Mobile learning:
Crossing boundaries in convergent environments

21-22 March 2011, Bremen, Germany

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editorial

Editorial

About Mobile Learning

The current transformations in social and technological structures, changing cultural practices of learning as well as changing institutional cultures pose new challenges for learning - be it institutional (e.g. school, university) or work-based, formal or informal. Mobile, networked media play an increasingly important role for meaning-making and appropriation in users' life-worlds which calls for new understandings in, and approaches to formal learning.

As mobile devices offer flexible access to the Internet and communication tools for learning within and outside of the classroom, and as they support learning experiences that are personalised as well as collaborative, accessible and integrated within the world beyond the classroom, mobile learning can open up new contexts for learning, with ubiquitous connectivity allowing interactive and connected learning in school and university, in the workplace, in the home and in the community. As for technological developments, mobile and networked technologies and devices become increasingly powerful, the rise of an 'app culture' marks a large commercial market, driving a new wave of creativity in the design of learning applications.

Research on mobile learning is reacting on these changes and opportunities inherent since recent years already and is focusing - by engaging in project orientated research as well as theory building - technological developments and pedagogically informed approaches to use and design of mobile technologies. Also industry and politics are paying more and more attention to the filed of mobile learning. Not at last the the considerable sums of research funding being available in German speaking countries, in particular Germany and Switzerland, gives evidence to this.

About the conference

The 'Mobile learning: Crossing boundaries in convergent environments' Conference, taking place in Bremen (Germany) from Monday to Tuesday, March 21st to 22nd, 2011, builds on a series of mobile learning research symposia hosted by the WLE Centre for Excellence at the Institute of Education, University of London between 2007 and 2009. The conference, to which people from all over the world are contributing - will focus on the challenges of developing new pedagogic approaches and on the potential of mobile devices for learning in formal and informal contexts.

As mobile learning is not only about learning with mobile technologies, but also considered to be "new" learning, the conference will look, too, at challenges for research and practice in understanding the changing social and technological structures allowing the use of technology for learning that are present in our personal lives, in school and in work places. Thus mobile learning crosses the boundary of institutional learning and looks at school and formalised learning as well as to practical fields like work-based learning and everyday life. Also, the conference will glance at the latest developments in hardware and software which can support personalised learning.

By focusing on theory and practice, development and use, teaching and learning, formal and informal contexts, the 'Mobile learning: Crossing boundaries in convergent environments' Conference will offer spaces for researchers, practitioners, developers, the industry and policy makers to exchange ideas, experiences and research around issues and approaches to mobile

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learning, including sociological and educational issues and their effectiveness and desirability as learning spaces as well as the design of environments. To allow exchange amongst the participants, the conference features many un-conferencing formats in order to encourage people to step into discursive communication and conference culture.

About the book of abstracts

This book of abstracts includes most of the presentations, posters and workshops accepted for the MLCB conference. It intends to provide participants a quick access to contents provided during the two-day event.

As the structure of the book may give evidence to, the quantitatively most dominant aspect is the one of mobile learning practice. It covers issues relevant to medical learning, higher education, work-based mobile learning and learning in schools by using mobile devices. But also the theory is strongly represented. The contributions point to issues that are able to support mobile learning and include research questions concerning practical implementation, infrastructural aspects, technological equipment, evaluation and teaching and learning settings. The potential of learners' agency, theories to analyse and to plan mobile learning settings, as well as critical perspectives on mobile learning will be presented and discussed. Aspects of learning support, identity formation, aesthetics, the use of different modes and media for mobile learning and aspects relevant for software design are part of the set-up as well as topics pointing to development and special needs areas.

The contributions accepted promise to be a strong basis for interesting and fruitful discussions and will hopefully give incentives for the further development of this discipline.

Bremen, March 2011

The editors
Klaus Rummler, Judith Seipold, Eileen Lübcke, Norbert Pachler, Graham Attwell

about the London Mobile Learning Group

About the london mobile learning group

The London Mobile Learning Group (LMLG; www.londonmobilelearning.net), of which many of the conference organisers are members, is an international interdisciplinary group of researchers from the fields of education, cultural and media studies, (social) semiotics, pedagogy, educational technology, work-based learning and learning design. The group is especially engaged and spearheading efforts in theory building in the field of mobile learning internationally. Thus, since 2007, a strong international group of scholars has formed which meets regularly and which has developed a theoretical framework for mobile learning around the notion of a socio-cultural ecology (see Pachler, Bachmair and Cook (2010): Mobile Learning. Structures, Agency, Practices). The LMLG currently inter alia works on the validation of its socio-cultural ecology through research of mobile learning projects in school and other settings (educational and medical) as well as in the area of work-based learning.

Previous events on mobile learning which were preceding this conference and on which the MLCB conference builds in format and intellectual trajectory, were research symposia organised by the LMLG at the WLE Centre, IoE London. They were thematically orientated around new approaches to mobile learning, 'Research methods in informal and mobile learning' and 'Mobile learning cultures across education, work and leisure'. Some of the conferences resulted in publications (e.g. Vavoula, Pachler, Kukulska-Hulme (Eds.) (2009): 'Researching mobile learning: frameworks, tools and research designs' as well as Pachler, Pimmer, Seipold (Eds.) (2011): 'Work-Based Mobile Learning. Concepts and Cases').

Beside these events, members of the LMLG presented the group's work at some of the most important events around mobile learning and education. For instance, the LMLG organised a number of workshops, for example at the DGfE conferences in 2008 ('Mit dem Handy-Alltag der Jugendlichen Schulkultur transformieren – Mobile Learning als pädagogische Antwort auf die Diversifizierung von Bildung) and 2010 (Individualised mobility as cultural resource: harnessing the 'mobile complex' for participatory learning) as well as the 2009 2nd Alpine Rendez-Vous Stellar workshop (Technology-enhanced learning in the context of technological, societal and cultural transformation). Also, LMLG had workshops at CAL and AERA conferences in UK the USA.

Current publications include two special issues of the International Journal of Mobile and Blended Learning (IJMBL) that emerged from the workshop at the 2nd Alpine Rendez-Vous, as well as a Special Issue of "MedienPädagogik: Zeitschrift für Theorie und Praxis der Medienbildung" (Themenheft 19: Mobile learning in widening contexts: concepts and cases, edited by Norbert Pachler, Ben Bachmair and John Cook).

Information about the LMLG and their activities is available at www.londonmobilelearning.net.

section 1 - theoretical inputs on mobile learning

Providing scaffolding by using mobile applications in connectivist learning environment

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Abstract

According to Siemens (2008) connectivism is the new paradigm for learning. Furthermore learning is a network formation process of connecting specialized nodes or information sources. The ability to see connections and recognize patterns and make sense between fields, ideas, and concepts is the core skill for individuals today. In this changing learning environment learning support should be reviewed. This study reveals traditional forms of Vygotsky's 'scaffolding' concept based on the connectivist perspective. The study discusses the use of mobile applications in instructional scaffolding for learners to learn in a network, social scaffolding for them to exist in a network, technical scaffolding to assist their utilization of tools belonging to the network society, and administrative scaffolding to allow them to manage their educational process in this informal mechanisms and learning environment by using the mobile applications.

Keywords

Connectivism, scaffolding, mobile learning, mobile applications, theory

1. Connectivism

The theories of behaviourism, cognitivism, and constructivism provide an effect view of learning in many environments. However, learning moves into an informal, networked, technology-enabled arena (Kesim & Ozan, 2010). Connectivism is a learning theory for the digital age (Siemens, 2005). According to Siemens (2005), connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Furthermore, learning is a process of connecting specialized nodes or information sources and a learner can exponentially improve their own learning by plugging into an existing network.

2. Scaffolding and Learner Support

Scaffolding is a metaphor to describe and explain guiding learning and development processes (Verenikina, 2003). It is an umbrella term to describe " the way that teachers or peers supply students with the tools they need in order to learn" (Jacobs, 2001, p.125).

Scaffolding is an instructional strategy in which the external support is provided to the learner in person or through artifacts to enable achievement of learning goals and tasks within the zone of proximal development until the learner can independently perform the task (Kebaetse, 2010). Basic properties of scaffolding as follows:

- The scaffolds facilitate a learner's ability to build on prior knowledge and internalize new information (Vygotsky, 1978).
- When a student is at the ZPD for a task or concept, providing the appropriate scaffolding will give the student enough of a "boost" to achieve the task.
- It is very important to allow the student to complete as much of the task as possible, unassisted.
- Once the student has mastered the task or concept the scaffolding is removed and the student will then be able to complete the task on their own (Vygotsky, 1978). Scaffolding is temporary and usually task-oriented guidance which is especially provided to learners with a 'just-in-time',' 'just enough,' 'just-for-me', 'just-in-case' approach.
- Scaffolding can be provided by an instructor, peer or course material.

Since 'scaffolding' is a kind of support or assistance to learners with a 'just-in-time',' 'just enough,' 'just-for-me', 'just-in-case' approaches; it has usually been used in face-to-face education till recent years. In distance learning environments 'learner support' strategies are used. Berge (1995) proposes a widely used classification of supporting activities for online education under four categories: pedagogical, social, managerial, and technical. Berge's categorization for online learning is actually applicable for scaffolding in mobile ecosystems. According to Berge, the pedagogical role concerns the teacher's contribution of specialized knowledge and insights to the discussion, using questions and probes to encourage student responses, and to focus discussion on critical concepts. He states that successful online teaching requires a friendly social environment. Hence the social role concerns promoting human relationships, affirming and recognizing students' inputs, providing opportunities for students to develop a sense of group cohesiveness, maintaining the group as a unit, and helping students to work together in a mutual cause. The managerial role concerns organizational, procedural, and administrative activities. This role involves providing objectives, setting timetables, setting procedural rules and decision-making norms. The technical role concerns responsibility for ensuring participants' comfort and ease in using the network system.

As a consequence of connectivist paradigm distance and face-to-face education are converging. We can combine learner support strategies of distance education and scaffolding strategies of face-to-face education in connectivist learning environment. Within this context for mobile and networked learners we can provide:

- Instructional scaffolding to learn in a network,
- Social scaffolding to exist in a network,
- Technical scaffolding to assist utilization of tools which belong to the network society, and
- Administrative scaffolding to allow them to manage their educational process in this informal mechanisms and learning environment.

3. Providing Scaffolding by Using Mobile Applications in Connectivist Learning Environment

According to Vygotsky social interaction plays a fundamental role in the process of cognitive development. This is the intersection point of scaffolding and connectivism. Mobile technologies provide us an opportunity to provide 'just-in-time,' 'just enough,' 'just-in-case', 'just-for-me' help, in

other words scaffolding, to learners without the constraints of tightly delimited physical location. Mobile scaffolding is the provision of this type of support via mobile applications listed below:

- Mobile Productivity Applications
    - To-do Lists and Notes
    - Calendars and Reminders
    - Checklist and Rubrics
    - Quiz
    - Portfolio
- Mobile Social Media
    - Mobile blogging
    - Mobile photo blogging
    - Mobile video blogging
    - Mobile voice blogging
- Mobile Bookmarking and Social Tagging
- Mobile RSS
- Mobile Social Networking
    - SMS Messaging Networks
    - Friend/Community Networks
    - Personal Content Networks
    - Location-Based Social Networks
- Mobile Maps Applications
- Augmented reality applications with social interaction
- Podcasting (Student generated via mobile device)
- Vodcasting (Student generated via mobile device)
- Mobile 3D
- Mobile Games
- Mobile Learning Management System

Type of Scaffolding	Strategy	Mobile Applications
Administrative scaffolding Aim: To help student to manage his/her own learning in connected environment	Encourage planning / organization	Mobile calendars and reminders
	Encourage student to monitor himself/herself	Mobile checklist, rubrics, quizzes
	Encourage self-evaluation	Mobile quizzes
	Encourage peer review	Mobile Bookmarking and Social Tagging
Instructional Scaffolding Aim: To help students to learn in a network	Foster just-in-time review & sharing	Podcasting
	Encourage brief information sharing	Mobile microblogging
	Promote multisensory learning and sharing	Mobile photo, video and audio blogging
	Aggregate information	Mobile RSS
	Improve access to resources	Mobile RSS, Mobile social tagging & bookmarking
	Promote idea formation and sharing	Mobile forums
	Encourage individual thought and reflective activities	Mobile blogging
	Foster collaborative writing	Mobile Wiki
	Show cases	Vodcasting
	Provide course content on mobile devices	Mobile learning management system
Social Scaffolding Aim: To help student to promote human relationships and work together	Promote to guide and help others	Mobile collaboration
	Encourage to cooperate with others	Mobile collaboration
	Encourage to negotiate with others	Mobile forums
	Foster sense of presence	Mobile friend/community networks
	Support community-building	Mobile social networking
	Enhance collaboration	Mobile social tagging & bookmarking
	Mobile social networking	
Technical scaffolding Aim: To ensure student's comfort and ease in using the system	Provide How-to's	Mobile learning management system
	Provide showcases	Vodcasting
	Provide FQAs	Mobile learning management system

Table 1: Scaffolding by Using Mobile Applications in Connectivist Learning Environment

4. Conclusion

This study reveals traditional forms of Vygotsky's 'scaffolding' from the point of connectivism, Berge's learner support approach and mobile applications. Mobile technologies provide us an opportunity to provide 'just-in-time,' 'just enough,' 'just-in-case', 'just-for-me' help, in other words scaffolding, to learners without the constraints of tightly delimited physical location. Hence we can use mobile applications in instructional scaffolding for learners to learn in a network, social scaffolding for them to exist in a network, technical scaffolding to assist their utilization of tools belonging to the network society, and administrative scaffolding to allow them to manage their educational process in this informal mechanisms and learning environment by using the mobile applications.

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It's not what you know but the device you know: The influence of ownership on appropriation of mobile devices for learning on field trips

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Abstract

This paper proposes that the kind of ownership over a mobile device a learner experiences may determine how they appropriate that device is for learning. It describes field observations of three different kinds of ownership (borrowed, partial & personal) and how they changed the learning experiences of the students on Masters level geoscience field trips. It uses work by Pachler et al. (2010) on appropriation to inform this analysis. The research found that the rapid uptake in ownership of smart devices might mean personal devices replace institutional teaching devices to support and enhance learning in this setting. Therefore planning for technology enhanced learning (TEL) in similar future settings might benefit from considering how personal devices might be appropriated and so enable practitioners to exploit this change in cultural practice. It may be that providing more blended opportunities for learning which draw upon the different types of ownership could allow learners the choice and ability to appropriate the technologies (both personal & institutional) for their learning needs.

Keywords

Appropriation, Ownership, Institutional mobile devices, Personal mobile devices, Field trips

1. Field trips and ownership of mobile devices

There currently runs a contentious debate surrounding institutional vs. personal mobile devices. This paper does not attempt to fully address such a wide-ranging and complex issue but provides some evidence that, in settings that enable choice, learners are favouring personal devices over institutional ones. It discusses an emergent theme; ownership and its influence upon appropriation for learning. This stems from the ongoing analysis of ethnographic observations during three residential geosciences field trips, two in the UK and one international. Each employed the use of mobile technology that incorporated Global Positioning Systems (GPS) for field data collection (Beddall-Hill & Raper, 2010). A selection of GPS devices was provided for the students to use ranging from simple trackers to more specialized equipment. A total of 26 students attended the three trips. The common demographics were: mature, male, international students looking for career change or progression.

The field trip setting is a highly complex semi-formal learning environment. The implicit learning aim is to experience the processes of conducting research or work-related activities in the real world. These trips allowed the observation of small groups of postgraduate students engaged in joint knowledge construction and mediation with the natural world via mobile technologies. Within this setting the tutor, learner, curriculum and device create a complex web of intersecting formal educational, natural and social worlds. This creates a rich picture from which to draw lessons about the use of technology in fluid contexts.

Mobile methods including the use of a head mounted camera (See Beddall-Hill, 2010) and researcher's iPhone were used to gather a variety of data on the students interacting with and around the institutional devices (often one device shared within the group). The author witnessed three types of ownership over mobile devices during these field trips namely 'borrowed', 'partial' and 'personal'.

1.1 'Borrowed'

During case one the students were not in charge of the advanced GPS devices. They experienced limited ownership hence these became 'borrowed devices'; with duties such as charging and maintenance undertaken by the lead lecturer. A device deemed suitable for the task was given to the group at the start of their projects and they 'borrowed' it until the end of the project. They owned simple GPS trackers and received prior training prior to the trip. They were also introduced to the advanced devices, but the students commented they had not 'had the opportunity to play with those devices' and some distance students had not encountered them before.

1.2 'Partial'

In case two there was wider variety of technology present and the implicit aim was learning to use it. Each group was given a set of four devices that they were in charge of during the trip (partial ownership). Other more specialist devices were introduced depending on the project. They were given one day training before data collection and were able to compare the devices' strengths and weaknesses. By the end of the trip the students had more trust in certain devices and had developed attachments to them perhaps as they spent more time in charge and 'playing' with them.

1.3 'Personal'

In case three the lecturer's Smartphone was used as an institutional device and several of the students used their own Smartphones (particularly iPhones) to capture media and collect GPS track logs alongside the institutional devices. During this case they appropriated their own personal technology for data collection, as they trusted and seemingly preferred it to the institutional devices.

2. Appropriation

Pachler et al. (2010:2) as part of their socio-cultural ecology theoretical model, propose "a view of school as cultural practices of teaching and learning into which the cultural practices of the use of mobile devices and their applications in everyday life need to be assimilated." It would seem that in case three this assimilation has begun to take place and is largely orchestrated by the learners. The use of the 'borrowed' lecturer's Smartphone may have influenced their perceptions of what technology is appropriate and trustworthy. However these students had prior social structures surrounding the use of their own devices as GPS trackers and data collection tools. They transferred those experiences from an informal to a semi-formal learning setting and with the agency they had over their personal devices, created new practices. This is illustrated by them downloading applications, using 3G to search references, find documents and check weather reports. They also used the phone's GPS capabilities if the other trackers where low on battery. Therefore they appropriated both the borrowed and personal devices to suit their learning needs at that time and crossed the boundary between the social media complex and its use in learning. However the mobile phones present in previous cases were mainly used for social communication only. The factors that underpin such a decision may be numerous; cost of data roaming abroad or lack of access to smart devices and the existing attitudes of staff and students to the use of personal devices for learning. This could be explored further using the observations to identify the conditions

that enable and inhibit the use of personal devices but ultimately it would be difficult to generalize from small cases, as is an overall limitation of ethnographic research. However the depth at which it allows researchers to explore social interactions remains invaluable.

3. Implications and future directions

Mobile technology is developing at a rapid pace, making it impossible to future-proof institutional teaching devices. Where as students in UK higher educational contexts are increasingly likely to own a Smartphone. Therefore integrating the student's devices could prove beneficial where the situation, institution, devices and consent allow. It may be that blending the use of teaching and personal devices might be most appropriate and beneficial solution at this present time. This could reduce the shortcomings of the different types of ownership and allows choice for the students in their learning needs and tool choice. In the near future this area will continue to evolve but towards which model of ownership (institution or personal) remains undecided. In the meantime this research will continue to explore the influence of power and trust related to ownership and appropriation in this setting.

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A critical perspective on mobile learning: Results of a heuristic analysis of the scientific process and a hermeneutic analysis of mobile learning practice

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Abstract

Educational and pedagogic research on mobile learning is about ten years old. Over this time the scientific process can be split into three phases, which reach from (1) research on practice via (2) the application of existing learning theories to (3) the generation of new theoretical and conceptual frameworks for mobile learning. With a view to the different lines of development within these phases it becomes evident that there are e.g. attempts not only to understand what mobile learning is, but also to demand changes in the educational system. The latter refers not least to a process of democratisation of learners and learning that is about to take place.

Focussing on mobile learning practice, ambiguities and contradictions in the use of mobile devices in learning contexts appear. They stand in contrast to what research on mobile learning suggests, e.g. ad-hoc use of mobile devices, collaborative learning, the crossing of conceptual and local contexts etc. On the other hand, practice also suggests the power of learners being able to create new learning spaces and concepts as well as implementing multimedia and multiple modes into school learning that replace the written text as dominant mode for learning.

The paper will outline the scientific processes of the mobile learning field with a focus on the educational and pedagogic developments in mobile learning taking place in the UK and in Germany. The results deriving from this heuristic and hermeneutic analysis will be reflected critically in order to reveal 'pseudo' changes and 'success stories' in the use of mobile devices for learning, as well as the potential of such a discussion.

Keywords

mobile learning, theory, practice, scientific process, analysis, qualitative heuristics, objective hermeneutic, dialectics of practice

1. Structure of the scientific process of the educational and pedagogic research on mobile learning

The development of the scientific mobile learning discussion in the UK over the recent years resulted in the autonomy of the discipline in the educational and pedagogic field.

Referring to categories of a qualitative heuristic method, the process can be described in terms of social and cultural contexts of the mobile learning discussion (i.e. related disciplines such as sociology and e-learning), the social practices constituting the mobile learning discussion (i.e. lines of argumentation, concepts, definitions), and the developing process characterising the mobile learning discussion. The latter consists of three phases each of which is characterised by lines of

development. Whilst the phases are structured by time, the lines of development can be seen as characterising the respective chronological phases. In addition, the lines of development are describable as approaches and fields of research that are persisting independent of time.

Phase 1: Explorative, technology-centred and practical implementation: Phase one can be described as explorative. Mobile devices were installed in educational settings in order to see how mobile technologies allow for changes in teaching and learning processes. The discussion was very much technology driven.

Phase 2: Application of existing theories and conceptual frameworks: The second phase focuses on the application of existing theories and conceptual frameworks such as Activity Theory (Engeström, 2001, 2005) and the Conversational Framework (Laurillard, 2007), as well as on personal (Green, Facer, Rudd, Dillon, & Humphreys, 2005), collaborative and situated learning (Lave & Wenger, 1991) with the aim to explore dynamic processes around formal and informal learning and knowledge building.

