialogue and collaboration at the core of the science community.

1. Traditional scientific publishing

Do research. Write paper, citing previous work. Send paper to reputable publication that reviews paper with some peers. Get published. Get prestige via citations. Repeat.

The nature of science publication is almost unchanged in 450 years. Even online, the model is predominantly physical, restricted in distribution, access, and creation. The scarcity of the channel has inflated the reputation of the publishers, allowing them to act as gatekeepers and toll collectors for information. Yet, the physical metaphors of science publishing do not lend themselves to modern online collaborative or creative systems. And the calculations of impact and reputation are locked into the physical model where information is static, or at least isolated from change.

To be fair, restrictions in access are decreasing as Open Access online publishers, complete with peer-reviews, static articles, impact, and reputation, slowly gain traction and prove their business models. And these open publishers, once online, are beginning to experiment with more social interactions, albeit, overlaid on the restrictions of a traditional publication's reputation and authority models.

2. The Social Web

The Web is social, centered on the individual, flipping traditional publication, sharing, and content creation models on their head. Just as the printing press increased the number of contributors

to the total sum of human knowledge, the creation of easy-to-use online publication tools have caused an explosion in the numbers of people who directly participate in the formation and sharing of human knowledge and experiences. A whole slew of media sharing services have sprung up, facilitating the sharing of text, photos, music, software code, and bookmarks.

Furthermore, the Web has become a collection of loosely associated morsels of data that can be easily published and permanently linked to. As all these small pieces of media are published, they are annotated through tags and comments, enriching the items of content with human-generated semantic information. And service designers are recombining these morsels of information and data ("mash-ups") in novel ways.

Finally, there are strong and transparent models for reputation and authority in the Social Web. Links, comments, influence, reach, and traffic are good measures for an online publisher's reputation. And the need to measure authority and influence has given rise to independent services specifically for tracking this.

In summary, the Web has basic attributes that allow for social interaction with and around the morsels information and data that flow through it. Every element can have a life of its own, a life that can be linked, commented, searched, embedded, or syndicated.

2.1 Mapping features onto an older model

These usage behaviours of the Social Web mirror the processes of generation of scientific knowledge. That is because science is by nature an incremental, social, and collaborative process that builds and recombines (mashes-up) previous information. As shown in Table 1, one can walk through the scientific publishing process and map it to how the Social Web is used.

Activity	Traditional	Social Web
Collaborating with other lab members or other laboratories	Sharing documents.	Online document creation and project management services.
Searching prior pubilcations	Literature search and journals behind paid subscriptions.	Search tools with semantic information from data mining and user tags and comments.
Peer-review	Small number of reviewers with a physical document.	Any number of reviewers openly and collaboratively discussing.
Publication	Static unit with outlinks (references).	Morsels of methods, figures, references, results, and conclusions thruogh hyperlinked blogs, wikis, and media.
Scientific discourse around publication	Public letter writing (another journal paper)	Publication open for commenting, tagging, embedding, searching, and linking.
Authority, impact, reputation	Citations, influence, caliber of authors, circulation	Caliber of authors, links, comments, reach, traffic

Table 1. Mapping traditional science publishing with usage of the Social Web.

2.2 Beyond the bench

Mobile internet-connected devices have transformed how people access, interact, and follow what is happening in the Social Web. Any science publishing process online needs to be access-device agnostic, to allow for open access and commenting, easy finding and navigation, annotations and contributions from anywhere. Not only is this important for various aspects of the scientist's searching, collating, and publication of scientific knowledge, but is also critical to allow a more fluid and dynamic interaction between scientists, students, and others participating in the process. The challenge, as it is with and service in the Social Web, is how to provide relevant and useful features in a mobile context.

3. Summary

Old media publishers have been shown that models of business and publication, built in the days before the Social Web, are not necessarily the best to apply online. Traditional scientific journals arose as a form of public letter-writing among scientists, efficiently using a physical publication and distribution model that worked well in the pre-Web days. The Social Web has shown the strength of open online collaborative networks as a way to contribute and extend human knowledge within a trustworthy system of reputation and authority. These are strong indicators of a future way to find, navigate, recombine, and publish scientific knowledge without changing the open dialogue and discussion that is the core of the scientific community.

track 1
learning across contexts

Mobile learning and assessment: the student perspective

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Abstract

This paper outlines the initial student experience of using mobile devices on placement for assessment and learning. Using mobile devices for work based interprofessional assessment is the core work of Assessment and Learning in Practice Settings. The feedback presented here was gathered at a series of training sessions attended by a total of 137 students involved in the ALPS programme; and identifies the key benefits and challenges students perceive when using mobile devices.

The findings reflect and build on earlier work, (Georgiev, 2004 and Kukulska-Hulme & Traxler, 2005), which identify that whilst the use of mobile devices can enhance learning for students, there are many challenges in the implementation of such projects.

Key lessons learned from this project so far include that functionality of devices and investing sufficient resources in the development of suitable learning materials are both important to maintaining student motivation. This is crucial for the mobile devices to enhance student learning and assessment opportunities; and therefore to result in positive cost benefit for Higher Education.

1. Context

Assessment and Learning in Practice settings (ALPS) is a Centre of Excellence in Teaching and Learning (CETL) collaborative programme involving 5 Higher Education Institutes and their partner Health and Social Care organisations.

Within these five Universities there are 16 different undergraduate health and social care programmes taking part in the ALPS programme

All these undergraduate programmes place their students with health and social care employers for experience and assessment. The placement Practice Assessors' and the HEI Tutors' judgement of the students' performance is combined to reach a final verdict of competence.

The vision of the ALPS CETL programme is to improve the competence and confidence of healthcare and social care students on graduation.

This is fulfilled by:

- providing students with mobile devices to facilitate timely feedback and opportunistic assessment experience whilst on placement

- developing Common Competencies and generic assessment tools in order to promote inter-professional placement assessments.
- encouraging service users and carers to assess the students.

This approach is based on Boud's (2000) theory of sustainable assessment where students are encouraged to take feedback from a variety of sources in order to improve performance. This fosters lifelong learning skills that can be taken forward into professional life.

Utilising mobile devices as a means of delivering assessment whilst the student is on placement, has the advantage of allowing timely access to additional resources such as reusable learning objects and the internet for research.

The immediacy of feedback when using mobile devices can be considered as an advantage (Georgiev et al, 2004) and there is also recognition that mobile devices can enhance learning outside the University and potentially reduce mistakes for nursing students. (Koeniger-Donohue, 2008)

It is anticipated that using the mobile devices and assessment tools will increase the richness and quality of the students' reflections by allowing reflection in action as well as reflection on action, and thus develop life-long learning skills.

2. Implementation

Each HEI has identified cohorts of students to use the mobile devices. At the University of Leeds students were identified from the following professional groups:

Nursing

Radiography

Audiology

Dentistry

A multi-disciplinary group of health professionals training to be mentors

The students have been trained in the use of the mobile devices and assessment tools, and in many cases follow-up sessions have been delivered to ensure IT software is functioning properly on the devices; essential for their use outwith the University setting.

The results presented in this paper are our thematic analysis of the students feedback received during the pilot phase of this programme; typically at the training and IT Support sessions. This feedback primarily relates to the use of the mobile devices during placement for accessing learning material.

Also presented is initial feedback on the use of the mobile assessment tools. We have taken this feedback and considered the implications raised by it to facilitate the successful roll-out of these tools to other students in terms of usability and usefulness.

Given the large amount of training and follow up sessions we have had to provide during the project we must ask, are our students' digital natives or digital immigrants? (Prensky, 2001)

3. Findings

The findings presented in this paper are gathered from a series of training sessions held at the University of Leeds. The numbers of students trained within each professional group are outlined below:

Audiology-12 students

Dentistry-24 students

Radiography- 25 students

Nursing- 64 students

Multi-disciplinary healthcare mentors- 12 students

The students were asked to write their observations and feelings on to post it notes which were then stuck on to flip chart paper and themed into the following areas:

Theme	Advantages	Issues
Access -personal	Personal use e.g. BBC News, Google map, train timetables, hotmail accounts	Not able to use as a mobile phone
Access - learning	Access to University learning Zone and VLE Check and record own progress immediately ability to view learning material in practice and capture reflections	Modification of existing learning objects into format suitable for PDA's
Communication	Communication between students and tutors Tutors provided resources/ activities on an ongoing basis keeping in contact with family and friends. check emails when away from a PC	Sometimes email didn't work Accessibility in practice – slow connectivity
Usability of device		Motivation for staff and students to utilise devices Concern over mobile devices in practice – risk averse organisations - safety and confidentiality Screen too small Storage space limited

3. Discussion

The ALPS programme has created a functioning mobile assessment system. This allows a tutor or group to develop an assessment tool using software (Compendle Question Builder) housed within an e-portfolio system. (Multi-port). The assessment can be sent out to the mobile devices via a delivery system known as Intellisync with any additional learning material the tutor thinks relevant.

The student completes assessments and gathers feedback using the device whilst on placement, sending the assessments back to the e-portfolio once completed. The tutor can then review the students' assessments within the e-portfolio and provide feedback and guidance remotely.

Initial reports suggest that once the students have tried these assessments, they find the feedback gathered helpful to their learning.

Despite some issues around connectivity, many students accessed learning material via the internet and found this a great advantage when in remote placements (e.g. a district general hospital) and when travelling to see patients (e.g. in community settings).

In one specific cohort of students, learning videos were downloaded remotely (i.e. whilst the students were on placement) and 50% accessed these for learning purposes.

Allowing students to use the devices for their personal use increased buy-in for the programme in the early stages. It also enabled the students to blend their learning and personal activities. Students don't necessarily make a distinction between learning and pleasure activities. For example; games can be developed to improve learning. (Prensky, 2001)

4. Issues

Whilst students were originally very impressed with receiving the devices, the initial excitement soon wore off (Kneebone, 2005).

Feedback about the screen size being too small, not being able to use the mobile phone (and therefore having to carry 2 devices) slow connectivity and lack of storage space, created early irritation and reduced motivation to use the devices. As a result, if faults were encountered with the device, students were not sufficiently engaged in their use to contact the ALPS Helpdesk. Increasingly, minor faults were not rectified (e.g. the e-mail system) and therefore reduced the motivation to use the devices for anything more adventurous; such as learning and assessment (Maslow 1946).

The adaptation of mobile learning resources and access to mobile friendly websites became a bigger issue than originally anticipated. Less reusable learning objects were sent to students than planned, as tutors were frequently trying to adapt existing material, creating frustration for them and the students. Using digital age technology without training and support for tutors can result in disappointment.

In the future, consideration may need to be given to a more focussed distribution of the mobile devices; for example for those students in remote placements or on particularly unusual placements with little access to conventional PCs.

Motivation for the student to use the devices is crucial in order to gain acceptability, as perseverance is vital for the benefits to be properly realised.

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Work-based learning and student agency: developing strategic learners

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Abstract

This paper will propose that a new approach to work-based pedagogy is required to enable mobile learners – often negotiating various physical, social and virtual learning environments – to develop greater personal agency and subsequent control over their Higher Education (HE) experience. A relatively new group of employer-sponsored, Foundation degree (Fd) students will be the focus of discussion, though it is hoped that issues raised are of wider relevance. Themes from ongoing research will offer perspectives on the importance of identity, purpose and relationships to students of health and social care, who have potential to become more strategic in their approach to learning.

1. Context

Foundation degrees were introduced in 2001 to upskill the workforce and widen access to HE (DfES, 2003). In healthcare, employers access the qualification to support the development of new roles. This is fuelling the demand for learning in the workplace, often supported by on-line materials. HE and FE providers remain responsible for delivering quality standards and student satisfaction, while preparing non-traditional entrants for academic success and progression into Honours programmes (HEFCE, 2000). Innovative approaches are therefore needed to bring these agendas together successfully; that is, approaches which go beyond routine consultation with employers.

A deeper understanding of how this employer-sponsored group of students make use of all their learning opportunities is necessary if they are to cope and even thrive. Of particular interest are the ways in which they translate their educational requirements into work activities, and in turn utilise their experiential learning at work to develop academic ability. Freedom from the somewhat restrictive features of traditional, professional healthcare programmes means more expansive approaches can be incorporated into programme design. Expansive curricula include broader experiences across workplaces, engagement with multiple communities of practice, access to career progression and scope to extend roles, as described by Fuller & Unwin (2003). Such creative and exciting possibilities must be balanced though, with the reality of juggling family life, work and HE study.

2. Research findings: places and people

This paper draws upon related aspects of two of the authors' current pedagogic research studies, to illustrate two different aspects of agency: a sense of moral identity and a sense of belonging. In the first study, the importance of feedback from service users, carers and workplace colleagues

emerges as critical to participants' sense of moral identity. Discourse analysis reveals these three groups to be the most frequently discussed in relation to self, decision-making and development of reasoning and judgement skills. Actions are reflected upon as 'right' in light of positive responses from those receiving care or support. The detailed recollection of interactions suggests a sense of moral proximity, which contributes to an identity not professionally-constructed but explained through personal experience: 'I remember when my mother was ill and trying to get treatment for her'. Users and carers appear to be part of a community of practice, providing not only a place to learn, but 'a context for new insights to be transformed into knowledge' (Wenger, 1998:214).

In the second study, graduates reflect upon their changing sense of self, as worker and learner. Findings indicate that one of the ways in which students become active participants of social communities is through the informal formation of peer support groups. However, their dual identity can be challenged, incurring a need to negotiate a new sense of belonging and legitimacy within a work-related social community. A degree of role-confusion was expressed: 'I'm here to be a student, well, when I'm at work I'm the manager so I couldn't really be a student, you know'. Yet our expectation as educators is that these roles co-exist for Foundation degree students.

Both studies highlight participants' reliance upon service users / carers, colleagues and line-managers for exposure to, and reflection upon, learning opportunities. While Virtual Learning Environments can provide continuity and scope to share resources, students in the second study reported needing a good deal of support to fully exploit this medium. Ashton (2004) found the most junior workers to be vulnerable to exclusion from networks and knowledge, raising the issue of how this group of students gain access to both during their working-learning lives.

3. A new approach to pedagogy: mobile learners as strategists and agents

To seek to work with employers, without reassessing the needs of the employed student, risks perpetuating myths regarding the benefits of work-based learning. Students report being motivated by a 'clear purpose and direction in life', above technical skill (Lizzio & Wilson, 2004:115), suggesting time invested in developing goals is well spent. However personal agency requires not only purpose, but knowledge of processes, cultures and norms, in order to influence relationships and access learning opportunities. Easily accessible information about entitlements, risks, rules – and when these change – is essential to students, as needed. Working students, with little time to waste, require strategic approaches to study: organising time and study methods, understanding assessment, self-regulating effort and developing meta-cognition (Entwhistle, 2000). It is unusual though, for such approaches to be explicitly encouraged and facilitated; students described taking many months or even years to work this out.

The third, and newest study, is a collaboration involving students and employers in a joint development of a work-based learning module. Its goal is to learn broader lessons about developing curricula and virtual resources in collaboration with employers, through the inclusion of the learner voice at all stages of the project. Students are included in all curriculum development and implementation alongside academics and employers. In this way the curriculum is co-constructed and all three stakeholders have a better understanding of the learning objectives which will result. It is hoped, that in this way, the learner voice will be captured at the development stage and this will lead to a better understanding of the competing demands on the students' time during the module by the academics and employers. By making explicit the role of agency and strategic learning, it is hoped that all contributors will generate ideas and learn from each other. In this paper, the authors will share some of the early findings of the study.

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Mobile Learning as a means for training - health care workers at the tertiary level

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Abstract

Up to now the potential of mobile technologies to assist health workers has mainly been used for clinical purposes. In this paper we present the integration of mobile learning into a degree course to acquire a Bachelor of Arts in Nursing at a German university. At present, German health care workers are confronted with a gap between nursing taught in colleges and the day-to-day experiences they have on wards or while working in ambulatory care. Consequently, there is an ongoing debate on the evolving place of theory within the professional training of health care workers. Mobile devices and the respective learning scenarios can accompany health care students in both realms, aiding students in understanding the scientific background of nursing without limiting the experience to classroom-bound education. The course material will be made accessible via Moodle and Moodle for mobile phones (MOMO). Being an Add-On for Moodle, MOMO can be used for implementing mobile learning scenarios using Moodle as a backend. The first course is designed to support the students in the acquisition of knowledge on scientific procedures and research. More courses will be made available if a formative evaluation shows that the students benefit from blended learning scenarios.

1. Mobile learning and health care in Germany

Health care and the training of health workers have been influenced by the rapid development of information and communication technologies for several years. Especially mobile technologies can support the development of knowledge, skills and attitudes during the vocational training of health workers as well as their continuing professional development (Cochrane, 2006). In Germany the potential for mobile technologies to assist health workers is mainly being used for clinical rather than learning purposes (Mania, 2008). The potential of information and communication technologies to support lifelong learning processes independently of time and place still remains an under-explored area.

2. Integrating mobile learning into a degree course for health students

Currently, more and more health care workers get their professional training at the tertiary level, especially at colleges of higher education. This shift is due to the increasing demands on the health care sector and the ensuing need for a high level of professionalization

(Deutscher Bildungsrat für Pflegeberufe, 2006). In the course of this process the Steinbeis University Berlin is developing a degree course to acquire a Bachelor of Arts in Nursing. Future health care workers can enrol during the last year of their vocational training and continue their studies during the first two years of working as health care professionals. Training health care workers at colleges of higher education or universities is meant to support them in meeting the increasingly recognized scientific demands of their profession. At present German health care workers tend to experience a gap between nursing taught in colleges and the experiences they have on wards or during ambulatory care. This college/ward divide is associated with a debate on the changing place of theory within the professional training of health care workers. There is a gap between the scientific methods taught at colleges and their modification or abandonment in the face of difficult situations at workplaces in the health care sector. Integrating mobile learning into a degree course for health students familiarizes them with teaching and learning methodologies that can bridge the gap between colleges and nursing experienced on wards or during ambulatory care. Coupled with open-source software tools, mobile devices accompany health care students in both realms and can provide content that guides them in developing insight into the scientific underpinnings of nursing without tying the experience to classroom-bound education.

As the degree course will be extra-occupational and extra-curricular, the students can especially benefit from blended learning scenarios involving e- and m-learning. Currently, these scenarios are relatively new to most health care workers and educators in Germany. Moodle, an open source Learning Management System (LMS), will provide the platform for a small chunk of the material covered for the Bachelor of Arts in Nursing. In addition, the course material will be made accessible via Moodle for mobile phones (MOMO). MOMO is an Add-On for Moodle that brings about the possibility to implement mobile learning scenarios using Moodle as a backend. Users need to install a Java-based application on their mobiles phones to get mobile access to Moodle courses. Health care educators can design courses that make use of mobile elements or they can recourse to complete mobile learning scenarios while using the tools and methods offered by Moodle.

This approach encompasses the integration of cooperative and collaborative forms of learning into distance as well as face-to-face education to foster interpersonal and communication skills. The proposed paper will present the structure and the content of the computer-supported learning scenarios. The main aim is to create content that is sufficiently modular to be truly adaptive to the needs of health care workers and educators. The first course will be designed to aid the students in constructing knowledge on scientific procedures and research to prepare them for forms of Evidence-based Nursing (EBN), which is an approach to ensuring and increasing the efficiency and the quality of health care by basing nursing practise on nursing knowledge. The health care students will be provided with scenarios that support them in acquiring knowledge on ways of upholding scientific procedures when confronted with the need to adapt to the situation at their workplaces. These scenarios will leverage the potential of quickly getting access to scientific resources, such as specific data bases for health care literature. The health care students will not only learn about the mere existence of these resources, but also apply their knowledge in the context of scenarios that require them to make informed decisions on current issues in inpatient as well as outpatient healthcare. One of the main goals is to support them in acquiring the skills to quickly locate, retrieve and evaluate nursing literature whenever they need it. Generally speaking, the first course will be designed to support the development of information literacy at the level of tertiary education. If a formative evaluation shows that the students benefit from blended learning scenarios, more courses will be made available via Moodle and Moodle

for mobile phones. These courses will be part of the degree course, which is being developed by senior health care professionals and tertiary educators.

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Mobile learning as a part of classroom instruction

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Abstract

This media literacy project aims at integrating mobile phones into classroom work and tapping their potential to encourage cooperative learning among school students, while promoting a wide range of media skills and options for mobile learning. Bridging the gap between curricular and recreational activities by making use of the 'internet-ready mobile phone', the project applies insights gleaned during a test run in 2008. It offers a fresh perspective for overtaxed teachers and supports them in embracing new instruction methods, strives to kindle more parental interest in youngsters' media opportunities, and provides outreach to socially or educationally disadvantaged students. Conceived as a 'learning laboratory' with ongoing scientific evaluation, the two-year project recently begun in the German state of Rhineland-Palatinate revolves quintessentially around the idea of convergence—with state-of the-art media applications being integrated into curricular work on a sustainable basis, and the interaction of youth culture with traditional forms of mimetic learning viewed as a generating force for motivation and renewal in education.

1. The media education task force medien+bildung.com

Educational authorities in the German federal states are currently pursuing diverse strategies toward establishing media literacy training in schools. The state government of Rhineland-Palatinate initiated, in 2007, the "Ten Point Programme to Promote Media Literacy in Schools" (http://medienkompetenz.rlp.de/10-punkte-programm.html), founding a project office at the Teacher Training Centre for Media and earmarking 10 million Euros. Much of this funding flows into technical investments (laptop-carts, software, or broadband access for 200 schools) and into training for multipliers and parents. Nonetheless, everyday access to schools is impeded by technical, psychological, and structural factors. The "media education task force" of medien+bildung.com (m+b.com) aims to help overcome these.

Founded as a not-for-profit corporation in December 2006 by the Central Authority for Media and Communication Rhineland-Palatinate (LMK), m+b.com pursues goals deriving from the media authority's mandate to promote the protection of minors in the media. Consequently, this pedagogical affiliate of the LMK develops and realises conceptions for practical media education in the state, including offerings for day centres for children, schools, training institutes for educators and universities, as well as agencies providing educational services to young people and adults outside of school contexts.

The central focus is currently on 'full-day schools' (Ganztagsschule), with year-round media programmes at 46 such schools as extra-curricular activities (video, audio, web 2.0, mobile phones). Furthermore, m+b.com conducts projects in numerous traditional, half-day schools. Close daily contact grants insight into the obstacles confronting media education: personal

anxieties among teachers, insufficient orientation in the media jungle and a lack of role models, minor and major technical hurdles, rapid developments in technology and in youth cultures, failure to comprehend the significance and magnitude of the subject—to name but a few. In this context, the appropriate response seems to be "flying doctors": specialised educators travelling with equipment (video, audio, photography, mobile phones), which they keep in almost constant use and repair along the way. Being "on location"—media work as outreach—makes it possible to identify needs on a grassroots basis, overcome inhibiting factors, and provide impulses that nourish the self-confidence so necessary to independent action. These media educators can demonstrate, within schools, the potential offered by active media work—for example, as a contribution to internal differentiation in classroom instruction, toward motivating young people tired of school or including disadvantaged students in team efforts.

2. Working with the mobile phone - the pre-project test run "pocket wireless"

Although all media areas remain underdeveloped in the classroom context, new technologies such as e-learning and mobile phones deserve particular attention. To explore concepts, methods, applications and technical obstacles, in 2008 m+b.com developed the project "pocket wireless" with the support of SAP Regio Sponsoring. Extracurricular activities were tested in a full-day school (Ganztagsschule) and in recreational youth work. Based on functionalities of today's mobile phones, creative media exercises, games, and competitive schemes were designed or adapted. This resulted in an SMS poetry slam, orientation and geocaching tours about town with photos as "proof", picture stories, learning maps, home-made ring tones, radio items or videos clips produced on mobiles, reports on vocational internships sent back to school via wireless, or cellcasting projects. Legal, ethical, and technical aspects were integrated. It was of particular interest to the media educators to discover which topics could be matched successfully with what methods, and whether certain project scenarios could promote particular skills. A number of technical pitfalls—often linked to unforeseeable details—were identified. One outcome was the recommendation of an appropriate mobile phone classroom set, which was purchased by m+b.com in January 2009 for its ongoing work.

The methods developed will be published in May 2009 in the brochure "taschenfunk", presenting a wide range of interesting examples that can encourage teachers and multipliers to follow suit. The brochure is also intended to help recruit partners for the upcoming project.