Phase 3: Building of theories and conceptual frameworks: The third and most recent phase is structured by attempts to build theories and conceptual frameworks, e.g. the socio-cultural ecology of mobile learning (Pachler, Bachmair, & Cook, 2010) or the "Theory of mobile learning" (Sharples, Taylor & Vavoula, 2010). Now, the learner is seen as standing at the centre of his/her learning processes. Against the background of the construction of theoretical and conceptual frameworks, the role of the devices is becoming less important. Instead, the social/societal framework and the learners' expertise, agency and cultural practices are gaining importance. Mobility is no longer defined through the devices, but through the learners' abilities to act flexible in ever changing and self-constructed learning contexts.

2. The dialectics of mobile learning practice

The analysis of mobile learning practices in school contexts was realised according to categories that were developed against the background of the socio-cultural ecology of mobile learning (Pachler, Bachmair & Cook, 2010). Focusing on the actual use of mobile technologies and convergent media it became evident that learning with mobile devices does not necessarily foster ad-hoc, collaborative, personalised, self-directed and innovative learning. In most cases, the teaching design is pre-structuring the use of the devices and thus limits in consequence the potentials inherent in the use of mobile technologies for learning. Here, mobile learning appears as old wine in new bottles. In case teachers are providing spaces to learners to act according to their expertises, interests, agency and cultural practices, innovative use of the devices and the generation of contexts by learners can be discovered. Here, user-generated contexts are a fruitful concept to frame mobile learning and to approach the design, the use and the analysis of mobile learning.

3. Methodology: qualitative heuristics and objective hermeneutic

The scientific process of the mobile learning discussion was carried out by using a qualitative heuristic method (see e.g. Kleining & Witt, 2000; Krotz, 2005). This 'discovering' method means that the analysis intends to bring aspects to the foreground that are inherent in the discussion. By referring to key components of this method, the following aspects were considered in order to allow for the caption of this phenomenon: the development process, social practices relevant for establishing the discussion, the contexts in which the field was raising and the meanings deriving from the development process.

As for the analysis of mobile learning practices, a hermeneutic analysis was undertaken. Hermeneutics is an interpretative method, which means that the scientist interprets phenomena

according to his or her research questions, the theoretical background he or she is using and his or her 'preferred reading patterns'.

Together, the heuristic and the hermeneutic analysis of the mobile learning field allow for conclusions that are able to describe and understand the field according to its structure, elements, development lines and their relation to each other as well as for tendencies and contradictions. The aim is to not only to be able to characterise the field, but also to point to discrepancies and thus aspects that need to be considered for further research and the development of the mobile learning field.

4. Results: Mobile Learning is governed by political demands, contradictions in practices and innovative potentials

From this perspective mobile learning is not only about learning but also – and more generally – about politics and the need to understand the school system, learning and the roles of teachers and learners in the context of current changes of mass communication and society. However, having a look at the mobile learning practice, there are several issues that are standing in contradiction with what research and theory development suggest. In fact, a lot of 'pseudo'-opening is taking place which makes mobile learning often appear as old wine in new bottles. This applies for example to features of mobile devices such as the ad-hoc access to and distribution of information, to the teaching design that can reduce learners' activities with mobile devices to behaviouristic learning instead of supporting constructivist learning, or to situated learning that can become gathering of information through the use of convergent media such as platforms. Besides, and this is part of the dialectics of mobile learning, there are real enhancements and innovations taking place in the use of mobile devices which are on the one hand achievements of the learners themselves, and which might on the other hand result from what is described as "pseudo-opening" above. Former are related to the use of modes of representation as well as the learners' creativity. Also, learners revise existing structures, connect them and established new ones in order to create their own convergent learning spaces and "learner-generated contexts" (see e.g. Cook, 2010). Latter provide structures for equal access of information and discursive engagement in learning materials.

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Longitudinal, educational design research investigation of the temporal nature of learning: Taking a Vygotskian approach

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Abstract

The nature of learning is being augmented by new digital tools, particularly by mobile devices and the networks and structures to which they connect people. In this paper I examine: (i) the powerful perspectives on learning and development put forward by Vygotsky, (ii) an evolutionary educational design research approach, and (iii) notions surrounding the temporal nature of learning. Specifically, this paper presentation will focus on exploring my research from the present, in order to propose some preliminary thoughts on the nature of what I am calling Augmented Contexts for Development (Cook, 2010a; Cook 2010b); an extension of Vygotsky's Zone of Proximal Development (Vygotsky, 1978 / 1930) that takes into account the characteristics of 21st Century mass media structures, agency and practices.

Keywords

mobile learning, theory, practice, Vygotsky, Zone of Proximal Development, Design Research, Augmented Contexts for Development

1. Key concepts of Vygotsky

Vygotsky (1978/1930, p. 90) proposed "that an essential feature of learning is that it creates the zone of proximal development; that is, learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. Once these processes are internalized, they become part of the child's independent developmental achievement." The implication of Vygotsky's line of argument on internalization and child development was, and continues to be, important in terms of learning from childhood onwards: it is not the learning object that is ruling the learning, but the student's development, i.e. the phases within a student's development, the so-called "zones of proximal development", in which the student is susceptible to internalizing learning objects. As can be seen from the above quote, this process relies on interaction with people. Learning awakens, and can set in motion, a variety of internal developmental processes (culturally organized psychological functions) that would be impossible without learning. Thus, there is a temporal role for learning as a hook that pulls developmental processes into the future of what is possible.

2. Evolutionary educational design research

Plomp (2009) has recently summarized 'educational design research' as addressing complex problems in educational practice. Educational design research tends to have interventionist characteristics, is process oriented and contributes to theory building (Plomp, 2009, p. 17). Indeed, educational design research is context bound in nature, which means generalizations from this type of work tend not to be context-free. However, Design Researchers do strive for generalisable design principles whilst generalising to a broader theory (Plomp, 2009, p. 33). Consequently,

we can conclude that the emerging educational design research approach provides a frame or lens through which we can examine the unique affordances of mobile learning. What educational design research in my own work is that we need to consider repeated cycles of: empirical work, theory/model development and tool development. These particular aspects are typically conceived as overlapping activities and phases (rather than as sequenced 'steps'); this is illustrated in Cook, 2002.

3. Temporal nature of learning in augmented contexts for development

The aims of the case study presented here was to (i) support archaeology students as they engage with a contextualised, historical account of the units that contribute to the construction of a Cistercian Abbey in Yorkshire, UK, and (ii) provide rich mobile-phone based visualisations and video blogs to augment archaeology students' learning whilst on a field trip. A qualitative analysis of video data of students interacting with a mobile phone-based tool (Cook, 2010b) appears to illustrate that the 'co-constructed area' linking the physical world (i.e. what is left of the Cistercian Chapels in the field trip under examination), and the virtual world that is visualised in 3D on the mobile devices is inhabited by a shared representations or what Vygotsky called a 'time field' (1978/1930, p. 35-36) that is jointly owned by the students, and that this appears to indicate development and learning. This qualitative analysis has enabled a re-examination of Vygotsky's notions on perception and attention in an attempt to conceptualise what it is we are observing in this sample interaction. I have termed this whole approach Augmented Contexts for Development (see Cook 2010a; Cook 2010b).

4. Conclusion

There appears to be a generality uncovered by my proposed visualisation/augmentation oriented approach; learners are supported as they co-create temporal contexts where the time field of attention becomes detached from the perceptual field and unfolds itself in time, thus augmenting development and learning. Future research will revolve around the following issues and questions. During their activity, what will the learning trail left behind by learners tell us as they move from one learning context to the next? How does this relate to developmental events (the time fields)? What are the implications of the above conceptually driven notion of Augmented Contexts for Development for the emerging field of mobile augmented reality (which tends to be driven by commercial developments)?

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A design toolkit for next generation mobile learning

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Abstract

This paper argues that design can be the catalyst for changing how mobile learning needs to be developed, implemented, and evaluated. It has been suggested that the limitations of computers for use of education are constrained by the lack of human imagination, old technological habits, and social structures. This clearly is a design problem and a different approach is needed. The paper introduces a design toolkit concept to help address these challenges.

Keywords

design-based research, mobile learning, interaction design, practice

1. Introduction

The widespread use of computers and mobile devices and their integration in our everyday activities are changing the way we communicate, share information, and learn. For many users, mobile devices along with different types of computers are always connected, providing a constant stream of digital content to and from people and thereby adding new layers to the everyday information landscape. Contemporary educational researchers have pointed out that the very nature of learning is also changing from transfer, remember, and recall to focusing on creativity, discovery, interconnecting, and understanding ways to apply knowledge across these cultural contexts (Bransford, 1998; Pea et al., 2008). From an educational perspective, Sawyer (2006) has argued that students need conceptual understandings of complex concepts with the ability to creatively generate new products, new theories, and new knowledge. Furthermore, Scardamalia and Bereiter (2006) argue that technology needs to support knowledge-building didactics to connect learners to what is most dynamic and meaningful in the surrounding society. Therefore, the rapid adoption of these computers offers new opportunities to support teaching and learning. Although, these emergent trends are changing communication and collaboration patterns, they have not yet been effectively applied for technology-enhanced learning.

2. The Challenge

Nearly 20 years ago, it was argued that the limitations of computer use for education in the coming decades would likely be less a result of technological limitations than a result of limited human imagination and the constraints of old habits and social structures (Kaput, 1992). These two latest behaviours are still observable in many of today's classrooms and impact the research, design, evaluation, and assessment of mobile learning and other new technologies. Therefore, different strategies are needed to explore and promote innovative educational practices supported by mobile and ubiquitous technologies, and the author will argue that design can be the catalyst for such a change. The main research question to be raised in this position paper relates to what new approaches can be developed to design mobile and ubiquitous technologies for learning. In order to investigate this question, different design approaches were used bringing the perspectives of technology-enhanced learning (TEL), mobile computing, and

interaction design together. The empirical work discussed is based on the activities and outcomes that emerged from three projects that included informal learning activities, inquiry-based science learning, and mathematics learning inside and outside the formal classroom. From these projects, the most relevant design approaches were identified through a comparative analysis that has provided the foundations for a general design toolkit.

3. The Design Toolkit

The intention of creating and using such a design toolkit is to provide a set of guidelines for researchers, designers, teachers, and other stakeholders to tackle the challenges of designing innovative TEL activities supported by mobile and ubiquitous technologies. The design toolkit draws inspiration from diverse design processes such as user toolkits of innovation (von Hippel, 2001), Reciprocal Research & Design (Alexander et al., 2010), and other design-based research processes. Where the design toolkit differs is in its approach to managing both the research and product design process both from participatory approaches of involving stakeholders and the support of innovation through discursive practices. The toolkit recognizes the need to shift design from the preoccupation with appearance and surfaces of tangible products to design materials that can make sense to the users, in this case learners, teachers, and other related stakeholders (Krippendorff, 2006).

The initial focus of the design toolkit is on managing the design process that involves and recognizes the needs of learners and teachers to become active creators of learning artifacts that support the design of the next generation of mobile learning tools. More empirical work and evidence are required if the toolkit is to generate significant results as for a design approach for mobile learning and have an impact on research learning outcomes. Future research is needed on how to expand the toolkit ideas beyond a conceptual and process model that can encompass greater design management and provide more concrete tools for these different stakeholders to use. Although there are many benefits of involving the different stakeholders in the research and design process for educational and software development, it has to be clearly noted from a research and user perspective that this alone is not a recipe for good results (Verganti, 2006). Researcher's using DBR approaches have explored the many challenges in generating theory and evidence-based results while raising important issues with shortcomings in scientific rigor with this type of practice (Barab & Squire, 2004) The arguments are rightly focused on how to validate the findings from DBR beyond local theories to a more general knowledge that can generate widely adapted educational innovations. In the field of the human-computer interaction, Muller, (2008) has raised similar unsolved problems along the lines of cultural differences in workforces, evaluation and methods for working theories and practice.

4. Discussion

Norman (2010) raises an intriguing issue to consider about design research and its role in improving products and the gulf between iterative design processes and inventions, when it comes to generating breakthrough innovations. Part of the struggle of design-based research concerns the gap between theory and practice, but this gap is related to the fact that, what drives technical innovations is the creative drive of technologists to invent, like other creative professionals such as designers or artists (Norman, 2010). The challenge for the future of mobile learning is to find ways to integrate invention and innovation that supports the needs of people (learners, teachers, and the social structures around them) into more unified research and design processes. Design approaches that consider both the philosophy and the creation of new artefacts (tools, processes, etc.) have benefits for design-based research and interaction design since they share the goal of improving peoples' situations into more preferred ones (Simon, 1996). The possibilities of making space for invention and innovation needs to be addressed to the push

boundaries of TEL and mobile learning while keeping in mind that acceptance of innovations requires that they provide tangible solutions that can help everyday educational practices.

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“Recombinant Fiction” theoretical paper and manifesto

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Abstract

In previous ages, mediums for narrating fiction such as theatre, literature, cinema and television have defined languages, models and formats; each media development provided an expressive shift in forms of storytelling. Nowadays, media are multiplying, hybridizing, and mutating. The way they are used alters continually, creating potentially new ways of producing fiction and spectacle. Networked digital media merge as a productive vehicle to create new forms of fiction. In fact, the rise of forms of storytelling such as ‘Transmedia Storytelling’, ‘Alternative Reality Games’, ‘Transfiction’, ‘Dispersed Fiction’ and ‘Viral and Guerrilla Marketing’ is a clear sign of an important revolution in ways to tell stories.

Recombinant Fiction emerges as a political and aesthetic fiction genre of this new immersive and participative form of art. By identifying valuable, distinctive characteristics and objectives, Recombinant Fiction defines a unique genre able to drive tactical activism and dramatic purposes.

Our contemporary media environment era is characterized by the explosion of Personal Media [1] (e.g. devices with platforms for email, instant messenger, blogs, photo and video sharing services, etc.) resulting in new modes of personal expression and interpersonal relations. Nonetheless, Mass Media continues to grow as well. Networked media generates new channels and interconnected devices for consuming entertainment and news (e.g. proprietary web platforms, digital TV, portable video/reader players, screen billboard, etc.). This results in the deregulation of advertising restrictions and privacy policies by the corporate media complex to boost the flux of information. Additionally, networked digital technologies accelerate and facilitate the production of offline and analogue spaces of information (e.g. print-on-demand, production of manufactures, organization of public assembly, mapping public spaces etc.). This results in a new mass of active prosumers, and a general increase of information in interior and urban landscapes.

All of the above listed media are digital in origin, and therefore easily reproducible and transmissible through networks (e.g. Internet, GSM, Wi-Fi, etc.). Networked digital media generate an intensification of flux, interactions and processes of communication. The informative environment created by all those media that broadcast messages, is defined as Infosphere [2]. This conceptual sphere is the space in which modern society is immersed, where people express themselves, build their own realities and manage societal organization.

In this context, a modern form of fiction should be narrated by networked media and staged in the Infosphere, which can be used as the medium to dramatize reality and find a way to change it by a dramatic representation, as humanity has always done.

http://www.paolocirio.net/press/recombinant-fiction.php

Recombinant Fiction pieces: The Big Plot (http://www.thebigplot.net) and Drowning NYC (http://www.drowning-nyc.net)

“Recombinant Fiction” theoretical paper and manifesto
Paolo Cirio
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Keywords

Education, activism, theatre, cinema, social media, infosphere, digital network, personal devices, facebook, twitter, web, cross-media, alternative reality games, digital narratives.

1. Manifesto:

1. The fiction is told through traditional news media, online social media and public space interventions. The pieces of the fiction converge and evolve in one rhizomatic stage, synchronized and organized by networked digital media.

2. The fiction has conflicts and resolutions among characters with engaging personalities. There are not challenges or gaming aims for the audience, it must be pure fiction and its nature should be obscured but not hidden.

3. The fiction penetrates reality by including real entities in the narrative. The created fictional reality is made from contemporary real-world patterns, which are semiologically relinked and mutable in the narrative elements.

4. The fiction is interactive and participative. It is unfolded with the active interaction of an audience that can participate in it by creating characters and reshaping the storyline through their personal media and by public interventions.

5. The fiction has activist and educational qualities to achieve social change goals, by spotting controversial identities or organizations, or by increasing awareness of real world plights. It must be without commercial or promotional purposes at all.

1.1 Theory for practicing Recombinant Fiction:

Recombinant Fiction is composed of layering mediums, spaces, identities and modes, which can be seen as formally interconnected as a rhizome [3]. The rhizome reflects the abstract network structure, the configuration of the Infosphere. The fiction is told through the convergence [4] of narratives broadcasted by networked media. Organized and synchronized, these media create a rhizomatic space of narrative information that audiences can unfold and participate with.

Stage.

The convergence of narrative elements broadcasted by the media is facilitated by the semiological links that can be created among them. Each media of the rhizome is directed organically to broadcast narrative elements of the story that refer to each other. The networked convergence of scenographic elements creates a rhizomatic totality, recognizable as single stage, where the story is told and evolves. This stage embodies the Infosphere, denoted by the media that broadcast messages and by the messages themselves. The broadcasted narrative signs are linked together in a network of signifiers, which constitutes the rhizome in which all the signs used in the narrative build the environment of the fiction. As in semiotization [5] in theatre, in the Infosphere, signs present in the narrative rhizome became functional to the construction of the fiction.

The fiction is unfolded by links that refer to each other, creating a semiotic networked storyline within which the audience can be actively surrounded. This unfoldment should not have challenges or ludic elements. Instead, it should simply be easy to interact with and readable by the audience.

Furthermore, this process of semiotization through linking, quoting, cloning signs of reality is thought to integrate real entities into the fiction, transforming real-world patterns into fictional ones, and vice versa, fictional patterns of the story can be perceivable as real.

Characters.

Characters in the Recombinant Fiction use networked media to dialogue and articulate their messages. Characters show their masks digitally created and tell their stories through the disseminated media of the Infosphere that fit and build their personalities.

General identities and entities are made by pieces of information broadcasted, which build their existences in the Infosphere and influence directly their presence in the ordinary physical world. The informational body that is broadcasted in the Infosphere through media can materialize the representation of the self, a general agency and any activity. This state of being empowers the characters of the fiction to enact their roles with masks that appear realistic and familiar to the audience. Hence, the way characters use these media reveals personality traits and intensifies the emphatic effect on audiences.

Considering the audiences present in the rhizomatic stage of the fiction, they are able to unfold the story and follow the characters' revelations with immediate ease, because characters and audience members share the same tools of expression and communication. This enables the audience to participate in stories by converging their mediated identities of the Infosphere into the rhizomatic narrative stage through their Personal Media (or other media of the Infosphere) and by having direct conversations with the main characters or even creating new characters and adding new elements to the dynamic storyline.

The audiences know how to have control over their own characters, since they build their identities and related relationships with others through networked digital media in the everyday life. Often the projection of the self onto the Infosphere is characterized by the attempt to appeal to others. This sort of internalization of the spectacularization of representation of the self facilitates the personal reinvention for the performative acting in the fiction.

Through their participation, audiences turn into characters of the fiction. As they develop their personas and create new narrative aspects, the storyline takes shape and opens to new dramatic concepts. In their new participatory role, the audience consciously performs a responsible act in the fiction's dual being, which is both inside the actual social reality and in the fictional story. As the audience shapes the story, they become aware of its fictitious double identity.

Drama.

The fiction uses variable forms of dramaturgical structures with interweaved situations among characters. The story is told with dialogues, statements, monologues, public interventions and actions about a fictional scenario that take place in a storyline over the Infosphere's stage.

Characters tell about discoveries, conflicts, reversal, resolution and twists of their existences, through background dramas of interior feelings and foreground plots of public fights. The fiction should trigger the original aims of dramatization of human condition for cathartic functions, representation of possibilities, and escapism from daily pressures through engaging stories.

In the first person narrative voice, main and minor characters communicate their experiences and claims directly to the audience with their masks. Characters' voices are broadcast over Social and any media functional to the expression of the characters. Concurrently other media broadcast information to build the scenography and the atmosphere of the drama.

The fiction is broadcasted live. Narrative situations happen in real time. Narrative information is communicated simultaneously with the characters' declarations and dialogues, creating a spectacle that occurs during a concentrated span of time. Audiences are pervaded in the story as they find themselves engaged with the progress of fiction or as they attend scheduled dramatic events.

The action line oscillates on a variable mutable timeline. Multiple references among situations and characters on the timeline make it unbroken and comprehensible as a complete reticulated sequence of narrative occurrences. After the live broadcasting, the final documentation of all the narrative elements allows audiences to browse the fiction permanently.

The drama is set in the present, with scenarios contextual to the contemporary society and scripts similar to the ordinary behaviors of the audience. In order to thoroughly penetrate reality with an active fiction, the topic of the main conflict in the fiction should be a real world social matter familiar to the audience and engaged with mainstream media content.

The fictional nature is declared; the audience must notice or perceive to attend at a fictional drama, through narrative patterns blurred with real patterns, to involve the audience in an immersive fiction. Real and illusory events come to inform each other. Memory and associative processes are subtly moving and shifting at all times in relation to the present context.

2. Tactical functions of the fiction.

Over the course of human history, stories have always been used to understand and interpret reality, from religions to ideologies, beliefs and identifications in large narratives defined civilizations. However it is in our mediated society that stories replace realities in creating fragmented artificial worlds and capturing people's minds and imaginations within them. Reality continues to be redefined not only by its narrated image as fabricated by the entertainment and media industries, but recently also by the single individual who thinks and produces his/her own image to fit the artificial worlds.

Only by dramatizing the artificial reality of the Infosphere can audiences understand and then change their physical reality, over which they have recently lost control. Recombinant Fiction is about staging a drama inside the Hyperreality and Spectacularization of society to engage participants in a process as political agents.

The endeavor toward an efficient modern drama with effective outcomes requires strategy on stages and mediums as well as the employment of a language and aesthetic that speaks to the mindset of an individualized audience. The educational, informative and transformative purposes of the dramatic actions should be developed for motivating and transforming audiences usually indifferent to social issues and for mobilizing victims of oppression. This can be accomplished by infiltrating the audience's language and environments with stories and characters that tempt the attention and interest of the target. Through identification with the characters' dilemmas and public claims, Recombinant Fiction becomes a useful tool to reach new and large audiences whilst creating concern for social issues.

Tactical Recombinant Fiction is a powerful art form to exchange in or manipulate human consciousness, demystify absurd beliefs, undermining unethical powers and informing on social problems.

Quotes:

"There will be never winning over the system on the real layer [...] because the system relies on symbolic-violence", J. Baudrillard. [6]

"Theatre is a rehearsal for revolution no matter that the action is fictional; what matters is that is action!", A. Boal. [7]

Theories that have inspired Recombinant Fiction:

" Recombinant Theatre " by Critical Art Ensemble
" Invisible and Forum Theatre " by Augusto Boal
" TransMedia Storytelling " and " Convergence Culture " by Henry Jenkins
" Dispersed Fiction " by Jason Nelson
" TransFiction " by Alok Nandi

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[1] "The digitalization and personal use of media technologies have destabilized the traditional dichotomization between mass communication and interpersonal communication, and therefore between mass media and personal media."

Marika Lüders , 'Conceptualizing personal media', New Media & Society, Vol. 10, No. 5, 683-702, 2008

[2] "The infosphere denotes the whole informational environment constituted by all informational entities (thus including informational agents as well), their properties, interactions, processes and mutual relations."

Luciano Floridi, 'Ethics in the Infosphere', The Philosophers' Magazine, 6: 18-19, 2001.

[3] Related to the theory of Rhizome as "Principles of connection and heterogeneity: any point of a rhizome can be connected to anything other, and must be."

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[4] "'Convergence' must be understood as a process that has several different manifestation." Henry Jenkins, 'Convergence? I diverge', Technology Review, 2001.

[5] "The semiotization of an element of performance occurs when it appears clearly as the sign of something. Within the framework' of the stage or the theatrical event, all that is presented to the audience becomes a sign that "wishes" to communicate a signified."

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Learning in liminal spaces

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Keywords

unconference, professional learning, digital technologies

The term 'unconference' is a generic term for a virtual debate between professionals, who are seenas equals regardless of status, culture and nationality. The unconference mode of informal learningas recently been modified by professional educators in a version called a MirandaMod (www.mirandamod.ac.uk/mirandamods), started in2007 by members of MirandaNet, a professional organisation founded in 1992. In these events a wide range of education professionals choose a theme for a face-toface meeting. But others join in cross national boundaries, using a range of such digital communications as video conferencing, microblogging and collaborative concept maps.

The technologies used – whether laptops, smartphones, desktop computers or Netbooks – enable people to participate from a range of locations. Some lead participants set the tone in five minute talks, usually without presentation software, and further contributions are selected by the chairperson to achieve a balance in participation between teachers, researchers and teacher educators. Many of the educators in MirandaNet are taking or have taken higher degrees and are interested in exploring the theories and the pedagogies underpinning teaching practice, so this debate merges with their formal learning. These MirandaMods, therefore, provide an innovative extension to Continuing Professional Development (CPD) where professionals collaborate to manage their own learning agenda.

This online and virtual social interaction was first recorded face-to-face in the process of building 'communities of practice' as a means of informal learning (Lave and Wenger 1991). In Braided Learning theory (Haythornthwaite, 2007: Preston 2008) MirandaNet Fellows are tracking informal dynamic knowledge creation in collaborative contexts, as the participants move from textual debate in a conventional mailing list to video conferencing, micro blogging contributions and collaborative concept maps.

Fellows see this collaboration creates a liminal space – a term drawn from anthropology that describes a rite of passage, in which a person moves from one state of being to another. In Braided Learning, debaters who make frequent use of this MirandaMod community facility are observed to be transformed in this liminal space by acquiring new knowledge, a new status and a new identity in the community. Our view is that this change is of critical importance if learning is to be successful. Whilst remote and informal learning is largely is what has been understood about mobile learning, the concept can now be extended to include these informal spaces in which learning takes place – the liminal spaces that those who push the boundaries of digital possibilities now inhabit intellectually (Cuthell, Preston, Kuechel and Cych, 2009).

This paper aims to extend understanding of liminal spaces and their contribution to the Braided Learning process. Evidence from MirandaMods that have involved participants from the United Kingdom, Europe, West Africa, the United States and Australasia is used to estimate the value of suchinformal learning for professionals. The qualitative and quantitative research tools that record both the numbers involved in the different activities, levels of participation and the extent of the professional knowledge created are identified. Some consideration will be given to the long-term impact of building professional knowledge in a range of media that are not subject to conventional peer review. Finally the advantages and disadvantages of informal learning against formal learning will be summarised.

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Creation and curatorship in new media

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Abstract

This short paper advances the theory that curatorship can be constituted as a metaphor for a new literacy practice in new media. It is based on doctoral research in two primary schools which examined digital video authoring strategies used by children aged between 8 and 11 when they were making short, self-representational pieces. Drawing directly on the data, the presentation will show how transdisciplinary set of frameworks drawn from socio-cultural and media literacy can be used alongside an adapted form of multimodal analysis to investigate a new set of skills and dispositions around identity, memory and voice, which, as suggested by the title, merge in the concept of the producer as curator. The seminar discussion will focus on how these ideas might lead to a set of proposals for teaching and learning with digital video and other media in the primary school arising from a description of the key self-representational possibilities inherent in the medium and framed by the concept of "curating the self" as an essential skill and disposition in lived culture.

Keywords

Video, curatorship, identity, transition, representation, literacy practice

1. Curating the self: theory and methodology in the project

One of the key concepts in mobile learning is that of learner-centred activity; agentive use of devices in a context of situated learning (Naismith, Lonsdale, Vavoula, & Sharples, 2004; Traxler, 2009). Whilst the project reported in this paper certainly sought to explore the use of a particular set of mobile devices in the hands of learners who had not had such opportunities for creative production in new media before, theoretically and methodologically the work was located in the discourse around identity and media literacy and emphatically not around the devices used. In taking this particular stance the project is located in the "third phase of mobile learning" as described by Pachler, Bachmair and Cook (2010, p.32). Yet there are many resonances with key tenets of m-learning more widely, not least in the exploration of mobility in social and institutional spaces and the affordance of devices for collaborative learning (for an account of these and other resonances see Traxler, 2009). With its emphasis on the learner, in particular on how the learner makes meaning using the multimodal resources and assets available to them as they move through a space, this project was one in which the focus on the technology receded and the experiences of the children as authors with their own motivations came to the fore.

Primary aged children who were in transition to secondary education in a UK setting made short video productions which were intended to represent their time at the school before they left. With the children located in an area of distributed school transfer and up to twelve different secondary schools being their ultimate destination, the work was predicated on a desire to inscribe aspects of their identity, their relationships, their memories and representations of the spaces in which they had spent the preceding few years.

In this project, then, the mobile devices - the digital video cameras and laptops - were the tools employed by agentive learners to make moving image texts from the resources of lived experience and lived culture (cf. Williams, 1961). In analysing the project later, a particular kind of multimodal analysis was used to focus on the texts produced by the children, derived from adapting aspects of multimodal analysis to the moving image (Burn & Parker, 2003; Kress & Van Leeuwen, 2001). This process unlocked key aspects of self-representation in the spaces of the school and the lives of the learners. These were discussed using perspectives drawn from media and cultural studies, particularly those concerned with habitus and field (Bourdieu, 1986) with conceptions of identity (Buckingham, 2008; Giddens, 1991; Goffman, 1990; Merchant, 2005) and with notions of movement through a space and its recording as a representative act (de Certeau, 1984; Foucault, 1984).

The project and its various outputs have attempted to cross theoretical and methodological boundaries between a technocentric set of explorations of culture and learning and a media and cultural studies location for the work. The outcome was reported at length in a doctoral thesis and subsequent publications (Potter, 2009, 2010). This paper is an attempt to open a dialogue with the m-learning community on the key finding of the study, namely, a description of a new cultural and literacy practice taking place in the spaces of new media, online and onscreen, characterised as "curating the self", arranging memory and learned experience for different meanings and at different times. In this, mobile technologies, networks and cloud computing are all playing a facilitative and mediating role but they are not the sole determining factors in the outcomes and outputs. These factors also include the interests of the meaning-makers themselves, their selection of assets and resources and their agency in assembling and representing themselves and their experiences in new media.

2. Curating the self: implications for learning

Taking the discussion into wider, lived digital cultures, the notion of performed identity is of particular significance in an age in which potentially multiple versions of the self are distributed across YouTube, Blogs, Facebook, Twitter and more. Along with these versions of the self are the organisational principles for created or discovered digital assets and information of all kinds which an individual locates and curates. This will include the results of searches, text-based, images or media forms produced by others but located in the learner's collections. If curatorship is a key new literacy practice, and one which privileges those with certain types of access, skills and disposition, what does this suggest for the organisation of formal learning and the curriculum?

Certainly the notion of a "curriculum" in a traditional sense is up for debate and discussion, not least amongst those societies and communities with easy access to networked technologies, and is taking shape in a number of forums online (see, for example, Williamson, 2010). For others, digital literacy practices with their many possibilities for finding, making meaning and distributing resources at speed, raise key questions about the nature of learning and the potential need to give space and value to reflection (Kress & Pachler, 2007).

It is clear that the practice of self curatorship in which many young people engage (at least those with time and access to digital resources, including mobile devices) requires them to be able to multitask, assemble information from different sources, be quickly and critically responsive to media assets, and be acutely aware of their performed selves, their reflexive identity and their lives as essentially a visible project. For those engaged in teaching it is increasingly critical to engage with lived culture and such self-representational projects are a potentially rich resource and a valuable site for research.

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Using theory to drive the design and re-design of mixed reality visualisation systems

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Abstract

This research is concerned with the theory driven design of mobile augmented and mixed reality systems. These systems are used to explore the relationship between contextual factors and knowledge formation. These rapidly evolving spaces are inherently social, tangible, and real-time. These factors all point towards key design challenges for technology enhanced learning. The intention is to use the methodology that AR enables as a framework of investigation for understanding the bi-directional nature of knowledge construction. What impact will the use and development of this 'interface' have on the construction methodologies at work in the transformation of information into knowledge? A number of case studies which result from the theory driven design process will be examined.

Keywords

Augmented and Mixed Reality, Collaborative Visualisation, Learning Science, Design Based Research

1. Introduction

The wide adoption of AR, delivering information just-in-time, just-in-space, requires skill sets which have not yet been formulated such as spatial literacy. "The skill of writing is to provide a context in which other people can think" (Schlossberg, 1977). The dynamic creation of context using print has now radically evolved under the influence of mediums such as augmented and mixed reality. MAR (Mobile Augmented Reality) is "inherently about who you are, where you are, what you are doing, and what is around you" (Shute, T, 2009). Context is central and being able to adapt and manipulate elements of the context has never been easier. As a result MAR is fundamentally enabling the user to see things from a different point of view.

An example of this is how the physical use of space can be altered to reflect the subject content under review. For instance the context of one subject (language learning) can be transferred into another subject (urban education) through a simple reconfiguration in the attachment of relevant information within the augmented space. It is not just the context of the content which can be reconfigured in mixed reality but also the context of the interaction design. One example of this is being able to transform the emphasis upon teacher-learner interactions into learner-learner interactions.

Educators now have powerful new ways to combine practise and theory in the same space in order to produce new modes of learning. As a result AR provides an opportunity to improve and fundamentally transform our understanding of the impact of context on learning. All aspects of the user's context (physical, technical and social) can now take an increasing role in the design. Design-based research was introduced with the expectation that researchers would systematically

adjust various aspects of the designed context so that each adjustment could be tested and fed back into the next iteration of the intervention (Plomp, 2007).

The work is framed by the socio-cultural ecology approach developed by Pachler, Bachmair and Cook (2010); this outlines the triangular inter-relationships between structure, agency and cultural practice. The second framework which has acted as a lense and a measure of the successful augmentation of context was the Augmented Context for Development (see Cook, 2010).

In order to examine the potential of MAR to enable these new contextual modes of learning a series of case studies have been produced. One of these involves using MAR to widen the range of participation during the re-design of educational learning spaces by enhancing in-situ collaborative visualisation.

This case study built on the results of a previous European project called CONTSENS (http://www.ericsson.com/ericsson/corpinfo/programs/using_wireless_technologies_for_context_sensitive_education_and_training/) which involved creating a mobile learning environment to support the training of urban design professionals. The project enabled these urban planners to examine past and present representations of urban schools using mobile technologies in context to see how the organisation and re/structuring of urban space related to educational discourse. The intention was for learners to examine the community from the past, in order to engage, understand and inform the present, as urban space and society becomes made and remade.

This work attempts to extend and build upon the design based research framework which focuses on human-centred design (the needs of the users) and object-centred design (the form and function of the product) by using augmented and mixed reality to open up the largely unexplored space in-between.

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section 2 - practical issues to support mobile learning

ConEx - mobile collaborative learning environment for conferences

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Abstract

ConEx is an application and research setting which aims to support mobile collaborative learning in the context of conferences and lectures. The primary objectives is to diversify and deepen the conference experience, increase the interactivity between the participants and the presenters, bring new networking opportunities to the participants and to observe the applicable educational potentials in general.

In our research and application development we emphasize the idea of mobile computer-mediated collaborative learning. More specifically, the interactive learning affordances in the conference situation. We think that the mobile computer-mediated collaborative learning approach in the conference presentations, lectures etc. expands the learning activity from the one-way communication to multi-directional communication. This means that the learning situation becomes more active, more open and more egalitarian. Beside the application and the accompanied social practices, we have designed an ethnographic research setting to test how the chosen social media tools with our additions work in real-life. Our contributions in this case rely on communication theory, dialogic learning, computer-mediated collaborative learning and ethnomethodology.

Keywords

Twitter, mobile, CSCL, MCSCL, Dialogic learning, ethnography

1. Introduction

In this paper we introduce the service called ConEx (Conference Experience Connector). ConEx is a Twitter-based mobile conference service which is tightly bounded to the research settings of the Tekes (The Finnish Funding Agency for Technology and Innovation) funded CoEx (Communal Activity Supporting Spaces in Sharing Experiences)- research project. We have developed the concept and the software iteratively in the contexts of two different conferences (ITK and MindTrek) at the beginning of the year 2010. The primary objectives of our software development and related studies are

- to diversify and deepen the conference experience
- increase the interactivity between participants and presenters
- bring new networking opportunities to participants
- to observe the educational potential.

In the next section we will briefly discuss the ConEx software. After that we provide a short introduction about the theoretical and methodological background behind the ConEx service. In the final chapter we explain how the software development is related to the theoretical and methodological background.

2. ConEx – Conversations, Application, Social Media Aggregator and Backchannel

The practical solution is based on one of the most popular social media tools, Twitter. The idea was to make Twitter more suitable and more useful to use in conferences and lectures. The aim was to combine conference program and Twitter more closely, in order for communication to be as easy as possible. Furthermore, Twitter as a widely used social media service gives an audience and presenters an opportunity to share their ideas, comments, conversations and questions to their followers.

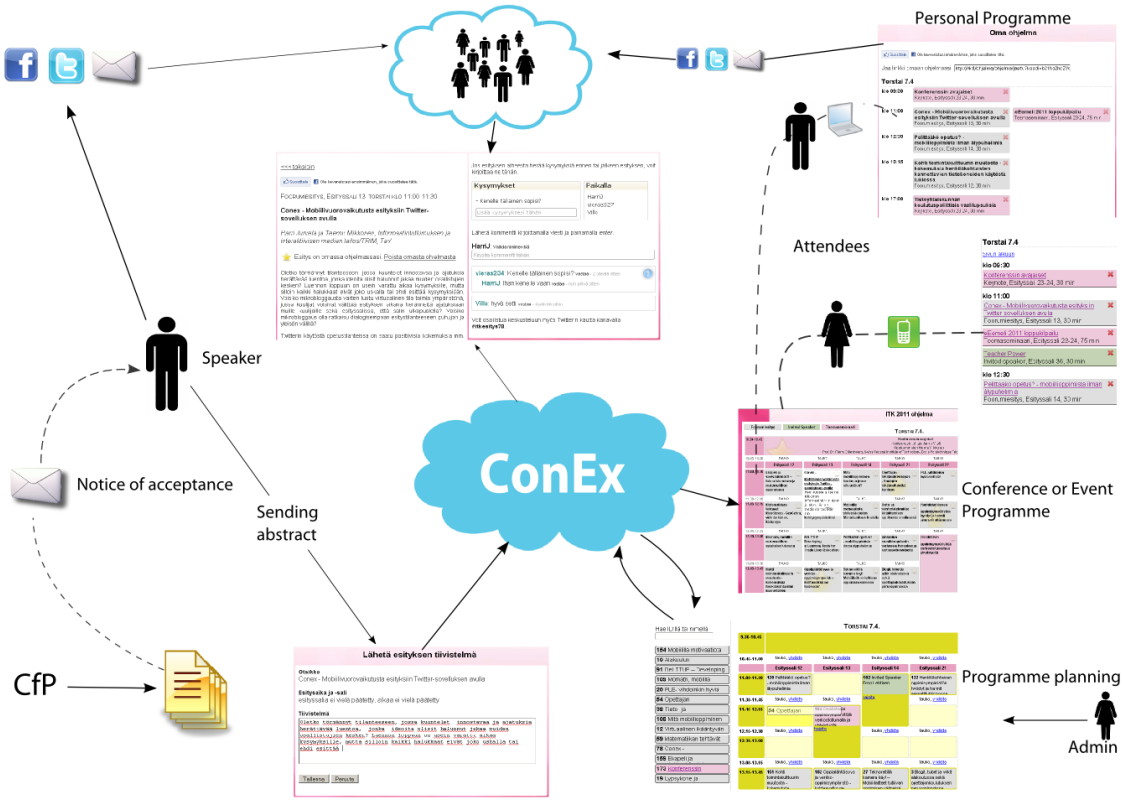

Figure 1. The Concept of the ConEx

We have developed an interactive system which integrates the conference program site to the virtual commenting space (Figure 1). The process starts when an applicant gets the notice of acceptance from the conference organizer. After that the chosen applicant sends his/her proposal to the system and an admin builds the final program which will be published on the website. Now the presenter may promote his or her presentation widely in his/her social network and gain more contacts before the actual conference is being held. He/she may create a poll

to his or her presentation page, to interact with the visitors and get more information about the subject.

Attendees (Attendees viewpoint: see the upper right corner of the Figure 1.) may browse the conference program and send comments and questions to the speaker using PC, laptop or mobile phone. Mobile interface is shown automatically when user browses the site with mobile phone. User (attendee or presenter) may create a personal program by authenticating with email address and selecting most interesting presentations from the conference program. It is also possible to recommend the personal program via Facebook or Twitter, so colleagues may see which presentations he or she is planning to participate.

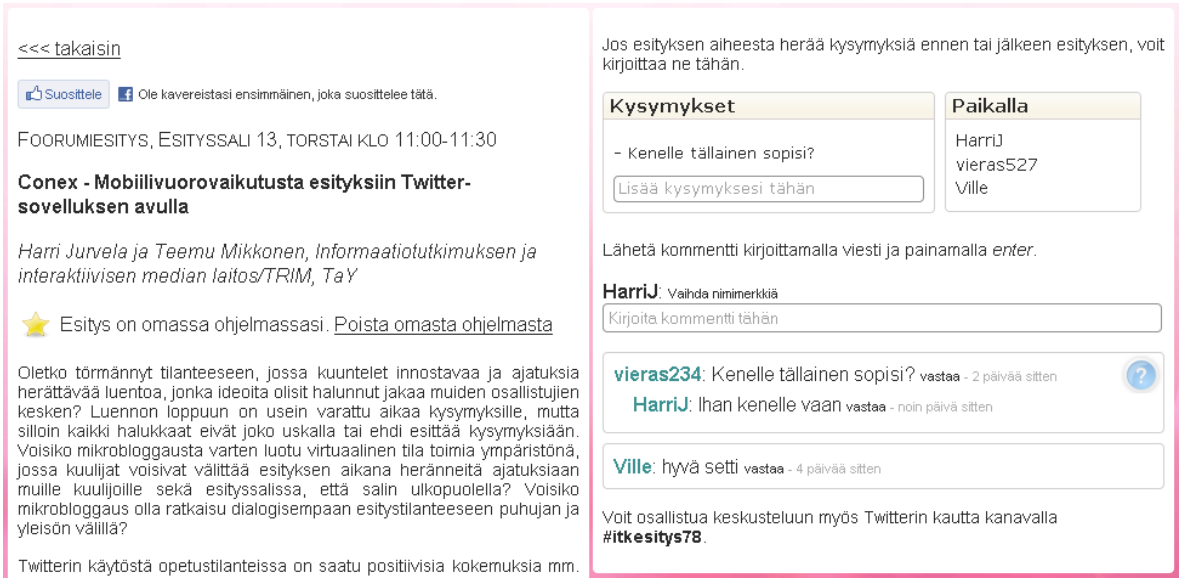

Figure 2. Information about the presentation and the Twitter tool

The application enables sending questions to the speaker, commenting on her/his presentation real-time and to discuss public with the audience by mobile devices inside and outside (it is possible to follow the lectures/presentations thorough video stream) the room (see Figure 2.).

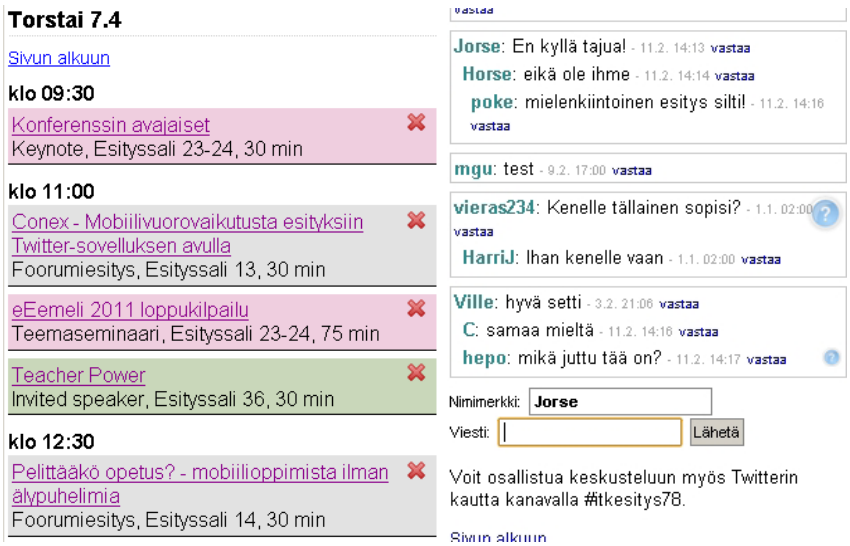

Figure 3. Mobile Interface, Personal Programme and Twitter commenting tool

Nowadays participants use more and more different kinds of mobile devices in conferences. The virtual interaction of tconferences happens mostly with mobile devices (notice: here mini laptops are also considered as mobile devices). Because our studies of the MindTrek2010 - conference showed that 1/3 of the Tweets were sent by a mobile devices (other than mini laptops), we developed a lighter mobile interface (see Figure 3.) to facilitate the browsing of the program and the sending of the Twitter/ConEx - chat messages with the mobile phones.