Several of the methods developed have already been introduced into teacher training at the University of Mainz by a media educator from m+b.com (cellcast, geocaching, SMS poetry, etc.). Initial resistance among the trainees—"We'll never be able to use this in school!"—soon gave way to enthusiasm and the wish to test these methods in classroom teaching.

3. The planned project "Mobile learning as a part of classroom instruction"

The conceptual preparation for the new project "mobile learning" is now (from March 2009) being advanced in cooperation with scientific advisors and adapted for classroom use with interested teachers. The project foresees a communication strategy on several levels, with particular emphasis on winning the support of parents, teachers, school principals and administrators so that mobile phones can be integrated into normal classroom situations. Typically, mobiles in the classroom have a negative image, as disturbing or "hazardous". They appear useless to many older teachers (and some parents), who themselves use mobiles only in emergencies or when no landline is available. This often leads to an uncomprehending attitude toward the technology and its role within the culture of young people. In many schools, mobile phones are banned so that they can't be used for mobbing or cyberbullying, or simply to avoid ringing and "fiddling around" as permanent disruptions.

Classroom testing of the didactic materials and project concepts will take place during the academic year 2009/2010 in four- to eight-week activity periods at different types of schools and in various curricular fields. These instruction phases will be realised in cooperation between media educators from m+b.com and teachers in their normal classes, the media educator attending to technical and media production aspects while the teacher is responsible for content. The project aims at establishing a partnership of the teacher, media educator, and students that enables division of work and mutual team efforts. Patten et al (2006, quoted in Bachmair 2009, p. 199) circumscribe the learning effects emerging from mobile phones as "collaborative, constructionist, contextual". Youthful interest in technology and new work patterns—such as solving math problems on the mobile phone—can be tapped to reduce aversions to certain content or learning methods and to allow for more a positive experience at school.

The practical realisation will be monitored, adapted where necessary, and accompanied by external evaluation. Methods and strategies that prove successful toward achieving pedagogical goals will be documented and presented in transferable form (e-learning scenarios, tutorials, training courses, etc.). The project outcomes will be presented in written and audiovisual form, and methods made available in an online databank together with suggestions for their application in the curricular context. Possible cooperation with partners in England or Scotland is envisioned later in the project.

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Bridging formal and informal learning using mobile digital museum trails

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Abstract

This paper looks at a project that developed and tested trails for Higher Education (HE) Design students to access mobile devices in the museum. It details findings about the needs of HE Design students in the museum and the ability of mobile learning to play a part in supporting learners' needs. Evaluation of such technology raises interesting methodological questions about how to take learners' life worlds into account. Pedagogical issues raised by the project include balancing direction and free choice in museum visits, designing generic learning materials for HE, and collaborating with a wide range of contributors. Technological issues raised by the project include ambivalent responses from students to the devices and suitability of this tool as a learning device for HE students in museums.

1. Introduction

Museums are acknowledged to be an important part of Higher Education students' learning, yet museums and universities are not collaborating as much as they could be. Museums are often seen as a place of 'leisure learning' (Hooper-Greenhill, 1999) but play a very different role for HE students. Current approaches to museum learning acknowledge the different and individual stories that make up learners' life worlds. This includes individuals' prior experience, interest and beliefs as well as choice and motivation.

2. The iGuides from StreetAccess project

The 'iGuides from StreetAccess' project involved the creation of 20 web-based gallery trails for design students to access on Personal Digital Assistants (PDAs) at the V&A using StreetAccess software (see Figure 1). Students could access the learning resources designed for them as well as input their own information in the form of voice recordings, photographs and text. They could access their 'personalised' trail on the web afterwards.

Trails were evaluated as part of a formal strategy designed to elicit attitudinal responses to trail content and the technology. The aim of the evaluation was to look at evidence of meaning making from students' dialogue and activity in context. It addressed this through methods including accompanied visits, interviews, focus groups and analysis of the data uploaded by the students. The project was analysed using a methodology adapted from

Falk & Dierking's (2000) Contextual Model for museum learning, Laurillard's (2002) Conversational Framework, and Activity Theory (Kaptelinin & Nardi, 2006).

Figure 1. Jasjar iMate PDA used in project.

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3. Findings

Baseline research conducted as part of the Centre for Excellence in Teaching and Learning through Design (CETLD) at the V&A provided useful insights into the 'life worlds' of Design students. Designers are drawn to concrete, sensory experiences, learning in a hands-on way by trial and error and by testing concepts in new situations. In the museum, Design students need help with learning to look at and from objects, and they are likely to continue object-based study after their visit. Trails were designed to accommodate Design students' learning styles and to be used on unaccompanied visits to the museum (see Figure 2). In the trials, students conducted the trails in pairs, with one PDA per pair. This arrangement seems to have stimulated dialogue between the students.

Responses to the trail content were broadly positive. Students appreciate information presented to them in different modes such as images and audio, and they valued the inclusion of multiple

perspectives from outside as well as inside the museum — particularly those of tutors and other students. The trails encouraged students to investigate objects they would have otherwise overlooked, and to spend longer looking at and examining objects in close detail.

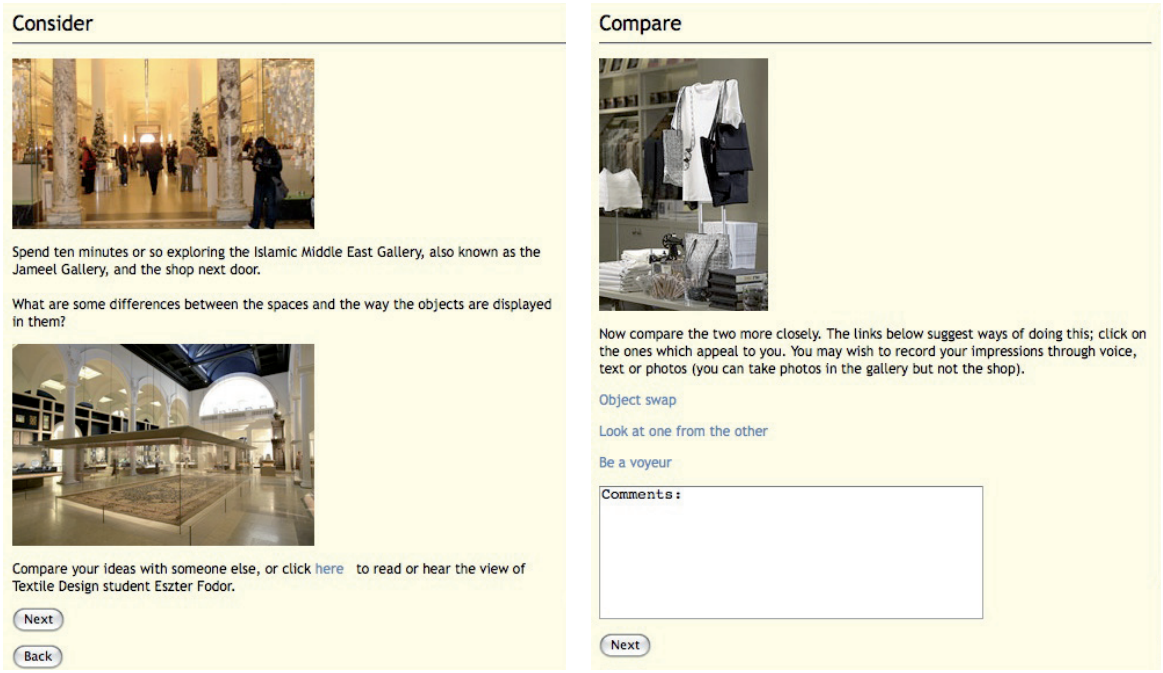

Figure 2. Screenshots from 'Shopping for Ideas' trail.

We experimented with different trail types and structures, some for example comparing display strategies in the galleries and the museum shop; others prompting students to undertake behaviour and activities not common in museums, as a way of drawing attention to museum social conventions. The technology mediated students' experience of the trails by prompting and enabling the collection of multimodal data, which was then carried across contexts via the Internet. At the same time, technological breakdowns brought to the fore issues of mobility and network access, device usability and the relative notion of portability.

Students' captured trail data is not a validated form of assessment, but tutors agreed that mobile learning implementations of this type can serve a valuable purpose in supporting students' learning in between assessments, since at HE level assessments are fewer and further between than in schools. They also agreed that the technology can play an important role in informal learning since the time tutors can spend with students has been steadily falling. Based on our findings, successful interventions should include and support multimodality and multivocality, and treat the technology as a bridge between different learning contexts, linking not only physical locations but the personal and social connections between students, artefacts, history and use

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Interaction heuristics for context-sensitive mobile learning

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Abstract

This paper examines a case of location-aware context-sensitive learning. We examine in some detail Dourish's notion of context, highlighting six principles to guide our work. This is followed by the a brief presentation of a case study in the area of urban education that the authors are engaged in as part of the EC funded CONTSENS project which is investigating the use of wireless technologies for context-sensitive education and training. By drawing this case we propose a set of 'interaction heuristics'; these are rules of thumb that should in future systems be able to guide a mobile learning system's responses as learners operates within a learning context.

1. Introductions

This paper examines a case of location-aware context-sensitive learning. We examine in some detail Dourish's (2004) notion of context, highlighting six principles to guide our work. This is followed by a brief overview of a case study that the authors are engaged in as part of the EC funded CONTSENS project. This case is used to propose a set of 'interaction heuristics'; these are rules of thumb that should in future systems be able to guide a mobile learning system's responses as learners operates within a learning context.

Mobile learning is increasingly able to make use of the GPS feature of devices to enable location-based and context-sensitive learning. Location-aware systems are already used by emergency services to detect the exact physical location of mobile devices. Context-sensitive systems in contrast are also aware of the activities of learners and can thus offer to give assistance in the form of appropriate learning content.

2. A view of context

According to Dourish (2004) the determination of contextuality cannot be made a priori. It is an emergent feature of the interaction, determined in the moment and in the doing. In other words, context and content cannot be separated. Context cannot be a stable, external description of the setting in which activity arises. Instead, it arises from and is sustained by the activity itself. (Dourish, 2004). Dourish presents a "model of context … in which context and activity are mutually constituent" (p.14). Dourish's model of context follows (keywords are in bold):

"Contextuality is only a relational property that holds between objects or activities. It is not simply the case that something is or is not context; rather, it may or may not be **contextually relevant** to some particular activity. " (Dourish, 2004, p. 5)

Context cannot be defined in advance but is **defined dynamically**.

"Context is particular to each occasion of activity or action. Context is an **occasioned property**, relevant to particular settings, particular instances of action, and particular parties to that action." (Dourish, 2004, p. 5)

"Context **arises from the activity** being maintained and enacted in the course of the activity at hand." (Dourish, 2004, p. 5)

"If activity is the site of contextual manipulation, then this move argues for a link between action and meaning as the primary concern of ubiquitous computing. We find the link between these two in the concept of **practice** … the concept of practice is one that unites action and meaning. It describes how the world reveals itself to us as one that is meaningful for particular sorts of actions, and as a result of our participation in communities." (Dourish, 2004, p. 9-10)

"What is crucial to the **interactional** (rather than representational) view is to see practice as a dynamic process. It evolves and adapts. As technologists, then, our concern is not simply to support particular forms of practice, but to support the evolution of practice – the "conversation with materials" … out of which emerges new forms of action and meaning." (Dourish, 2004, p. 10)

Defining and building models of contextual learning is still an active area of research. The purpose of the work described in this paper is to contribute to this field by explicitly interrogating the construction and formation of contexts in a field trial of location-aware learning. Indeed, we question whether Dourish is being too narrow in his approach to the construction of context. Winters and Price (2005) argue that Dourish does indeed create an unstable and elusive notion of context which may well hinder any ambition to build interactive systems for context sensitive learning.

3. Case study

The mobile learning application is being used with students of Education Studies and also trainee teachers to explore their knowledge and understanding of urban education in a meaningful context (Smith, Cook and Pratt-Adams, 2009). An urban area close to London Metropolitan University is being used to explore from 1830 to the present day how schools are signifiers of both urban change and continuity of educational policy and practice.

4. Heuristics for enhancing emergent interactions

For us the context is emergent and not predetermined by events; centrality is placed on practice, which can be viewed as a learner's engagement with particular contexts.

This section will outline our findings. For example, one question in our interview with the tutor in our case study was as follows: Question. What do you think it added for the students? For example, did the facilities provided by the phone change way they undertook the tour and the tasks they were asked to complete? The tutor responded as follows:

- They were very engaged and excited.
- The students could have developed some of the tasks more. We could encourage them to spend longer on tasks.
- The tasks on the mobile tour are more structured which give students the opportunity to get beneath the surface of the tasks and actually get collaboratively involved. On the tutor guided tour, tasks mainly consisted of the tutor asking the students questions.
- Because they were in small groups on the mobile tour, there was a more productive form of pedagogy.

- You can engage with their learning more on the mobile tour. The mobile tour is much more focussed and you can get students to develop their learning in more productive ways.

Based on this and all the evaluation data initial heuristics for our learning enhancement system are that we need to:

- Encourage students to spend longer on tasks.
- Vary the form of interaction: one student commented in the field that our system should have some form of talking head, like "brain-trainer software", to provide a more personalised view and motivator to engage with the task.
- Improve indexing (being aware of all the content that was available in the system to view at any time).
- Improved digitisation of content (especially the archive material which students claimed was grainy and of poor quality).
- Support for the evolution of practice (students claimed that it would be good to fit this practise into a larger context of being able to see the same area over time and to be able to choose the time-scale to be investigated on the tour).
- Have greater granularity around the location including placing sensors in the environment (comments and instances of the unreliability of GPS prompted this heuristic).
- The ability to perform deep customisation including level of detail, preferences and order of presentation (some students were at different conceptual levels and would have benefited from this ability to tailor the content to their individual level of interest).
- Provide video and audio searching facilities (one student said they wanted to skip to a part of the video even search a video for a specific building which would have to be tagged to find its location in the clip).

5. Conclusions

Future work aims to examine whether such heuristics (successful interventions) can go further and feed into a model for guiding interactions in other learning contexts.

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Integrated microlearning – concepts, cases, and scenarios

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Abstract

In the rapidly-changing world of the Internet and the Web, theory and research frequently struggle to catch up to developments, interactions and permutations in technology and the social forms and practices evolving with it. In respect of practical issues, lots of promises have been made when introducing distributed education, networked learning, and distance learning. Today, some seem to claim a kind of evolution from e-learning 2.7 to m-learning 0.9. Are we moving on from e-learning promises to m-learning-promises? Are there useful cross-over concepts in a situation of fragmentation of knowledge, formats, audiences, and even life?

In this presentation understandings of microlearning and ways of designing didactics of microlearning are explored. A special focus is put on the concept of integrated microlearning as it has been developed in Innsbruck (Austria). The concept is illustrated on the basis of two use cases both acting as mobile examples. Furthermore, experiences and evaluation results are discussed. Finally, the author is showing selected scenarios for future developments.

Integrated Microlearning – Concepts, Cases, and Scenarios

In the rapidly-changing world of the Internet and the Web, theory and research frequently struggle to catch up to developments, interactions and permutations in technology and the social forms and practices evolving with it. In respect of practical issues, lots of promises have been made when introducing distributed education, networked learning, and distance learning. Today, some seem to claim a kind of evolution from e-learning 2.7 to m-learning 0.9. Are we moving on from e-learning promises to m-learning-promises? Are there useful cross-over concepts in a situation of fragmentation of knowledge, formats, audiences, and even life?

In this contribution understandings of microlearning and ways of designing didactics of microlearning are explored. On the one hand, there is long history of learning according to concepts of enchainment of small steps. On the other, newer forms of microlearning imply a shift in emphasis by means of digital media, mediated environments, conditions of socialization, and mega-trends like globalization and individualization. The question is how micro steps and short-term learning activities are positioned, situated, contextualized, valued, combined, complemented, contrasted, counterpointed, etc. and which forces are at work in institutional contexts and elsewhere. As a result, microlearning can be understood in manifold ways which can refer to micro aspects of a variety of phenomena including learning models and didactical concepts. Along with that, the corresponding levels of meso learning or macro learning can refer to different areas. They are relational and depending on contexts, perspectives of description, and frames of reference micro, meso and macro aspects vary. For example, in the context

of language learning, one might think of micro aspects in terms of items of vocabulary, phrases, sentences, and distinguish them from situations and episodes (as meso aspects) and socio-cultural specifics or complex semantics (as macro aspects).

As to didactics of microlearning, it is important to be aware of different cultural and academic traditions. It makes a big difference if we understand didactics mainly as instructional design, as literary genre, as it is discussed in the French speaking cultural area, or as an umbrella term which refers to a variety of concepts, approaches, models, theories, experiences, or technologies, or to questions of an art of teaching and learning. However, didactical considerations may focus on subjects (who), contents and skills (what), methods and technologies (how), reasons, purposes, and goals (why and what for), as well as on social relations, institutional and societal conditions, settings and arrangements, learning ecologies and cultures, media environments, power and control, or evaluation and assessment. Furthermore, there are general models which open up different ways of understanding how microlearning elements can be linked together. Here are four examples (cf. Hug 2007, p. 20):

- In the multicomponent model micro aspects or contents are combined more or less systematically in sequences, linear, recursive and/or branching, relating to each other as separate components.
- In the aggregation model microlearning elements that are fundamentally similar are bundled or combined as a relatively unstructured entity or homogenous mass ("aggregate").
- In the conglomerate model diverse micro elements are arrayed as a kind of assortment or "bouquet" of learning products and processes.
- In the emergence model new phenomena, coherent structures and qualities evolve from and between microlearning elements themselves. These novel patterns or properties cannot be attributed to any single element. Instead, they arise out of a multiplicity of relatively simple interactions or steps in dynamic process of self-organization.

According to the ways of modeling, the form of a final microlearning product may have characteristics of fragments, facets, episodes, skill elements, discrete tasks, etc. Even though we have manifold options of describing and creating microlearning phenomena, its general characteristics are easily outlined: In terms of time microlearning is related to relatively short efforts and low degrees of time consumption, and in terms of content it deals with small or very small units and rather narrow topics. In other words: microlearning is a cross-over concept in terms of special moments or episodes of learning while dealing with specific tasks or content, and engaging in small but conscious steps.

As to politics, with the exception some individualists, school experiments, and innovative companies, the mainstream seems to insist on traditional learning models. In many places, e-learning has promoted rather bureaucracy and spheres of influence of ICT-administrators rather than innovation in education. Issues of administration, accounting and controlling are still central, even though media developments and learner interests are creating a situation in which new learning cultures and more flexible educational alternatives are needed. M-Learning and microlearning approaches can promote such alternatives. But they don't do it per se. It depends on meaningful didactical settings, on ways of promoting decision making and encouraging meaning making, and on the modes of making use of the use of media.

This can be shown at the example of different mobile microlearning applications. Especially the concept of integrated microlearning which has been developed in Innsbruck (Austria) can be utilized by putting an emphasis on institutional and/or individual settings. The current version is promoted by a spin-off of the University of Innsbruck and the Austrian Research Centers

(see www.yocomo.at). It is designed as a mobile training system in which data are being processed on the basis of a special learning-algorithm similar to the former use of file-card boxes. Thus, learning can be a concomitant element in everyday routines and workflows. Apart from the aspect of integration in everyday life, the mobile microlearning application can be an integral part with respect to

- overall didactical concepts, knowledge management and communication design,
- collaborative learning and group didactics,
- practice, knowledge transfer and application of learning results,
- and to learning success and evaluation.

The application is illustrated on the basis of two use cases both acting as mobile examples in the field of second language learning. One is situated in the context of continuous education, the other in the context of institutional learning in a business school. First evaluation results show potentials of the approach not only in the field of second language learning, but also with respect to many other fields and subjects of formal, non-formal and informal learning of all age groups. Some of these potentials are depicted in the presentation by a selection of scenarios for future developments.

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Personal Inquiry: linking the cultures of home and school with technology mediated science inquiry

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Description

The Personal Inquiry (PI) project is investigating ways to help young people aged 11-14 to understand themselves and their world through a process of active scientific inquiry across formal and informal settings. The children use new methods of Scripted Inquiry Learning, implemented on ultra-mobile PCs (UMPCs) and classroom technologies, to gather and assess evidence, conduct empirical research and engage in informed debate. Their activities are based around topic themes e.g. 'myself', which are in line with key elements of the new 21st century science curriculum (Millar & Osborne, 1998). This paper refers to the experiences of working with an inner city school in Nottingham where pupils were given a UMPC and a camera to use at home, for a period of three weeks. The educational aim was to help students pursue an inquiry into how healthy their diet is, with the students describing and photographing what they ate for a few days. This was supported through an 'inquiry guide' implemented on the UMPC that followed the structure of their relevant science lessons. Nine science lessons were structured around the following inquiry activities: find a focus, decide on the inquiry questions, plan the investigation, collect data on daily eating, import it on a special software, convert it into nutrients, compare their nutrients to a recommended nutrient intake, draw inferences, prepare a presentation, present it and finally reflect on it.

A large pool of data has been collected, consisting of video recordings of lessons, log files, interviews with the teacher and pupils, questionnaires and observation notes. This paper mainly focuses on data coming from interviews with pupils but based on the teacher's account and our observation notes, overall, pupils generally succeeded in collecting meaningful data outside the class, displaying it in a meaningful diagrammatic way (with the aid of the technology), drawing conclusions based on their data, and sharing their understanding with the class.

The school undertaking the study does not normally set homework for its students. The science teacher we are working with, in particular, views homework as a set of extension activities that motivated students might do. Homework however has multiple instructional purposes such as a) to practice or review material that has already been presented in class, b) to introduce material to help students obtain the maximum benefit when the new material is covered in class (preparation assignments), c) involves the transfer of previously learned skills to new situations (Extension homework), d) to integrate separately learned skills and concepts by using book reports, science projects, or creative writing (Cooper et al., 2006). As a result, the provision of technology to take

home could be seen as an opportunity to improve not only academic achievement but also the degree of engagement to school-related tasks.

Bearing these in mind, after each of the first four lessons, pupils were given the task of recording their food for a day as homework. Another homework task was to complete activities that did not finish in the class. They could also extend their inquiry activities, e.g. by carrying out an online search on healthy eating. From the children's perspective, even a simple task as taking photos was a challenge and the fact that they brought photos back to the class was a success in itself. However it was not a task easily achieved. In particular, some pupils were hesitant to take photos of what they ate and sharing it with the class. Based on interviews, this was due to forgetfulness, embarrassment or lack of interest. Taking photos of what they eat is distant from their routines so for example, some said that they would not remember to carry the camera with them when eating out. Additionally, since the pupils come from a relatively deprived socio-economic background, pupils were self-conscious of what they eat. During group interviews with pupils, it was often said that food looked disgusting when in a photo or that it was not healthy. Furthermore, most pupils were reluctant to share their food with the rest of the class. When asked, they mentioned that people in the class would want to know whose meal it was so that they would ridicule them. It took pupils a few lessons to realise that they would not be required to share their photos with the class or the researchers.

There were two particular instances that motivated pupils to bring photos from home: 1. when relating their food to the recommended nutrient intake (for their age group) and 2. when preparing their presentations. These instances were critical in that pupils could not proceed in the investigation unless they completed the part they were responsible for. That is, they could not draw inferences about their diet unless they collected personal data of what they ate, and they could not present their investigation unless they had drawn inferences. Furthermore, as the intervention progressed, more pupils became engaged, while those remaining disengaged faced the danger of standing out by not doing it.

Apart from taking photos, technology at home was used for various activities, including playing games (online or embedded in the machine), web browsing and social networking. Based on data from group interviews with pupils during and after the intervention, there were pupils who also used the technology for inquiry based activities such as

1. catching up with previous lessons activities, especially when they missed a lesson
2. finishing off what they did in the class,
3. preparing their presentations
4. accommodating feedback they took from presenting their investigation.

Pupils' attitudes towards the technology shifted during the course of the investigation. At the beginning, pupils were excited to take the technology home and play with it. Towards the end of the investigation, however, some pupils seemed bothered by the chore of carrying it back and forth. They complained about the lack of a place to store the equipment while in the school premises (but outside the science class). It was difficult for them to carry it around during breaks and they were also under pressure to share it with other school children which they did not like.

Based on pupils' accounts, the perspective of the family during the investigation resembled pupils' attitudes to the project. At the beginning, family members appeared to be supportive: they reminded pupils to take photos; a pupil also mentioned that their parent took dinner photos on their behalf. As the investigation progressed in time, however, some families complained to the

students about the length of the investigation. Pupils mentioned comments like: 'are you still doing this?' or 'there is no point of doing it if nobody else is doing it'.