3. CoEx – research project and the Social Practices Behind the Application Development

Collaborative learning embraces in our vision more egalitarian and more constructive communication between the presenters and the audience by supporting peer-to-peer communication between the members of the audience and between the presenter and the audience. This means that in the conference the audience has an opportunity to challenge the speaker with comments and questions in the virtual space (the Twitter-based "chat" is projected behind the presenter). The ConEx – application also gathers all comments, conversations and questions before, during and after the conference for research purposes.

Our approach is based on design research (e.g. Reeves, 2006, Bereiter, 2002) and we have two different cases to develop. The first experiment was implemented at the ITK -conference in April 2010 and another was implemented at the MindTrek – conference in October 2010. Next experiment will be carried out again at the next ITK - conference in April 2011. The more collaborative and more dialogical (Burbules,1993) approach in the context of conferences and lectures means in our research settings that the learning situation becomes more active, more open and more egalitarian.

4. Conclusion

In our research and application development we emphasize the theories and methods related to computer supported collaborative learning (CSCL) or more specifically mobile computer supported collaborative learning (MCSCL) (e.g. Cortez & al. 2004). We think that mobile devices such as mobile phones, laptops, iPads etc. could enrich social interaction and cognitive activity thorough the chosen social media services (Twitter & Facebook). In conferences the communication has usually been one-way communication from the speaker to the audience. With our solution the communication process becomes "multi-directional" expanding it beyond the physical and social boundaries of the conference.

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L3T assists m-Learning

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Abstract

L3T is a project founded by two researchers of Technology Enhanced Learning in April 2010 with the goal to establish a book for learning and teaching with technologies, short e-Learning. Due to the fact that publishing a book in a traditional way is not appropriate for a Web 2.0 community the project integrates from the very first beginning different Social Media channels like Facebook, Twitter, YouTube etc. as well as provides different possibilities for access via mobile phones. In this publication we give a short overview about the mobile Learning Strategy in more detail how we are able to ensure that all chapters of the book can be read with modern smartphones like iPhone or Android phones by developed appropriate Apps. Furthermore an iPad App gives insight into the possibilities of providing chapters as innovative and interactive eBooks.

Keywords

L3T, mobile learning, mobile access, iPhone, Android

1. L3T – an innovative book project

The project L3T ("Lehrbuch für Lernen und Lehren mit Technologien") aims to create a textbook for learning and teaching with technologies in a collaborative way. Addressing the goal of instant availability for students as well as teachers each chapter is also published online with open access since February 2011 [1].

Therefore a call for chapters initiated in April 2010 finally encouraged 115 authors to participate by writing collaboratively a chapter on learning and teaching with technologies. Afterwards more than 80 reviewers helped to improve the chapters. The whole process of the book as well as a huge social media initiative can be found at this URL [1]. By the integrative usage of Facebook, Twitter, YouTube, Flickr and other communicational and media platforms lots of different content is shared by the community to enhance the chapter of a traditional book.

In this proposal we like to point out how this project also contributes to the field of m-Learning. M-learning, defined as the combination of e-learning and mobile computing (Tatar et.al, 2003), promises the access to applications and information that support learning anywhere and anytime. Even more, handhelds should also support project-based learning in context, that is, using the mobile as an integral part of one's own learning activity; most of all: ongoing assessments and possible feedback (Holzinger et al, 2005) (Klamma et al, 2007). Kukulska-Hulme & Traxler (Kukulska-Hulme & Traxler, 2005) especially restricted mobile devices in teaching and learning to some few learning and teaching settings, but expressed especially two major facts: The connectivity within learning communities through communication techniques and the benefit of location-independent information retrieval.

From this point of view one of the primary goals of the research team was to extend the existing open-source platform in use (based on Open Journal System [2]) to allow mobile access to all articles (information retrieval) as well as the possibility to discuss, comment any published contribution (connectivity).

We address the research question how an existing open-source system can be enhanced to allow access to learning content just-in-time and how communication can be established by providing an according API and how we can fulfil the needs from an m-Learning perspective.

2. Access via Smartphones

According to the widely-used mobile platforms iPhone OS and Android free available apps (Fig. 1 / Fig. 2) were developed to get all articles on appropriate devices [3] [4]. The chosen open-source software Open Journal System has been enhanced by a special developed iPhone/Android gateway (plugin) and offers now an open API to exchange data with mobile devices. Furthermore to foster discussion amongst different articles the plugin introduces a comment-possibility to each article via mobile-devices.

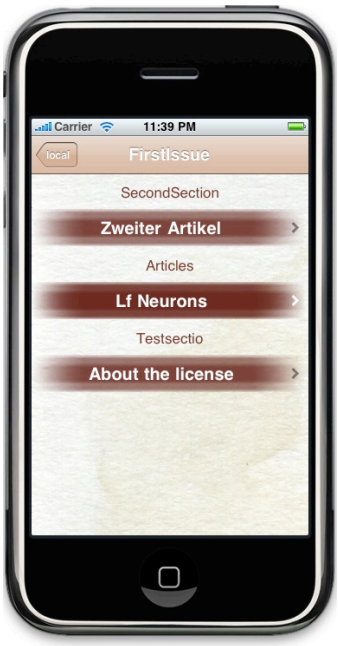

Figure 1. iPhone App

Figure 2. Android App

The most sophisticated part of the work was the design of the user-interface according to Human-Computer Interface guidelines (Ebner et al, 2010). Ease-of-use as key principle led to a complete redesign of the existing data model. Bearing in mind that the interfaces of iPhone and Android smartphones are differ, completely different design issues had to be carried out. Afterwards paper mock-ups and first usability tests with end-users forecast user satisfaction.

3. E-Book for iPad

The project aims not only to assist mobile information retrieval but also to investigate how e-books can look like in future. Therefore, one chapter of the book, about the description of different technologies used in classrooms, was taken and published as iPad App [5]. It can be shown

how traditional text can be enhanced by interactive possibilities. For example Figure 3 shows a diascope, where users can switch pictures via the red button on the remote control. With this simple animation it becomes clear how such technology will work and assists in understanding the corresponding text.

Figure 3. Screenshot of the iPad App

3. Conclusion

It can be summarized that traditional text books in future have to address the needs of a mobile society. In this particular case an appropriate API for the Open Journal System was developed to allow access to all articles stored on the system. Afterwards two Apps for iPhone and smartphones with Android OS were programmed and released in the different App-Stores. Furthermore one chapter is published as interactive e-Book. Due to the fact that the book in general is offered with a Creative Commons license and all Apps are accessible for free this seems to be a valuable contributions to the field of Open Educational Resources as well as mobile Learning itself. In future data about the usage will be gathered to improve the existing environments.

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Additional Hyperlinks

[1] http://l3t.eu
[2] http://pkp.sfu.ca/?q=ojs
[3] http://itunes.apple.com/at/app/iojs/id396906126?mt=8
[4] https://market.android.com/details?id=org.androidforge.ojs.view
[5] http://itunes.apple.com/at/app/l3tmedia/id415465498?mt=8

Workshop: Mobile Learning in School

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Abstract

The workshop focuses on the implementation of mobile devices at school and raises the question, to which extent and in which way mobile learning can be realized. Based on the presentations of concepts and research results of four school projects, two issues are mainly discussed: *didactic and methodical questions* as well as *basic conditions*, or rather success criteria, for implementing mobile devices and enabling mobile learning. In addition to the talks, the participants will have the opportunity to exchange ideas and to introduce their practical experiences.

Keywords

mobile learning, school, digital media, netbook, theory, practice

1. Concept of the Workshop "Mobile Learning in School"

Just as in other areas of education, schools are not unaffected by the current rapid technological developments, particularly where the mobile use of digital media is concerned. The increasing multiple functionality of mobile phones (e.g. smartphones) and the development of small and reasonably priced computers (e.g. netbooks) open up new possibilities for establishing a more frequent and effective use of computer technologies in the classroom.

Mobile computers permit flexibility in terms of space and time. Tin comparison to computer rooms, they allow enhanced flexibility in seating arrangements, which can be organized in a dynamic and demand-oriented way, according to intended work tasks. The devices can be use at the pupils' tables and can easily be employed for short-term teaching sequences.

Beyond the classroom, locations for teaching can include the school building or even learning locations outside of school (in terms of 'opening up the school to the outside' and 'learning on site'). Provided that pupils have personal devices available (1:1-computing), which they can also use outside of class and in their private environment, didactical and organizational considerations have to take these out-of-school contexts into account.

The understanding of mobile learning within this workshop comprises more than just the supply of small, mobile computers. Embedding the devices into learning environments is essential. Inter alia,

this includes consideration of suitable working and learning materials as well as on connections to other members of the study group. The Internet (in particular Web 2.0 and the Social Web) provides a wide range of options for these purposes.

This workshop focuses on the practical use of mobile technologies in school-based teaching and learning. The speakers, who are all involved in the application of mobile computers at school from a scientific perspective, will introduce several school projects and present the results of their project-related research. They will also outline their understanding of mobile learning and explain how it relates to the school projects.

Based on practical experiences we will discuss to what extent and in which way mobile technologies actually become digital learning companions within and outside of class as well as which basic conditions are relevant to achieve this goal.

The focal points of the planned debates are the following issues:

1. Didactic and methodical questions
This issue concerns aspects of change in educational designs as well as possible consequences for the roles of teachers and students. In addition, we will address the question of how ongoing technological and school-related developments (e.g. regarding individualized teaching and cooperative learning) can be brought together.

2. Existing and desirable basic conditions
Among other issues, the technical equipment of schools and the potential of the Internet will be discussed as well as teachers' competences and initial and further teacher training required in this field.

2. Individualized Education within the Hamburg Netbook Project – Lucia Müller, Rudolf Kammerl

As a pilot project that ran in the school year 2009/2010, Hamburg employed 500 netbooks in 15 secondary schools. The main objective of the Hamburg Netbook Project is to increase personalized teaching and the individualization of learning processes. Beyond that, the mobile usage of the computers is included among the project aims.

As the scientific evaluation shows, only some of the teachers and pupils took advantage of the devices' potential by using them in different locations. Technical obstacles (e.g. the lack of wireless Internet connection) and especially the teachers' ideas appeared to be determining factors. Thus, just a few teachers expressed concrete plans for working with the computers outside the classroom or the school building at the beginning of the school year.

Some of the participating schools decided to assign personal netbooks to the pupils, which they were allowed to use outside the school. Just with this concept, integrating the netbooks into a digital learning environment, which offers access to learning materials anywhere and anytime and which additionally supports networking within the study group, seems to be particularly fruitful.

Classroom observations, semi-structured interviews with teachers and questionnaire surveys confirmed that the characteristics of the netbooks (inter alia their mobility and long lasting batteries) provide many opportunities for realizing educational designs which are rich in methods and adaptable concerning space and time. Many successful practical examples showed that the integration of this kind of computer is promising for individualized education. Nevertheless, further efforts as to school and lesson improvement are required to exploit these potentials comprehensively. The presentation will examine success criteria and examples of teaching practice and their potential to enable mobile learning.

3. Flexible Learning with Netbooks – Erich Herber

Mobile learning and web technologies show the potential to overcome the traditional barriers of formal education. They can be seen as enablers of individualized and flexible learning settings. As tools they can be used to create innovation, flexibility and mobility in classroom teaching and beyond. Mobile learning therefore shows the potential to develop a new lifestyle in education and learning which matches the personal interests and learning motivation of learners.

In the workshop we will examine models, opportunities, challenges and barriers to mobile learning, with a particular focus on the use of netbooks in schools. We will describe possible learning scenarios, demonstrate use cases, and provide hands-on experience as well as tools from recent netbook pilot projects. Based on the results of an empirical research project, we will also discuss the extent to which netbooks can facilitate learning outside the classroom ('360-degree-learning'). We will examine aspects of time, place and frequency of use. The presentation will shed light on the process of implementing mobile learning projects in schools. We will look at the institutional, technological and organizational level and discuss issues arsing, including financing, security, maintenance and support.

4. Paducation – Ralf Appelt

The Paducation project aims to investigate whether tablet computers can support individual and cooperative learning. The project is being implemented in a school in Hamburg, and is looking at whether the iPad provides for:

- fast Internet access
- the construction if and access to personal knowledge structures
- individual development
- the use of ePortfolios and learning diaries to support reflection
- support for collaboration
- presentation of one´s own creations
- mobile use within and outside of school.

A small pre-project is attempting to identify the strengths and weaknesses of the iPad and to evaluate the value of the project. Early results suggest the iPad is the best device for the Paducation Project due to its long battery life, fast booting, its absence of movable parts and fan noise and its intuitive usability.

The school which will run the project is equipped with high speed broadband Internet access, computer rooms and mobile notebooks. This infrastructure offers a suitable environment to develop up-to-date, digitally supported teaching and learning processes. Students should be enabled to participate in future society by gaining a high level of media literacy.

Personal devices in a one to one setting should support personal learning through their integration in individual learning processes facilitating learning anytime and anywhere.

The main focuses for the project are critical information retrieval from the Web and from databases, individual and collaborative preparation and sharing of knowledge including legal issues and reflection. Further objectives include improving presentation skills and the use of subject related applications in for example music, arts or language courses.

Other objectives are to improve teachers' and learners' media literacy and the improvement of the teachers' media pedagogical skills. Democracy education and a better understanding of participation can be developed by integrating social software tools such as blogs and wikis.

5. Observations of "Una Laptop por Niño" – OLPC Peru – Antje Breitkopf

Nowadays mobile devices are no longer exclusively found in high technology countries but can also be found in schools far off the beaten track, for example in the countryside of Peru, where, since 2008, laptops are being given to children as part of the worldwide "one-laptop-per-child" initiative. In 2010, Antje Breitkopf conducted field research in Peru to gather material for her MA thesis in Pedagogy, Cultural Anthropology and Political science and ePedagogy Design. She visited 12 primary schools in two neighboring, but geographically and culturally very distinct, regions; interviewed teachers and other people involved in the project, and gained a close insight into the organization and development of OLPC Peru over a period of more than 6 months.

After briefly introducing the OLPC project, she will present a short overview of her experiences and then concentrate on the question of where and when mobile learning can and does happen in that particular environment and with that particular technology. Here she will propose different ways to conceptualize mobile learning, meaning for example the mobilization of contents and the diversification of locations, but also enabling children to exchange and collaborate, and to have one device for many different tasks and activities. Those possible definitions of mobile learning will be discussed and their applicability for this project. Based on classroom observations of how and when the laptops were actually being used, the presentation will examine what progress was made and what problems were faced. Finally, the presentation will provide an overview of the potential capabilities and identify the general conditions necessary to enable and realize mobile learning in the local context.

Just because they own them, doesn't mean they use them: Exploring the potential for mobile learning in Higher Education

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Abstract

This paper explores a two year study conducted into current trends in student mobile device ownership and attitudes in a UK HE Institution. In February 2010 after the first year of our study, we reported on the finding that 99.8% of City University London students owned a mobile device, however our student body had clear ideas as to how they would like to utilise these devices for their Education.

This paper presents the findings of our 2010 and 2011 student mobile surveys. The survey results overwhelmingly indicate that even a year on from our original survey, our students still want to use their mobile devices for accessing teaching-related activities, learning content, and administrative tools. However after implementing a new wireless infrastructure at the University, based on the results from last year's survey, the majority of students are still not positive about using their personal devices for interacting in class. The paper explores what CUL are doing to respond to the request for more access to information via mobile devices, while questioning why students are not willing to use their mobile devices in a more formal classroom setting, and examines what happened when we piloted in class use of mobile devices.

Keywords

mobile learning, student owned, student survey

1. The Mobile Learning Survey at City University

The aims of the student mobile device survey was to discover the types of devices students own, what they currently use them for, their attitudes towards using these devices for formal and informal learning, and any issues surrounding the use of these devices on campus, and more importantly whether these attitudes are changing over time. The explosion in smartphones and more recently tablets has been attributed to advancements in wireless technology and 3G mobile networks, as well as the production of extremely sophisticated hardware. The 2009 Horizon Report suggested that mobile devices would be widely adopted for learning within a year (Johnson et al. 2009), and it is important for institutions to consider both the pedagogic potential, and the degree to which students are both willing and able to put their gadgets to this purpose.

1.1 Methodology

The Mobile Device Survey at CUL ran in January 2010, and then again in January 2011. Several changes were made to the survey the second time it ran, the most significant improvement

to the design has been to the sampling. During the first student mobile survey in January 2010, the research team used a "self selection" sampling technique in which the students were made aware, through the use of advertisement, of the study survey and could choose whether or not to complete the survey. The researchers had no control over who would take the survey and how many times, and this method does not allow results to be generalised to the target population as there are many biases involved.

During the second survey conducted in January 2011, based on methods outlined by Dr R. Sapsford, stratified random sampling was applied (Sapsford 2007), this was in order to give a research sample that would be more representative of the population studied as a whole and therefore more likely to satisfy mathematical assumptions underlying many of the statistical tests we wished to use during analysis of the data. To produce a random sample we obtained an accurate list of student email addresses at the University. The sample was then stratified according to School so that students from all Schools were fairly represented, the researchers then used a program to randomly assign a number to each member of the population from which the sample was taken, these students were then send personalised email invitations asking them to complete the survey.

In order to ascertain whether the questions on the survey were clear, we used a pilot group of colleagues within the University, but not necessarily working with technology to pilot the survey and produce feedback, before releasing the survey to the students.

2. Results and Conclusions

Although the methodology used in disseminating the survey changed in 2011, the results have been consistent across both years of the survey despite avoiding a "self selecting" sample the second time round. The survey showed that only one student each year did not own a mobile phone, and many students own Smartphones and tablets. In 2010 69% of students had used their mobile devices for web browsing during the last ten days, in 2011 initial results show that this has risen to 72.3%, In both 2010 and 2011 65% of students use their mobile phone to access their email, and that 53% of students had accessed Facebook on their mobile phone within the last 72 hours. These results illustrate that our students not only own sophisticated devices, but also use them in a sophisticated way.

In the 2010 survey the majority of students complained about their inability to access the wireless network on campus via their mobile devices, at that time you could only access campus WiFi with a laptop. The evidence collected during the survey was used to build a business case to improve the network infrastructure on Campus, and this new network was then implemented in September 2010. However while students now use the improved WiFi network on their mobile devices, the way in which they want to use their mobile devices on campus has not significantly changed.

We asked the students "if accessibility was improved at CUL, what would you like to use your mobile device(s) for? (please select all that apply)". In both 2010 and 2011 the results were very similar. The top three answers that students gave were: Viewing timetable information (2010 & 11), Receiving Grades and Feedback (2010 & 11), Receiving Txt Alerts from Tutors and administrators (2011), Accessing the VLE (2010). The answers that the fewest number of students opted for were: Asking questions in class by Txt message (2010 & 11), in class voting (in place of PRS/Clickers) (2010 & 11), Subscribing to RSS and Podcasts (2010 & 11).

It was clear from these results that while students are extremely competent at using the complex features their phones offer, and would like greater mobile access to institutional services such

as grades and feedback, they are not keen to use these devices in a formal classroom setting. In both the 2010 and 2011 surveys the majority of students ticked a box that said they "did not want to use my mobile device in class as part of my education", many students left additional comments stating that this could be distracting, and they didn't think it was appropriate.

In his 2010 article on student mobile devices John Taxler said that "student devices unlock the dreams of agency and control and choice amongst students... Universities cannot afford, procure, provide nor control these devices, but they cannot ignore them" (Taxler, 2010). With the current funding cuts in Higher Education across the UK, coupled with the pressure from employers to provide graduates with high level computer literacy skills, institutions may expect student owned mobile devices to play a larger role in students formal education. As institutions become less able to afford up-to-date technologies, our paper examines how student attitudes may influence our use of mobile devices for teaching and learning.

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It's not a netbook – it's a lifestyle! How could mobile technologies be used didactically to bridge formal and informal learning?

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Abstract

This paper takes a pedagogical perspective and tries to set an impulse towards more flexible educational scenarios. It deals with didactic approaches that support the transfer of knowledge caught between formal and informal learning. They are based on theories of constructivism and learner-centred learning and are designed to be realised through mobile learning technologies. The paper looks at possible scenarios from four different perspectives and includes examples from the classroom while also looking beyond formal education. Those scenarios are based on empirical research and studies carried out within a network of Austrian schools that introduced netbooks in their classroom teaching.

Keywords

constructivism, education, formal learning, informal learning, mobile learning, netbooks

Pedagogical Perspectives of Mobile learning

Mobile learning has the opportunity to provide didactic concepts that comply with the general request for flexible learning scenarios orientated towards learners' skills, competences and personal spheres. In this context it has to be investigated if and how it is possible by means of mobile technologies to overcome didactic and institutional limitations of traditional learning settings so as to bridge formal and informal learning.

Based on four didactic approaches, which are presented in Figure 1, the paper discusses various opportunities that mobile learning may offer for formal and informal learning, which requirements have to be met by institutions, learners and teachers, and where the limitations of mobile learning are.

The four perspectives (which we suggest with respect to mobile learning) relate to the constructivist theory of learning which emphasises the construction of knowledge by the learners themselves and regards self-organisation as paramount for learning. This implies that learners have to master a variety of skills and challenges to refine their understanding of a subject through collaboration, creativity and reflection. In addition to that, learners are flexible in selecting learning methods and media that they find suitable for their specific contextual needs and interests. This leads to more personalisation and improved media competence.

Constructivist learning related to real life situations has positive effects on learner motivation, practical outcomes and authenticity of tasks and assignments by providing hands-on experience.

Thus, teachers working with technology-enhanced learning need to provide educational scenarios offering learners opportunities to engage.

This requires teachers to actively reflect on their own digital literacy and be prepared for constant development. Apart from the equipment in schools, careful planning of didactic scenarios is essential for the success of a learning project. Suitable learning scenarios are practically oriented, open to active learner participation and enrich traditional teaching methods. The four approaches discussed below reflect learning settings that can be realised by means of netbooks or other mobile devices.

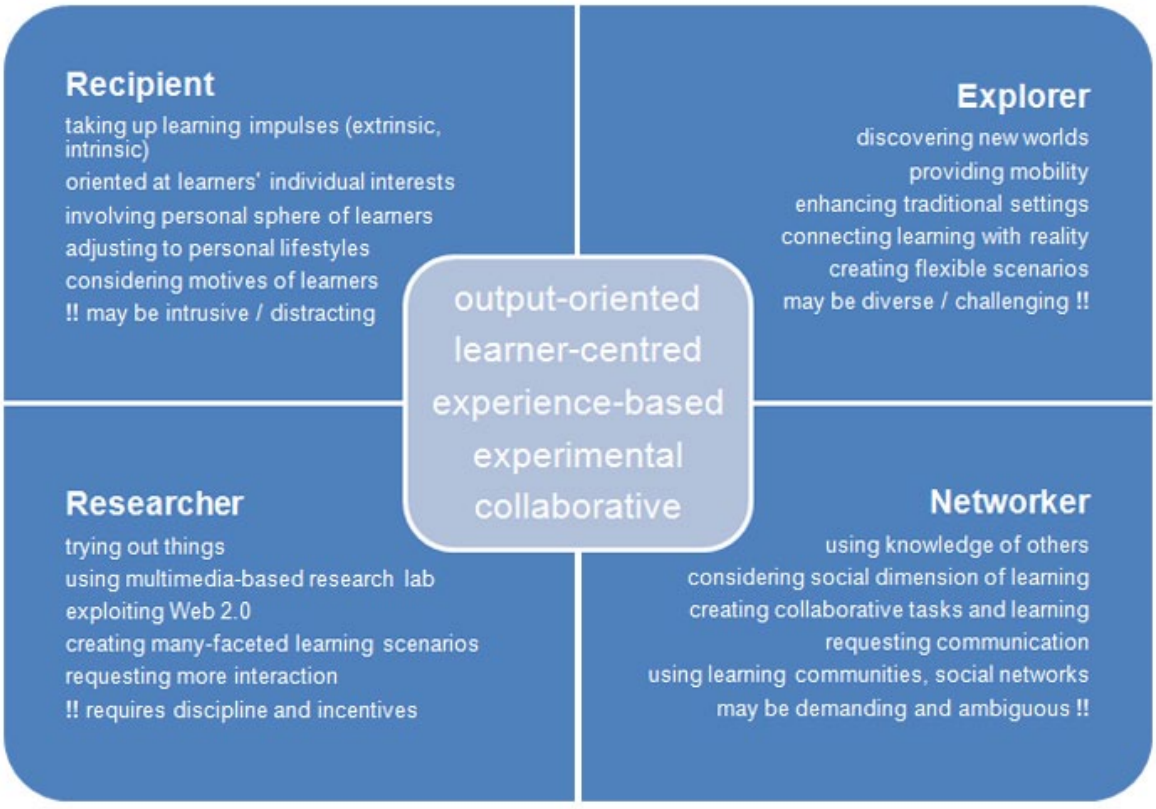

Figure 4. Pedagogical perspectives of mobile learning

1. Recipient

"Recipients" are receptive to impulses (either extrinsic or intrinsic) that stimulate our learning. We encounter them constantly in our homes or in public, e.g. a spontaneous idea in the bus or a URL discovered on a poster. Mobile devices, which are ready to use everywhere (on the way to school, at home, on the road), enable us to immediately take up those impulses and use them for our formal or non-formal education. Learning becomes better integrated in the personal sphere of learners and more oriented at personal lifestyles and motives of learners. Learning and reflecting thus can get more immediate, more effective and more efficient, but also more intrusive and distracting in private settings.

2. Explorers

"Explorers" are not satisfied with their familiar surroundings, but set off to discover new worlds. Due to their mobility (size, weight, battery, Internet connection) mobile devices enhance traditional settings of formal learning outside the classroom. Learners do media based research

and document their learning in environments (e.g. nature, libraries, museums) not traditionally associated with technology enhanced learning. Thus teaching gets more connected with reality. Additionally, the organisation of learning scenarios becomes much more flexible. At the same time it becomes more diverse and therefore challenging for learners, teachers and institutions.

3. Researchers

"Researchers" try out things and take part in creating and designing. By means of their mobile devices both teachers and learners create their own multimedia-based research lab - especially when they exploit the opportunities of Web 2.0. They become researchers and actively explore diverse areas of interest. Teaching and learning scenarios become many-faceted, more interactive and more orientated towards learners' individual interests and motives, but at the same time they assume discipline, incentive and creative spirit.

4. Networkers

"Networkers" take part in the knowledge of others and make use of the important social dimension of learning when collaborating in groups. Mobile devices support collaborative learning by providing communication and networking tools (camera, microphone, Web 2.0 tools). In combination with wikis, online learning communities and social networks, mobile devices can be powerful tools for collaborative tasks and learning in the classroom and outside school, but at the same time, learning may be experienced as more demanding and ambiguous.

Conclusion

The scenarios described above present opportunities for a creative, learner-orientated and increased use of mobile learning technologies in education. They may contribute towards ensuring a smooth transition from formal to informal learning. Yet, the use of mobile devices also has its limitations and should therefore be used deliberately and purposefully. Challenges can be seen in limited performance, increased distraction from learning, and problems of institutional inclusion in traditional environments. Still there is a long way to go. The presented perspectives, however, shall provide a possible approach towards flexible learning by means of mobile devices.

Background to our research

Our approach is based on empiric research and studies carried out within a network of Austrian schools that introduced netbooks in their classroom teaching. Our research focused on three areas: 1) new didactic scenarios, 2) aspects of ubiquitous learning and 3) educational governance.

A series of interviews, participatory observations and expert discussions were conducted between September 2009 and June 2010 which involved 6 schools, 120 learners and 12 teachers. For a limited period of time learners were additionally asked to record their daily use of mobile technologies for learning by means of microblogging which produced a set of empiric data that was analysed with respect to ubiquitous learning.

The primary target of our research was to collect first-hand experience from 'early-adopters' of netbooks in schools that may contribute towards generating general assumptions and hypotheses as opposed to developing in-depth quantitative research. The four different perspectives mentioned above may be seen as conceptual clusters of scenarios and experience that we

observed from the analysis of our interviews, participatory observations, microblogging and expert discussions.

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Lerninfrastrukturen für mobiles Lernen: Rahmenbedingungen bei der Einführung mobiler Lerntechnologien

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Abstract

Mobile Lerntechnologien erweitern die didaktischen, zeitlichen und örtlichen Möglichkeiten des Schulunterrichts. Gleichzeitig steigt mit Ihnen die Komplexität im Einführungsprozess und Regelbetrieb. In der Praxis zeigt sich allerdings, dass die 1:1 Ausstattung mit mobilen Lerntechnologien in Schulen nur dann erfolgreich sein kann, wenn die Schulleitung, das Kollegium und die Umwelt es schaffen, optimale Rahmenbedingungen für deren Nutzung zur Verfügung zu stellen. Dieser Beitrag behandelt Beispiele solcher technologischer, institutioneller und organisatorischer Rahmenbedingungen bei der Einführung mobiler Lerntechnologien im Schulunterricht.

Keywords

1:1 Ausstattung, Infrastrukturkonzept, mobiles Lernen

Einleitung

Im Ökosystem des lebenslangen Lernens ergibt sich ein Bedarf an Infrastrukturkonzepten, die formelles und informelles Lernen als Ganzes erfassen und institutionelle sowie private Infrastrukturen der Lernenden zusammenführen. Die zunehmend besser werdende und weitreichende private Ausstattung von Lernenden mit mobilen Endgeräten (z.B. Netbooks, Smart Phones, iPads) lässt die Forderung nach der Integration solcher (mobiler) Geräte in die institutionellen Lerninfrastrukturen lauter werden. Schulen greifen dieses Thema auf. Dies zeigen zahlreiche Schulversuchsprojekte, die 1:1 Konzepte mit mobilen Lerntechnologien in schulinternen oder schulübergreifenden Projekten pilotieren, in den Regelbetrieb überführen und auf die Relevanz im praktischen Unterrichtsbetrieb hinweisen.

Mobile Lerntechnologien und 1:1 Ausstattung

Die zunehmende Bedeutung einer 1:1 Ausstattung im Schulunterricht, welche die individuelle Ausstattung aller SchülerInnen mit Lerntechnologien (PC, Notebook, Netbook etc.) meint und in dieser Absicht speziell den mobilen Lerntechnologien großes Potenzial zuschreibt, zeigt sich auf unterschiedlichen Ebenen: Zahlreiche europäische Initiativen, z.B. Studien der OECD[1], internationale Empfehlungen (Indikatoren) zum Vergleich von IKT-Infrastrukturen in Schulen[2], diverse Pilotprojekte internationaler Schulnetzwerke wie beispielsweise European Shoolnet[3] bis hin zu aktuellen Spezialausgaben von Fachzeitschriften[4], die sich mit Konzepten der 1:1 Ausstattung bzw. neuen Ansätzen bei der Infrastrukturentwicklung an Schulen beschäftigen, weisen auf die Bedeutung individueller bzw. mobiler Infrastrukturkonzepte hin und bestätigen die internationale Dimension dieses Themas. Aufgabe und gleichzeitig Herausforderung der Institution

Schule ist es dabei, diese Infrastrukturkonzepte erfolgreich umzusetzen und die erforderlichen Rahmenbedingungen für den Einsatz der (mobilen) Lerntechnologien zu schaffen. Dabei genügt es nicht, ausschließlich Fragen der institutionellen Einbettung mobiler Lerntechnologien zu behandeln. Diskutiert werden müssen Themen wie Vorbereitungs- und Einführungsprozesse bei der Integration der mobilen Geräte in den Unterricht, Software- und Sicherheitsbestimmungen, Technologieverträglichkeit, Technologieangebote und Finanzierungsmodelle, sowie die laufende Kommunikation unter Einbeziehung aller Interessensgruppen, insbesondere der Technologieanbieter und Eltern, damit die Nachhaltigkeit derartiger Konzepte gesichert werden kann. Letzteres ergibt sich insbesondere aufgrund der Annahme, dass sich schulische Unterrichtsprojekte, die mobile Lerntechnologien einsetzen, häufig mit direkter Finanzierungsbeteiligung der Eltern finanzieren. Das mobile Gerät der SchülerInnen geht dabei in ihr Privateigentum über. Die Finanzierungsmodelle reichen von Ankauf mit Einmal- oder Ratenzahlung bis hin zu Mietmodellen mit regelmäßiger Gebührenzahlung. Eine geringere Anzahl der untersuchten Projekte stellt schuleigene Geräte zur Verfügung.

Rahmenbedingungen bei der Einführung mobiler Lerntechnologien

Welche Rahmenbedingungen sind nun zu erfüllen, damit mobile Lerntechnologien in Schulen erfolgreich eingeführt werden können?

Um diese Frage zu beantworten, wurde der Prozess bei der Einführung von mobilen Lerntechnologien im Schulunterricht auf einer breiten Datenbasis untersucht. Als Untersuchungsgegenstand wurde der Unterricht mit Netbooks in sechs österreichischen Schulen im Schuljahr 2009/10 herangezogen. Aus der Untersuchung ergaben sich eine Reihe methodologischer Fragestellungen, denen im Sinne der Akteur-Netzwerk-Theorie (ANT) nach Latour[5] ethnographisch nachgegangen wurde. Dabei wurden wichtige Aspekte des Ökosystems Schule im Zuge der Integration mobiler Lerntechnologien im Unterricht, beispielsweise

- Menschen (Lehrende, Lernende, Schulleitung, Eltern, Technologieanbieter, etc.)
- Technologien (Netbooks, Beamer, Schulnetzwerke, private IT-Infrastrukturen, etc.)
- Lehr- und Lernorte (Raum- und Schulorganisation, Bibliothek, Labor, etc.)
- institutionelle Artefakte (organisatorische, rechtliche Rahmenbedingungen, etc.)
- Wissensbasen (Web 2.0 Tools, persönliche Lernumgebungen, etc.)

identifiziert, beobachtet und als mögliche Größen bei der Identifizierung der erforderlichen Rahmenbedingungen angesehen. Einzelne Aspekte aus dieser Untersuchung werden nun im zweiten Teil dieses Beitrags näher betrachtet. Sie beschäftigen sich mit den technologischen, institutionellen und organisatorischen Rahmenbedingungen eines möglichen mobilen Unterrichtsprojekts.

Technologische Rahmenbedingungen: Spezifische Technologie- und Serviceangebote

- Handelsübliche Pauschalangebote zu mobilen Technologien erfüllen die erforderlichen Bedingungen von Schulprojekten in der Regel nicht. Technologieentscheidungen sollten auf Basis eines *Pflichtenheftes* erfolgen und Technologiestandards für Schultypen und Schulstufen spezifisch festlegen (z.B. Mindestakkuleistung, Geräte- und Bildschirmgröße, Geräteperformance).

- *Technologieentscheidungen* sollen, aufgrund der raschen Veränderungen am Technologie- und Anbietermarkt (rascher Preisverfall und steter Technologiewandel bei Geräten und Mobilfunkverträgen), möglichst zeitnah mit dem Beginn eines Projektes zusammenfallen.

- Bei verstärktem mobilem Einsatz der Lerngeräte empfiehlt es sich, *Versicherungen* gegen Schäden, Verlust oder Diebstahl (ggf. Garantieverlängerungen) abzuschließen.

- Der Abschluss von *Mobilfunkverträgen* sollte nicht an einen Gerätekauf gebunden sein – insbesondere dann nicht, wenn Schulen bereits über WLAN bzw. SchülerInnen über Internetanbindung im privaten Umfeld verfügen, um auf individuelle Bedürfnisse zu reagieren.

- *Supportkonzepte* und Vereinbarungen für First-, Second- und Third-Level-Support sollten mit den Technologieherstellern oder lokalen Servicepartnern getroffen und den SchülerInnen und Eltern weiterkommuniziert werden.

Institutionelle Anforderungen: Schulinterne Maßnahmen mit dem Projekt entwickeln.

- Es empfiehlt sich, Art, Umfang und Regeln bei der Nutzung der mobilen Lerntechnologien im Unterricht in Form *schriftlicher Verhaltensvereinbarungen* festzuhalten, um ungewollte Ablenkung im Unterricht oder in unterrichtsfreien Zeiten (z.B. Pausen) zu vermeiden.

- Trotz ausreichender *Akkuleistungen* sollte darauf geachtet werden, dass Ladestationen in der Schule (am besten direkt in den Klassenzimmern) vorhanden sind, da SchülerInnen erfahrungsgemäß nicht immer ihre Akkus vor dem Schultag komplett geladen haben.

- Software-Installationen auf mobilen und/oder privaten Geräten erfordern spezielle Lösungen, z.B. *Sondervereinbarungen zu Softwarelizenzen*, Open Source Produkte, Client-Server-Lösungen.

- *Software-Images* helfen dabei, ein schnelles Wiederherstellen von Softwarekonfigurationen bei Geräteausfällen zu garantieren.

- *Ersatzgeräte* für SchülerInnen und LehrerInnen sollten verfügbar sein (am Schulstandort oder beim lokalen Serviceanbieter), um kurzfristige Geräteausfälle zu überbrücken.

- *Sicherheitstechnische Maßnahmen* zum Schutz der mobilen Lerngeräte sind notwendig (z.B. Abschließen von leeren Klassenräumen, verschließbare Aufbewahrungsschränke, etc.).

- Die *Weiterbildungsmöglichkeiten und mediendidaktische Unterstützung der LehrerInnen* in Form von ausgearbeiteten Unterrichtsszenarien, Ressourcen oder Anwendungsbeispielen sichern den Erfolg des mobilen Unterrichtsprojektes.

- *Flexible Formen der Raumgestaltung* im Schulgebäude (z.B. nicht ausschließlich frontal ausgerichtete Bestuhlung im Klassenzimmer) sowie die *mediale Grundausstattung* in den Unterrichtsräumen (Beamer, interaktives Whiteboard etc.) begünstigen den Einsatz mobiler Lerntechnologien.

Organisatorische Rahmenbedingungen: Zusammenarbeit mit wichtigen Interessensgruppen.

- Eine direkte Finanzierungsbeteiligung der Eltern bei der 1:1 Ausstattung erfordert ihre Einbeziehung in viele *Entscheidungsprozesse*, z.B. Entscheidung über Gerätetyp, Abschluss des Kaufvertrages, Mobilfunkverträge, Versicherungen, Software-Konfigurationen etc.

- Schulen sind in diesem Prozess *VermittlerInnem*. Sie leisten im Regelfall Unterstützung, beispielsweise bei der Angebotseinholung und Bestellabwicklung (z.B. Sammelbestellungen).

- Über den Ankauf der Geräte oder den Abschluss von Kauf- oder Serviceverträgen entscheiden die *Eltern*. Im Regelfall nehmen Eltern eine interessierte aber kritische Haltung ein, fordern hohe Investitionssicherheit und müssen in wichtige Entscheidungen eingebunden werden, z.B. in Elternabenden.

- Eine der größten Herausforderung für ProjektkoordinatorInnen scheint in der Abstimmung der Interessen und Aktivitäten der verschiedenen Personengruppen, insbesondere zwischen den Eltern, Technologieanbietern und Servicepartnern, zu bestehen.

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Using mobile 360 degree performance feedback tools in Health and Social Care practice placement settings: An evaluation from the students' perspective.

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Abstract

This qualitative study investigates the student view of using reflective assessment tools in practice. These tools were developed collaboratively across sixteen health and social care professions and could be accessed by the undergraduate students via a mobile device, using a PC or on paper whilst on their placement experience. The tools were based on common competences and therefore they were able to seek interprofessional feedback when naturally occurring in the practice settings. Additionally, service user feedback is part of the assessment tool.

This work is supported by the Professional, Regulatory and Statutory Bodies (PSRB) appertaining to these sixteen professions. Student cohorts were selected to be involved in this study and they were then invited to attend focus groups following their experience of using these tools. Their views were recorded, analysed and themed by the team of researchers involved in this programme. Students may experience different levels of complexity during their undergraduate career, but the tools are designed to be sufficiently adaptable. Themes resulting from the analysis were broadly in four categories; the mode of delivery, the content of the tools, the process of gathering feedback and workplace issues.

Keywords

Paper based feedback, web based feedback, mobile based feedback, performance feedback, perceptions, common competencies, practice placement learning, work-based learning, interprofessional assessment, common competences

1. Introduction

This is an action research study of a large-scale award-winning mobile learning solution which is a successful example of a "proof of concept" for the implementation of a shared services model. It involved over nine hundred users from five UK Universities and sixteen health or social care (H&SC) professions. It was developed by the Assessment & Learning in Practice Settings (ALPS) Centre for Excellence in Teaching & Learning (CETL). Central to the work has been a Common Competency Mapping exercise, involving all sixteen professions, which produced three Common Competency Maps on the topics of teamwork, communication, and ethical practice (Holt et al, 2010).

From these, five 360-degree feedback tools were developed which can be delivered in mobile, web and paper based formats. They enable the student to gather regular formative feedback, whilst in practice settings, from a range of stakeholders including their practice educator (from their own or a different profession), their peers (from their own or a different profession), the service users (and carers), and self and encourage them to reflect 'on' and 'in' action (Schön, 1995). The five tools are based on commonly occurring practice based scenarios as follows:

- 'Knowing when to consult or refer'
- 'Working interprofessionally'
- 'Demonstrating respect for a service user during an interaction'
- 'Gaining consent'
- 'Providing Information'

Feedback is more effective when it is provided often enough, in enough detail and in a timely manner (Gibbs and Simpson, 2004).

The ALPS assessment cycle and its associated mobile platform support the dynamics of the tripartite relationship between the learner, the workplace, and the university. The platform, support, and training which underpin its use have been described previously (Taylor et al, 2010). In brief, assessments tools are pushed out to students' ALPS mobile devices (i.e. HTC Vario I and Vario II PDAs) and used to capture feedback using both text and audio. Completed assessments are uploaded to an e-portfolio which tutors access back at the University to monitor students' progress and provide additional feedback. The tutor then matches the student's performance with relevant skills defined in the ALPS common competency frameworks.

2. Method

We used a two-stage qualitative methodology to investigate the students' perceptions of the mobile assessment processes. Stage one has been reported (Taylor et al, 2010). We will present findings from the stage two evaluation that involved conducting eleven cohort-specific focus groups involving eighty three students from seven of the ALPS professions. Cohorts used paper, web-based or mobile tools.

A thematic analysis established twenty initial themes placed into four categories: Mode of Delivery; Assessment Tool Dynamics: Content; Assessment Tool Dynamics: Process, and Work Based Issues.

3. Results

For the mobile delivery there was a mixed response. Generally, when the technology performed as planned, and the students were in a supportive environment, there were practical and pedagogic advantages. Many students commented on the benefits and the issues relating to the 360-degree feedback process and reflective learning and could see that the concept behind the mobile tools, that of being a structured way of capturing feedback from several sources, was useful and helpful to their learning.

In practice, rolling out the programme was disruptive due to its large scale, and its innovation in terms of interprofessional assessment practices. This was particularly true for the mobile delivery as students had to be active agents in its use and not all of them had the time, confidence and skills to collect feedback from the full range of stakeholders.

With the ongoing improvements in mobile technology such as increased battery life, better connectivity and faster download speeds, the mobile delivery of 360 degree performance feedback offers real promise compared with the other modes of delivery, as it empowers students to actively engage a range of stakeholders in their learning whilst they are on the move.