These issues offer opportunities for understanding pupils' experience with technology mediated science inquiry. They sometimes suggest simple ways to support them, e.g. by providing a storing space while in school. In some cases, support is more challenging: how to involve more parents in their homework or how to increase the time for engaging in inquiry activities are still open issues. They are explored and are going to shape the iterative design decisions for the PI toolkit and inquiry activities.

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Touch the world - and communicate the experience via mobile phones: when mobile media promote personalised learning processes at museums

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Abstract

The paper presents a project involving school children's use of mobile phones at Moesgaard Museum, in Aarhus, Denmark. A special anthropological exhibition called "Touch the World" is arranged around itesms supplied by the UNESCO Educational Collections. The paper discusses the pedagogical perspective of using mobile phones as a vehicle to enhance pupils' learning by making their own documentation of their experiences and by communicating these experiences to fellow pupils. We argue that mobile phones have a potential to support these learning processes as a personalised tool for documentation and communication.

1. Learning activities are king

The project employs a constructivist approach to learning in a museum setting. According to a constructivist understanding learning is not a passive process of receiving knowledge. Knowledge does not lie within content. Knowledge is constructed by the individual, when he/she uses content or resources for a purpose. This means that learning activities become the focal point of attention (Bang & Dalsgaard 2006; Koper 2001). Learning requires that individuals actively take resources into use to support their activities. Koper sums up the core of the approach:

"(…) a lot of learning does not come from knowledge resources at all, but stems from the activities of learners solving problems, interacting with real devices, interacting in their social and work situation. (…) it is the activities of the learners into the learning environment, which are accountable for the learning." (Koper, 2001 p. 3).

2. Touch the World

As the title of Touch the World indicates, the exhibition allows school children to touch and use the exhibited items during their visit to the museum. The main idea behind Touch the World is

that the children should not just look at objects in exhibition cases, but touch the objects and do something actively with them.

The target group for the exhibition was 4th to 10th grade (but our case study is based on 6th grade students). Touch the World is divided into four workshops: clothes, food & cooking, exhibition, and music & film. During the visit, the children are divided into four groups who participate in one of the workshops. In the clothes workshop children try out different kinds of clothes. In the food & cooking workshop children make tea, cut out a variety of exotic fruits, open coconuts, etc. The exhibition workshop contains various artefacts such as musical instruments and games that the children can use. Finally, the children in the fourth group watch videos and read magazines in the music & film workshop. Instead of visiting all four workshops, the pedagogical idea behind the exhibition is that children in each group should communicate their experiences between groups by making presentations when they are back in the classroom. To support the children's choice of workshop, a wiki containing pictures and short descriptions of the exhibited items is available prior to the visit.

The groups in each workshop are equipped with two mobiles phones with picture and video functionality. The objective of the mobiles phones is that the children should use them to document their work in the workshops by taking pictures and speaking or writing notes. In that sense, the children worked as ethnographers collecting information from the exhibition. Further, the objective is that the children use the mobile phones to communicate their experiences to the other pupils. Besides taking pictures, the children record videos, in which they present the artefacts in their workshops (see examples of pupils' productions at http://roerverden.dk/1/, http://roerverden.dk/2/ and http://roerverden.dk/3/).

During the exhibition, computers (via bluetooth) collect the pictures from the children's phones and project them "live" on a screen in the exhibition room. Furthermore, pictures, videos and notes are sent to the school, and when the pupils come back, they can edit their pictures and videos into presentations to be shown to the other groups in the class. Finally the pictures and videos with comments from each class may be uploaded to a weblog at the museum.

3. Learning through communication and presentation

A main pedagogical principle of Touch the World is that the children should focus on how they will present the artefacts and their experiences to other children. When the children have to communicate or present their experiences to others, they must reflect on the artefacts. Following constructivist theory, this is a learning activity, because the children are activated; they must do something with the artefacts. The process of making such a presentation can be seen as a learning process, in which you make the artefacts "your own". Leont'ev (1981) uses the word appropriation to describe the learning activities, in which an individual takes something into use and, thus, makes it his/her own (Davydov 1988; Wertsch 1998).

> "Appropriation is not the individual's passive adaptation to the existing conditions of life in society. It results from the actively reproductive activity of a child who is mastering historically elicited modes of orientation in the world of objects and the instrumentalities whereby that world may be transfigured, which gradually become the forms of his self-activity."
> (Davydov, 1988, p. 69)

Learning is an active process that involves the individual's use of tools. This does not mean that knowledge exists within the tool, but rather that it exists in the active use of the tool for a purpose. In that process, the individual makes the tool his/her own. The learning process takes place through the individual's use of tools within a given context.

The constructivist approach of activation, engagement and appropriation is the basis for development of the learning environment in Touch the World. As we observed the activities in the exhibition, we identified two phases in the learning activities of the children:

- Immediate and spontaneous interaction with the artefacts of the exhibition.
  A phase of touching the world, experimenting, exploring and playing.
- Reflective attitude towards the artefacts of the exhibition.
  A phase of documentation, narrative construction and reflection.

In the first phase the activities of the children are dominated by exploration, examination, experimentation – much like play. When the mobile phones are introduced in the second phase, children's relationship with the exhibition is mediated. The children are asked to use the mobile devices to communicate and present their experiences. This triggers reflection. What happens is that the media create a distance between children and artefacts, and, thus, a space for reflection. The children are made aware of their own participation in the exhibition. This setup in the exhibition creates a demand to narrate and document their experiences; i.e. to transform their experiences into stories. The role of the mobile media in this context is to create a reflective distance and to function as a tool for documentation and narration.

The objective and the end result of the activities of the children is a product in the form of pictures and videos. An analysis of the videos show that the children make the exhibition "their own" and present their approaches in a variety of ways. Different kinds of videos include demonstrations of how to cut certain fruits and how to play on musical instruments, "TV show" presentations of artefacts, and "fashion shows" exhibiting clothes. Also, certain videos were developed as interviews between the children.

4. Conclusion

The study of the Touch the World exhibition has shown that there is a learning potentials of mobile phones to provide a personalised tool for documenting and communicating experiences in (and out of) museums. The role of the mobile phones in the learning activities of the children was to create a space for reflection. Asking the children to document and tell stories about their experiences by use of the mobile phones created a reflective distance between children and artefacts of the exhibition. The result was that the children developed different kinds of videos that expressed their individual views and understandings of the exhibition.

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The GeoHistorian project

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Abstract

Wireless mobile technologies have drastically changed the ways in which we communicate and access digital content. Moreover, these portable tools are allowing us to easily capture, edit, upload, and share media such as pictures, video, and audio clips. The Geo-Historian project is based on work in the areas of ubiquitous computing and mobile learning that focuses on the use of mobile technologies to break down the barriers between schools and society. The goals of the Geo-Historian project are to investigate mobile phones as educational tools inside and outside of the classroom; reduce the barriers between schools and community resources such as zoos and museums; and above all, to give students the opportunity to create digital resources for their community. The project utilizes wireless mobile technologies to link classrooms with local historical landmarks. Technologies include mobile phones with video capturing capabilities, built-in GPS, and wireless Internet access, and Internet-based media sharing sites such as PocketCaster. Using these technologies allows students to become video historians, creating and sharing a living history of real people and real places.

1. Introduction

Wireless mobile technologies have drastically changed the ways in which we communicate and access and share digital content. Moreover, these portable tools are allowing us to easily capture, edit, upload, and share media such as pictures, video, and audio clips. Even though mobile phones are the most widespread digital technology in the world today, they have not been widely used in education (yet), as many adults are still reluctant to allow access to the devices in formal educational settings. However, the potential for their use is great (e.g. Belshaw, 2007; Davidson, 2008), and mobiles are seen as "an ever more versatile tool that can be easily adapted to a host of tasks for learning, productivity, and social networking. (Johnson, Levine, & Smith, 2009, p. 4). In addition, because many students already own mobile phones, this may take the burden off of educational institutions to provide hardware to learners.

2. The Geo-Historian Project

Thus, the Geo-Historian project is based on work in the areas of ubiquitous computing and mobile learning (see http://www.youtube.com/watch?v=EsPRpQfHYOY). It focuses on the use of mobile technologies in social studies education to break down the barriers between schools and society (see e.g. van 't Hooft & Swan, 2007; Vavoula, Sharples, Lonsdale, Rudman, & Meek, 2007). The goals of the Geo-Historian project are to investigate mobile phones as educational tools inside

and outside of the classroom; reduce the barriers between schools and community resources such as zoos and museums; and above all, to give students the opportunity to create digital resources for their community. The project utilizes wireless mobile technologies to link classrooms with local historical landmarks, and provide digital content within the context of physical locations. Technologies used include mobile phones with video capturing capabilities, built-in GPS, and wireless Internet access, and Internet-based media sharing sites such as PocketCaster. Using these technologies allows students to become video historians, creating and sharing a living history of real people and real places.

Students start out by picking a topic of interest and doing some preliminary research to determine what kind of content they can capture. They can visit a historical location or a museum exhibit. They may interview somebody or capture historical artefacts. Next, students go out with their mobile phones and capture the content digitally. This can be in the form of pictures, audio, or video. Students either save their digital artefacts on their phones or upload them to a media-sharing site on the Internet. Students use their pictures, audio, and video to create Internet-based content, usually in the form of a short video or a website that is compatible with a mobile device.

Once the content is uploaded to the web it is accessible on mobile devices. However, in order for others to access content relevant to a particular location, QR (Quick Response) codes are created that can be physically posted at each site or printed out for students to use. QR codes are two-dimensional bar codes that contain information such as a url or text and can be generated using free online services such as Winksite. Users with a camera phone that has a QR code reader can then scan the QR code by taking a picture of it. The code reader will then launch the phone's browser and redirect it to the url embedded in the QR code.

3. Conclusion

The Geo-Historian project is still in its early stages. So far, we have been successful in using mobile phones for content creation and uploading to the Internet. We have also been able to create and use QR codes to access that same content and are currently investigating how we can incorporate QR codes as a way in which to effectively and meaningfully deliver student-created digital content within its physical context and to allow for distribution of this content to a wider audience.

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Learning math while mobile: creating opportunities for elementary math learning

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Abstract

Mobile devices can create opportunities for learning that might otherwise be lost. This pilot study reports on one such opportunity. During Fall 2007, a group of 18 first-grade students from an urban school district in Northeast Ohio attended the AT&T Classroom at Kent State University for a six-week period. We investigated their use of MathAce, a mobile application that provides practice in basic math facts, during their travels to and from the AT&T Classroom. Research questions that guided our research included:

- *Does the use of handheld with math facts practice software increase student knowledge of basic math facts?*
- *If so, is there a relationship between the size of student improvement in achievement and the frequency in which they practice?*

Pre and post-test data were collected via a pencil and paper prompt containing 30 addition problems, mimicking the ones on the handhelds. In addition, student MathAce usage data were captured. Findings indicate that using mobile devices in this way helped improve knowledge of basic math facts, and that the larger the amount of items students practiced, the bigger the difference between pre and post-test scores.

1. Background

Mobile devices can create opportunities for learning that might otherwise be lost. This pilot study reports on one such opportunity, the use of mobile devices for learning basic math facts while travelling to and from school. The research reported on in this paper is based on research in mobile and ubiquitous computing in education, specifically on the idea that mobile technologies create opportunities for learning in time and space that might otherwise be lost (see, e.g. Sharples, Taylor, & Vavoula, 2007; van 't Hooft & Swan, 2007).

2. Methods

During the Fall 2007 semester, a group of 18 first-grade students (8 boys, 10 girls; 17 African American, 1 Caucasian) from an urban school district in Northeast Ohio attended the AT&T Classroom at Kent State University for a six-week period. Students primarily came from low income families.

Students used mobile devices (Palm TX) for learning during their travels on the school bus to and from the AT&T Classroom. Students were accompanied by their teacher, and sometimes a few parents. Each trip took about 30 minutes, and students were told where to sit on the bus, although they did not have assigned seating. Therefore, about one hour of travel time was turned into instructional time each school day, which is a good example of how handhelds can provide opportunities for learning time that could otherwise be lost. Students used the devices for a variety of purposes while on the bus. We investigated their use of MathAce, an application that provides practice in basic math facts. Students used this three times a week or more on the bus, practicing basic addition problems by taking timed, one-minute quizzes using the mobile application. Students could take as many quizzes as they had time for and get instant feedback on their performance.

The following research questions were used to guide our research:

1. Does the use of handheld with math facts practice software increase student knowledge of basic math facts?
2. If so, is there a relationship between the size of student improvement in achievement and the frequency in which they practice?

Pre and post-test data were collected for 16 students by administering a pencil and paper prompt containing 30 addition problems, mimicking the ones on the handhelds. In addition, student MathAce usage data were captured, including date and frequency of use, number of items attempted, and number of items correct.

3. Results and Analysis

To answer the first research question, a paired-sample t-test was performed to look for differences between the pre-test ($M = 3.25$, $SD = 2.44$) and post-test ($M = 6.94$, $SD=4.22$). The resulting t-statistic, $t(15) = 5.729$, $p < .001$, indicates that there was a statistically significant difference between pre and post-test scores. That this difference is also practically significant was indicated by a large effect size, $ES = .83$.

To answer the second research question, simple correlations between various relevant variables were calculated (Table 1).

Variables correlated	Correlation (r)	Alpha Level (p)	Coefficient of Determination (r2)
Size of pre-post test difference & MathAce quiz scores	.640**	.008	.41
Size of pre-post test difference & Number of MathAce items attempted	.625**	.010	.39

Variables correlated	Correlation (r)	Alpha Level (p)	Coefficient of Determination (r2)
MathAce quiz scores & Number of MathAce items attempted	.580*	.015	.34
Pre-test score & Number of MathAce items attempted	.513*	.030	.27
Size of pre-post test difference & Number of MathAce quizzes attempted	.267	.317	
Size of pre-post test difference & Number of days MathAce was used	.133	.625	

* statistically significant at p = .05

** statistically significant at p = .01

Table 1. Correlations between student achievement and frequency of practice

4. Discussion and Conclusion

What do the results mean? Initial data analysis has led us to the following conclusions:

- Using MathAce helped improve knowledge of basic math facts. Pre to post differences averaged 3.69 points (ranging from -1 to 8 points);
- Student pre-scores made a big difference during the intervention: the higher the pre-scores, the more items students attempted;
- The more items students attempted, the higher their quiz scores were;
- When considering frequency of use only the number of items attempted made a difference, not number of days used or number of quizzes completed.
- The higher the quiz scores, the larger the difference between pre and post test scores.

In addition, the question could be raised whether students could have done the same thing without using relatively expensive mobile technology, e.g. by using flip cards. While students could have done so, they would have been restricted in their learning. For one, when using flip cards, the number of problems they would have been able to practice from would have been limited, eventually leading to a testing effect. In addition, MathAce provided students with consistent and timed practice exercises, and immediate and detailed feedback following each quiz, keeping students current on their performance and motivating them to practice more.

The results of this study are promising but do need to be interpreted with caution. First, the size of the study was relatively small (16 students), and a control group was not used. Second, the length of the study was short, spanning a time period of only six weeks. Third, only the use of mobile devices for practicing basic math facts was investigated.

Future research with a larger sample size, a control group, and over a longer period of time is therefore warranted. Moreover, the use of mobile applications for similar types of practice in other subject areas will be considered as well.

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Work-based mobile learning in the health sector - concept of a mobile learning system exemplified by educational scenarios of junior doctors

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Abstract

This paper describes conceptual scenarios where learners are supported virtually in critical situations by mentors with smartphones using image and video technologies. The multimedia materials generated in this way can later be used in follow-up meetings and training sessions. The concept is exemplified by educational scenarios of junior doctors and analysed against the background of situated learning and cognitive apprenticeship methods.

1. Requirements and concept

The postgraduate medical education of junior doctors is different from teacher and classroom-centred learning approaches: The theoretical part is relatively small and has little direct impact on improving professional practice (compare e.g. Davis et al., 1995, Marinopoulos et al., 2007). Competences and skills are mostly acquired through systematic practising at the clinical workplace (Berendonk et al., 2008, 1337). This work-based education is complex, stressful and error-prone (compare e.g. Chow et al., 2005, Lesar et al., 1990, Weingart et al., 2000, Williams et al., 2005). Junior doctors are in need of expert support when dealing with difficult problems. These experts are – due to high local mobility and limited human resources – often not available. If the problem cannot be solved via phone, patient and junior doctor have to wait for the on-site support of the medical specialist. This tends to result in a loss of efficiency, the dissatisfaction of junior doctor and a loss of confidence at the patient's side. Junior doctors who make decisions without consulting experts are likely to commit errors. Thereby, learning is not encouraged.

Existing technological solutions only partly meet educational and work-related needs in clinical contexts: multimedia learning programmes, for example, can illustrate authentic problems. However, they do not close the gap between theory and clinical practice (Mandl et al., 2002, 148). Just-in-time learning programmes focus on the timely integration of short learning sequences into work practices (compare e.g. Harun, 2001, Kahn et al., 2006). However, when physicians have to deal with immediate, complex, patient-related problems they mostly rely on consultation with colleagues (Bennett et al., 2006). In addition, current learning programmes are predominantly available for stationary PCs, and therefore have limited impact at the point of care: clinical staff may cover distances up to 15 km during their shift between patients, offices and work stations (Bardram and Bossen, 2005, 132). Mobile learning addresses these needs with portable

computational devices. At the same time current mobile learning software focuses rather on the provision of content than on social interactions. Telementoring, in contrast, is based on social interactions to provide real-time guidance and instruction to a learner in a remote location, based – for example – on audio and video technologies (Rosser et al., 2007). Unfortunately, the focus of existing telementoring systems is on diagnostic quality and technical requirements. Didactic aspects of telementoring have rarely been considered.

A mobile system that combines aspects of telementoring and learning should be valuable in this context. It has to support just-in-time problem solving and, subsequently, encourages discussion and reflection through the generated materials. The following description illustrates a possible case of use in practice: in problematic situations junior doctors convey the symptoms and proposed treatment procedures to distant senior doctors with the help of their mobile devices (e.g. smartphone) based on imaging and video streaming. Through simultaneous discussion the junior doctors are supported in the problem solving process. The multimedia materials generated in this way are later used in follow-up meetings and training sessions.

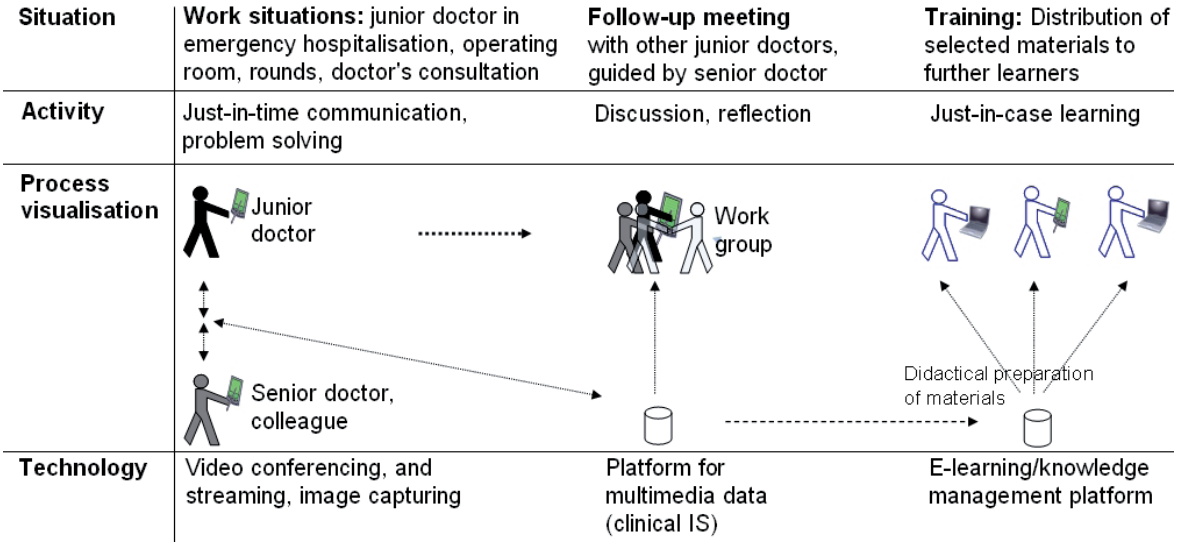

Figure 1 Learning scenario

The proposed concept is seen as an 'add-on' to existing technological solutions. Learning does not take place in teaching scenarios distant from the workplace. It is encouraged through multimedia enhanced problem-solving and reflection processes.

2. Theoretical and empirical background

It is assumed that certain on-site interactions can be replaced by virtual support using the multimedia-enhanced communication features described above. A number of studies show that diagnosis and consulting can be realised on mobile devices through image and video technologies (compare Ebner et al., 2008, Eze et al., 2005, Hsieh et al., 2004, Hsieh et al., 2005, Piek et al., 2006, Tsai et al., 2004, Yamada et al., 2003). Telementoring can increase efficiency (compare e.g. Rosser et al., 2007, 1458). However, its impact on learning and teaching should be critically analysed.

Clinical and medical learning in general and the effect of this concept in particular might be explained by theories of situated learning and the cognitive apprenticeship model. Situated learning stresses the importance of authentic activities and social interactions. Learning occurs among peers (compare e.g. Lave and Wenger, 1991, 93) and in mentor-learner relationships

as described by cognitive apprenticeship. This model combines elements of traditional apprenticeship learning with cognitive elements of schooling. The model is illustrated by activities such as reading, writing and mathematics (Brown et al., 1989, Collins et al., 1991). It is also used to explain the development of clinical or medical competences (compare e.g. Balmer et al., 2008, Cope et al., 2000, Stalmeijer et al., 2008, Woolley and Jarvis, 2007, Alan, 2006, Mandl et al., 2002).

Cognitive apprenticeship is an approach that describes how to design situated learning scenarios by the following didactic methods: modeling, coaching, scaffolding, articulation, reflection and exploration (Collins et al., 1991). These methods are typically applied in clinical teaching and learning scenarios (compare Stalmeijer et al., 2008, Cope et al., 2000, Woolley and Jarvis, 2007). The proposed concept supports and/or encourages coaching, articulation, reflection and exploration. In particular, reflection techniques might be enhanced by the use of the generated multimedia materials. However, modeling and scaffolding are difficult to virtualize with the described functionalities in the clinical context. These methods need to be particularly encouraged and practised in order to enable a well-balanced curriculum in the spirit of cognitive apprenticeship.

The system's impact depends on a number of individual, sociocultural, organisational, legal, technological and ethical questions. A key factor is the acceptance and satisfaction of patients (compare e.g. Ebner et al., 2008, 6).

So far, the impact of the proposed concept can only be anticipated by the analysis of similar projects and be discussed against the background of learning theories. Next, it will be necessary to implement and examine the concept in order to show detailed effects. Thereby, two main research questions should be addressed: how will the multimedia-enhanced collaboration and learning system affect the cognitive and sociocultural practices of junior doctors and will these new processes improve the quality of their learning compared to that of junior doctors taught by existing methods and technologies? (compare Sharples et al., 2002, 13).

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The use of mobile learning to break down barriers between education and work in Further Education

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Learning and Skills Network

1. Introduction to the MoLeNET 2007/8 project

The Mobile Learning Network (MoLeNET, www.molenet.org.uk) is a collaborative approach to encouraging and supporting the use and integration of mobile devices for teaching and learning, primarily in the English Further Education sector. In 2007/8 MoLeNET supported 32 projects (single college and consortia) through a shared-cost funding model involving £6million of capital funding from the Learning and Skills Council, with training, support and evaluation provided by the Learning and Skills Network. Approximately 10,000 learners of varying ages, studying numerous subject areas, at different levels, some college-based and others work-based, were involved. The projects conducted their research using a practitioner-led action research approach and reported on 107 research questions between them.

1.1 Focus on Work Based Learning

The first phase of the MoLeNET programme (2007-2008) involved over 1,000 WBLs (work-based learners), in 18 projects which had identified WBL as a national priority. "Mobile" technologies were principally used for :

- Learners to communicate with peers, tutors or assessors
- Learners to collect video, audio and photographic evidence for their portfolios
- Tutors and assessors to assess portfolio evidence and provide feedback
- Learners to gain access to learning content through the VLE or internet
- The provision of additional resources and instruction materials through video recordings
- Learners to complete 'written' work by providing them with internet access for research, and software to type up tasks or assignments.