There were practical issues of using in practice settings; the very busy clinical and social care settings often made it difficult for the students and their practice assessors to easily complete their assessments. As it was a pilot project, it was often an addition to their existing required assessments. Therefore, the students who found them easier to complete were the ones for whom the ALPS assessment tools were more integrated into their course requirements.

It was found that for some cohorts, the tools did promote reflective practice and therefore their learning in practice.

Some students found the experience empowering as they used the tools to advantage their learning. This was less than expected, however, as we had introduced the tools as "student led."

4. Discussion

The mode of delivery of the tools was certainly an issue. The mobile devices, however, were not up to date by the time this study was evaluated. This could be easily resolved by using more modern technology such as iPhones.

The practice issues were important as the practice educator tended to direct the course of action, which influenced whether the tools were acceptable to the students or not. Further education and embedding of the tools into curriculum requirements can largely overcome this issue.

It was hoped more students would find the assessment tool more self-directed and empowering. Some students did this where the tools were more embedded into their assessment requirements, and their cohort tutors can have great influence here.

It is clear there is great potential for the use of these tools to enhance students' reflective learning experience in practice and the barriers identified can be overcome over time.

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MoLeaP – the mobile learning project database

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Abstract

This poster aims to introduce 'MoLeaP - the mobile learning project database', a service provided by the London Mobile Learning Group (LMLG; www.londonmobilelearning.net) via www.moleap.net. MoLeaP is a public and free-of-charge online database for education professionals interested in mobile learning practice underpinned by theory. Projects, applications, and resources can be submitted by users in order to make materials and experiences available to a broad audience and to encourage the implementation of mobile learning projects in different learning contexts, such as school/college/university, family, workplace, and/or everyday life to enhance the replicability of mobile learning projects, and to contribute to sustainability in teaching, learning and research on mobile learning. The database categories are based on a conceptual framework of a socio-cultural ecology of mobile learning and are derived from a methodological framework for the description and analysis of mobile learning practice.

Keywords

mobile learning project database, replicability, transferability, socio-cultural ecology, methodology

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, 'MoLeaP – 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 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.

Also, MoLeaP aims to provide a rich resource for mobile learning experiences in order to allow researchers and practitioners from all over the world easy access to projects and relevant resources. The categories for project description might assist practitioners in planning mobile learning projects and enhance dissemination, replicability, and transferability of projects by

providing a common basis. It is hoped that the database will be able to support educators in the implementation of mobile media and mobile learning projects in any educational context and that it contributes to sustainability in teaching, learning, and research.

2. Theoretical and Methodological Background

The project database combines theory, research and application and aims to provide straightforward functionality on the basis of design principles derived from principled conceptual work (Seipold, Pachler, & Cook, 2009; Seipold & Pachler, 2010; Pachler, Bachmair, & Cook, 2010) in an attempt to facilitate the sharing of pedagogical practice. The categories, which are used to describe and analyze mobile learning projects, are based on the theoretical background of a socio-cultural ecology of learning with mobile devices (Pachler et al., 2010; Pachler, 2010). The socio-cultural ecology consist of the three key components: structures, agency and cultural practices and aims to describe mobile learning as a process within changing mass communication and thus changing appropriation mechanisms attendant to engagement in masse communication. As a consequence, the database is open to any projects with mobile media, irrespective of the notion of learning underpinning it and irrespective of the setting.

2.1 Categories for Project Descriptions

The theoretical work of the LMLG has led to a set of categories, which are intended to be applicable to projects taking place inside and outside of educational institutions; they provide the basis for the categories of MoLeaP. The structure of the database has been designed to be helpful to colleagues planning mobile learning projects by flagging key considerations to be attended to during the planning and evaluation phases, in addition to fostering shareability by providing a common 'language' (soft ontology) to talk about practice:

1. General project data:
   language of the 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; age of participants; number of learners involved; number of teachers involved; number of supporting staff; role of supporting staff; duration; location; location latitude & longitude (of the location where the project was conducted; for further implication in location-aware contexts); type of educational establishment; phase of education; subject domain; teaching/ learning focus; tags/ keywords; optional text field.

2. Context/rationale:
   background information, i.e. how many persons; type of educational establishment; duration; devices used; technical support etc.; learning and teaching aims; and envisioned role of mobile devices.

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

4. Technologies and requirements:
   interoperability, storage, usability etc.

5. Project outcomes.

6. Lessons learned/ issues emerging.

7. Recommendations and future possibilities.

8. Replicability and transferability.

9. Recommended literature and references (optional).

10. Project analysis (optional).

2.2 Categories for Project Analyses

The analysis framework might best be described as heuristic and hermeneutic with relevance for mobile learning in the context of a socio-cultural ecology, covered under meta-categories rather than a rigid analysis scheme. The analysis framework is open to examples from school contexts as well as to examples from everyday life. We opened the analysis to aspects of identity construction, and social inclusion/exclusion in order to be able to access the most evident issues of cases of mobile use from everyday life. Also here, the criteria for the analysis relate to key concepts of the theoretical framework of the LMLG of a socio-cultural ecology. As this framework deals with a number of theoretical concepts, which are not self-explanatory, contributors to MoLeaP are free to provide a project analysis that refers to the following categories:

1. Agency, structure, cultural practice:
   e.g. new habitus and social segmentation; 'at-risk learners'; literacy, traditional vs. new; understanding media as cultural resources; participation in cultural practices.

2. Approaches to teaching and learning:
   e.g. informal/situated/collaborative/problem-based learning; bricolage; knowledge building; meaning-making.

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

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

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

2.3 Categories for applications and resources

In order to address not only practitioners through project concepts but also people who are only interested in the use of single applications, or in references to literature and project websites, MoLeaP covers these aspects as well. The option to systematically submit references, e.g. to project websites, to the database makes project websites quotable and allows researchers to refer to such projects in texts by means of references. The categories for the submission of applications and resources differ from the project categories in order to meet the requirements for providing information about applications and resources.

3. Poster

The poster will show a short abstract, followed by an overview on aims, theory, project categories and analysis categories. Also, it will provide a short introduction to the features of the website.

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mobileTUD – der lange Weg zum “mobilen Ruhm”

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Abstract

The article considers three main aspects of developing mobile learning for serious learning scenarios at universities and further educational training sectors. The first is about getting in touch with mobile learning in general and analysing actual e-learning-systems at the Technische Universität Dresden. The second aspect focuses on micro learning as a potential didactical approach. Having a look on prototyping pitfalls and problems will complete the introduction. For discussing the presented issues concerning technical, didactical, learning and teaching problems there will be a workshop session with three round tables using the worldcafé method.

Keywords

mobile learning, micro learning, micro content, learning content management, mobile devices, cross media publishing, application development

1. Ausgangslage

Immer mehr Studierende an Hochschulen sind mit leistungsfähigen mobilen Endgeräten ausgestattet und integrieren diese vollständig in ihren Lebens- und Lernalltag (vgl. JIM-Studie 2010). Diese Entwicklung stellt neue Herausforderungen an die didaktische und technische Aufbereitung der Lerninhalte durch Lehrende an Hochschulen, und in dessen Folge auch an Medienzentren als Einrichtungen, die oftmals Inhalte in deren Auftrag umsetzen. Ausgehend von der initialen Idee einer TU Dresden-App entstand im April 2010 ein In-house-Projekt am Medienzentrum der TU Dresden. Mit einem explorativ-heuristischen Ansatz wurde dem Wettlauf mit den sich rasch verändernden Technologien und Nutzungsverhalten Rechnung getragen und damit auch der Intention, mit begrenztem Vorwissen und wenig Zeit zu guten Lösungen zu kommen. Ein weiterer Vorteil dieser Methodik ist, dass die Mitarbeiter nicht aus ihrem Arbeitskontext gerissen werden und das Erforschen der zur Verfügung gestellten Geräte im spielerischen Sinn erfolgt. Dabei war es den Initiatoren wichtig, alle Abteilungen einzubinden, sodass sich Informatiker, Erziehungswissenschaftler und Designer mit Fragen der Mobilität und nicht zuletzt des mobile learning auseinandersetzten.

2. Entwicklungsschritte an der TU Dresden

Bis heute wurden am Medienzentrum drei wesentliche Phasen durchlaufen:

- Initialphase: Kennenlernen der Geräte und Technologien; aktive Beobachtung des eigenen Nutzungsverhaltens, didaktische Überlegungen,
- Fokussierungsphase: Zielpriorisierung und
- Prototypenphase.

2.1 Phase 1: Initialphase

In der ersten Phase lag der Fokus auf den mobilen Endgeräten und dem Nutzungsverhalten. Systematisch wurden vorhandene Lehr- und Lerntechnologien mit den Geräten erprobt und bewertet. Dabei zeigte sich, dass weder OPAL, das Lernmanagementsystem aller sächsischen Hochschulen, noch MAGMA, der dazugehörige Streaming-Dienst für Audio und Video, ohne weiteres nutzbar sind. Aufgrund der Displayauflösung und der verwendeten Technologien in den Systemen waren einige Funktionen „unsichtbar", also außerhalb des sichtbaren Bereiches auf dem mobilen Endgerät. Durch die Einschränkung der genutzten Apple-Hardware konnten Dateien weder im System abgelegt noch dauerhaft auf dem mobilen Endgerät gespeichert werden. Ähnliche Probleme traten bei dem eingesetzten Content Management System für E-Learning Inhalte (ELCMS) auf: Zwar lassen sich die Webseiten darstellen, gebrauchstauglich im Lernprozess waren sie jedoch nicht. Eine intensive Auseinandersetzung mit dem breiten Angebot von Apps im Apple App-Store zeigte, dass es bereits spezielle Apps für den Zugriff auf LMS (z.B. Blackboard und Moodle) gibt. Auch wurden Möglichkeiten gefunden MAGMA zu nutzen, auch wenn die Ergebnisse eher als prototypisch einzustufen sind.

Zur ersten Phase gehörte zudem eine intensive Auseinandersetzung mit den didaktischen und lerntheoretischen Problemstellungen. Im Lehren und Lernen mit neuen und hier speziell mobilen Technologien sind Geräte wie iPad, iPod touch und iPhone nur eine Seite der Medaille. Als didaktische Grundlage sind Microlearning und der damit verbundene Microcontent für gelungene Lehr- und Lernszenarien unerlässlich. Dabei bezeichnet Microlearning „kurze Online-Aktivitäten", in denen ein klar abgegrenztes Thema in einem formellen Kontext behandelt, oder die Antwort auf eine aktuelle, oft auch spontane Fragestellung selbstorganisiert recherchiert wird (Robes 2009). Die dafür zur Verfügung stehenden Lernmaterialien, die in dieser kurzen Zeit bearbeitet werden können, werden dabei als Microcontent bezeichnet. „Micro" bedeutet in beiden Fällen also „inhaltliche Kompaktheit", die einerseits den zeitlichen Rahmen berücksichtigt, der unterwegs üblicherweise zur Verfügung steht und andererseits Vor- und Nachbereitungen unnötig macht. Es soll „Ad-hoc" und „on-demand" gelernt werden können. Mobile learning bedeutet somit eben nicht, herkömmliche E-Learning-Inhalte auf mobilen Endgeräten wiederzugeben (vgl. Pimmer 2008), andererseits ist mobile aber auch nicht mit Microlearning gleichzusetzen, da auch von einem Desktop-PC aus kurze Lerneinheiten aufgerufen oder „ergoogelt" werden können. Nach unserer Definition vereint Mobile learning […] alle Formen des Lehrens und Lernens in der Fremd- und Selbstbildung, die beim Realisieren von Lehr- und Lernprozessen drahtlose Informations- und Kommunikationstechnologien einsetzen, um (auch standortbezogene) Inhalte in kurzen (teils ungeplanten) Lernphasen zu vermitteln (vgl. Neumann et al. 2010). Davon ausgehend impliziert Mobiles Lernen zwar kein Microlearning, die gegenseitige Begünstigung ist aber offensichtlich. In der Diskussion um Integration von Microlearning-Phasen in den Lehr- und Lernprozess stellt sich mittlerweile vermehrt die Frage, ob dies ohne ein rahmengebendes Konzept (im Gegensatz dazu als „Macrolearning" bezeichnet) überhaupt sinnvoll ist (vgl. Reinmann 2010, Lorenz 2010). Im vorliegenden Beitrag soll diese Diskussion näher beleuchtet und wesentliche Unterschiede und Beziehungen unter den Elementen herausgearbeitet werden.

2.2 Phase 2: Fokussierungsphase

In der zweiten Phase wurde festgelegt, welche Inhalte und welche Geräte zur prototypischen Umsetzung zugrunde gelegt werden sollten. Bei der Wahl der Inhalte fiel die Entscheidung auf ein

bereits realisiertes Projekt aus dem Bereich der Methodenlehre in der Psychologie (http://elearning.tu-dresden.de/versuchsplanung), da hier schon ein breites Spektrum an Lerninhalten und einigen Testmodulen gegeben war. Diese Inhalte wurden mittels Content Management System erfasst und gespeichert.

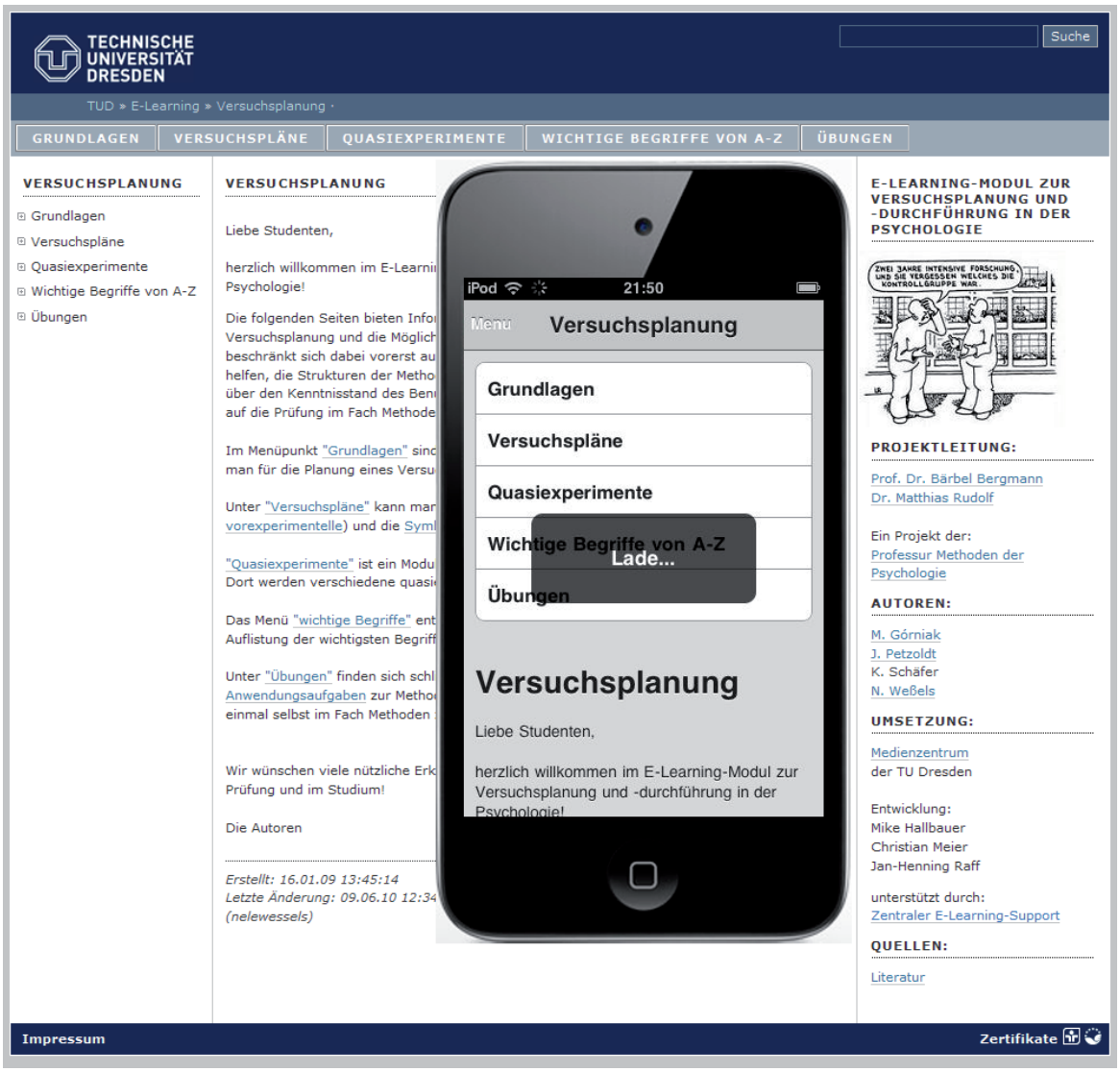

Abbildung 1: Startbildschirm im Vergleich - Desktopbrowser und mobile Web-App

Als Testgeräte wurden iPad und iPod touch der Firma Apple gewählt, weil diese Geräte ein homogenes System und ein konsistentes Zusammenspiel zwischen Hard- und Software bieten. Geräte mit einem Android-Betriebssystem wurden zunächst ausgeschlossen, denn zu diesem Zeitpunkt waren noch keine praktikablen Geräte am Markt verfügbar. Weiterhin herrscht bei diesen Geräten eine starke Fragmentierung der Systeme zwischen verschiedenen Herstellern bzw. Geräteversionen vor.

2.3 Phase 3: Prototypenphase

Aus Sicht der technischen Entwicklung wurde hoher Wert darauf gelegt, vorhandenes Know-How in der Webprogrammierung nutzen zu können. Die Darstellung von bestehenden Webseiten bzw. -applikationen kann auf mobilen Endgeräten oftmals 1:1 erfolgen, da die mobilen Browservarianten in der Lage sind, standardkonforme Webinhalte zu interpretieren und anzuzeigen.

Allerdings kann ohne Optimierung auf die kleineren Displaygrößen (insb. von Schriftgrößen, Links, Buttons, etc. – siehe Abbildung 2) keine adäquate Darstellung ad hoc erreicht werden – da helfen auch Zoom-Funktionen nur bedingt weiter. Nicht zu unterschätzen ist insbesondere der Trend hin zur speziellen „App" für jedes denkbare Einsatzszenario. Auch wenn es sich bei der intendierten Anwendung im engeren Sinne lediglich um die Anzeige von Webpublikationen handelt, erwarten die Nutzer eine entsprechende App dafür (bspw. geschürt durch den Marktführer Apple mit dem Slogan: „There's an app for that"). Somit kommt der direkten Nutzung von Browsern auf mobilen Plattformen im Gegensatz zu den jetzigen Desktopsystemen zunehmend eine untergeordnete Rolle zu.

Abbildung 2: Beispiel für optimierte Darstellung auf kleinerem Display

Trotzdem stellen die im Hintergrund verwendeten Webtechnologien (HTML/ CSS/ Javascript) weiterhin die Grundlage dar. Dies bildete für die Arbeitsgruppe mobileTUD den strategischen Ansatz, um sich in einem ersten Schritt mit der Umsetzung von mobilen Lernanwendungen zu beschäftigen – genauer: mit der Adaption bzw. Optimierung vorhandener Lernanwendungen für mobile Endgeräte. Die Auseinandersetzung mit der Programmierung von sogenannten Native-Apps für Apples iOS-Plattform (mit Programmierung in Objective-C) wurde in dieser Projektphase aus Ressourcengründen (zeitlich, finanziell) zurückgestellt. Stattdessen wurde eine sogenannte mobile Web-App (auf Basis von HTML/ CSS/ Javascript) umgesetzt, welche allerdings beim Endnutzer den Eindruck einer „richtigen App" erzeugen kann.

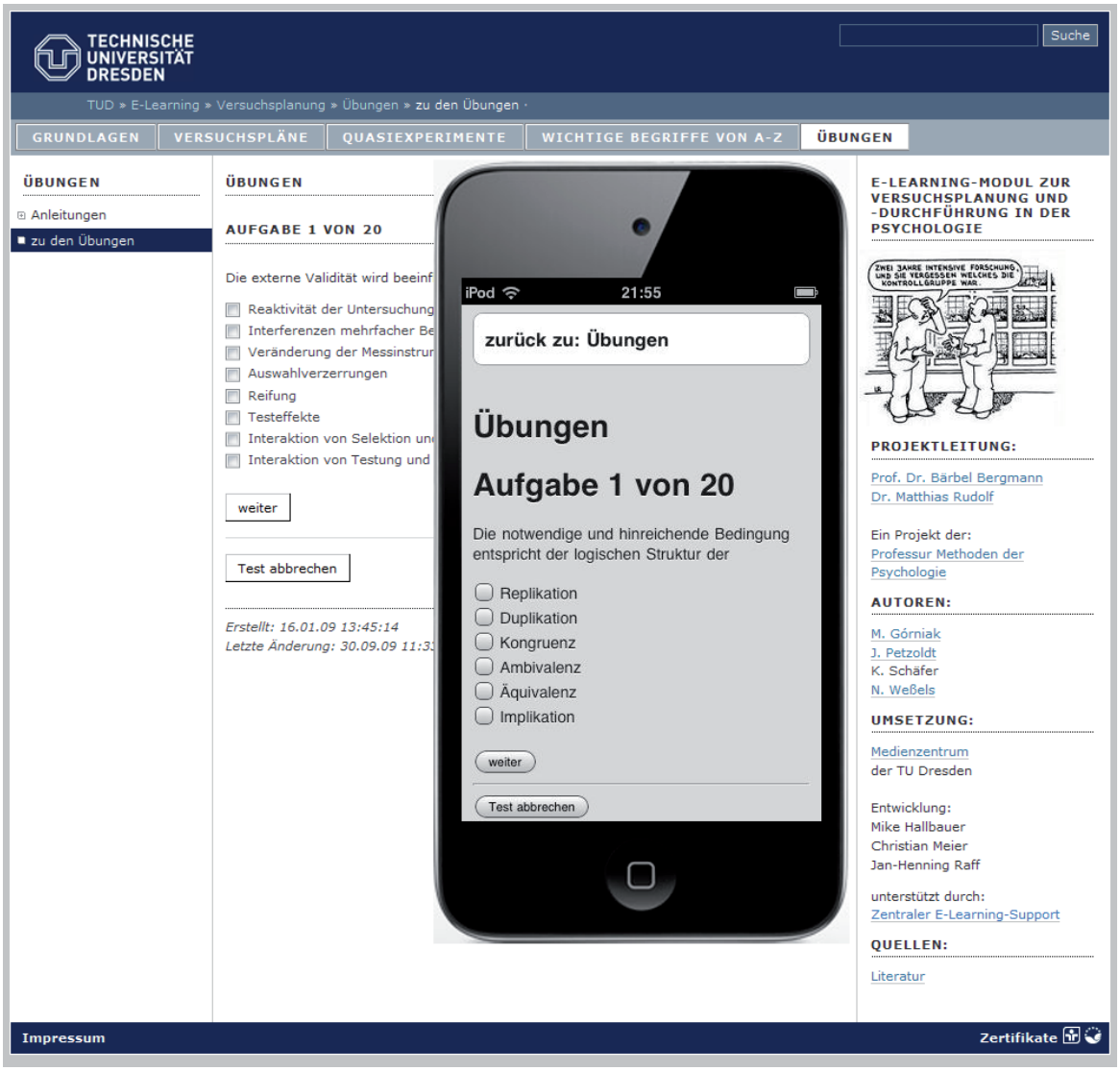

Abbildung 3: Übungsszenario mit Multiple-Choice-Aufgaben

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Learning, mobiles & development

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Abstract

This workshop will introduce and question some of the powerful and seductive myths surrounding the use of mobiles to supp.ort learning in Africa. After a shared reading and discussion of references from different intellectual and research communities, the participants will work on a more nuanced and critical account of using mobiles for learning and explore about the implications for some future engagement.

Keywords

Africa, development

1. Introduction

There is considerable and unusual expertise in the London Mobile Learning Group (LMLG) and its associates. It is perhaps not typical of the usual Anglophone perspectives on mobile learning, those that draw almost exclusively on disciplines at the interface of psychology and computing. It has understandably focussed on mobile learning in 'developed' European contexts. This workshop aims to explore the relevance of that expertise to 'developing' specifically contexts in the light of current activity, research and theorising.

2. Background

There is much activity, much discussion and much interest around the capacity of mobile devices to deliver, supp.ort and enhance learning for the disenfranchised, the disadvantaged and the developing communities and regions of the world especially those in Africa. Much of this discussion, interest and activity is however uncritical, simplistic and poorly synthesised.

In general the argument for using mobile phones or other mobile devices to address educational disadvantage is straightforward: their ownership and acceptance are near-universal and cut across most notions of 'digital divides'; their use is based around robust sustainable business models; they are, unlike other ICTs, found at the base-of-the-pyramid (BOP) amongst the 'next billion subscribers'; they deliver information, ideas and, increasingly, images.

There is moreover the rapidly increasing ownership of more powerful handsets in the developing world, the decreasing real costs of this hardware and connectivity, the increasing coverage of higher specification networks in these regions and the increasing activity of corporates representing publishing, handsets, services and infrastructure looking for sustainable business models based on the educational use of mobile devices in developing regions. These represent opp.ortunities to intervene, to promote and to guide this activity in order that worthwhile educational experiences and opp.ortunities become more widely and more equitably distributed.

A more critical discussion is however needed because various communities, necessary actors in facilitating successful learning using mobile devices and technologies in Africa, each come with considerable potential but often inapp.ropriate contributions, partial understandings and flawed assumptions:

- Mobile learning is an emerging global research, policy and practitioner community that has exploited mobile devices to extend the reach of learning and of educational opp.ortunities, and has developed app.lications and formats that enhance and extend the concepts of learning and education. The projects and pilots of the mobile learning community now impact on policy and provision in many parts of the developed world thanks to judicious advocacy and credible evidence. The achievements of the mobile learning community are not necessarily characterised specifically by any 'developing'/'developed' divide but equally are not widely known or understood in the developing regions.

- The m4d, and larger ICTD, community of researchers, activists and practitioners have currently generally only addressed learning and education as 'service delivery' issues, using mobile technologies to smooth the operations of educational institutions, and have not engaged significantly with education processes or practices.

- Mobile learning, insofar as it takes place in Africa, has been seen as part of e-learning in Africa and as part of the rhetoric of 'catching-up' and 'leap-frogging'. The technologies of e-learning necessarily but perhaps implicitly embody ideas and practices of teaching and learning native to America or Western Europe. Furthermore the model for procuring and deploying and supp.orting ICT for education is no longer app.ropriate, being based on institutional provision rather than learner ownership.

- The pace at which mobile devices and technologies are brought to market and more importantly are exploited, domesticated and app.ropriated leads to a very fragmented understanding of their affordances and of the nature and significance of any medium-term trends.

- Given the momentum and widespread acceptance of the 'development' agenda, it is important and urgent to debate and discuss the issue of 'development' and the issue of 'app.ropriate' technology, in relation to e-learning, and especially to debate and discuss these issues in relation to each other. The key questions are, "Are they antithetical? Is one at the expense of the other? Can they be reconciled?"

- Is in fact, 'development' a flawed modernist and western European concept, ill-suited to cultures and societies that were possibly only partially 'modern' and may be transmuting with something beyond modernity as they engage with near-universal mobility and connectedness?

- There can sometimes also be vagueness in defining in practical terms the 'African-ness' that 'development' or 'app.ropriate' technologies and systems are supp.osed to be addressing: is it sparsity, rurality and distance? Is it poverty and deprivation? Is it infrastructure, capacity and organisation? Is it national, cultural and linguistic diversity? Or is it something else? There is always a risk of making superficial generalisations or untrustworthy inferences but there is always a practical need to learn what can be transferred or replicated too, and a need to formulate policy.

- Mobile devices increasingly allow users to generate, share and discuss ideas, images, interpretations and information, specific to them, their locations and their own physical and virtual communities, in effect to determine and manage their own learning and knowledge. This problematises the role, status and credibility of formal education and its institutions but also impacts and perhaps threatens learners' indigenous cultures, languages and social structures, perhaps rooted in stable hierarchies, a more oral tradition and unique epistemologies.

- Tension between philosophically sophisticated researchers, cautious and conscious of (over-) generalising from a messy and contingent reality and policy-makers and donors needing simple prescriptions and universal truths to work with (and fund).

Areas that must be explored also include the balance between top-down and bottom-up app.roaches, 'progressive' versus 'traditional' values in education, the need for educational technologies that enable some Africans to compete in a global knowledge economy and for educational technologies that enable others to subsist and survive, the relationships between mobile learning, lifelong learning, distance education and classroom teaching, the ethical and cultural aspects of educational interventions and the boundaries and differences between various research communities and their methodologies for example between participative design and anthropology.

3. Conclusion

After a shared reading and discussion of the references listed below (and some other resources) from different intellectual and research communities the participants will work on a more nuanced and critical account of using mobiles for learning in Africa and ask about the implications for some future engagement.

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Technology narratives and mobile spatial learning

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Abstract

Over the last few years there has been a proliferation of location-sensitive applications and devices that can support mobile learning. The result is that learners have access daily to a wealth of spatial data. Yet, it is questionable as to whether this data is actually contributing to learning or whether learners are just overloaded with information. In this paper we propose that interaction with technology should be in the form of a narrative, where the learner can actively shape the format, mode and most importantly the context in which they learn. In this way we approach the concept of narrative not from the perspective of the way that a story is told, but rather with a focus on how the interaction with technology itself adopts a narrative structure. This involves thinking about mobile learning in a holistic manner and allowing for ambiguity and serendipity in how someone engages with media. In order to critically investigate this approach we will review three projects which we propose integrate a technology narrative and seek to describe how these different examples support learning.

Keywords

technology, narrative, space, locative, mobile, place, location

1. Introduction

We propose that learning will only take place in such situations when the technology is embedded in a form of narrative framework (Willis et al. 2010). According to David Turnbull, the narrative format creates such possibilities since "storytelling is how a particular piece of technology becomes seamlessly integrated into our cultural practices" (Aedy et al. 2002). This sees technology as reflecting the situated nature of lived experiences such as that described by McCarthy and Wright, who urge the need to "review lived, felt experience as prosaic, open, unfinalisable, situated in the creativity of action and the dialogicality of meaning making, engaged in the potential of each moment" (McCarthy & Wright 2004). This supports an approach to learning where the technology use becomes situated in the changeful everyday practices of the learner, in a manner outlined by Suchman who concludes that "to be made useful, these devices needed to be read in relation to each other and to an unfolding situation. Technologies, in this view, are constituted through and inseparable from the specifically situated practices of their use." (Suchman et al. 1999).

Narrative has always been used for learning, but it has tended to focus on the idea of a story or a way of sharing knowledge through exchange. In this paper we refer to the idea of narrative as the way that the technology engages and interplays with the learner, providing a structure for the interaction. A story is a "symbolised account of actions of human beings that has a temporal dimension" (Sarbin 1986). Dettori et al. (2006) distinguish the roles in the process as showing, telling and authoring. The key aspect focus of technology narratives is on enabling a form of authoring through the learners engagement with technologies. This sees users of technology as described by Dunne where learners are "actively making sense of the situations they encounter, negotiating the ramifications, radically reshaping their experiences with technologies, chasing their own desires,

making something of what they are given, and making sense of themselves in the process. Seen in this light, users are authors, characters, protagonists, and co-producers" (Dunne 1999).

2. Co-authoring with technology

In order to understand the way in which learning is supported and extended through engaging with technology as narrative we will investigate three case studies. The first is a prototype mobile street game: hide&seek that seeks to enable the exchange of knowledge about places through a shared narrative structure. The second study is called mudlarks and is a mobile location-based media application platform aimed at older children. The third case study reviews the way in which a location-based game: geocaching enables users to find and share experiences about their participation.

3. Case Studies

3.1 Hide&Seek

Hide&Seek (Giles et al. 2007, Willis et al 2010) is a street game experience, which creates opportunities for place-based knowledge transfer. The game narrative is based on the concept of sharing place-based knowledge where participants assume the role of either 'Guest' or 'Host' of the story. The host creates a personalized adventure route through a known space and publishes it to a specific person. The guest then has the opportunity to explore an unknown place through unravelling of a series of clues, which lead them through a particular spatial experience. The treasure at the end of the game is not a material reward but rather the construction of a shared social experience; the exploration and revealing of a place known to the host and initially unknown to the guest developing as a valuable artefact in the memory of both game participants.

3.2 Mudlarking

The mudlarking project was designed to enable young teenagers to actively engage with an area of historic and educational interest by using state-of-the-art mobile technology to design and produce their own guided tour. Using a media platform called 'mediascape' (Futurelab) students create multimedia enhanced landscapes that combines text, drawings, images (still and video) and audio – and which future visitors access and add their own reflections to. In this way developing a mediascape is an active and creative endeavour and promotes the engagement of learners in both the conceptual design and content authoring, as well as in the technical processes required to complete a mediascape.

3.3 Geocaching

Although geocaching is not strictly a learning environment it does offer the opportunity for players to engage with their physical surroundings in a game format that forms part of a non-structured learning experience. In geocaching, the publishing of raw GPS data apparently leaves little room for participants to construct their own narrative. However, it is the way in which this method of publishing data leaves people free to plan the way they choose to act on it in the searching or finding activities that distinguishes its application. They are offered simply a piece of location data that is the 'goal' and many of the means of reaching this outcome are left open to the geocacher to define themselves. Additionally, the mobile device used in each case to receive and gather information is often only one part of a selection of technology interactions available.

4. Technology Narratives

Although all the case studies are focused around particular technologies they do not 'live or die' based on these technological frameworks. Rather than the technology suggesting a fixed outcome or goal, it simply creates a point in space to which people weave their own practice of the use of technology. The application of the technology enables associations between location and assets (place and media files) to be developed. Reid et al. highlight how this is one of the key attributes of this media authoring format since "coincidences between events in the virtual world and the physical world are memorable" (2005) suggesting that learning happens in what the authors term 'magic moments' of coinciding experience which the learner becomes intimately involved in.

In all three case studies the web site provides a key starting out and returning point (e.g. through the log or feedback) for the activity, but the ability to engage with a range of media formats seems to be a critical aspect of the success of the activity. Thus a linear narrative loop engaging media use as appropriate in a range of stages as follows: Observation, Planning, Testing, Making, Iteration, Reflection, Delivery, Feedback

The use of photography and analogue media formats, such as an analogue feedback system, enables participants to negotiate their own narrative through the technology. A further critical aspect is that that media is used before, during and after the activity, which means the interaction with the technology is not limited within the frame of the activity but becomes an open-ended system.

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An invitation to a joint post-assignment reflection – using podcasts as media for offering reflective space within vocational teacher education

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Abstract

This paper presents the very early stages of a study that investigates how podcasts via mobile phones could be one medium of offering reflective space within vocational teacher education. The context of the study is provided by The HAAGA-HELIA School of Vocational Teacher Education (HH SoVTE) program and a group of teacher students studying their certificate in vocational teacher education. A design science approach is used in this study. A design scientist attempts to engineer innovative educational environments and simultaneously conducts experimental studies of those innovations.

Keywords

Mobile phones, reflective space, podcasts

1. Setting the scene

This paper reports a study that investigates how podcasts via mobile phones could be one medium in offering reflective spaces within vocational teacher education. This paper is inspired by the context-based assessment perspective (Poikela, 2004). Context-based assessment requires that situational and contextual factors of generating learning and knowing – the social, cognitive, operational and reflective processes of learning are considered carefully.

The context of the study is provided by The HAAGA-HELIA School of Vocational Teacher Education (HH SoVTE), situated in Helsinki, Finland and a group of student teachers studying their certificate in vocational teacher education. Since 2006 HH SoVTE has offered a web-based vocational teacher education program which taps into various social media in its implementation. The student teachers participating in this study are enrolled on this web-based program.

It is challenging to find only one suitable device for several student teachers, so we ended up using cross-media. Cross-media refers to the use of more than one medium. In addition to mobile phones, students are invited to use e.g. laptops for producing podcasts. However, the tutors are using mobile phones.

2. Introducing the process of creating reflective spaces

One important module of the program is the Organizations and Networks of the Vocational Teacher. The module consists of three assignments (a literature research paper done in study circles and submitted to the tutor for assessment; an organizational and network analysis on two chosen entities with a strong self-assessment part with a rubric, and a joint debriefing in an organization and network forum where student teachers externalize their findings and negotiate their meaning on a more general level).

The pedagogical script of the module is based on socio-constructivist and inquiry-based learning. The student teachers are invited to develop their epistemic agency, analyze authentic problems in the organizations and networks in question, constructively use authoritative sources in their analyses and engage in internal assessment of their whole learning processes (Scardamalia, 2002). Until now, the internal assessment part has been quite modest, and therefore we want to invite the student teachers to reflect their learning activities more thoroughly via use of podcasts – to be more precise we invite the student teachers to be involved in observing, analyzing and clarifying their learning activities by receiving and producing podcasts. It is only after reflection that new learning can emerge. This invitation to reflection is coming unexpectedly to the student teachers (not aligned with the current written curriculum), therefore it is a gentle one, and one to be negotiated with the student teachers. As Moon (1999) points out the important conditions for reflection are time and space, a good facilitator, a supportive curricular or institutional environment, and an emotionally supportive environment.

A reflective space is understood here as a space where understandings emerge from often complex situations during the course of studying. Reflective spaces could be seen as offering transformative positions in which change, reflexivity and new stances can emerge. A reflective space supports internal processes of cognition and processing of affect that make it possible for participants to make sense from their participation in the student teacher group. (E.g. Smith, 1994; Ringer, 2001; Savin-Baden, 2008.)

The student teachers are thus invited to produce a comprehensive story of their learning process, the learning that resulted from the various assignments of the Organizations and Networks of the Vocational Teacher module, and encouraged to identify the key features of their learning experiences. They are also invited to examine their emotions related to their learning and understand how learning has affected them and how they themselves have been affected by their learning.

The process of post-assignment joint reflection consists of four phases in this study. The student teachers are first asked to reflect with – hopefully - ample time and with a list of guiding questions their individual experiences of their learning process. During the second phase the student teachers should meet their peers of the same team (3-5 members) to present their reflections. This phase should offer an opportunity for individuals to deepen their reflections through articulating their internal discussion as they explain their reflections to their peers. The third phase engages the participants in to a reflective dialogue with set of prepared questions for clarifying understandings and learning outcomes. The final phase invites the members to draw from the joint reflections and produce a comprehensive learning story to be podcasted via Audioboo. The end of the podcast would naturally include a meta reflection on the role of the whole process to their individual learning and professional development. (See e.g. O'Hara, 2004.)

3. Conducting the study

A design science approach is used in this study. A design scientist attempts to engineer innovative educational environments and simultaneously conducts experimental studies of those innovations

(Brown, 1992). Design science aims to find out what works in practice. In this study we aim to produce a novel way of inviting our student teachers to negotiate a reflective space. In this presentation, we report the preliminary results of using the reflective space concept via mobile phones to examine the perceived functionality and the impact of receiving and producing podcasts on the student teachers' willingness to reflect their learning activities.

4. Evaluating the outcomes

March and Smith (1995) identify two design processes, build and evaluation. In the design science approach the most important feature is to build and evaluate the utility of the artifacts. Utility refers to e.g. the usefulness, serviceability, or helpfulness of the artifact. Hevner et al. (2004) note that empirical techniques can be used to evaluate the quality and functionality of artifacts in design science approach. Progress is achieved when more functional technologies replace existing ones. In this study, empirical studies are used to evaluate the reflective space concept via mobile phones.

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Augmented reality as a tool for mobile learning and a method for scholarly dissemination

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Abstract

The aim of this paper is to present the innovative potentials that occur when we combine the assets of smartphones, techniques of augmented reality, and the distribution of scholarly knowledge. I argue that there is a two-way potential embedded in this triad, as it offers new paths for learning and new roads for scholarly dissemination. Firstly, the triad offers an alternative way for learners to gain insights into scholarly knowledge, as learning can be filtered in a visual and location-aware manner. Secondly, the triad provides a platform for scholarly dissemination that makes it possible to communicate research findings more directly and to a wider audience.

The paper reflects on an ongoing study carried out at Aarhus University and it thus highlights the *raison d'être*, hypotheses and research design of the study rather than its conclusive findings.

Keywords

context-based learning, augmented reality, scholarly dissemination, information retrieval

1. Current challenges

One of the fundamental methods of gaining new knowledge is carrying out an information retrieval with the appropriate keywords; e.g. through the index of an encyclopaedia, the search engine of the local library, and increasingly often through the wonders of the Internet and in particular Google. There are at last three notable concerns in this process.

Firstly, being able to find the *right* keywords is not necessarily easy and often requires that the learner has *a priori* knowledge of the given subject. Say the learner wants to know more about the historical matters of Europe in the 16th century; *Renaissance* is a useful keyword to be familiar with. A priori knowledge is also helpful if you want to learn about the site-specific history surrounding you. Former geographical names, overall historical trends and important local actors are relevant entries in such cases and requires prior knowledge. Thus, the difficulties are significant when it comes to information retrieval, not only in relation to historical matters but also to knowledge acquisition in general.

A second concern is the problem of *abundance*, the information overload that characterizes the Internet and in relation to this the lack of transparency that confronts the learner when he or she tries to determine the quality of the material found. Is it credible or rather dubious? The lack of a priori knowledge and the abundant and opaque nature of information on the Internet can indeed be an obstacle for learners.

A third challenge is identifiable, if we turn the table and shift our focus from the learners to the trained scholars. Due to my own scholarly background the historical field will be used to illustrate this challenge. Historians usually like to dig. Getting dirt under their nails while brushing off historical layers and dusty fingers when running through forgotten archives. But to *dig* in the meaning of digitizing research findings, is still a relatively rare phenomenon. Few historians make use of digital platforms (blogs, twitter, apps etc.), and when they do remediation is often the case. Research articles and books are digitized as a genuine replica of the original, paper-based publication neither utilizing nor exploring the advantages of digital technology. More troubling, the research findings are to a large extent kept within the narrow academic circles and rarely reach the public. This does not only apply to historians but to academia in general. Thus, one of the essential obligations for researchers, namely to disseminate research findings not only to colleagues and students but also to the wider public, is being neglected.

2. Approach

The aim of this particular study is to investigate if and how these challenges can be overcome (or overcome in new and better ways). The study takes an action research approach as it explores the qualities of mobile and visual technology (e.g. GPS, camera, Internet and augmented reality) in relation to the dissemination of scholarly knowledge. A key aim is to develop a replicable model for a mobile application that can display research findings, in this case historical research, to the public in a location-aware and visual manner.

There are two main technical developments in the empirical realization of the study. One is to geo-tag and slightly reshape the information on www.danmarkshistorien.dk [www.danishhistory.dk]. This is a price winning research-based website covering Danish history from ancient times to today created by my fellow colleagues, historians and archaeologists, at Aarhus University. As part of this operation lengths and formats of the research findings are prepared for mobile reading. The other development is to create an augmented reality 'app'. This will draw material from our website to smartphones according to the user's location. The development is based on experiences gathered from the creation of a pilot that uses the leading augmented reality browser *Layar*. There are several advantages to creating the pilot as a historical filter in *Layar*. Besides the time- and money-saving aspect compared to developing unique augmented reality apps from scratch, it also provides a reputable platform and hence an existing audience. Thus, if the pilot is successful a subsequent development from scratch is neither necessarily needed nor desirable.

These technical implementations will facilitate dissemination and display of research findings in a completely new way. When the app is activated, the relevant articles, pictures, films, sounds and original sources from our website is sorted and visually displayed on the smartphone as the user walks through the surroundings. The historical layers unfold and visualize on the smartphone as the techniques of augmented reality add virtual layers to the physical reality seen through the lens of the mobile camera. Panning around with your smartphone at the central square in Aarhus, Denmark, you can e.g. watch an 'on site' historian who guides you around the Cathedral explaining its role in the Middle Ages; if you pan further an eyewitness describes his experiences from the Danish liberation May 5th 1945 from the same balcony where he was witnessing the event 65 years earlier.