2. Research findings

Of the 107 research questions reported on, 15 focussed specifically on WBLs, with numerous others investigating the impact of mobile learning on WBL within much broader research questions. Key areas of interest within the research included remote access to learning resources and content and its impact on the learner experience; opportunities for communication afforded by mobile devices; the evidence gathering and assessment processes and how mobile technologies can improve them.

2.1. Access to resources and their impact on learner experience

WBLs often are unable to access the same resources/materials as college-based learners, particularly because access to computers/the internet is often limited, if available at all. Several projects reported that they were able to address this barrier to learning and were also able to offer learners electronic resources, as opposed to written instructions or handouts, through the provision of mobile technologies. A learner at the Swindon project explained that:

". . . I work with guys who have been in the plumbing trade for years and years and seen all sorts of work and they can't remember everything and I think if you did have that (a book) on site you might get ribbed a bit but if they think he's got that on his iPOD, that certain boiler, they might say can I have a look at that iPOD to remind me its there for the future?"

Other project examples were learners working in Gloucestershire in the industrial services being able to access health and safety videos through their mobile devices; learners in Bolton's riding and horticultural centres being able to access electronic resources that previously would have been unobtainable due to space and power restrictions in the centres; and staff at Accrington and Rossendale College who felt that enabling WBLs to access the VLE helped them to feel a part of the wider college community.

2.2. Communication

For WBL, effective communication can be difficult. By introducing mobile devices, learners and staff could communicate more effectively, using voice, text or email. Learners could seek help more easily, share files with other learners and their tutor/assessor, and receive feedback more quickly. Working at their own pace, being well supported and giving and receiving regular feedback were all factors identified as supporting success by Hughes and Monteiro (2005). It is important to note, however, that this particular advantage of mobile technologies relies on either an internet connection or a data contract, which may not always be provided. Furthermore, some learners felt that face-to-face feedback could not be completely replaced by other forms of communication

2.3. The assessment process

Assessment and verification are at the heart of WBL and are important in securing student retention and achievement (Smith and Hughes, 2003). Many projects reported that using mobile technologies had helped to improve the assessment process. Video and audio recording equipment was available on the majority of the mobile devices used, which enabled learners to collect and store evidence for their portfolios with greater ease and effectiveness. For example, Chichester College reported that

> "The most significant impact seen with the use of the ASUS was the earlier completion and submission of coursework and the increased quality of the work produced"

and that this may have had a significant impact on timely achievement. Accrington and Rossendale College explained that this method of evidence collection meant that learners were able to capture their progress and achievement at any time and did not have to wait for an assessor to observe them. Furthermore, that

> "embedding video materials, photographic evidence and transferring data using 'Bluetooth' had been extremely successful with learners, and the tutors have been able to utilise 'Bluetooth' technology to very good effect in terms of sending work, materials, evidence etc in a way that has created a streamlined process of managing work based portfolios"

It is 5 years since Smith and Hughes (2003) proposed that students be encouraged to telephone assessors on their (the assessors') mobile phones as this was considered to aid retention.

3. Recommendations from the research

Our WBL research has shown that learners can be motivated by using mobile devices to gain additional skills and qualifications, and that these help to develop their self-esteem and confidence (which also help develop good practice in on-the-job learning (Hughes and Monteiro, 2005). Young people find this type of e-technology motivating because it fits in with their normal behaviour, custom and practice (Harvey, 2007). However, to make the most use of mobile devices for WBL they should:

- Have internet access (eg for VLE access, research opportunities, communication via emails etc
- Training should be offered for learners, tutors and assessors so that mobile technologies be used effectively and all parties work together.
- In the case of external verification of portfolio evidence, institutions should check with examining boards that video, audio and/or photographic evidence is acceptable, as, at the time of writing, this is not the case for all examining boards.

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To be or not to be M-learning (that it is the Question)

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Abstract

Video presentation introduction at:
http://olcw.thegraal.net/diversos/mlearning_london/mlearning_london.html

1. Methodology and evolution of learning

Up until the end of the 20th Century, distance learning and presence learning coexisted in different stages. Until then, the debate was normally focused on the different distance learning generations (age groups).

Today, the debate is centered in the different e-learning generations and supporting technologies.

Are we still referring to e-learning as distance learning, when talking about online learning? Or should we be talking about:

- distribution of contents synchronously in face to face or virtual classrooms or asynchrony in LMS[1];
- "online tutoring" and "formative evaluation" in synchronous and asynchronous formats; and
- no mobile or mobile tools.

This is only possible because today we have mobile "communication tools" and "virtual classrooms" that allow teachers and students to develop the virtual format with new forms of interactivity ("online tutoring" activities and real time "formative evaluation").

If we take into consideration the above mentioned generations, a new uprising e-learning 3.0 model is shown in the horizon and follows the most relevant learning models reported as e-learning contents models:

1 LMS – Learning Management System

CLE[2] by Jonassen

OLE[3] by Hannafm, Land and Oliver

SOI[4] by Mayer

Instructional basic principles by Merrill

ARCS[5] by John Keller

To plan and develop e-learning courses, the most used models are:

Kemp, Morrrison and Ross, ADDIE[6]

R2D2[7] by Smith and Ragan

RADIE[8] – Reutilizing, Analysing, Developing, Implementing and Evaluating meta model

Now we can enunciate the highlights of a new model that we will name the E/L 3.0 model[9]

According to this concept, contents can be distributed synchronous or asynchronously in a multi channel format, which may fulfil the different learning styles requirements. Dominant and interactive activities will take place in a constructivist perspective:

- Online tutoring in presence or virtual classrooms / mobile environment;
- Collaborative activities that drive students to overcome the 50/50 barrier;
- Continuous formative evaluation complemented by summative evaluation;
- New technologies and new methodologies will be dominant, at all education levels and environments;
- Teaching process should be centred in teachers and tutor's skills and oriented towards students' learning styles;
- The learning process should be based in the interactivity and collaborative work.

An important question is: "does technology fulfil good practices profiles" or is no more than "technological noise" to make some of our "digital students" happy, offering nothing more than "surface learning"?

The uprising of New Information and Communication Technologies (NICT) increases the gap on pedagogical and didactical skills on education agents.

It is therefore urgent to ensure appropriate pedagogical and methodological training linked to the recently developed technological tools.

Human resources skills are key tools for problem solution as opposed to an exclusive technological answer.

2 CLE - Constructivist Learning Environments
3 OLE - Open Learning Environments
4 SOI - Selecting, Organi¬zing, Integration
5 ARCS – Attention, Relevance, Confidence and Satisfaction
6 ADDIE – Analyses, Design, Development, Implementation, Evaluation
7 R2D2 – Reflective, Recursive, Design and Dissemination
8 RADDIE – Reutilization, Analyses, Design, Development, Implementation, Evaluation
9 Reis, António; (2007-2008) Support documentation for Post graduation on Pedagogic and didactic Skills on e-learning and ICT

In parallel with other technologies mobile support is a complementary tool to facilitate the learning process. A precise and concise demonstration of its potential is critical to the implementation of "NICM - New Information and Communication Methodologies" in order to improve the quality of the education process.

Our research developed during recent years includes among others, differences and similarities between presence learning and distance learning, online learning generations and the evolution and changes of e-learning.

In this paper we address how m-learning fits into the learning process, and make a proposal in the framework of the general concept of mobile learning about new methodologies for real time formative evaluation and online tutoring activities.

2. Technological aspects of mobile devices for m-learning

There are different initiatives and projects aimed at developing applications for mobile devices that will help the user to perform a wide variety of tasks, such as among others: a) visiting a museum assisted by a mobile device (Bruns, 2007); b) teaching art history collaboratively helped by a mobile device and using augmented reality (Wagner, 2006); c) creating augmented reality in simulation games in handheld computers (MIT, 2009); or d) video lecture streaming (Olabe, 2007). Figure 1 illustrates the use of PDAs in these types of applications and services.

We have defined the Wearable Personal Assistant, WPA, (Izkara, 2008) as a tool that provides user-support for the development of daily activities; physically it is a lightweight device, easily manageable and with high quality visualization and audio playback devices, applicable to many different environments: education, industrial maintenance, cultural tourism, and others. A particular case of WPA oriented towards teaching laboratories was set up with our software MobiMedia that integrates a variety of multimedia tools in a PDA (Basogain, 2008).

Figure 1. Use of PDAs in education and collaborative tasks: a) visit a museum. b) art history collaborative class. c) simulation games. d) video lecture streaming

Figure 2. Collaborative Laboratory with MobiMedia.

Figure 2 shows a case of collaborative laboratory with MobiMedia a) Teacher explains an industrial system; b) Teacher takes a picture; c) Teacher makes manual annotations before sending it; d) Teacher writes and sends (upload) an exercise in text format; e) Students receive (download) the multimedia contents; f) Students read the exercise; g) Students carry out the assignment over the picture; h) Students send their work; i) Teacher corrects the student's answer.

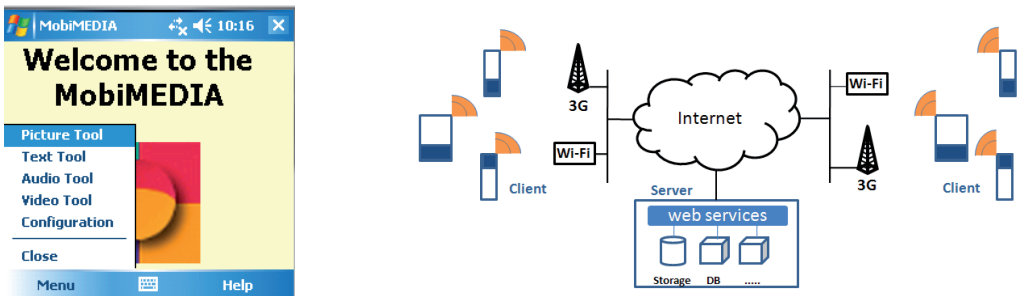

Figure 3. Menu and infrastructure of the MobiMedia system

MobiMedia provides the user with an application that lets her/him record video and audio, take pictures and draw or write over the photographs manually, or write text notes. In addition, users can share their multimedia content, or content from other users, sent or received via wireless (Wi-Fi or 3G) through webservices (see Figure 3) represents the client menu and the infrastructure of the MobiMedia system.

The test of Mobimedia in this laboratory shows several advantages enhancing and complementing the traditional face to face laboratory; students and teacher work collaboratively and a new set of multimedia data (images, video, text and audio) constitutes the records of the laboratory. Some of the current constraints of PDAs are going to be overcome with the new mobiles devices such as netbooks or notebooks.

3. Conclusions

The general concept of mobile learning process has been enhanced with new issues coming from the technology side but, at the same time it requires the help of the NICM (New Information and Communication Methodologies). In particular we address the new methodologies to reach the goals of formative evaluation and tutoring online.

E-learning can be a powerful support tool to presence and distance learning, as long as it provides bi-directional tools at all education levels and environments. Today a mobility approach is a must at all stages of learning process. But it should be used properly and according to the objectives of the learning process, this means that we must use an audio mobile device for surface learning, and audio and visual devices for deep learning.

From the point of view of mobile devices we have implemented the concept of the WPA (wearable personal assistant) through Mobimedia software. It has been applied to a laboratory and the first results show enhancements about collaborative work and multimedia records for reporting the laboratory. At the same time a gap between this new technology and the methodology to use it emerged.

During the European year of creativity and innovation the educators we have the challenge to look for new ways to teach and learn but it always should be based on a clear rationale and efficient solid facts.

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Use of mobile phone technologies in the classroom context

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Abstract

This study investigates the use of mobile phone technologies in classroom interaction. Classroom interaction promotes active learning and enhances the student experience. We make on overview of current classroom mobile interactive technologies, discuss experiments with three different systems and evaluate these experiments.

1. Introduction

This study investigates issues raised by the use of mobile phone technologies in classroom settings. Experiments with SMS and web based systems used in lectures are considered and evaluated.

The most common way of delivering teaching materials to a large group of students is through a lecture. Although this is widely used and a cost effective way for teaching students at universities, students often participate only passively by listening or taking notes. It is well known that people retain most knowledge if they actively participate in the learning process by doing an activity and applying the concept presented to an appropriate problem.

Using interactive classroom pedagogies in large classes is not trivial and requires a lot of effort from the lecturer (Freeman & Blayney, 2005). Classroom interaction in the form of asking questions, gathering answers and giving feedback, and/or role play during a seminar/lecture session enhances the students' learning by improving their attention and giving them an opportunity for reflection on the content presented (Ruhl & Suritsky, 1995), (Waite et al., 2003). It also promotes an active learning environment, provides feedback for the lecturer to constructively align the learning and teaching approaches with the expected learning outcomes, and increases students' motivation (Bär, Rößling & Tews, 2006).

Mobile technologies offer capabilities that can support classroom work via web or SMS based systems. The web based systems can be used by other mobile wireless devices such as notebooks or PDAs. However, modern mobile phones have similar capabilities, and they are less costly and more ubiquitous.

1.1 Overview of related studies

In recent years there has been considerable interest among educators in finding ways of integrating mobile and wireless technologies in learning and teaching. There have been a number of systems developed and tried using mobile phones in support of classroom interaction.

A so called "TV remote" (Bär, Rößling and Tews, 2006) system offers a solution for supporting interaction in class through mobile phones using Bluetooth connections, with no transmission costs incurred by students. Some of the drawbacks of this system include complicated implementation

and limitations of the Bluetooth technology, such as much lower data transfer rates compared to other wireless communication technologies.

Other studies use SMS/MMS in classroom interaction systems (Lindquist, Denning, Kelly, Malani, Griswold and Simon, 2007; Markett, Sánchez, Weber and Tangney, 2004; Scornavacca & Marshall, 2007). These systems promote active learning in the classroom by giving opportunity to the students to send SMS/MMS messages in the form of comments, questions or multiple choice-questions. However, one major issue with these systems is the cost of SMS/MMS, which may prevent their wide adoption, especially from the students' point of view. Another problem is the aggregation of the messages and their interpretation in real time by the lecturer.

There are other types of interactive systems, such as 'Turning Point Interactive Response Systems' (TPIRS), e.g. www.misco.co.uk, typically used for interaction with a TV audience during a quiz show. This system integrates well into almost any environment and gives instant user feedback for any electronic presentation. However, there is a high initial cost of acquiring such a system and restricted flexibility.

2. Experiments and evaluation of SMS and web based systems

2.1 SMS – Edutxt system

"Edutxt" (www.txttools.co.uk) is an online application developed and supported by texttools.co.uk which allows the sending and receiving of SMS text messages from a desktop to a large group or single mobile phone instantly. "Edutxt" has been used in a large number of colleges and universities across the UK to support marketing, recruitment, student services, learning and teaching. "Edutxt" was introduced to students in a lecture session for "Information Systems Modelling and Design". The students were asked to submit answers to three multiple choice questions via SMS at the end of a lecture session. The students were also encouraged to use the "Edutxt" to submit comments, suggestions and questions related to the module. Although a preliminary survey (Arreymbi &d Draganova, 2008) has indicated that students are positive about the use of the mobile phones in learning and teaching, only very few took part in this experiment. However, the students commented that they like to have the option to send a text message to the tutor about the module. Some students used the system to send questions related to the submission of the assignment and comments related to the tutorials. The main benefit of using "Edutxt" is its inclusiveness, i.e. providing the option to students to actively participate in the session by answering/submitting questions or submitting feedback. The lecturer can address some of the submitted answers/questions/feedback immediately or in subsequent sessions using the relevant interface.

2.2 UEL uHavePassed system

"UELuHavePassed" is a Java application for mobile phones developed by Luzia research (luziaresearch.com). The application allows the lecturer to upload question banks and make it available for download and installation to the students. Once installed students can practice the questions and use it as a formative type of assessment. "UELuHavePassed" consists of approximately 80 multiple choice questions from different topics related to the module "Information Systems Modelling and Design". The main benefit of this system being mobile is that it can be used at any time and any place. Therefore students can practice when they are on the move and want to utilise this time for study. Moreover, the system provides instant feedback to each question, it is cost free for the students and it is suitable for the majority of students' mobile phone devices. However, "UELuHavePassed" is more appropriate to support independent study

rather than classroom interaction. The students, who downloaded the application, have given positive feedback of using it.

2.3 On-line intelligent multiple choice questions system

The possibility of using web applications to support classroom interaction is another viable option. In many university campuses, WiFi networks are available and students can use free broadband connections on their mobile phones. This makes it possible to have web applications that implement mobile services related to classroom interaction. Such solutions offer free-of-cost connections and make use of the modern capabilities of mobile phone devices.

It is also possible to automatically collate students' messages and to make intelligent interpretation of the students' answers. Having such capabilities in a system would enable sending appropriate automatic individual feedback to the students' mobile phones and providing the teacher with an idea of the students' misunderstandings (Lee, Palmer-Brown and Draganova, 2008).

We have developed an on-line self-assessment system, which incorporates a neural network model that categorises the learner's responses as having a significant level of similarity with a subset of answers it has previously categorised. Each category is associated with feedback composed by the lecturer on the basis of the level of understanding and predominant misconceptions of that category-group of answers. In this way the feedback addresses the level of knowledge of the individual and guides them towards a greater understanding of particular concepts. This approach allows capturing the data that is generated by the students when they attempt on-line formative assessments, which can provide lecturers with a detailed picture of the learning of their students. Since this system is accessible via the web it can be utilised in classroom sessions settings to support interaction and active participation, provided students have mobile devices with WiFi capabilities, or another type of web connection. It will also make it possible for students to use the system at any location to support their learning. The next stage in this study is to modify the interface of the system described here in order to make it more accessible via a small screen on a mobile phone or device.

3. Conclusion

The pilot experiments carried out in this study demonstrate the potential of three real systems for supporting learning and teaching via mobile phone technologies in a classroom context. The students have expressed a positive attitude towards the use of these systems. "Edutxt" and the "On-line intelligent multiple choice questions system" compared to classroom response systems are more ubiquitous since they are based on mobile phone and internet technologies. These systems do not require the installation of additional devices or systems in the classroom and they can also be used in face-to-face sessions taking place outside a classroom. Although the experiments that have been carried out in this study relate mainly to multiple choice assessments, the systems can be used for other interactive classroom activities. For example, "Edutxt" offers the possibility of submiting free text questions or comments, instantly sending messages to a large group of students and, in general, adding an additional channel of communication between the lecturer and the students. The "On-line intelligent multiple choice questions system", which is a web-application can be extended to include similar functionalities to "Edutxt" with the added benefit of automation in collating and manipulating the student answers and comments.

Moving towards wider application and objective evaluation of the trailed systems is the next stage of this project.

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Track 2
Cultural approaches to mobile learning

Historical perspective on appropriation as a key term for a socio-cultural ecology and an educational framework for mediated learning

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Abstract

The International Communication Association (Livingstone 2008) began a debate on mediation by probing terms like mediatization, mediazation or medialization to lead communication theory over two maelstroms, the changing phenomena of communication and the interferences of different academic cultures in the process of globalisation. An educationally motivated theory of media focused for a long time on media effects or, alternatively, on the process of reception. In the running stream of mobilization and individualization an educational conceptualization could centre on appropriation as a key term.

1. What are the advantages?

One advantage would be to reconsider the social frame of media in the cultural practice of education and learning from a user's point of view. In Anglophone theory such a theoretical social frame e.g. for learning and media seems to be obvious, almost guaranteed by referring to Vygotzky. But outside the English language and on first sight the term 'social' is misleading; social in the sense of interactive or social in the meaning of society. Difficulties emerge because both meanings are framed by complex theories. Looking for a theoretical anchor from the first third of the 20th century, why Vygotsky and not George Mead ("Mind, self, and society)? He arguably more adequately explains e.g. what 'social' includes for informal learning with handhelds from everyday life. Further wouldn't it be more adequate for our social context to see the social together with culture as Adorno did? With reference to the term appropriation the following three strands of a social frame can be discussed:

- meaningful activities,
- society and
- culture.

Such a theoretical frame correlates with Giddens' concept of social structures and agency.

A further advantage of 'appropriation' could be to feed the rather long research tradition of media reception studies into the discussion about mobile media and their social application. The second and societal strand lends itself to an elaborate discussion by addressing agency as a subjective dynamic if one talks about appropriation as media-related activity.

2. Why pursue such an enterprise?

An epistemological frame for appropriation could identify the parallel development of subjectivity and its underpinning theories. A definition of appropriation puts 'cultural products' in the foreground. Cultural products are objectivizations in the dynamic of personal internalisation and externalisation. Subjectivity, which is the social formation of the interrelation of world and person, was explained by early theories of modern societies such as Bildung (Humboldt) or "mind, self and society" and its "reflexivity" within the dialect of "I and me" (Mead), "internalization of higher psychological functions" together with "learning and development" (Vygotsky 1978 / 1930). The task is to bring these theories in line with the ongoing socio-cultural transformation especially that of individualised, mobile mass communication and its mobile media. In the light of Giddens' structuration model agency is located within the moulding socio-cultural structure to which mobile media contribute or, dialectically seen, of which mobile media are one result. In view of different cultural traditions the term appropriation opens also traditional discourse lines in which Vygotzky's or Mead's contributions emerged and by which recent socio-cultural developments can be better understood. One of these discourse lines comes from the German educational idealism of the cultural transformation of the French Revolution in response to which Humboldt outlined a model of appropriation. In this view the Anglophone term 'cultural product' could be viewed as 'cultural manifestations' or 'objectivizations', which bring together modern life-worlds and individualised appropriation. An exiting task is to use these long established theories on appropriation within the context of the ongoing cultural transformation. This transformation seems to lead to specific and mobile cultural features, probably the following ones which are summarized as hypotheses here:

- Mobility in multimedia and multimodal spaces of activities and meaning which is integrated in regional cultural traditions and global entertainment.
- Mass communication as a compressed and accelerated cultural system of individualised media production und individualised cultural practices to which user-generated contents and contexts contribute.
- Fragmented, individualised meaning-making in individualised, culturally different situations which reaches from media use to formal learning.

What can a cultural ecology contribute?

In the tradition of historical reflection and explanation of a social frame for education and media by referring to the educational idealism of the late 18th and early 19th century, the interrelation of socio-cultural structures and agency can be widened. Giddens' structuration model is built on an interrelation of socio-cultural structures and agency. A triangular interrelation adds cultural practices to the dialectic of the socio-cultural development of structures and agency as the frame for appropriation.

How to achieve coherence and practical aims for this complex interrelation? It could come from the idea of a cultural ecology, which sees mobile media as resources, but not just for a consumptive appropriation under the auspices of dominant structures. Dealing with mobile media as cultural resources within the socio-cultural development of structures, agency and cultural practices, the ecological approach proposes the idea of reconciling nature and the industrial society also for culture. Not the exploitation of the mobile applications and students' agency for improving learning is the pursuit but their communicative adaptation for learning as meaning-making and for participation.

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The London Mobile Learning Group socio-cultural ecological approach to mobile learning: an overview

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Abstract

Mobile learning is an emerging, and rapidly expanding field of educational research and practice across schools, colleges and universities as well as in the work place. The London M-learning Group brings together an international, interdisciplinary group of researchers from the fields of cultural studies, sociology, semiotics, pedagogy and educational technology from the Institute of Education, the University of Kassel, the London Metropolitan University and the University of Verona. The group is working on a theoretical and conceptual framework for mobile learning around the notion of cultural ecology which is outlined in this paper. The analytical engagement with mobile learning of the group takes the shape of a conceptual model in which educational uses of mobile technologies are viewed in ecological terms as part of a cultural and pedagogical context in transformation. Members of the group work on various projects and publications with each other, and organise joint events.

Overview

In view of the increasing portability and functional convergence of technological devices, as well as the reduction in their cost, and the cost of services available for them, mobile devices have become more and more embedded in the life-worlds of users. It is the growing significance of mobile devices in learners' everyday lives, i.e. their ubiquity and personal ownership of them, as well as their increasing use for what is traditionally called 'informal learning' that motivates our interest in them.

We are concerned about the dangers of a failure of the education system to keep pace with the developments in the life-worlds of young people and society more widely and argue the need for a purposeful 'push' in approaches to mobile learning in all sectors of education in order to avoid a potential disconnection between the way young people operate in their daily lives and the way educational institutions interact with them. Educators in all phases are having to face up to the challenges posed by mobile learning and its integration in their professional practice and we are hope to be able to make a meaningful contribution to understanding the complex processes involved and possible ways forward through our work.

Mobile learning – as we understand it – is not about delivering content to mobile devices but, instead, about the processes of coming to know and being able to operate successfully in and across new and ever changing contexts and learning spaces. And, it is about understanding and knowing how to utilise our everyday life worlds as learning spaces.

Our ecological approach attempts to provide a conceptual framework for an educational response to current social and economic trends in a world marked by fluidity, provisionality and instability, where responsibilities for meaning-making as well as other risk taking are firmly located with the individual. It also attempts to take into account current changes in the authority over education from state to the market, changes to consumption and production as well as current characteristics of the media landscape like participation, distribution, local and global content, ubiquity and multimodality. (Kress, 2008)

We see a very close connection between meaning-making and learning, in semiotic terms between the making of signs and the making of concepts. For us, both are the result of semiotic work: that is, purposive work with meaning resources (Kress and Pachler, 2007).

In the main, the following aspects characterize our proposals for an ecological approach (see Figure 1):

- agency: young people can be seen to increasingly display a new habitus of learning in which they constantly see their life-worlds framed both as a challenge and as an environment and a potential resource for learning, in which their expertise is individually appropriated in relation to personal definitions of relevance and in which the world has become the curriculum populated by mobile device users in a constant state of expectancy and contingency (Kress and Pachler, 2007);
- cultural practices: mobile devices are increasingly used for social interaction, communication and sharing; learning is viewed as culturally situated meaning-making inside and outside of educational institutions and media use in everyday life have achieved cultural significance;
- structures: young people increasingly live in a society of individualized risks, new social stratifications, individualized mobile mass communication and highly complex and proliferated technological infrastructure; their learning is significantly governed by the curricular frames of educational institutions with specific approaches towards the use of new cultural resources for learning.

Figure 1: Key components of a socio-cultural ecological approach to mobile learning – a typology

We see learning using mobile devices governed by a triangular relationship between socio-cultural structures, cultural practices and the agency of media users / learners, represented in the three branches in Figure 1. The interrelationship of these three components: agency, the user's capacity to act on the world, cultural practices, the routines users engage in in their everyday lives, and the socio-cultural and technological structures that govern their being in the world, we see as an ecology which in turn manifests itself in the form of an emerging cultural transformation.

The diagram in Figure 1 is deliberately non-hierarchical, i.e. it can be read clockwise or anticlockwise and each one of the three branches of the concept map can be read first. It seems important to us that none of the domains is dominant over the other, and that their relative importance is determined by the specific context in which the model is used.

Invariably, there is insufficient space here to represent and discuss each of the sub-branches of the concept map in any detail. For a fuller discussion see Pachler, Cook and Bachmair, forthcoming and Pachler, Bachmair, Cook and Kress, forthcoming.

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Beyond hardcopy: the inevitability of microcontent

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Abstract

A recent significant transformation in the life-worlds of young people is the loss of willingness, and indeed of the ability, to read extended printed texts. Increasingly, young people will read and write exclusively in the digital medium. In the world of work, this means that the paperless office is today becoming reality. The new generation of workers, having grown up with e-mail, word processing, and the internet, no longer feel the need to use printouts. And in the realm of education, students increasingly prefer reading on-screen to leafing through hardcopy pages. However, the logic of longer texts encountered or composed on-screen is less easy to follow or to maintain than in the case of hardcopy documents. Also, the dominant screen today tends to be the small display of the smartphone, rather than the larger one of a laptop. The inevitable educational challenge, then, and particularly a major challenge in m-learning, is to convey substantial knowledge in the form of small documents – in the form of what has become known as microcontent. In a rapidly expanding space of knowledge, teachers face the challenge to build, and the humanities the challenge to articulate the theory of, such content.

1. Postliteracy prefigured

Taking the background of the shift to a world of mobile communications for granted, another recent significant transformation in the life-worlds of young people, from an educational point of view, seems to be a loss of willingness, and indeed of the ability, to read extended printed texts – books, papers in periodicals, or even newspaper articles. To be sure, preliminary signs of this transformation have long been noticed. More than a decade ago John Updike (1995) had Bill Gates say to Gutenberg that, already, "a generation or two has come along that can't be bothered to read; it absorbs all its information from television and musical tapes". Turning away from the printed text did not, eventually, result in turning away from reading and writing: by today a kind of "secondary literacy" (Coy, 2003) has emerged, an online literacy in which features of the written and the spoken merge. Increasingly, young people will read and write exclusively in the digital medium. In the world of work, this means that the paperless office, still said to be a myth a few years ago by Sellen and Harper (2002) and many others, is today becoming reality. The new generation of workers, having grown up with e-mail, word processing, and the internet, no longer feel the need to use printouts. Mead (1970) had coined the term "prefigurative" for the kind of culture in which "the elders have to learn from the children about experiences which they have never had". Ours today is such a culture.

2. Digital microcontent

The evidence may be anecdotal, but it certainly is overwhelming: students, even in higher education, increasingly prefer reading on-screen to leafing through hardcopy pages. Now this psychological and cultural change does not render invalid earlier arguments to the effect that the logic of longer texts encountered or composed on-screen is less easy to follow or to maintain than in the case of hardcopy documents. Also, the dominant screen today tends to be the small display of the smartphone, rather than the larger one of a laptop. The inevitable educational challenge, then, and particularly a major challenge in m-learning, is to convey substantial knowledge in the form of small documents.

Coherence enframed

The limited space for the essential content of the message, as well as the speed of communication – the limits of time – necessarily lead to the phenomenon of "microlearning" (Benedek, 2007), and to the genre of microcontent. In its spatial dimensions, microcontent does not extend beyond the frame of the given display. From the point of view of educational theory, it is a first step in the right direction that (albeit for technical and commercial reasons) providers of lengthy hardcopy texts in the digital medium tend to process the former into small chunks of two to four pages: think of Google's "snippets", or of Amazon Online Reader's search results. But this is definitely only a first step. Real microcontent is specifically designed to be compact, lavishly linked to other microcontent items, and combines text with images – still images, and animated images. Also, as Lindner (2008) shows, microcontent transcends the world of learning; it already plays a major role in the world of leisure, too. Think of keitai novels; think, indeed, of YouTube.

Links to the future

Microcontent is inconceivable without a hypertext structure: extended content is analysed into, and represented by, a web of microcontent. In 2003, the authors of this paper launched the Hungarian Virtual Encyclopedia project (www.enc.hu). It is an encyclopedia in the classical sense: attempting to represent, albeit on a modest level, a full circle of learning – which in the given case means a densely interconnected web of entries, with specially designed software to map and display the structure of links. From the point of view of educational theory, we regard the Hungarian Virtual Encyclopedia to be a paradigmatic experiment in microcontent design (but of course not a competitor of Wikipedia).

3. Mobile images

As the saying goes, a picture is worth a thousand words. Pictures, images, are rich carriers of meaning, but note that they can certainly gain, and usually do gain, from being complemented by verbal expressions. Yet in many instances, such verbal additions need not be lengthy, and often they are not needed at all. Wittgenstein (1953), introducing the example of a "picture-face", stressed that there are pictures which convey unambiguous meanings even though we have never been taught how to interpret them. Emoticons – the descendants of Wittgenstein's "picture-face" – are today all over our displays. Think of instant messaging, think for instance of Skype chat, and the animated – thereby quite unequivocal – emoticons it standardly employs. Chat offers the total integration of voice, text, and iconic symbols. Also, it comes in small chunks. Skype and its like can certainly be regarded as everyday workshops of microcontent creation. On a less pedestrian level, in a rapidly expanding space of knowledge, it is us teachers who have to build, and the humanities which must articulate the theory of, microcontent.

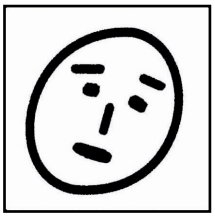

Figure 1: Wittgenstein's "picture-face".

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Blurring boundaries: how ICTS are challenging notions of learning in South African universities

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Abstract

This paper uses a mixed methodological approach to reflect on a five-year study of South African universities students' access to and use of ICTs for learning. We examine how the original assumptions that underpin the study no longer pertain in the same way as they did at the outset. Distinctions pertaining to the digital divide, pedagogy, learning spaces and social and academic use are, on reflection, less dualist and more complex. In some cases, divides are being exacerbated, in others the neat demarcations are becoming blurred (resulting in grey areas) and in yet others they are being reconstituted offering new possibilities not previously considered. It is of note that our observations are made in a context where cell phones have become almost ubiquitous across the demographics of the student population in just a few years. .

1. Introduction

This paper arises from reflections on a project on access to and use of ICTs by students in South African higher education over the past five years. The project comprised quantitative analysis of two surveys of 10 110 students (undertaken at two distinct times), qualitative analysis of the questionnaire's open-ended questions and selected additional student interviews.

Our original questions were straightforward. How were South African students, from different backgrounds and studying in different disciplines accessing and using ICTs in support of their university studies? Sub-questions related to demographic differences and digital differentiation. A number of papers were written and findings reported (see http://www.cet.uct.ac.za/node/212/).

Implicit in our research were a number of assumptions, based on our developing country context, the diverse student body and trends from emerging research. We assumed that we were focusing on ICT use in the context of:

1. a digital divide (in terms of physical, personal and contextual resources);
2. a pedagogy of formal learning and in a defined curriculum;
3. defined learning spaces (ie on campus and off campus, virtual and physical);
4. students' academic activities as separate from their social ones.

However, an important realisation upon reflection of the entire project to date has been the difficulty of categorising and neatly differentiating our findings. We found this process was both

complex and contradictory and were struck that dualist and neat distinctions no longer pertain in the same way as they might have done at the outset of the project, just five years ago.

With regard to boundaries and categorisations, we observed four possible relations or demarcations. Firstly, in some cases our assumed binary distinctions did still hold true. Secondly, sometimes distinctions were becoming exacerbated and there was evidence of increasingly polarisation occurring. In the third case, we saw traditional activities and categories becoming less clearly demarcated with grey areas creating a kind of hybrid, made up of new constellations of elements previously associated closely with distinct categories. Fourthly, we found that the distinctions had dissolved creating entirely new categories and new possibilities which we had not previously considered.

This paper describes the four areas where the findings of our study indicate that parameters are increasingly less distinct: digital divide, pedagogy and the curriculum; learning spaces; and social and academic use of ICTs. Our aim, in this paper, is not primarily to disseminate the results of the studies, but rather to use examples from the data to illustrate the challenges of sustaining dualistic distinctions and to consider the implications of the kinds of blurred and reconstituted boundaries which emerged during the analytical and interpretative process.

2. Findings: Complexities and contradictions

Digital Divide: expanding and reconstituting

If one conceptualises the digital divide in terms of computers and the Internet then the digital divide is firmly in place, as the differences are indeed stark across the higher education student body, with some groups relying heavily on campus-based facilities for equitable access (Czerniewicz and Brown in press). This group is being increasingly alienated from a small group of students who have access to a plethora of digital devices and practices (opportunities provided by pervasive broadband and wireless connectivity in their homes and communities) which suggests that in some cases the divide is being exacerbated (Brown, Czerniewicz et al. 2008). However, this notion of access is murky as students from low socio-economic backgrounds do not fall into clear "have not" categories, especially when cell phones are considered. For example, amongst students who fail computer literacy tests at university and report minimal access to computers, cell phone ownership and the use of popular mobile-based chat is pervasive. These students' daily lives are being mediated by cell phones in a range of ways whose relevance is being investigated by many researchers (Sharples, Taylor et al. 2005, for example). The cultures of use being brought into higher education by an entire student cohort for whom mobility is a key aspect of their technological habitus, suggest that the digital divide is being completely reconstituted if not overturned.

The curriculum: opening up and entrenched

"In" the curriculum and "out" the curriculum used to be concepts where a clear consensus was in place, and in our case the distinction continues to hold true. But, as has been noted, the boundaries between what is in and what is out of the curriculum are becoming porous in various ways, because of ICTs. While informal learning is not a new phenomenon, its increased visibility through the use of ICTs is evident in our data, where findings show how tools such as cell phones extend and blur the curriculum/ non- curriculum spaces. For example, students use ICTs (even in resource poor contexts where cell phones are relevant) for establishing networks and getting feedback from peers, for finding information beyond the curriculum and as a tool to assist them in understanding content which is not in their home language. This echoes suggestions of a movement towards notions of curriculum-oriented informal learning, where goals of learning are

explicitly defined by the learner but linked with the curriculum (Mann and Reimann 2007). At the same time, we see evidence of students actively rejecting the opening up offered by online possibilities and preferring the "safer" and often print-based space inside the curriculum.

Learning spaces: intact and fluid

Location remains an important descriptor and divide when describing learning spaces in a context where differences between on and off computer campus access are so severe. At the same time physical and virtual spaces are proving complementary rather than alternative. While ICTs in our context are still identified with distance and the online, our findings making such distinctions difficult to sustain, when for example, students move interchangeably between online and off-line realms even for a single task. Students are also savvy about resource utilisation, basing group work divisions of labour around on both skills and access to ICTs. They also draw on different types of ICTs in a multiplicity of ways depending on their locations and the availability of resources. However, while places are located in spaces, but not all spaces are places (Rettie 2005), it is connectivity which makes new spaces available to the entire student population. In a severely bandwidth- constricted context such as ours, that connectivity is afforded by cell phones which disrupt and extend even in the most difficult environments, as evident by a cluster of enterprising student cases (Czerniewicz, Williams et al. 2008).

Social and academic: isolated and interwoven

On the one hand, the concern and excitement about the social and the educational made possible through the rise of social software internationally is not pertinent in our context where evidence is that the uptake of social software for learning has been low (Brown and Czerniewicz 2008). On the other hand, interesting grey areas have emerged in that there is some evidence of tools normally associated with one type of activity sometimes being used for the other (for example, the use of blogs for feedback on assignments and creation of student social groups on VLEs, and the use of cell phones for assignment submissions). In addition, ICTs have been found to play an increasingly important role in the affective issues normally associated with social spaces, including emotional support and stress relief, further challenging the narrow distinctions of social and academic use of ICTs. Another complication is that students are found to no longer neatly divide their academic and social use along on-campus and off-campus dimensions. They report using computer labs on campus for non-academic work with facilities often extremely congested during "open access" times when social networking and web-based sms applications are enabled. It is becoming evident that ICT-mediated learning is becoming interwoven with the activities of everyday life

3. Discussion

In our presentation we will elaborate on these examples in order to show how complicated traditional distinctions have become in our context. We recognise that the "shaking down" of new practices is slow and messy, and realise that our examples are true for a given moment in time, with ongoing tensions between "in", "out" and "in between". However, we have found the four demarcations of relations a useful analytic tool for describing the various ways that boundaries are being demarcated, reconfigured or kept in place during times of ICT-enabled social flux and changes in higher education generally. Lastly we will consider the implications of these complex categorisations and blurred boundaries for future research, students and institutions alike.

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best paper award

It's (I'm) not good enough: contrasting discourses of ICTs amongst South African university students

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Abstract

Based on the responses to open ended survey questions of 2552 students from 11 South African universities, this paper uses Gee's notion of big D Discourses to examine university students meanings of ICTs in education. Gee's concept of Discourse enables elucidation and interpretation of findings relating to students' technological identities and how this impacts on their relationship to or use of ICTs. In this paper I examine the role that students' Discourses of ICTs have on the acquisition of the skills, strategies and dispositions that allow them to use the Internet and other ICTs effectively to identify important questions, locate information critically evaluate the usefulness of the information and synthesise it to answer questions and communicate to others (Leu et al 2004 p1590). This is particularly interesting in an environment where continuous connectivity is achievable through the ubiquitous presence of cell phones and where students' cell phone literacy may be different to their literacy in terms of use of Internet for learning.

Preliminary findings show that for students the dominant Discourses about the use of computers in education are that of efficiency of the technology (indicating an acceptance of computers as part of life and focusing on the imperative to keep up with demands) and aptitude (with student perception of the right level of knowledge and computer literacy and support as an advantage and lack of these as disadvantage). A sub focus of this paper is to examine whether different Discourses are connected to different social groups of students and how this impacts on their use of ICTs.

1. Introduction

This paper uses Gee's notion of big D/little d D(d)iscourse (1996) to examine the different meanings South African university students have in relation to Information and Communication Technologies (ICTs) in education. Gee's concept of big D Discourse encompasses more than just the use of language (what he refers to as little d discourse), it includes ways of being (thinking, acting and interacting) (Gee, 2000) that take on socially meaningful identities in various situations or contexts.

Gee's approach to Discourses has been utilised by various researchers to facilitate the elucidation and interpretation of findings across many different contexts (eg fan fiction writing, internationalisation of universities and science learning) in relation to how individuals use language and text to identify aspects of their identity when traditional markers of identity are unavailable (Black 2007), how individuals co-construct meaning through interactions that position them as

certain types of people (Brown et al 2005) and how language, identity and technology connect (Nguyen 2007). In this paper I explicitly explore students ICT Discourses in education and unpack what this tells us about how students think, feel, value and use ICTs for their learning (Lankshear and Knobel 2006)

In particular I am interested in the role students' Discourses of ICTs in education play in relation to their acquisition of the new literacy skills, strategies and dispositions that allow them to use the Internet and other ICTs effectively for learning (Leu et al 2004 p1590).

2. Background

Research on discourses of ICTs in general have revealed on a variety of themes. Whilst terminology differs between contexts (whether the ICT discourses are viewed in relation to policy, education, government etc) the themes which are common across the settings are ones of technological determinism/ optimism, efficiency, liberation, imperialism/ globalisation (digital divide) and productivity (Budd 2005, Thompson 2005, Wilson 2003). Using these common discourses as a starting point, texts from 2552 responses to open-ended questions about access to and use of ICTs for education were drawn from a survey of students from 11 South African universities and coded and analysed.

3. Methodology

As the analysis of the text was conducted using Nvivo the coding of the open ended responses was also able to be linked with the students' demographics and answers to the quantitative component of the survey. The ability to conduct such mixed method analysis has the added advantage of enabling the examination of Discourses which emerge in terms of students' social groups and reported ICT practices through the comparison in matrix tables.

4. Preliminary Findings

Preliminary findings show that all the Discourses discussed above are apparent amongst South African university students. In a random sample of 400 responses, Discourses related to ICTs could be identified amongst 390 students.

However the dominant Discourses about ICTs in education were that of efficiency of the technology (163 students) (indicating an acceptance of computers as part of life and focusing on the imperative to keep up with demands) and a new Discourse surrounding personal aptitude (70 students) (with student's perception of the right level of knowledge, computer literacy and support as an advantage and lack of these as disadvantage). Whilst the discourse of aptitude is not explicit in the research about ICT discourses, it has elements of a deterministic discourse (a discourse in which ICT uses are seen to be more valid than non-ICT uses) and a globalisation discourse (in that students who have these skills and competencies are considered advantaged over others).

Samples of text which illustrate these Discourses will be discussed and analysed to try and understand the values and viewpoints that underlie them. Some examples include:

Efficiency discourses

Students view that lack of efficiency of ICTs impend work productivity "The computers at [name of lab] are disastrous they are old. My floppy disc has gotten stuck in them twice in the last 3 weeks." However as the quote elucidates it may possibly the student who is lacking the skills to recognise which technology to use.

The discourse of efficiency also results in a perception that ICTs have an integral role in the learning process, sometimes elevated above the content and lecturer with ICTs becoming the face of the university experience. Students also place the responsibility for their success or lack of it in the hands of the computer. "Seeing that science faculty computers are so damn slow learning experience for me so far has been hell on earth!!!!!" and "If there are more computers avail i would have all my assignments and other duties on time." Inefficiency is a result of computer problems not students.

Ability discourses

In terms of the discourse of ability, the lack of a "desired ability" makes students feel personally inadequate. Distinctions are drawn between those that have and those that don't have skills. The [university] would really do well to train assistants in helping students sympathetically and not making them feel like idiots or a nuisance for asking the aid/services (from it personnel) that they pay for.

Students also talk about ability in terms of ICTs being seen as a privilege with student keen to show their commitment and the value it would hold for them. "I like to use computers but difficult for me i could get training - it would be easy & i enjoy it. I will take most of my time concentrating on it." And keenly aware that when they have this "ability" it is an advantage "I am very fortunate to have a good understanding on how to use a computer."

5. Discussion

These selected excerpts show that amongst some students with an Efficiency Discourse in which the role ICTs have to play in learning is assumed (something these students expect) but not one for which they take personal responsibility (their attitude is that this is someone else's problem and as a consequence do not appear to empower themselves to make ICTs work for them). In contrast other students' Discourse sees the use of ICTs for learning as an opportunity but one for which they are ill equipped and feel inadequately prepared to take advantage of. However the attitude they have towards ICTs and the value they place on them appears to result in these students being more empowered in terms of making the most of opportunities (eg asking for help, asking for training).

What is also interesting is that the mobility and mobile technologies are not explicitly mentioned in most of the discourses. This raises questions about how students regard mobile technologies. Recent interviews with students seems to suggest that students do not see mobile technologies as part of their learning as they use them almost without conscious thought and only when prompted about how they use cell phones for learning do they begin to realise that this in indeed part of their educational technology toolkit.

Whilst discussion about Discourses and meanings is illuminating about students as individuals it is only really relevant to educational technologist if it impacts on their use of ICTs for learning? When comparing the Discourses as coded through open ended questions with a gross measure of teaching and learning use (average use across 27 activities) we can see that more students with a Discourse of Efficiency have an above average use of ICTs for learning than students with Discourses of Aptitude or technological determinism.

As Gee (1996) also connects Discourses to a particular social groups' way of being in the worlds, their "form of life" their very identity, a sub focus of the paper will examine whether different ICT Discourses are connected to different social groups of students and how this is impacted on by different literacies, which both Gee (1996) and Leu et al (2004) see as varying across different social contexts.

In our context Discourses do not vary across gender, however more students from average and higher socio-economic groups (SEG's) have Discourses around Efficiency as opposed to Discourses of Aptitude which are more dominant amongst students from low SEG's. Other intersection will also be explored further in the paper.

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A life-style segment of 'at-risk learners': Using mobile media provides educational opportunities

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Abstract

This presentation discusses 'At-risk learners' from the perspective of lifestyle aesthetics and from the gender perspective. Within this theoretical framework usage data on mobile devices, such as mobile phones and portable gaming consoles, is presented and used in order to argue that there are certain risks inherent in the life-styles of young people and especially 'at-risk learners'. These risks are highly ambivalent as the 'at-risk learners' are facing passive risks like social inequality. Despite of that, using mobile media is active, risky consumption and offers educational opportunities and positive implications for agency.

1. A life-style of 'at-risk learners' who fail in traditional school contexts

Generally 'at-risk learners' are considered as pupils with a certain distance to school, those who have difficulties in school and thus who face difficulties in integrating into society. The distance to school becomes evident e.g. through truancy although this phenomenon is not specific to a certain socio-economic group. Pupils with disabilities are facing very specific challenges in the educational system, but will not be focussed on. The results from the PISA studies suggest a focus on pupils with migration backgrounds, pupils from lower socio-economic levels and pupils who do not successfully graduate from compulsory education after year 9 in Germany. The usual educational track in German speaking countries would be to enter an apprenticeship or vocational training or continue in secondary education. The lack of a secondary general school certificate in most cases prevents this entry requirement to the job market. Within those groups the special focus lies on the boys as the girls are more successful in the educational system and the boys are rather likely to be unemployed after their time of compulsory eduction. These groups of pupils are identifiable within society. Statistics on school graduation and school achievement, census data and data on social segmentation suggest a focus on this group.

In the United Kingdom, China, South Korea and Japan the term NEET is used for the group of young people who are not in education, employment or training. According to the UK's department for children, schools and families (dcsf.gov.uk) almost one tenth of the "16- to 18-year-olds were NEET at the end of 2007" (DCSF 2009). For Germany about 8% of all 16-year-olds do not graduate successfully from compulsory education (Autorengruppe Bildungsberichterstattung 2006) and the PISA studies 2001, 2003 and 2006 suggest that about 20% of the 15-year-olds do not meet the basic level 2 of reading, mathematics and natural science competencies. For Germany one should additionally consider that the school system puts pupils 'at-risk' as it provides three different types and therefore levels of schools in parallel after elementary school. Over 80% of the pupils attend the intermediate school (Realschule)

and the grammar school (Gymnasium) whereas the rest attends secondary general school (Hauptschule). (Translation from German Embassy London) The 'at-risk learners' in Germany are closely related to the the problem of the Hauptschule as almost one third of its pupils have migration backgrounds (just one 4th of the grammar school pupils have migration backgrounds) and the majority of the pupils attending this school type is male. According to the PISA studies the pupils attending Hauptschule have low socio-economic backgrounds with rather little access to financial resources. Adding to that, the majority of unemployed people in Germany have attended Hauptschule (Autorengruppe Bildungsberichterstattung 2006).

2. The framework of life-style segmentation unveils educational opportunities for 'at-risk learners' inherent in their mobile media usage patterns

The presentation will argue that current structures of society need to be regarded as segmented according to lifestyle (everyday lifestyle aesthetics) as well as according to education, income and social status. This is especially necessary to gain more detailed views on the educational potential of digital mobile devices for adolescents.

The group of 'at-risk learners' is not only derived from education data and it is not only a group of individuals who fail in school. It seems as if there is an overarching trend in Europe where a certain group of young people fail in traditional school contexts on the one hand, but at the same time are successful in their meaning-making with media and especially with mobile technology. The aim is thus to understand 'at-risk learners' as a holistic life-style, incorporating patterns of media usage, approaches to education and learning as well as general decision making, value orientation, the visible and audible style of e.g. clothing and music tastes. The approach of social segmentation or social milieus which is mainly used by the marketing industry seems appropriate to cover
(a) the socio-economic backgrounds in the sense of a class system and (b) to cover value orientations and general styles or tastes. Two German research institutes (SINUS Sociovision and SIGMA) offer data on social segmentation covering media usage, general consumption and education.

The presented data was drawn from the German market media study Verbraucheranalyse 2008 II Märkte which carries data in respect to the SIGMA Milieus. The information on informal learning of the Precarious Consumers and Hedonists can be found in the studies on the attendance of further education courses by Rudolf Tippelt, professor for educational sciences at the University of Munich. Those studies were conducted in the perspective of the SINUS milieus and are comparable to each other for those two segments and use the same epistemological model. (Barz/ Tippelt 2004, Tippelt et al 2003)

The most significant social segment in relation to adolescent 'at-risk learners' are the Hedonists. They are the greatest youth segment with about one third of all adolescents. It is the mainstream of youth segmentation. Due to the size of this segment there are great intra-segmental differences and the segment differentiates into the youth styles and scenes where these styles and scenes distinguish themselves from each other, sometimes quite violently. The main characteristic of this segment is being in opposition to all authorities and mainstream society.

The media usage, leisure time activities and important things in life describe 'at-risk learners' as a lifestyle that is shaped by precarious consumption and hedonism.

This includes active risk taking and active risky consumption, e.g. spending money for partying, gaming, ringtone subscriptions, mobile phone contracts, etc. Their active risk taking also happens in school by standing actively in opposition to authorities like school, teachers or the teaching

content. The active risk taking is in tension with the passive risk not to graduate from school, risking to descend in society by the lack of certified schooling.

Active risk taking and being exposed to risks seems to be an inherent component of adolescence and especially for young Hedonists. These risks might be seen as unpredictable dangers but can also be seen as uncertainties that have relevance for agency and offer educational opportunities as they offer reflexivity and orientation.

The presentation will demonstrate the educational potential of active risk taking and the passive risk visible in selected German mobile media usage and consumption data. The most important results and educational potential are:

- The great educational potential for boys lies in the combination of gaming enabled devices and devices that are able to produce media at an adequate and appropriate quality. This does not necessarily involve a mobile phone.
- Active risk taking offers spaces for uncertainties where the boys work on educational tasks. These risky spaces also include heavy gaming and recording dubious videos.
- Educational institutions outside school like youth clubs can offer the secured space for at-risk learners where these media can be tried, discussed and reflected upon and are actually used by the boys for this purpose. Social research just has not yet investigated these places.

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A self-reflexive semiotic analysis of mobile devices

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Abstract

The paper presents the results of a self-reflexive experience with a Smartphone and of the consequent semiotic analysis carried out on the basis of the fieldwork observations. Through a one-month familiarization with the device, the researcher has been able to investigate its semiotic affordances, in terms of the representational possibilities and constraints implied in the design of its hardware, software and functionalities. These fostered and hindered (backgrounded and foregrounded) representational uses of the device require certain skills to be developed while backgrounding others. These insert themselves in contemporary changes in communication, thus influencing the way we make meaning of the world (i.e., we learn). A prioritization of representation as selection and assemblage, of tactics over global and strategic planning, of real-time multitasking and synergic immediacy over fine-grained accuracy, of processes (how-to) over contents (what), combine with a fostered conception of agency as selection among option, of our life-world as an artefact to be captured and (re)used, and of life experiencing as informed activity. It is argued here that, on the basis of these foregrounded and backgrounded skills, implications can be derived for the introduction of mobile devices in educational contexts.

1. Rationale for the study

Too often the introduction and widespread use of a specific technological device is argued pro or against on the basis of (pre)judgements on technology as a phenomenon (evil or good) in itself. Analogously, in the educational context the adoption of any type of technology is often accompanied by a hot debate between enthusiastic promoters and tenacious detractors of technology itself.

The view of the London Mobile Learning Group (www.londonmobilelearning.net) is rather different, in that it conceives (mobile) technologies as cultural resources, which insert themselves in, follow and foster contemporary social trends and transformations.

In a social semiotic perspective, every medium – every technology that we use to communicate – has affordances (Kress & van Leeuwen, 1996, 2006), in terms of both material and social possibilities and constraints, in terms of what is materially and socially fostered (enabled and permitted) and hindered (prevented and prohibited/stigmatized) to do with it.

If learning is a process of meaning-making of ourselves and the world (of our 'life-world', cf. Kress & Pachler, 2007), the media which we use and their affordances influence the way we make meaning and hence the way we learn.

Smartphones – 'media convergent' mobile devices – have been recently introduced in our media landscape (among the media we use in our everyday life). Understanding their affordances can

cast light onto the skills that they foster as well as on the backgrounded ones, and, hence, on the way we make meaning of the world through their use, and on the way we approach and conceive our life-world. This can lead to considerations onto the implications of their adoption in schooling contexts on a maybe more grounded basis than on the above-cited (pre)judgements on technology as a (evil or good) phenomenon in itself.

In this view, within the work of the London Mobile Learning Group, the researcher was given the task of attempting an investigation of the affordances of mobile devices, so as to give material and social groundings to the implications of their possible introduction in educational contexts.

2. The study

The paper introduces the methodology and the findings of a self-reflexive social-semiotic study on the familiarization and use of a Smartphone.

The researcher was given a Nokia N95 for a month, without any direction on its use and functionalities. She used it during her every-day activity in view of carrying out a social-semiotic analysis on its affordances. After the fieldwork, an analysis has been developed which gives insights into how the affordances of mobile devices foster certain types of representation while hindering others and, consequently, how their use – inscribed within other contemporary social trends – changes the ways we learn, conceived here as the ways we make meaning of our life-world.

The paper discusses the fieldwork experience and the consequent analysis, which has involved a generalization process of what subjectively experienced during the fieldwork. Generalization has consisted of turning the observations driven by the specificity of both the particular model of Smartphone and the context in which it was used into results which can be valid beyond this specific variables. It has also meant considering the researcher's specific background and interests as part of the data themselves.

Therefore, at a first stage, the presentation of the study is a self-reflexive narration of the fieldwork, in which both the researcher's background and interests and the specific context are discussed. At a second stage, the analysis generalizes the subjective observations and examines the affordances of both the hardware and software design of the N95 – taken as an exemplary instance of Smartphones –, of the material and social implications on the use of its main applications and functionalities as well as of its media-convergence and multi-functionality feature.

3. Anticipation of the results

Rather independently of the specificity of (a) the model, (b) the context and (c) the 'user', the affordances of Smartphones foreground certain meaning-making practices while backgrounding others. Their use requires (and thus fosters) certain skills over others.

The hardware design backgrounds the textual input in favour of the visual output, thus fostering representations made through selection and transformation rather than through text-creation from scratch. The software design grounds interaction on a menu-based semiotics, so that agency and action are more likely to be conceived as navigation and selection among options rather than as architecture building. As a consequence, production is more likely to take place through selection, transformation, bricolage and recontextualization of pre-given templates.

The functionalities allow for an overall blurring of boundaries between virtual and real, offline and online, among times and sites of information, activities and relations. Through the imaging functionality, the self, everyday life and the environment can be captured, thus becoming

representation and artefact to be selected, edited and (re)used. Through mobile Web browsing, the offline world is provided with online information on the spot, hence experiencing is likely to be conceived as an informed-activity rather than an exploration of the unknown.

In terms of skills, the use of Smartphones requires flexibility and adaptation, together with tactical (operational and local) planning rather than strategic (global) planning. It fosters immediate synergy and real-time multitasking over meditated fine-grained focus and accuracy. The efficient use of these devices hinges on learning how-to (processes) rather than what (contents); indeed contents can be accessed and captured from both online and offline environment in any time and place, so that knowing where and how to access the (reliable) information needed at any given time becomes the prioritized skill. A real-time selection of the most apt option according to micro (individualized) interests is prioritized over the creation of macro-designs. In sum, (mobile) learning now deals (more) with: how-to access, select, capture, use and transform in real-time global/collective info/events for local/individual aims/relations/activities. These fostered and backgrounded skills afforded by Smartphones seem to be shared also by other technological devices which we use to represent and communicate. These changes on meaning-making fostered by the affordances of mobile devices can lead to useful considerations in relation to educational contexts, in terms of the specific skills which could be developed through the adoption of mobile devices in schools, as well as the backgrounded skills which schools may consider to focus on so as to fill the gap of what is not afforded by these media.

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Towards a methodology of researching mobile learning

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Abstract

Pedagogic research on mobile learning is currently experiencing a shift from practice-orientated research to theory building, often focusing on theorising communicative and discursive practices. In this context, an emerging tendency in theory building is to consider experiences related to the learners' life worlds, agencies and cultural practices, in out-of-school, informal contexts. In this paper we will briefly outline the conceptual and theoretical context on which the London Mobile Learning Group (LMLG) is currently working, namely the notion of a socio-cultural ecology. Also, we will outline categories for the description and analysis of mobile learning cases which are a result of the theoretical work.

1. Mobile learning as socio-cultural ecology

In order to be able to fully understand learning from a socio-cultural perspective, we argue, practitioners and researchers need to explore the life world contexts of learners in terms of their personal lifestyles, socio-economic status, experiences, interests and media practice. The challenge is to learn from the agency of the learners, to critically reflect upon the changing socio-cultural practices that emerge from the use of new technologies, and to integrate the practices that young people develop and acquire in leisure contexts meaningfully into formal learning contexts in school, higher education and work. We conceive of the dynamic around these interacting processes and variables as a socio-cultural ecology (see Pachler et al. forthcoming). Our analytical engagement with mobile learning, therefore, takes the shape of a theoretical and conceptual framework for mobile learning in which educational uses of mobile technologies are viewed in ecological terms as part of socio-cultural and pedagogical contexts in transformation. Such a socio-cultural ecology considers different components, which are dynamically interrelated with each other: the learner; the learner's everyday life practices; and school/university/the workplace, including the cultural resources from all these fields. The practical pedagogic aim behind this conceptual framework of a notion of a socio-cultural ecology is to find a balance between the different system components for the benefit of learners, for example to build new links, or to strengthen existing ones, between the different contexts in a learner's life world with the aim of providing continuity for learning, of minimising the risk of failure, and of nurturing lifelong

learning. The question of such balances (or imbalances) is strongly related to ethical questions of power within social constellations and provides evidence of the relationship of the notion of socio-cultural ecology with the tradition of cultural studies. Media and cultural studies, its theories and methods, can be used to describe and analyse mobile learning in schools and everyday life: In such a view, the agencies and meaning-making processes of learners are seen in relation to aesthetics and life styles, and their biographical experiences are acknowledged as 'cultural capital' (Bourdieu 1984, 1987; see also Lindern quoted by Mikos 2001, p. 324). As well as drawing on key notions from the field of cultural studies, a socio-cultural ecological approach in our view aims to reflect the interaction between agent and cultural resources as well as the interaction in a wider cultural and life world-related frame (see Mikos 2001, p. 326). Lifestyle (aesthetics), which is shaped by social status and value orientation, is in this context seen as a structuring characteristic. There is also a strong relationship of the concept of socio-cultural ecology to the notion of appropriation, which can be characterised as processes attendant to the development of personal practices with mobile devices, in the main interaction, assimilation and accommodation as well as change (see Cook et al. 2008). Specifically, appropriation furthers our understanding of how situative activities take place as users/learners develop personal practices – framed by specific aesthetics and social contexts – as it points to contexts and has a focus on the adoption of resources into the cultural practices and discourses of the learner and thus situative meaning-making. Such an approach, in our view, has the power of providing a conceptual frame for analysis of the life-world of users/learners as they engage in interactive, practice based meaning-making.

2. Selection and description of case studies and framework for comparative analysis

In order to be able to adequately examine the interface between the different domains, which are part of the socio-cultural ecology, i.e. the place where situative dynamics of agency, meaning-making and knowledge-building are arising and evolving, in our view a 'method mix' is necessary. Particularly, we wish to achieve the following: identify as many aspects as possible of the socio-cultural ecology; gain an understanding of the dynamics around learning with mobile devices in the context of the conflicting demands of the component parts of socio-cultural practices of learning; identify how these practices are shaped by educational institutions on the one hand, and the nature of the link to everyday life practices of the learners, which might have relevance for learning in formal settings, on the other.

The analysis framework we are proposing here draws on several methods, which are used in contemporary qualitative media research and which are also acknowledged methods in the field of cultural studies. They are seen as appropriate to consider the activities of learners in the context of school/university and their life worlds, as well as the resources, which learners are using (in terms of agentive and meaningful activities), and to ask for the potential inherent in these resources and activities. This is particularly important as the research base and conceptual understanding in this area is currently relatively small. Grounded theory (Strauss and Corbin 1990) was the basic approach to generate a pool of mobile learning examples supplemented, as appropriate, by further methods. The research design, therefore, is a triangulation in respect of methods, investigators and (interdisciplinary) theories (Treumann 2005, p. 210f). Concerning the latter, we refer to action theories (e.g. conversational framework; Laurillard 2007), social theories (e.g. socialisation, social interaction, identity building, social segmentation) and system theories (socio-cultural ecology). The research process was guided by the following methods, even if we did not follow each method in detail.

1. **Grounded theory** and opportunity sampling (Brown and Dowling, pp. 29-30) were used for the compilation and selection of the sample pool of cases; theories were chosen on

the basis of their relevance for the analysis framework. Theories are used only to guide our selection and initial discourse; we remained open to the potential emergence of new concepts and meaning from our cases.

2. The analysis focuses on **individual case studies**: selected mobile learning projects were chosen as typical cases for mobile learning in formal educational contexts. For the use of mobile phones in conjunction with the internet as convergent medium, a case was chosen (see Bachmair et al. 2009) which, in relation to school-based learning, represents a contrastive and unique example (Baur and Lamnek 2005, p. 245). It is meant to contrast learning in formal education contexts with agentive media use in everyday life and an understanding of learning as participation and appropriation.

3. Mobile learning projects located in school contexts were reviewed using a **discourse analysis** approach in the broad sense (cf. Foucault, 1972). Moreover, the idea of considering activities and conversations within learning in formal educational settings as discourses allowed us to gain an understanding of the different (conceptual) bases, meanings and assumptions on which a didactic/pedagogical design or learning by using mobile devices is based. Thus, the analysis could be characterised more generally as analysis by means of **action theories** (see Diana Laurillard's [2007] discursive model of a 'conversational framework', which describes interactivities between and activities by teacher and learner in the meaning-making process) as they allow access to the individual's perspective, situation, role and identity (Krotz 2005, p. 46), as well as social interactions and the communicative, discursive and participatory role of the leaner in the meaning-making and knowledge building process.

4. In order to contrast learning in formal and informal contexts, a single case study from everyday life was chosen (see Bachmair et al. 2009) which related to the agentive use of (mobile) media in one specific context only captured a specific episode pertaining to the practice depicted; in a sense in the case of this case the stance of **interpretative ethnography** (Winter 2005, p. 553) was adopted. Here, the observation of practice was carried out without the researchers appearing on the scene, but instead by researchers reverting to material, which is freely accessible on the internet. A reflexive approach was adopted insofar as the everyday life example has to be seen as being in tension with the examples from mobile learning in formal educational settings and – in terms of school/university and social integration – successful learning, and is thus in turn considered to be a representative example for 'at-risk learners' (i.e. learners who may be at distance to education in formal settings and/or society; these are the types of learners we wish to include in the more formal educative processes).

5. The final step of the analysis was a **case comparison**. The results of the analysis of the individual cases are compared with each other in order to gain a greater understanding of a socio-cultural ecology through a hermeneutic process, i.e. to find overall results (Baur and Lamnek 2005, p. 246) as well as contrasting points for further discussions.

3. Categories for description and analysis of the mobile learning cases

For single case and cross-case analyses, the group developed a set of criteria, which are basing on the theoretical framework outlined above. In the following we describe the generation of these categories.

3.1 How, and on the basis of what data the cases were compiled

The cases, which are described and discussed, were chosen after a review of mobile learning projects conducted in July and August 2007. The search focused on the UK and German

speaking countries: Germany, Austria and Switzerland. As a result, a list originated which contains 49 projects and applications with relevance for learning. Emphasis was placed on examples of the use of mobile devices with school-aged children. In a **first** step the projects were attributed to the categories "in school" and "outside school", and within these two categories to the following sub-categories: (a) Projects in schools: mobile phone as topic, mobile phone in use, mobile phone as topic as well as in use, mobile phone for administration; (b) Projects outside school: location awareness, software applications with interactive features, sound applications without interactive features (audio files), infrastructure.

In a **second** step, the projects were attributed to (1) their focus on teacher, learner and content, (2) to school subjects in which they were conducted1, (3) to a functional framework2 and (4) to pedagogical underpinnings3. The quantification of these categories provides an overview which is not representative (as we didn't aim to assemble a comprehensive sample), but which allows the exploration of some assumptions: that mobile learning is designed for students rather than for teachers; that there is a strong focus on the school subject and the curriculum; that mobile learning has a strong focus on pre-defined task/problem solving; that mobile learning is strongly represented in natural sciences and languages. We note that interdisciplinary projects are underrepresented and that mobile phones are used for interactivity purposes and information delivery. Furthermore, we note that instructional approaches to teaching and learning are more dominant than for example constructionist and collaborative approaches. From the full set of examples, a subset was chosen in order to discuss mobile learning under the framework of a socio-cultural ecology. Accordingly, those examples were chosen out of the pool whose teaching focus is on an task centred approach and, as far as possible, on the context of everyday life and its connection to school and the curriculum. Learners' physical activity and collaboration during the project, the use of the mobile device as learning tool as well as the location of the project, inside or outside school, were crucial for the selection. Finally, the number of relevant projects was limited to 4, whereas each example is typical for a specific combination of context and activity patterns, i.e. project situated in school, outside school or leisure time and activity patterns envisaged by each project such as instrumental to experimental use of the mobile device.

In the **third** step we examined the most salient aspect of each project. They form the focus of our analysis with other aspects being backgrounded. The following list (see Table 1), which is the result of the characterization of the projects, provides a basic overview of the learning and teaching related coverage by giving the central key words of each project, sorted by their relevance for the respective project (right hand side column). The left hand side column gives (1) the name of the project, (2) the country in which the project was conducted, (3) the subject and level of education as well as (4) the location (classroom, fieldtrip, leisure).

Project	Key words/coverage
(1) Handy (2) Switzerland (3) German, French, Maths; Secondary (4) Classroom	multimodal content creation (transformative; knowledge building); microlearning; m-maturity/technical literacy; archive; sustainability; peer-teaching; languages; Mathematics; everyday life; expert scheme; genres
URL: http://metaportfolio-phsg.kaywa.ch/	
(1) Mobile Classroom Experience (2) Austria (3) Physics; Secondary (4) Classroom	Physics; assessment; audio-video; archive; sustainability; literacy (talking, writing, picture); connectivity; convergence; sharing
URL: http://moodle.mobileclassroom.at/moodle18/course/view.php?id=5	

Project	Key words/coverage
(1) Learning Lab (2) India (3) Natural sciences; Secondary (4) Field trip; classroom	informal context (out of school); location awareness/GPS; data collection; life world (reflection); visualisation and knowledge building; natural sciences; pictures; media convergence; media literacy; combine analogue and digital media
URL: http://www.cks.in/html/ecology_htmls/cks_ecology_building01.html#section11	
(1) Cyrill (2) Germany (3) - (4) Leisure/city, without relation to school	'at-risk learner'; life world; everyday life; cultural practices; Youtube as convergent media platform; informal learning; literacy; modes of representation and design; critical reflection; identity
URL: www.medienpaed.com	

Table 1. Overview of the examples
Source: Bachmair, Pachler, Cook 2009: Mobile Phones as Cultural Resources for Learning

3.2 How, and on the basis of what data the structure was compiled

Drawing on a research tradition which leans on phenomenology and hermeneutics, we have developed an analytic framework, which is characterised by two levels: (1) common sense and accessible aspects and (2) latent – not immediately accessible – aspects. This hermeneutic analysis is based on the following questions:

(1) Level 1: the readily apparent, the core of an example of mobile learning: On this level considerations, concepts and lines of thinking about learners as experienced and culturally intelligent participants in school, mass communication or any other relevant cultural area are summarised.

- Leading question 1: What is obvious, accessible and readily readable 'on the face of the materials'?
- Leading question 2: What is (thematically) in the centre of the mobile learning example, what aspects are in focus?

(2) Level 2: the salient/foregrounded structures of the example, which have to be extracted by a theoretically informed analysis: On this level the theoretical framework is brought to bear: the model of a socio-cultural ecology for analysing the ongoing cultural transformation in society, media, school and everyday life.

- Leading question 1: What is covert and not readily accessible to description and analysis?
- Leading question 2: What is of the example, other than the main focus of attention of the teachers or of the students or separate from the main stream of the example?

With the following framework, we aim to act in accordance with such an analytical approach, being aware of not being able to provide a completely comprehensive and exhaustive analysis, as well as having taken only a small step towards the core of what is inherent in the data/materials. Although more cross-case analysis is needed, we feel our framework and analysis has already brought into view key issues related to the notions of mobility, mobility across contexts, as well as agency, cultural practices and approaches to teaching and learning. At the same, we deem

the analytic framework to be a novel and transferable frame for analysis of cases, which can be used independently from the cases which we haven chosen to include in our analysis.

3.3 Analysis framework

As far as the structure of the discussion of the examples is concerned, the first part consists of the project description (I), the second part of the analysis (II).

(I) Project description: The data basis of the project descriptions is compiled from information available from written project reports and/or from project presentations on the internet. In some cases the project coordinators or key persons involved in the project were contacted and provided additional information. To provide coherence in the description of the different projects, the following scheme was developed and applied as structure for the description to all cases:

1. context/rationale: background information (i.e. how many people, type of school, duration, devices used, technical support, ...); learning and teaching aims and envisioned role of mobile devices

2. approaches to teaching and learning: how are the devices used; key activities, key tasks, key pedagogical/'didactic'4 issues

3. technologies and requirements: interoperability, storage, usability etc

4. project outcomes

5. lessons learnt/issues emerging: incl. replicability and transferability

6. recommendations and future possibilities

7. general project data: project name, url, country, year, contact, types of mobile devices, further media, number of persons, duration, location, educational establishment, phase of education, subject domain, teaching/learning focus, keywords

(II) Project analysis: The criteria for the analysis relate to key concepts of our theoretical framework. During the analysis process the scheme was refined according to progress of the working group on theory building, and resulted in the following list:

1. agency, structure, cultural practice (educational script): new habitus and social segmentation (see e.g. Kress and Pachler, 2007); 'at-risk learners'; literacy traditional vs. new; understanding media as cultural resources; participation in cultural practices

2. approaches to teaching and learning (Didaktik) ('didaktik'/learning/teaching scripts): informal/informal/situated/collaborative/problem-based learning; bricolage; knowledge building; meaning-making

3. notions of mobility: mobile device used as tool; mobile devices used in relation to meanings; mobility in contexts (place, time, concepts, social constellations, activities, curriculum, cultural resources, meanings)

4. user-generated contents and contexts: transformation of mass communication; mobility; learning as meaning-making in context; ubiquity, choice, appropriation; context crossing

5. replicability and transferability: replicability and transferability of the 'didaktik' script, using it in a new context; scalability

In a first attempt to analyse the examples, some redundant items emerged and the group decided to merge and simplify the analysis framework according to the perceived usefulness of items for each single case. The key questions for the analysis derive from the foci as described above in step three of the case compilation, which might differ from one example to the other, but which can be kept under the five meta-categories A-E.

4. Discussion and conclusion

This paper has put forward an approach to theory building by considering the experiences of learners' life worlds, their agencies and socio-cultural and media practices, be they in or out-of-school. We have foregrounded the conceptual and theoretical context of socio-cultural ecology. Following a methodological exploration of how the concept of socio-cultural ecology was used to frame our understanding of various diverse cases, we have presented a novel and transferable frame for analysis of cases. Although more cross-case analysis is needed, we feel our framework and analysis has already surfaced key issues related to the notions of mobility, mobility across contexts, as well as agency, cultural practices and approaches to teaching and learning.

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i-Learning – the enculturation of 21st Century life and learning

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Abstract

This study addresses the undefined phenomenon of i-learning and enculturation. There is no international definition available in the research literature for i-learning and we therefore propose its first commencement and revelation to the academy for debate. Moreover, we will further explore the reality of i-learning from an authentic and encultured perspective. Finally we will examine the correlation between the notion of Continuous Partial Attention and encultured i-learning for 21st Century education.

1. Introduction - The Nature and Definition of i-Learning

The overall educational challenge of today's knowledge society is the enhancement of learning through and beyond Mobile Digital Information and Communication Technologies, (M-DICTs). It requires creativity as well as innovation and change in educational psyche to identify didactic paradigms, which allow for transformative learning processes to unfold in real-time and virtual contexts in ways that truly provide quality in processes of learning at all levels, (Bates, 1999; Collis, 1996; Koschmann, 2002; Collis, 2001, Sorensen & Ó Murchú, 2005, Ó Murchú & Sorensen, 2009), and what we refer to throughout this paper as i-learning at all levels, evolving towards and beyond invisible M-DICTs.

> "Learning for learning's sake isn't enough. . . . We may learn things that constrict our vision and warp our judgment. What we must reach for is a conception of perpetual self-discovery, perpetual reshaping to realize one's goals, to realize one's best self, to be the person one could be." Gardner (1983).

For all intensive purposes we unambiguously define i-learning as being innovative, inclusive, integrative, imaginative, inspired, inventive, intuitive and ingenious learning, which utilises all forms of M-DICTs to enhance encultured learning in real and virtual settings and environments globally. Moreover, we regard all i-learning as being incitive by definition, as it challenges every educator, in each and every organisation, to resourcefully and skilfully debate, transform and adapt all technology usage to enhance the multiply-intelligenced individual in transforming his/her meaningful learning in an encultured and authentic fashion, (Ó Murchú, 2005, Sorensen & Ó Murchú, 2006). Furthermore, we define encultured learning as the facilitation of real and meaningful learning, which is unique, creative and complex and produces authentic knowledge that is both transformative and transferable.

As we move closer to the end of the first decade of the 21st Century, the concept of 'innovative, authentic thinking' has become, and will continue to become even more and more highly valued and sought after in all areas of life and learning in society. As we face into a very volatile, universal economic downturn, global economies and employers anticipate citizens who can think critically, imaginatively and innovatively, and who can cogitate decisively in an encultured, constructionist fashion to enhance society as a whole.

The mastery of content knowledge is no longer satisfactory in itself; we are expected to be reflective, think creatively, solve problems, and transform our learning so as to communicate clearly. This is not to say that knowledge is not important. Effective critical thinking and problem solving actually depend upon relevant knowledge and previous experience (Facione, 1998 & 2000). However, knowledge acquisition ought not to be an end in itself, nor should the use of technology be regarded as a separate entity in any i-learning process. The ultimate goal should be to develop the ability to inclusively incorporate facts and concepts in our problem solving and evaluative thinking in a transformative, encultured manner (Ó Murchú, 2005). Moreover, we propose that unless this transformative, constuctionist thinking is aligned with i-learning (being innovative, inclusive, integrative, imaginative, inspired, inventive, intuitive and ingenious learning, beyond all forms of e-learning and M-DICTs as we know them), then we will fail to address, inspire, prepare and 'dress' for the real challenges of life and learning in the 21st Century.

2. What is Meaningful Encultured i-Learning - MEiL?

In order to effectively and ingeniously integrate technology into a meaningful encultured i-learning experience, we must first have a clear understanding of what an MEiL is. MEiL occurs when learners are empowered and indirectly oriented towards global democratic citizenship (Sorensen et al., 2008; Sorensen, 2009) in their learning process. It happens when interpret and transform their learning experiences using internal, cognitive operations, which meaningfully allow for the construction of their own authentic learning in an encultured setting. MEiL requires that teachers and learners naturally interchange their roles from sage to guide, from giver to collaborator, from instructor to instigator (Ó Murchú, 2003), from producer to constructor, from acceptor to innovator, from believer to authenticator. Since all students learn from thinking about what they are doing, the teacher's and learner's role, whomever they may be, becomes one of stimulating and supporting encultured, authentic activities that engage in critical, transformative thinking. Teachers must also be comfortable that this thinking may well transcend their own insights. MEiL requires learner empowerment and knowledge to be constructed by the learner, not just transmitted (Jonassen, et al., 1999, Ó Murchú & Muirhead, 2005). Constructionist learning proposes that learning is a dynamic process wherein learners are actively constructing mental models and theories of the world around them. Constructionism holds that learning can happen most effectively when people are actively making things in the real world. We also concur with Jonassen, et al. (1999) who propose meaningful learning as a phenomenon unfolding in a complex network of the following characteristics:

- Active (manipulative)
- Constructive and Reflective
- Intentional
- Authentic (complex and contextual)
- Cooperative (collaborative and conversational).

What Jonassen et al. do not mention in their model is the importance of meaningfulness and soulfulness as vital ingredients in promoting learner empowerment and active, encultured citizenship.

To experience meaningful, authentic and empowered i-learning, students need to do much more than just access or seek information. They need to know how to examine, perceive, interpret and experience information and think critically and at all times beyond the walls of the usual formal and traditional learning spaces embracing and utilizing the mobile possibilities of 21st Century technologies, M-DICTs.

3. Continuous Partial Attention and i-Learning

On the 21st Century digital learning arena, it is important that learners develop their own identity in terms of understanding themselves as active citizens5. In the very extreme case, the declining interest in (local and global) societal and political processes amongst people may, inevitably, give rise to serious concern amongst many governments, when dealing with e.g. intercultural challenges of war, terrorism, etc.

> As globalisation continues to confront the European Union with new challenges, each citizen will need a wide range of key competences to adapt flexibility to a rapidly changing and highly interconnected world. (Hoskins, 2006, p. 130)

In 2006 Linda Stone coined the notion of Continuous Partial Attention (CPA) defined by a tension between the collective and the individual (2006). Descriptive of the younger generations of today and the behaviour of young people, in particular, in relation to M-DICTs, she identified the following trends:

- Trust network intelligence and scan for opportunity.
- Being connected makes us feel alive.
- CPA is motivated by being connected, not by productivity.
- Life is empty and without meaning without increasing growth in connections and networks.

Young people seem motivated by a desire not to miss any opportunity that might contribute to keep them abreast, speedy and agile. They thrive and feel alive by being connected and feel alive by being part of networks. In a perspective of CPA they constantly scan their surroundings for new opportunities (Ó Murchú & Sorensen, 2009). CPA is a state of dynamics and involvement – not a reflective state. It is a state in which they encounter a continuous flow of interactions and in which they need to partition attention (Stone, 2006).

In summary, the ambition to promote MEiL, learner empowerment and democratic citizenship in an i-leaning context framed by CPA and M-DICTs, demands an unambiguous need for educators and educational designers to explore, seek out and uncover new concepts, models and pedagogical methodologies relevant to learners of the 21st century, even if it means a movement from formal to informal structures of learning. We propose that our definition of i-learning challenges the academy to design for empowered learning in innovative, inclusive, integrative, imaginative, inspired, inventive, intuitive and ingenious ways.

4. Conclusion

This study has addressed the undefined phenomenon of i-learning and enculturation. This paper has proposed its first commencement and revelation to the academy for debate. Moreover, we further explored the reality of i-learning from an authentic and encultured perspective. Finally we

examined the correlation between the notion of Continuous Partial Attention and empowered, encultured i-learning for 21st. century education. All that remains is to state that we look upon this commencement of i-Learning as a mere beginning of a synergistic journey into the unknown. We finalise our thoughts by sharing that the essence of all mobile, virtual learning is, in our opinion, similar to that state of mind between waking and sleeping. A mobile, virtual environment where senses are heightened, reality seems tangible, anything is possible, but untouchable and indefinable due to its evolving and ever-changing 'dreamland' properties and yet nothing is impossible.

> Education in its deepest sense and at whatever age it takes place, concerns the opening of identities – exploring new ways of being that lie beyond our current state. (Wenger, 1998).

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New professional cultures: braided gatherings in The Third Space

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Cultures of learning are changing world-wide in this digital age. Conventional understanding of mobile learning, a useful term for digitally-mediated, multimodal learning, is usually framed in terms of devices that are not tied to specific physical locations: laptops; data loggers; PDAs, smart phones; netbooks and an increasing range of products that link learning to classrooms and curricula. Multimodality in this context means meaning-making through signs that include sound, gestures, animation, graphics, body language and so on.

Whilst learning remotely and informally is largely is what has been understood about mobile learning, we can now extend the concept to include the informal spaces in which learning takes place – the liminal spaces that those who push the boundaries of digital possibilities now inhabit intellectually. In discussing educators, Zeichner speaks of the Third Space to denote democratic sharing of professional resources and practices (Zeichner and Liston 2006; Zeichner 2008). This is a useful term to denote liminal spaces for educators.

The value of developing a web-based Third Space in a 'community of practice'(Lave and Wenger 1991) is highlighted in by digitally experienced teachers and advisers who are members of the professional organisations: Naace, MirandaNet and ITTE. These teachers and advisers who responded to a study about Continuing Professional Development in digital technologies explained that in these communities of practice (CoPs) social networking cultures were already established, although the majority of the members still confined their activities to email list discussions (Preston and Cuthell 2007).

From observations of the online activities in the Third Space of these three CoPs, an emergent model called Braided Learning has been developed that highlights the ways in which members of professional CoPs are developing the affordances of mobile learning for themselves (Cuthell 2005; Haythornthwaite 2007; Preston 2008). The braided metaphor describes processes of building collaborative knowledge using Web 2.0. The framework reveals a three–dimensional process of learning and practice that entails coming to understand and participate in a creative, progressive 'braiding' of text, opinions, and ideas. These processes reveal how learning by professionals, for the purpose of strengthening both the profession and individual understanding, unfolds in the online context.

There are three identifiable stages in the process professionals adopt and practice in their professional, online, learning. In the first stage the CoP engages in creating a braided text online

that supports diversity and change of opinions. Some members act as e–facilitators or braiders who help to shape the argument, provide interim summaries and change the direction of the discussion. In the second stage, braiders demonstrate meta–learning by constructing braided artefacts, which re–interpret the online debate in different styles for different audiences. In the third stage, accomplished fellows take the initiative to set up working parties to explore a subject in more depth. At this point the participants become active professionals, using collaborative knowledge to build new theories and policies. Collaborative publication is a key goal in order to impact on policy in the longer term.

Increasingly, these members of CoPs are shaping liminal spaces to fulfil their own professional needs. Most recently Braided Learning theory is being applied to emerging MirandaMod programme that is a modification of 'unconferencing'. Wikipedia defines the term "unconference" as applied, or self-applied, to a wide range of gatherings that try to avoid one or more aspects of a conventional conference, such as high fees, travel costs, sponsored presentations.

In MirandaNet such an unconference is called MirandaMod, an informal, loosely structured unconference of like-minded educators to share ideas about the use of technology to inspire others. Historically; Mod comes from the Gaelic word for a gathering, assembly or parliament. MirandMod is usually (but not always) a fringe event following or attached to a formal MirandaNet seminar/workshop or meeting. The Wiki-based format, with streamed webcasts, chat facilities and linked Twitter streams, mean that there is an international dimension to these events. Like wikis, blogs, chat and email, this online multimodal communication is unlike previous modes of knowledge construction because remote participation reduces time and cost commitments. In these unstructured activities software such as Flash Meeting linked to microblogging and instant communication streams empowers digital visitors to engage remotely with those at the terrestrial meetings, even to the point of placing a convivial beer next to their terminal. Second Life is also being considered as a welcoming MirandaMod location. Pilot evaluation using the Daly and Pachler indicators is already suggesting evidence of a sense of community, meta-learning and knowledge construction. (Daly and Pachler 2007)

What is important about this knowledge creation activity, however, is that the technology is sufficiently transparent to empower all members to set agenda at the grassroots. This mirrors young peoples' mobile learning activity outside school in easy to use virtual environments like ThinkQuest, Beebo and Facebook that allow them to follow their interests and exploits their existing talents. Significantly MirandaMods encourages democratic debate rather than promoting socialisation. These MirandaMods challenge the usual model of conferences for teachers where there is limited interaction, if any, between 'experts' on stage and the expert audience. In the MirandaMod professionals have equal input regardless of their differing status in the world of education. PowerPoint is discouraged, and each participant who has a seven minute spot is chosen on the night by software designed with a fruit machine interface that underpins the random selection. The iChat text, video stream and Twitter feed is then posted in the MirandaNet Third Space so that those who could not participate have a record of proceedings. Currently this material is also being used for research in order to develop the Braided Learning framework more comprehensively.

The MirandaMod is proving valuable in the creation of professional knowledge as opposed to socialising online. This instant communication between work-based experts is a valuable mode of professional learning, where all the participants define the agenda during the event. Unlike a more formal event, innovation can be reported as it happens even though it is not, perhaps, fully worked out. This gives a chance for other members of the CoP to comment whilst new developments are in progress. It also gives publication value to the kind of expert knowledge that teachers' are unlikely to commit to a full academic paper.

MirandaMod pilots, held at an exhibition called BETT09, are now being analysed to see whether this emerging mode of communication might now offer innovative and engaging opportunities for professional knowledge creation in the areas of Visual Literacy, Communities of Practice and Mobile Learning. The hope is that these new modes of learning can be implemented explicitly within work-based Continuing Professional Development programmes for teachers. This will provide more professionals with access to processes of knowledge creation through the application of mobile learning affordances.

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Track 3
Status quo, visions and conjectures

Does school fit in mobile phones? The whole world does

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Abstract

This paper presents the theoretical background and the design concept of a teacher support online discussion board "mSchool" that aims to promote and facilitate the use of mobile phones as a curricular resource. The focus is on educational applications that can be implemented with students' mobile phones and with no additional costs.

The project guidelines are based on some key ideas: mobile phones ubiquity in young people's lives; student's intensive digital practices in out-of-school contexts; the relevance of teacher's behaviour and attitudes in education system change; the present Portuguese technological context; and Diana Laurillard's "open teaching" concept and "bottom-up" system change perspective.

This project is a work in progress in the context of Portuguese education and aims to promote reflection on scattered experiments in order to build well-founded pedagogical strategies.

1. Youth, mobile phones and school

Mobile phones are fully embedded in young people's lives except for one area: school. In Portugal, as in many other countries, almost all young people have at least one mobile phone that they use intensively (Cardoso, Espanha, & Lapa, 2007).

Young people's digital practices are one of the key areas of identity performance and creative learning but they are mostly used in an out-of-school context (Drotner, 2008). This creates a new learning gap. For instance, the degree of personalisation of digital resources is the very opposite of formal school experiences (Green, Facer, Rudd, Dillon, & Humphreys, 2005).

Nowadays, information and media literacy skills are more vital to learners than factual knowledge because there is a need to distinguish trustworthy sources of information and to filter, summarise and critically analyse a vast range of different sources (Green & Hannon, 2007). Nevertheless, this skills training takes place in an informal context rather than in school.

Informal learning is happening everywhere and all the time and mobile phones are often used in this context as, for instance, participation in social networks (Cook, Pachler & Bradley, 2008). Formal learning could profit from young people's interests and enthusiasm in informal learning contexts, using mobile phones as connectors. Schools could build on the ways students are using their phones to learn what they want to know (Prensky, 2005) and use mobile phones to extend education outside the classroom, into the conversations and interactions of everyday life (Sharples, Taylor & Vavoula, 2007).

2. Teachers are the key to change

The major challenge regarding mobile phones in education is to change teachers' behaviour and attitudes. Teachers need to feel empowered and secure to dare in a space perceived as being student's territory (Green & Hannon, 2007).

In a school context, the promotion of informal learning awareness implies significant structural changes. However, we must not undervalue isolated individual teacher's initiatives in innovation. Minor, scattered changes may create a forceful impetus for structural change if they are promoted and coordinated.

According to Laurillard (2008a) teachers should be allowed to put their ideas into practice, to develop them by analysing them in practice, and to collaborate, exchanging ideas and sharing plans.

However, most of the reports on the use of mobile phones in school contexts include sophisticated hardware and are quite remote from teachers' and students' daily experiences. Our aim is to focus on educational applications that can be implemented with students' mobile phones and with no additional costs.

Technology in Portugal

The Technological Plan is a growth strategy based on knowledge, technology and innovation that aims to transform Portuguese society. According to the annual measurement of the progress of online public service delivery across Europe report (Capgemini, 2007), Portugal has made major progress since 2006 (from 11th to 3rd position on the fully-online availability index) and is considered a "fast mover". Under the e-school initiative: 100% of state schools have a fixed broadband connection; students and teachers can buy a laptop computer with mobile broadband at reduced cost; and the program "Magalhães" will launch the provision of laptops for all primary school students (http://www.planotecnologico.pt). In addition, a national study indicates that most schoolteachers are familiar with the use of web-based tools (Pedro, Soares, Matos, & Santos, 2008).

People's everyday lives are embedded in technology and this facilitates the embracing of technology in education. The question now is not so much about equipment but about purpose and pedagogical meaning. We have the hardware but, as Laurillard (2008b) notes, we need the quality of change management within our education systems that would enable us to exploit it.

3. "mSchool" discussion board

Based on Diana Laurillard's (2008b) "open teaching" concept and "bottom-up" system change perspective, this paper will present the theoretical background and the design concept of a teacher support online discussion board to promote and facilitate the use of mobile phones as a curricular resource.

Quoting Laurillard (2008b), "open teaching" essentials are: 1) support for some personal development in how to teach; 2) the means to build on the work of others to design their approach; 3) the means to experiment and reflect on what the results imply for their design and their understanding; and 4) the means to articulate and disseminate their contribution. (p18)

We are aware that this project will be a small contribution to a desirable major change. However, Web 2.0 tools make it possible and affordable for a single person to implement this project, and there is a large potential of teacher initiatives that need backing. Teachers need to feel encouraged to dare to create and innovate in a collaborative context. In the spirit

of a "bottom-up" perspective, this project is founded on people's motivation to innovate and on the idea that small changes can contribute to system change.

The "mSchool" discussion board framework will consist of four major areas:

- Description of experiments and trials (teachers can introduce their own initiatives and tag them according to their characteristics);
- Collaborative area (open space to comment on experiments and trials);
- Links to research and theoretical studies on digital technologies and education;
- Reflection area (where the discussion on wider-ranging subjects is encouraged, such as: why, for what and how to use digital technology in education?).

Discussion board management will have some major concerns: trustworthy source, sustaining teachers' interest, and ensuring a balanced use of discussion board areas. Trust is a major issue when it comes to safeguarding and encouraging those who contribute. The discussion board will be associated with a Teachers Training Centre to ensure its trustworthy source. The use of moderators, regular feedback on contributions and social networking resources are the main tools we shall use to maintain teachers' interest in the discussion board's progress. To monitor the contributions and to create stimulating situations to increase participation are the strategies for managing the balanced use of discussion board areas.

This project is work in progress that will provide information on the status quo of mobile learning practice in Portuguese education. Our purpose is to create a movement that supports the use of mobile phones in a curricular context, and to promote reflection on scattered experiments in order to build well-founded pedagogical strategies.

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Deciphering the future of learning through daily observation

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1. Overview

The research presented here will share the insights and results that have developed from a doctoral study in progress, which examines individual and group study habits & learning practices. The results of this study provide foresight into emergent practices regarding formal and informal study/learning contexts. Furthermore, this research demonstrates that the future of learning is already here, it is increasingly becoming more oriented towards mobile-learning scenarios and that the mobile technologies, services and practices associated with shaping how we learn now and in the future are currently only practiced by a few, but will impact many in the near future.

2. Background

The purpose of this research is to examine how individuals and groups engage in various forms of learning to decipher the trends emerging from these practices and provide an empirically sound forecast of how new learning scenarios are emerging. The research conducted is an empirical study in progress, which is examining the daily habits of individuals and groups with regards to how they study & learn within everyday contexts. This research places great emphasis on examining how individuals and groups engage in learning within mobile contexts, including daily commutes, business / recreational travel and similar situational activities which involve a great measure of mobility.

The daily habits observed provide a glimpse into how mobile learning scenarios are emerging through the broad adoption and proliferation of mobile technologies and services. The Individuals and groups observed have demonstrated the ability to augment currently established methods of study and learning practice with mobile technologies and services, which, create the conditions for new and novel ways of studying and learning within various mobile contexts. It can be argued that learning practices today are increasingly becoming more oriented towards mobile-learning scenarios and that the mobile technologies, services and practices associated with shaping how we learn now and in the future are currently only practiced by a few, but will impact many in the near future [1].

3. Methods

The research presented here is a form of action research in which multiple research methods are employed based on the changing conditions of the study and the phenomena observed. The primary method used in this stage of this empirical is that of ethnographic field research. The secondary method is that of engaging in a form of participatory observation in which the researcher is engaged in using the very mobile technologies and services under investigation and practicing mobile learning scenarios in order to gain personal insight into how novel learning practices are emerging. These methods were chosen in order to inquire into and observe current study habits and learning practices in real-world contexts. The real-world contexts observed were situational activities in the daily lives of individuals (and groups) engaged in some form of study or

learning while in motion within familiar surroundings, (during daily commutes) and while traveling to/in unfamiliar surroundings (business / recreational travel).

4. Evaluation / Reflection / Presentation

In conjunction with the empirical study a comprehensive evaluation and critical appraisal of related mobile-learning research and related studies has been conducted. Moreover, a critical analysis of the empirical study will be made in order to reflect on the outcomes of this work in order to inform future studies of a similar measure in order to garner the greatest knowledge possible to help forecast the future of learning. In doing so, it is the hope that the research conducted will make a worthy contribution to helping shape the future of learning and help securely establish and embed mobile- learning scenarios within our societies.

The results presented in this research give account that the research conducted for this doctoral study highlighted conclusively demonstrates that the future of learning is already here [2], it is increasingly becoming more mobile and that the innovative mobile technologies, services and practices associated with shaping how we learn now and in the future are not evenly distributed.

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Emerging issues in mobile learning: future scenarios for work based learning

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Abstract

This paper describes the scenarios generated in one of a series of discussion workshops exploring visions of how mobile and pervasive technologies and devices will influence the future practice of students and staff in Higher Education and Further Education. This particular workshop focused on work based learning for students on placement, for example in industrial, retail or health care settings. On reviewing the scenarios several themes could be seen to be reoccurring. These included:

- *mobile devices enabling 'just in time' and 'as and when necessary' learning or training;*
- *always on, affordable connectivity and power;*
- *an approach to teaching and learning that is more collaborative than didactic and*
- *the merging of personal and vocational information.*

The ethical and practical implications of these conclusions for teaching and learning will be discussed.

1. Introduction

This paper reports on a series of discussion workshops exploring visions of how mobile and pervasive technologies and devices will influence the practice of users in Higher Education (HE) and Further Education (FE) in the future. This workshop series was funded by the UK's Joint Information Systems Committee (JISC) as part of the Emerge Community within JISC's own Users and Innovation research programme. A discussion workshop is a recognised method of collaborative knowledge construction through discussion and debate amongst peers or experts. These workshops were run as part of the Bristol based research network "Adding a Mobile Dimension to Teaching & Learning" which is an established community of over 120 individuals, more than half of whom work in HE or FE. Its members include internationally respected researchers and practitioners in mobile learning. The research network itself focuses on handheld technologies such as PDAs, Smartphones, play stations and MP3 players and how they can support teaching and learning. The network has run interdisciplinary workshops at the University of Bristol since April 2006. Each workshop has been attended by 12 to 24 members.

Details and notes from previous discussions are available online at http://www.bris.ac.uk/education/research/networks/mobile/.

This current exploration focuses on the increasingly likely large scale use of mobile phones and MP3 players with the capability to record both video and audio by workplace based learners and associated staff in HE and FE. These devices have become well established throughout the student community and students to come will be even more experienced in their use. For example, older students in schools that ostensibly ban mobile phones are now regularly being allowed to 'video' special events or experiments in lessons to help them revise.

2. Method

The workshop leaders used established scenario development tools such as the Cognitive Foresight toolkit (OST, 2005) and Futures Technology workshop guidelines (Vavoula and Sharples, under review) to engage selected members of the 'Adding a Mobile Dimension to Teaching & Learning' community in a sequence of three workshops specifically to build and evaluate scenarios for future uses of mobile and pervasive devices (5 years hence) in the following sectors:

- Undergraduate studies in HE
- Work placement based learning
- 16-19 year olds in FE Colleges

These scenarios are now in the process of being collated and presented to the entire research network for evaluation in order to ensure the team have created a shared achievable and realistic vision for the future impact of these devices on each sector in terms of learning, teaching and research and on the users (academic and support staff and learners). This paper will report on the results of this exercise reflecting on the likelihood of the different scenarios arising and to suggest other concerns to be considered alongside the scenarios.

3. Initial Outcomes

Initial results envisioned by the group suggest the following three scenarios as potential ways forward in work placement based learning.

Scenario 1 – Projecting Handheld Device - This is a handheld device with inbuilt data projector that supports students' physical and biomedical science learning in workplaces such as pharmaceutical companies, healthcare settings, chemical industries etc with projection, multi-band communication and multimedia. The device is capable of receiving and sending any kind of information, from the universal WiFi connection expected in 5 years time. The tutor can send images etc to be projected on a nearby wall or table for group discussion in the workplace and the student can sketch out diagrams and capture images to send back their tutor.

Scenario 2 - Connecting Student Doctors - Handhelds are employed as part of a system connecting student doctors with experts and/or tutors. The scenario involves a consulting room in a hospital, with a student doctor and a critically ill patient. The trainee doctor uses a mobile device that will record and display video, the room has a PC next to the bed, and a wall mounted larger information screen for displaying patient information, such as X-rays, calendars and case histories. The student can use the PC to search databases etc for information. Using their handheld (which has facilities for speech to text conversion), they can record case notes that are automatically added to the patient's records. Or if necessary the trainee can use it to contact a more experienced clinician, and who can supply advice or information via voice and video.

The student uses this technology to record their experiences for later reflection which can also be shared with peers and stored as a learning object for future use.

Scenario 3 - Life Space – is likely to lead to the merging of personal and work-based learning experiences. This envisaged scenario is much bigger than an e-portfolio and includes work experience, academia, qualifications, competencies, case studies of the full range of things that you've actually done. Your mobile device will handle and transfer items to and from the life store silo and will remind you to record your learning whether at work, in an educational institution, touring or at home. The process will be multi input including voice. The device will help your learning as it responds to the way that you organise your work. With appropriate viewing permissions set, a university or college tutor or employer could view your life store to see or assess how you've worked at certain tasks, how you've handled situations etc.

4. Conclusions

Some themes are persistent when considering work based mobile learning in the future. These include:

- the device that enables 'just in time' and 'as and when necessary' training;
- always on affordable connectivity and power
- an approach to teaching and learning that is more collaborative than didactic and
- the merging of personal and vocational information.

Other suggestions such as mobiles with pico-projection are novel and their potential has yet to be evaluated seriously by the community. It is also interesting to note that, though the participating group was multi-disciplinary, use of mobile devices within science, particularly bioscience, underpins two of the three scenarios envisioned. The presenters of this paper will offer the audience the opportunity to reflect on and discuss these proposed ideas and scenarios.

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Mobility in mobile learning: have we only scratched the surface?

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Abstract

Mobility is at the heart of mobile learning, but we do not yet fully understand its implications. If mobility is ascribed, a priori, a positive value, then how does that influence our understanding of the potential of mobile learning? It is argued that we need to re-examine, in a mobile age, received wisdom concerning the educational value of movement and travel. It will be necessary to join up investigations of experiences of movement, migration and travel (real and virtual) with sophisticated understandings of the value and role of these experiences in learning. In an effort to focus the discussion, the paper considers two aspects of mobility: state-of-mind and site-specificity. It raises questions concerning how travel or movement more generally, might engage or expand the mind, and the significance of 'place' and direct experience in relation to learning. Some recent analyses of mobile learning focus on its 'site-specific' nature. As the field of mobile learning moves towards greater maturity, literal interpretations of 'site' as a physical space are being expanded to include more abstract interpretations, but at the same time there is still a need to be able to describe the contribution of physical experience.

1. The value of mobility and travel

> L'air du voyage induit une éthique ludique, une declaration de guerre au quadrillage et au chronométrage de l'existence…
>
> (Michel Onfray, Théorie du Voyage, 2007)

In his book expounding a 'theory of travel', Michel Onfray taps into the spirit of our age when he hints at the playfulness and rebellion associated with escape from everyday reality into a state of nomadicity through travel. Nomadicity can be a chosen way of life: an improved way of living, a diversion, an escape from reality. Some adopt nomadicity as part of their working life. One of the challenges of our age is to cater to the learning needs of individuals who have chosen to, or are obliged to move about and travel. For others nomadicity is a way of life they have been born into. Thus another challenge is to cater to the needs of traditional nomads, those who "have limited access to formal education because of lack of resources" (Ally, 2008, p.39), by rethinking how content is organised and accessed, and where interaction can be built in to enrich and develop the content.

Travel has always had a certain appeal and it does not necessarily require physical displacement. The traditional 'armchair traveller' is someone who, by simply reading books about distant places, vicariously enjoys or benefits from journeys undertaken by others, whilst avoiding the risks, costs and temporary discomforts associated with real travel. Armchair travel might engage the imagination but it lacks most of the sensory inputs and actual experiences that are considered

to make a great contribution to learning and are the basis for exchanges between travellers. The contemporary armchair traveller might use the internet to engage in a similar (though not identical) activity; virtual experiences are now available to further enrich that experience. Can these be considered forms of mobile learning? Can vicarious and virtual experiences develop new ways of thinking that will result in new attitudes and skills for mobile learning? What is the contribution of physical experience, in the moment and over a longer period of time?

The questions are interesting because they raise issues of how travel, or movement more generally, might engage or expand the mind, and of the significance of 'place' and direct experience in relation to learning. Furthermore, they invite us to re-examine, in a mobile age, received wisdom concerning the educational value of movement and travel.

When educational initiatives and applications of new technology are described in terms such as: 'flexible', 'open', 'collaborative' or 'inclusive', there is broad agreement that words like these evoke overwhelmingly positive aspirations. 'Mobile' is not quite in the same category of self-evidently affirmative terms or concepts; yet among those who are pioneering mobile learning, there may be a commonly-held assumption that 'mobile is good', and by implication, always being in one place (physically or metaphorically) is nothing to be proud of. Even the 'disruption' of traditional education, in part due to the use of mobile devices, may be presented in a positive light, as a release from what some might regard as the shackles of convention or tradition.

If mobility has been ascribed a positive value, at least in some quarters, then how does that influence our understanding of the potential or future of mobile learning?

2. Mobility and its corollaries

Mobility has been the subject of some theorizing. Within the field of ICT and mobile technology, Kakihara and Sørensen (2002) argued that mobility is not only about movement or travel but that it relates to "the interaction people perform" and should be considered within three interrelated dimensions: spatial, temporal and contextual. Building on these dimensions, and with a strong focus on learning, Kukulska-Hulme et al. (2009) give emphasis to the shifts of attention associated with mobile learning, such as shifting between different devices (e.g. laptop and mobile phone); between learning episodes, various topics and themes; and within social groups (in the classroom, the office, the family). A broad vision of mobility, embracing the nature of learning 'in a mobile age' and the dialectical relationship between people and technology has been outlined by Sharples et al. (2007). Traxler (2009) situates mobile learning in the context of evolving societies where learning is part of a process of transformation, with ubiquitous technologies playing a pivotal role.

It is beyond the scope of this paper to examine the concept of 'mobility' it in all its richness and complexity. Its web of interconnected meanings includes migrations of peoples between different countries, movement between social classes, new patterns of employment. Similarly, the relationships between a person's physical movement, brain function and learning (Koester, 2006), whilst interesting and relevant, can only be alluded to in passing.
Yet in the long run, it will be necessary to make connections between these disparate yet related fields of knowledge and research. It will be necessary to join up investigations of experiences of movement, migration and travel – real and virtual - with more sophisticated understandings of the value and role of these experiences in learning.

Mobility is at the heart of mobile learning, but we don't yet fully understand its implications. Laurillard (2007) has tried to pinpoint the factors that make mobile learning different from other forms of learning, concluding that it is "digitally-facilitated, site-specific" learning (p.156); she highlighted furthermore its positive effects on learner motivation. Many current examples of mobile

learning relate to well defined activities involving a particular physical 'site' (e.g. a museum, a geological site), or a choreographed journey between two or more sites (e.g. a project which spans learning in a classroom, in a city centre and in the home). We can argue that mobile learning that is initiated or sustained by learners themselves, connected with movement and travel but not necessarily with a specific 'site', is liable to fall outside a definition that describes mobile learning as being 'site-specific'. In support of this, the idea of 'learner-generated contexts' draws attention to 'space' as a learner-focused construct: 'a learner's mobile device and the social networking that surrounds it" (Cook et al., 2007, p. 58.). In Japan, the success of collaborative novel-writing by texting points to the role of mobile devices in supporting collaboration and creativity, raising questions as to how this popular activity relates to a sense of space or place. Ros i Solé, C. (forthcoming) argues for an orientation to mobile-supported language learning that situates learners in a variety of contexts and spaces and considers the "constant flow of experience and activities" that learners engage in, viewing mobile-assisted language learning as a site for meaning-making and social practice. It seems that as the field of mobile learning moves towards greater maturity, literal interpretations of 'site' as a physical space are being expanded to include more abstract interpretations – but at the same time there is still a need to be able to describe the contribution of physical experience, including movement and travel.

3. Concluding thoughts

As mobile learning becomes more pervasive, we need to investigate mobility in terms of identifying and tracking the educational value to be gained from movement and travel. Received wisdom holds that 'travel broadens the mind'. Will travel with a mobile device broaden the mind, shrink it, or have no effect whatsoever?

The paper thus invites discussion of the value we place on mobility in a world where technology potentially facilitates mobile learning, and the role of technology within it. For environmental reasons, and for reasons of equality of opportunity, mobility and travel may be perceived as a controversial topic. This gives even greater impetus to forging a more precise understanding of what is gained through physical mobility and travel, and the role of virtual counterparts. To understand mobility more fully, we also have to develop our understanding of complementary physical and conceptual notions of 'space', 'place' and 'site'.

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Active and inclusive m-learning by mobile phones

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WellWorks Oy

Abstract

This paper is mainly supposed to awaken fresh ideas and new point of views how do we see and comprehend learning while the flood of information is passing by. As far as I can see the current has been too strong at least for two decades to be controlled by any administrator or politican. Should we still fight back or is there another option left – what if we change our way how to carry out education. Today and tomorrow learning is more or less like floating in the endless river – yet it doesn't mean that one should be drifting like a log – not at all. It means using the enenergy, motion and chances that around and avaible for us. Teaching and education should be more making of exiciting opportunities visible, usable and beneficial for each individual more than telling what one should do and what not. All kinds of new technologies have been at all times inspiring educators but those have had just a minor effect in pedagogy or didactics. Why so? In my opinion that is because those tools have been until the end of last century more or less under control by the teacher. Now - that era may be over…

1. Active and inclusive m-learning by mobile phones

Goals

1. to make m-learning more effective, easy and enjoyable for all
2. to encourage educators to find new roles during the m-learning processes
3. to examine m-learning process and it's ownerships

2. How to define m-learning

First of all we have to look how do we see all the aspects of what we call learning while it's combined with letter m. I like to think that we should start by setting very trivial questions like: why, what, who, where?

Why (to speak about m-learning)?

The very first answer is in your pocket or handbag. We all carry cell-phones with us everyday, all the time, everywhere we go.

The second answer is in the air. We are enclosed by wireless communication all the time, almost everywhere we are.

The third answer is in side of us. It is in our nervous system - or maybe I should say - in our mind. Some scientists claim that we are social animals. So we are keen for acceptance by others, we like to communicate and make a better conception about our chances to survive and have success in all environments we are or are supposed to face.

What?

Let's make things easy. As far as we are humans we like avoid frustration, working and putting our efforts in vain. M-learning should be as easy as use of a TV remote control while we sit on our favourit couch and switch between channels in our living room. Today if we dare – we can see a mobile phone as the most important remote control device of our life.

Who?

Today we have open learning spaces for anyone to take part and gain benefit in one form or another. This is the direction we also need with mobile learning. Unfortunately most of the present day teachers are 'prisoners' of the past. They desperately seek full control of learning processes they provide.

And that is where we face the important question: who has the ownership of learning process? Is it the teacher or the student? The answer could be neither – the learning process is the sum of independed actions, interactions, conceptions, emotions and many other variables that are not controlled either by the teacher or the student.

Where?

The answer is simple and obvious – everywhere.

Learning has never been dependent on the certain place like a school, classroom or any other specific facility. Learning is and has been a skill of survival.

And then what?

Our conception about many things which are commonly attached with change of one's behaviour might have a slightly different meaning in the future. Change has always been and will be a resource for both culture and society to survive and develop. M-learning is already one part of that change. New techonogies and innovations like NFC se combined with m-learning will increase the speed of change.

M-learning is only a logical consequence of the development since we started to use interactive media for open sharing of information.

Like all the explorers of all kind and all times - we should be open, ready and willing to try out the limits of m-learning now and in the future – then we might discover some thing new and something benefical. Something that we shall learn later on.

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Mo-LeaP – The mobile learning projects database

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Abstract

This poster/demonstration aims to introduce Mo-LeaP - the mobile learning projects database (a service provided by the London Mobile Learning Group [LMLG] via www.londonmobilelearning.net/moleap), which is a public and free of charge online database for people interested in mobile learning practice and theories. Projects, applications, projects resources, and reviews of them can be submitted by users in order to make materials and experiences available to a broad audience, to encourage the implementation of mobile learning projects in different learning contexts such as school/college/university, family, workplace and everyday life etc., to enhance the replicability of mobile learning projects, and to contribute to sustainability in teaching, learning and research on mobile learning.

1. Introduction

Research on mobile learning is essentially related to the implementation of mobile learning projects in different contexts such as education or everyday life. Projects are characterized by different approaches to teaching and learning, locations, and a broad variety of technologies; also, they are dealing with mobile technologies as topic or they support their use as learning and teaching tools. As the rapidly emerging field of mobile learning originates a tremendous amount of mobile learning projects, the Mo-LeaP – the mobile learning projects database is conceptualized as a resource and tool for people who are interested in mobile learning, especially in sharing their experiences and projects with others, or in learning from already existing projects. The database – which is based on the idea of non-proprietary and collaborative knowledge building – aims to provide opportunities for the systematic gathering of practice,

- to distribute knowledge which was gained within such projects in order to make practice less ephemeral,
- to enable synergies,
- to contribute to sustainability in teaching, learning and research, as well as
- to enhance replicability of mobile learning projects.

The option to submit data in two languages, English and German, is provided in order to support knowledge transfer and scientific exchange between these two language communities. We hope that the potential for educational exchange and knowledge sharing, the innovative use of mobile technologies in educational contexts as well as support for learners and their technology-related cultural practices will be an incentive for teachers – and educational professionals in general – to either contribute to the database or to learn from projects. As the fast growing content of already

existing websites with resources (such as www.lehrer-online.de which is an established website and comprehensive database with projects for the use of digital media in school in general) attests, such resources are willingly accepted, frequented and contributed by teachers in order to find new ideas to inform their teaching practice.

The database does not aim to achieve technical innovation, but simply to provide straightforward functionality on the basis of design principles derived from principled conceptual work – documented in Seipold, Pachler and Cook's paper for the IADIS 2009 conference – in an attempt to facilitate the sharing of pedagogical practice. The conceptual and theoretical work is considered to be a particular strength of this database. Furthermore, the operators of the Mo-LeaP database and website are aware that it is the initiative and willingness of project holders to contribute, which makes such a database a flourishing and rich resource. Mo-LeaP, therefore, is conceptually in one line with the practices of web 2.0 communities, who are commonly producing contents in weblogs, forums and other kinds of community-based websites, and are thus providing a basis for collaborative knowledge building.

2. The Mo-LeaP database

In the context of some previous research projects, the author was confronted with the fact that even if there exists a tremendous number of mobile learning projects as well as other resources, no database could be found which provides a comprehensive overview over existing mobile learning projects or focuses on a standardized set of categories which would allow interested persons to search by certain strings for specific projects according to their specific (research) interest. With this in mind, the idea to build a mobile learning projects database evolved. During the conceptualization of the Mo-LeaP database there were two components which provided a basis for the database design: one was the current research of the LMLG, which aims to develop within an analysis framework around the notion of a socio-cultural ecology which allows for project descriptions and analyses independently of their location, context, methodology and aims, and thus a comparability between different m-learning projects. The other component refers to already existing databases and resources which served as a model for this project, such as www.lehrer-online.de, www.handysektor.de, www.klicksafe.de, www.handywissen.at or www.internet-abc.ch. Further comprehensive resources with mobile learning projects are provided by the kaleidoscope m-learning SIG (now: The International Association for Mobile Learning – IAMLearn; (http://mlearning.noe-kaleidoscope.org/projects/), the Futurelab m-learning literature reviews and handbooks (http://www.futurelab.org.uk/resources/publications-reports-articles) as well as by Becta (http://www.becta.org.uk/). Furthermore, proceedings of mobile learning conferences such as mLearn, handheld learning and IADIS are seen as valuable potential resources in this field. In order not to ignore the efforts and relevance of these resources, the operators of the Mo-LeaP website provide links to these resources and provide thus access to further references beside the ones available in the database itself.

2.1 Theoretical and methodological background

As noted above, the group behind this project, the London Mobile Learning Group (LMLG), is working on a theoretical and conceptual framework of mobile learning in which educational uses of mobile devices are viewed in ecological terms as part of cultural and pedagogical contexts in transformation. Such a notion of a socio-cultural ecology considers different components such as the learners' agency, appropriation and cultural practices, their everyday life and school contexts, and considers structures and cultural resources as potential links between different system components for the benefit of learners. Accordingly, the database is open to any projects with mobile media which have relevance to (different notions of) learning, in school as well as outside.

The LMLG's work originated a set of categories which aim to be applicable to research projects from inside and outside school, and which are providing the basis for the Mo-LeaP categories.

2.2 Website and database technology

The Mo-LeaP database is available via a standardized website which is written in html and php code, including some java-script. The pages can be displayed with all common web browsers including browsers operating on mobile devices. Due to current incompatibility issues with mobile browsers Mo-LeaP does not use Flash. Furthermore, the website does not use cookies. Also, no other third parity software such as media players is required. The database storage engine is MySQL version 5.0.32 (www.mysql.com). The data input and output is managed by PHP (www.php.net). In order to allow instant access to and linking of recent contributions to the database, rss feeds are provided which are automatically filled with newly submitted resources. This feature provides information which is automatically sorted and outputted by specific topics (e.g. the latest projects, applications, reviews, resources).

2.3 Categories for project descriptions

The following categories, which are a product of the LMLG's research on mobile learning and socio-cultural ecology, were designed for project descriptions. The structure of the database might be helpful to colleagues planning mobile learning projects in terms of flagging key considerations to be attended to, in addition to fostering shareability by providing a common 'language' (soft ontology).

Contributors will have to follow a multi-step online submission process. Besides personal data for identification and authentication, the following information is either required or optional for the project submission (as projects are considered to be the core part of the database, the submission of applications, resources and reviews is omitted at this point due to space limits). An online help is specifying fields as necessary in order to provide orientation for contributors:

- General project data:
  Language of the following project description; Project Name; URL; Country; Year; Project owner and copyright holder; Contact; Partners; Project workers; Language in which the project was conducted; Types of mobile devices; Further media; Number of learners involved; Number of teachers involved; number of supporting staff; Role of supporting staff; Duration; Location; Location latitude; Location longitude; Educational establishment; Phase of education; Subject domain; Teaching/ learning focus; Tags/ keywords; Optional text field.
- Context/ rationale:
  background information, i.e. how many persons, type of educational establishment, duration, devices used, technical support etc., learning and teaching aims, envisioned role of mobile devices.
- Approaches to teaching and learning:
  how are the devices used; key activities, key tasks, key pedagogical/ 'didactic' issues.
- Technologies and requirements:
  interoperability, storage, usability etc.
- Project outcomes
- Lessons learnt/ issues emerging
- Recommendations and future possibilities

- Replicability and transferability
- Optional: recommended literature and references
- Optional: project analysis

Beside project descriptions, project and literature reviews, mobile applications and services can be submitted, as well as links to external resources. As Mo-LeaP is a resource for education, teaching and learning, all submitted data – projects, applications, reviews and links – are reviewed before they appear on the database in order to avoid abuse and violations, and to ensure high quality standards. As the Mo-LeaP database is a public and non-profit open resource, the Mo-LeaP operators and designer are copyright holders of the Mo-LeaP website and database only, using the creative commons framework (http://www.creativecommons.org), whereby the copyrights resp. the responsibilities of the submitted projects, applications, reviews and resources stays with the contributors. Searches can be carried out either via pre-given categories that apply to the category scheme outlined above, or via freely chosen search strings.

3. Conclusion

This project is seen as an effort to provide a rich resource for mobile learning experiences in order to allow researchers and practitioners from all over the world an easy access to projects and respective resources. The categories for project descriptions might assist others in planning mobile learning projects, and enhance replicability and transferability of projects by providing a common basis. The database hopefully will be able to support educators with the implementation of mobile media and m-learning projects in any educational context. Also, it aims to contribute to sustainability in teaching, learning and research, as well as to enhance the dissemination and replicability of mobile learning projects.

Acknowledgement

My thank goes to the Centre for Excellence in Work-Based Learning for Education Professionals (WLE Centre) at the Institute of Education (IoE), University of London, which is funding the project *"And don't forget to bring your mobile" – Informing educational target groups about mobile learning opportunities* (project holder: Judith Seipold) of which the Mo-LeaP database is part.

Also many thanks to Klaus Rummler, PhD student and academic and project manager at the University of Kassel, who invested much time in the technological implementation of the database; to those who contributed to this project by providing the theoretical background; as well as to those who took the time to submit their project data for test runs and contributed with their comments to the improvement of the usability of the website and database.

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call for manuscripts

work-based mobile learning: concepts and cases

a handbook for academics and practitioners

Edited by
Norbert Pachler (Institute of Education, London)
Christoph Pimmer (University of Applied Sciences Northwestern Switzerland, Basel)
Judith Seipold (University of Kassel, Kassel)

Published by Peter Lang, Oxford

Mobile learning is a rapidly expanding field. Its growing importance is reflected for example in the rising number of conferences and journals. Mobile phones were identified in the Horizon Report (2009) as the technologies with the highest likelihood of entry into the mainstream of learning-focused institutions within the next year. Issues surrounding mobile learning in work-based contexts have only been marginally covered to date despite the potentially huge impact of mobile technologies on supporting work-based learning activities.

Against the background of an increasingly mobile workforce, technological innovations and a changing corporate learning landscape, the central question of this book will be how mobile devices can be used to support work-based learning.

The editors welcome chapters on theoretical frameworks, concepts as well as latest empirical results in the field of work-based mobile learning. The aim is to provide innovative approaches of how mobile devices can encourage work-based learning activities. Contributions can relate to placements as part of education courses, to (semi-formal) on-the job training provided within organisations or to the manifold forms of informal and incidental learning experiences at the work place. Also, contributions, which consider life-long learning as a sustainable basis for work-based learning and critical reviews of cultural implications of work-based learning, are welcome.

Topics of interest in the field of mobile work-based learning include, but are by no means limited to:

- collaboration,
- mentoring, coaching & facilitating
- creation, reflection and sharing of learning materials,
- assessment methods,
- contextualisation and personalisation of content,
- location awareness,
- performance support,
- just-in-time learning.

Key dates

April 27, 2009:
First deadline for expressions of interest in the form of a 250-500 word abstract to the editors c/o christoph.pimmer@fhnw.ch

May 18th, 2009:
Notifications of invitations to submit a chapter / notification of rejection.
Two further calls will be issued (June, November 2009).

January 4, 2010:
Author deadline for submission of completed manuscripts of around 5,000 words.

February 1, 2010:
Editor deadline for reviewing chapters and returning comments to authors; each contribution will be sent to two referees for double blind peer review.

February 26, 2010:
Author deadline for making revisions and submitting final chapters.

September 2010:
Expected publication date.

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