3. Conclusion

In a mobile learning perspective, this study will be innovative in two ways: Firstly, it hopes to explore an alternative way for learners to gain insight into research-based knowledge in a way that is less limited by lack of a priori knowledge and the chaos of abundance. This should be possible as the smartphone *sorts* the relevant material from our website using the learner's location-

based context. Secondly, this non-commercial way of digitizing the past offers a new and useful platform for scholarly dissemination that facilitates the display of research in a more accessible, comprehensible and appealing manner.

Obviously, the kind of dissemination proposed in this paper has its limitations. As the information is sorted according to the user's location some sort of physical presence or geographical relevance of the disseminated data is necessary. This is a limitation not only to historical dissemination but to research dissemination in general. Other obstacles are also likely to occur. Is the scholarly reluctance towards digital tools too restraining? And equally important will potential learners make use of this new path to knowledge?

While these limitations require great awareness and further investigation, they do not outweigh the aforementioned potentials in my opinion. This suggests that academia generally and across disciplines might advantageously consider this approach in their future efforts to disseminate research findings to the public.

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How should mobile learning be evaluated?

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Abstract

In this discussion group session we will compare and contrast two approaches to the evaluation of mobile learning; an academic-led model and a student-led model. As mobile learning promotes active student engagement with the learning process, by putting the power and opportunity to direct learning literally into the student's hand (Coulby & Davies, 2011), it seems appropriate that students are also active in the evaluation process. What effect though does this have on the outcome, findings and quality of the evaluation? How much can we ethically expect students to input into the evaluation of their education? What are the benefits of student-led evaluation to faculty and students alike? Following a short presentation by staff and students from the University of Leeds we will facilitate a group discussion regarding these issues, the results of which we will use to create a checklist of considerations to be made when implementing mobile learning evaluation.

Keywords

mobile learning, evaluation, student-led, practice

1. Overview

Teaching initiatives are generally evaluated by academics that design and implement appropriate methodologies to gather the data they require. Students have traditionally been seen as passive recipients within the evaluation design process.

The use of mobile technology within education has resulted in more active engagement from students in the learning process (Ally, 2009, Laxton & Coulby, 2009, Pachler, Pimmer & Seipold, 2011). Students are able to generate their own content as well as viewing University produced learning materials; which changes the dynamic between tutors and students. Students become co-producers in their education (Bruns, 2007) rather than consumers. Learners of high self-direction welcome the chance to take more responsibility for their learning. (Coulby & Davies, 2011) In recognition of this changed dynamic it seems appropriate to involve students in the evaluation of learning as well as learning itself.

In this discussion session we will share the two different approaches we have taken to evaluating mobile learning, an academic-led evaluation and a student-led evaluation. We will explore with the group the implications of these approaches to the projects outcomes and the individuals involved.

University of Leeds academics will outline the academic-led model of evaluation, and medical students at the institution will outline the student-led model they used. Additionally they will share their experiences of designing and implementing evaluation and the wider impact on their studies, approach to learning and understanding of curriculum development.

Both the models' advantages, disadvantages and implications will then be discussed with the group. We will then widen the discussion out to examine alternative approaches to evaluation of mobile learning, the limitations and the ethical, pedagogical and quality assurance issues associated with these. Finally the students will share their recommendations for implementing student-led evaluation and research initiatives.

1.1 Aims of the discussion group

- To open a dialogue regarding evaluation approaches to mobile learning.
- To contrast the intended and unintended outcomes of academic and student-led approaches on project outcomes and individuals.
- To discuss the ethical, pedagogical and quality issues associated with different evaluation approaches.

1.2 Discussion group outline

Timings	Activity
5 minutes	Introduction and outline of discussion group
5 minutes	Academic-led evaluation of mobile learning model
5 minutes	Student-led evaluation of mobile learning model
10 minutes	Student experience of leading evaluation
25 minutes	Discussion regarding both approaches including advantages and disadvantages, considerations etc
25 minutes	Discussion of ethical, pedagogical and quality issues associated with different evaluation approaches to mobile learning in general
15 minutes	Student-led recommendations for driving student-led evaluation initiatives

Table 1. Discussion Group outline.

2. Outcomes

Rapporteurs will take notes from the discussion groups and the results will be used in a paper contrasting approaches to evaluation and research of mobile technology. Additionally practical considerations raised will be used to create a checklist of considerations to be made when evaluating mobile technology that we will make available to all group members through the conference proceedings book and website.

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M-project: first Steps to applying action research in designing a mobile learning course in higher education

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Abstract

Mobile learning is gaining increased attention in higher education. Our m-project engages university students as co-designers of a mobile learning course. The design process is rooted in participatory action research and is guided by a problem-based strategy, where learning is driven by challenging, group-based tasks. The process of integrating technology into the course is based on the Personal Learning Environment approach, allowing students to choose most suitable tools to support students' learning projects. The focus is on collaborative application of mobile technologies that encourages knowledge sharing and co-construction of meaning. Our m-course is anchored in the social constructivist paradigm and aims at bridging in-university and out-of-university contexts through engagement in social activities. In this paper we present a set of guidelines for a mobile learning course design in higher education, driven by action research and social constructivist pedagogies.

Keywords

mobile learning, higher education, action research, social constructivism, PLE

1. Introduction

We are immersed in a period of rapid uptake of mobile technologies, with evolving possibilities of "personal, spontaneous, opportunistic, informal, pervasive, situated, private, context-aware, bit-sized, portable" learning experiences (Traxler, 2009). Mobileweb and handheld devices allow to extend beyond sedentary classroom practice, integrating social interaction. These opportunities, however, do not come without challenges.

When introducing m-learning, some initial key questions arise:

1. Why to engage in m-learning? (rationale)
2. How to design m-learning? (pedagogy)
3. How to evaluate m-learning? (conceptualisation)

In this paper we present 10 guidelines for applying AR in designing a social constructivist mobile learning course in higher education. The guidelines are derived from a mobile learning project– m-project - conducted by the University Rovira i Virgili and the Beuth University of Applied Sciences. Our aim is to share these guidelines that have informed the design of the m-project to support lecturers and students in taking first steps to mlearning.

2. Rationale

With mobile learning becoming more and more visible in HE, the question about the rationale and the benefit of m-learning proves to be crucial and challenging. The rationale is important not only for designing a specific course but also for delivering a justification to the faculty and enhancing organisational uptake. M-learning has taken different forms and has drawn on a range of different theories and pedagogies. Therefore defining a single rationale is hardy possible (Frohberg, Göth & Schwabe, 2009). M-learning ranges from content delivery (Bradley et al., 2009; Muyinda, Lubega & Lynch 2010), interactive logbooks (Corlett et al., 2005), mobile game-based learning (Mitchell, Millwood & Fallenboeck, 2006), to mobile Web 2.0 (Cochrane & Bateman, 2010; Safran et al., 2010).

The benefit of mobile learning is given by the portability, flexibility and context-awareness of mobile technologies, enabling spontaneous, personalised and situated learning, promoting collaboration and encouraging autonomous, lifelong learning (Naismith et al., 2004; Dyson et al., 2008; Traxler, 2009). The potential of m-learning for development of generic skills necessary for successful education and career (Litchfield, Nettleton & Taylor, 2008) and the need to embed m-learning into mainstream higher educational practice have been pointed in a number of publications (Traxler, 2005; Dyson, Raban, Litchfield & Lawrence, 2008).

Mobile learning based on social constructivism emphasises the role of social interaction for co-construction of knowledge and meaning. Learners are encouraged to take control of their learning (by shaping learning goals and processes), collaborate with peers to produce content (instead of consuming content delivered by instructors) and to use mobile tools for investigation and exploration (Loke et al., 2010). Instructors as facilitators design the learning environment and structure learning processes (Jonassen, 1991).

Action research, however, goes a step further as it engages users as co-researchers in a reflective process of progressive problem solving. Learning takes place in real-world situations and aims at solving problems in teams. At the core of AR is the collection of feedback prior, during and after learning activities. This feedback serves as empirical evidence to support learning through investigation of different perspectives (McPherson et al., 2004). In this way solutions can be adapted to specific needs and participation targeted towards improved educational practice. AR allows co-/researchers to act as "technology stewards" (Wenger et al., 2009; Wenger et al., 2005), developing own learingprojects and acting upon received feedback (Cochrane & Bateman, 2010; McLoughlin & Lee, 2007; Wadsworth, 1998). Recent research studies account for the usefulness of AR in m-learning, e.g. research conducted by the MoLeNET initiative indicates the value of collaborative approaches to deploying mobile learning and improving educational practice.

AR provides an opportunity to explore and develop new strategies for mobile learning. Combined with a social constructivist approach it can facilitate learning in communities and taking responsibility for own learning.

3. Guidelines

In order for AR to be effective, it requires a series of research cycles. Starting with identification of problem areas, diagnosis through data gathering and analysis, action planning and action taking to evaluation, AR is viewed as a spiral of research steps (Hopkins, 1985; Coghlan & Brannick, 2001). Figure 1 summarises the key principles of AR, useful for defining design guidelines

1) Reflexive critique

The principle of reflective critique ensures people reflect on issues and processes and make explicit the interpretations, biases, assumptions and concerns upon which judgements are made. In this way, practical accounts can give rise to theoretical considerations.

2) Dialectical critique

Phenomena are conceptualized in dialogue; therefore a dialectical critique is required to understand the set of relationships both between the phenomenon and its context, and between the elements constituting the phenomenon.

3) Collaborative Resource

Participants in an action research project are co-researchers. The principle of collaborative resource presupposes that each person's ideas are equally significant as potential resources for creating interpretive categories of analysis, negotiated among the participants

4) Risk

The change process potentially threatens all previously established ways of doing things, thus creating fears among the practitioners.

5) Plural Structure

The nature of the research embodies a multiplicity of views, commentaries and critiques, leading to multiple possible actions and interpretations.

6) Theory, Practice, Transformation
For action researchers, theory informs practice, practice refines theory, in a continuous transformation.

Figure 1. Six principles of action research by Winter (1989)

Following the framework by Frohberg et al. (2009), social constructivist approaches to mobile learning emphasise:

1. Embedding learning in socializing contexts for cooperation in learner communities;
2. Providing opportunities for co-construction of content leading to deeper understanding, knowledge application, reflection and evaluation;
3. Optimizing level of control by scaffolding activities to enhance orientation and coordination;
4. Facilitating cooperation between learner teams to fulfil a common learning goal.

The combination of AR and social constructivist principles presented above results in our 10 guidelines to designing a mobile learning course in HE (Figure 2).

1. Engage Students as Co-designers of Mobile Learning

Engaging students as co-designers of a mobile learning course in higher education allows both students and instructors to develop a collaborative relationship and understand each others' perspectives. Participation of students in the research-design process can be highly empowering and motivating for both students and lecturers. Lecturers can gain insight into what is necessary for students to take up mobile learning and into students' current uses of mobile technologies. Systematic research cycles enable students and lecturers to reflect and take action based on what they learn in the design process. Engaging students may take different forms. For example:

- Enable students to co-decide about the content/topics of the course.
- Involve students in defining learning goals, e.g. as part of their learning projects.
- Encourage students to choose most appropriate tools to support their learning projects.
- Enable self-evaluation, e.g. reflecting on the extent to which they could reach their goals in the course.

2. Involve Other Stakeholders to Enable the Uptake of Mobile Learning

Action research may be used as a powerful strategy to involve faculty staff, other lecturers and/or administrative staff to enhance awareness, acceptance and the uptake of mobile learning. Involving colleagues and other professionals in the design process helps to share ideas, reflections and experiences in systematic and meaningful ways. Involving stakeholders may take different forms. For example:

- Get support in collecting and analysing data to gain insights into key questions.
- Share reflections and opinions on the findings and take action based on the results.
- Share learning experiences with others so that the communities involved can benefit.
- Use the knowledge gained through action research to inform others and explore synergies.

3. Enable a Socialising Context for Mobile Learning

Socialising context enables social participation and has a significant influence on the sense of connectedness with peers, communities and society. Socialising context in a mobile learning course allows realising the potential of mobile tools for forging interpersonal relationships and bridging different contexts, such as in-university and out-of-university, formal and informal, or academic and work-related contexts. Facilitating a socialising context may take different forms. For example:

- Supporting interaction with peer students in teams and between teams
- Supporting interaction with peer students from other universities (national and international)
- Integrating learning in and from everyday situations, e.g. capturing events and sharing them
- Involving out-of-university experts/professionals to provide relevant context information
- Developing communities of learners, including students, lecturers and broader communities

4. Facilitate Communication and Cooperation Between and Within Teams

Social constructivist approaches emphasise the role of communication and cooperation with other learners for construction of knowledge, deeper understanding and intensive reflective processes. As opposed to scenarios designed for individual, isolated learning, where students work alone and interact only with mobile device, social constructivist learning scenarios aim at enhancing team interaction to fulfil a learning goal. Enabling team interaction may take different forms. For example:

- Encouraging social networking and working together on tasks, e.g. group-challenges
- Facilitating group-based learning, e.g. cooperative and collaborative learning
- Connecting mobile learning to social network sites and focusing on mobile Web 2.0
- Engaging teams generating content, e.g. producing learning materials, tagging, podcasting.

5. Facilitate Co-construction of Mobile Learning Content

Social constructivist approaches emphasise the role of engagement in social activities for learning, including construction of content together with other learners. In context of mobile learning, delivering prepared content to students is not considered effective for activating learners and enhancing reflection (Frohberg et al., 2009). The potential of mobile learning is seen in encouraging students to work actively with mobile tools and produce learning content together constructing and applying knowledge in the process of content production. Facilitating co-construction of mobile learning content can take different forms. For example:

- Student teams work on situated tasks to create and annotate photos, record interviews using mobile cameras and audio recorders
- Students engage in participatory video task and create short films using mobile video recorders
- Students engage in collaborative writing with Google apps or text messages posted to websites
- Student teams engage in mobile tagging to initiate group-based challenges or discovery tasks for other teams
- Peers and experts provide feedback and/or rate content created by students.

6. Find the Optimal Level of Control by Scaffolding

Control in context of learning may be defined as responsibility for setting learning goals and designing the learning process (Frohberg et al., 2009). Social constructivism emphasises the importance of optimal level of control, in terms of the scaffolding strategy. Applying scaffolding means that instructors assist students with only those tasks that are beyond students' capability. Once the student can take responsibility for or masters a task, the process of "fading" begins and the instructor gradually removes his assistance and encourages the student to work independently. Scaffolding takes different forms in different phases. For example:

- Provide guidance to enhance orientation and coordinate student teams in a mobile setting
- Allow students to complete as much of a task as possible unassisted
- Embrace student errors as part of learning and provide feedback where necessary
- Prompt students to achieve a task or goal, e.g. by sending text messages or microblog posts

7. Encourage the Development of Higher-Order Thinking Skills

One of the guiding principles for 21st Century learning is to provide learning opportunities for students to acquire the skills necessary for living and working in a dynamically changing, networked information society. Therefore mobile learning should aim at empowering students to develop lifelong learning skills, supporting application, analysis, synthesis, reflection and evaluation of knowledge (Frohberg et al., 2009). Encouraging the development of higher-order thinking skills may include:

- Design situated tasks to encourage knowledge application and collaborative problem-solving
- Facilitate capacity to learn continuously, including using mobile technology to support learning
- Support the ability to think creatively, reason and interpret, e.g. by using mobile tools for investigation and exploration
- Facilitate deeper thinking through elaboration, e.g. documenting reflections of real-life situations and contexts,
- Encourage students to observe and modify their own thinking, e.g. by keeping logs of learning steps through mobile blogging.

8. Facilitate Bridging Different Contexts

Learning can be conceptualised as "conversation in context" (Sharples, 2005). Since learning not only occurs in a context, but it also creates context through interaction, mobile technologies are seen as an opportunity to bridge different contexts, such as formal and informal learning. Mobile technology can enhance learning through communication. M-learning enables students to interact with people and content whilst away from their normal place of learning, e.g. university or computer. Bridging contexts with and through mobile technologies may take different forms. For example:

- Enabling interactions between learners in real and virtual worlds
- Create learning communities for bridging formal and informal learning
- Using instant messaging or mobile microblogging for interactions fulfilling immediate needs
- Conversations between students and different subject matter experts and/or practitioners
- Calling on rich informational resources of the mobile Web in seminar settings
- Merging in & out-of-university contexts by extend support of learning to wider community

9. Engage Students in Evaluation

Action research emphasised the integration of systematic evaluation as part of the research cycle (Hopkins, 1985). Instructors can involve students as co-researchers in the design of the evaluation methodology and instruments to collect feedback prior to, during and after learning activities, in this way adapting solutions to specific learning needs. Engaging students in evaluation may include:

- Include students in finding ways to assess attitudes towards, patterns of usage and perceived impact of mobile tools on learning.
- Integrate learners' mobile tools and contexts in the evaluation, e.g. out-of university microblog entries
- Enhance self-evaluation, e.g. students assess to what extent the tools they chose helped them reached the goals they set
- Enhance peer-assessment, e.g. as podcasts with feedback for other teams.

10. Find Ways to Increase Sustainability
Mobile learning initiatives are often small scale pilot projects that are rarely integrated in institutional settings. As consequence these pilot projects often fail to establish long lasting, reusable outcomes (Wingkvist, 2008). Enhancing sustainability of mobile learning may take different forms. For example: ■ Analyse and describe the life cycle of a mobile learning project as an evaluation tool ■ Start developing ways for adoption of mobile learning by students and faculty right from the beginning of the design process ■ Allow students to use their own mobile devices to encourage interaction and exploration after the course ■ Iterate and focus on sustainability during the development process, using lessons learnt

Figure 2. Design guidelines for a mobile learning course in higher education

4. The m-project

The m-project is an initiative launched in 2010 aiming at designing and conducting a pilot mobile learning course connecting university students in Germany and Spain. The m-project focuses on the use of mobile Web 2.0 and social media for bridging contexts. The aim is to engage students in collaborative exploration of applications of mobile technologies for study and work, and in creating personal mobile learning environments to support own learning projects. The course will be deployed in September/October 2011.

The m-project is co-designed by students, who are involved in defining goals, content, process and evaluation of the course. Students decide which learning projects they want to pursue and select mobile tools to reach their goals. Lecturers provide models, good practice and guidance to steer orientation and coordinate collaboration in teams.

The course is guided by action research, social constructivism and problem-based learning, making real-world tasks to central activities (Delfino et al., 2009). Based on group-challenges, student teams devise self-consistent micro-tasks for other teams. All micro-tasks are part of students' learning projects.

The process of integrating technology is based on the Personal Learning Environment approach, allowing students to choose most suitable tools to support learning. The focus is on collaborative application of mobile technologies for knowledge sharing and coconstruction of content. The m-course aims at bridging in-university and out-of-university contexts through engagement in social activities with peers, practitioners and the wider community.

5. Conclusion

Mobile learning in higher education based on action research and social constructivist principles addresses some of the crucial issues of 21st Century learning, i.e. enabling students to learn anywhere and anytime, preparing students for lifelong learning, focusing on communication and collaboration, enhancing digital literacy, deep reflection, critical thinking and problem solving. With this paper we wish to encourage experimentation with mobile technologies and spur further exploration of mobile learning pedagogies.

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Exploring the order of precedence when using contextual dimensions for mobile information delivery

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Abstract

This study aims to investigate the use of contextual data for delivering module and course information from a virtual learning environment to mobile devices. Although in the past, context has been deemed as poorly utilized, mobile devices with their inherent characteristics have the potential to fully exploit the environment around them and consequently enhance the delivery of information to a presented situation. Understanding the different indicative characteristics which create and define any given context, the question arises as to which of these characteristics justifies precedence. Using mobile widgets which exploit the available ambient information surrounding the user, course information is disseminated to the student at certain temporal or spatial points. Analysing the responses from the study participants aims to identify if precedence exists between the two dimensions and subsequently form a basis for further investigation into the use of the remaining dimensions of context.

Keywords

Mobile Learning, Context, Information Delivery, RSS

1. Characterizing Context

Both the Situation theory (Barwise, 1987) and Zimmerman state that any situation or context can be described by a distinct set of dimensions. The five dimensions which Zimmerman states for context are location, time, activity, relation and identity (Zimmerman, 2007). From a mobile information delivery and learning perspective, an understanding of student's reactions and experiences when using the differing contexts can be used to determine the usability of context-aware behaviours to support mobile learning applications from virtual learning environments. Both mobile learning and context by their very nature are adaptive and supportive (Syvänen et al., 2006), providing a variety of learners and facilitators access to learning across contexts. Using the ambient information which exists within any context to deliver supporting educational updates to both students and faculty provides new opportunities for engagement with learning management systems or virtual learning environments.

A typical mobile user is constantly involved in a varied number of different overlapping contexts; consequently any activity and experience that result are influenced by the interactions between these contexts (Falk, 2002). Although location-aware services have become increasingly popular with the integration of GPS into mobile devices; context as a whole is a poorly used source of information in computing environments(Dey, 2001). In order to test location (spatial) awareness, GPS co-ordinates of key campus locations can be compared with the user's current location by the adaption engine. Parallel processes can be implemented to test the user's activity, temporal

value, identity and relationship to other people and objects to provide a service to the end user. Investigating beyond location awareness can observe how contexts for learning are created through continual interactions between people, technology, and settings (Sharples et al., 2009) and subsequently how other dimensions of context could be supported and maintained through future context-aware mobile applications.

Of course mobile learning provides an excess of opportunities when integrating context; below Dey (2001) argues context aware applications can be organised into three separate categories:

- presentation of information and services to a user,
- automatic execution of a service for a user, and
- tagging of context to information to support later retrieval.

All three categories presented identify the user as being mobile and open to every dimension of context available to a situation. Evidently end users may feel that one dimension may outweigh another, and argue the effectiveness in using every dimension available.

2. Description of Study

A preliminary study will be carried out which requests students to prioritise the five different context dimensions when provided with a theoretical scenario. This will be repeated on three separate occasions in three different contexts itself, this being once in a lecture theatre, once in student accommodation and finally once in a campus-leisure environment. Here, any differences which emerge from this preliminary investigation will be a starting point towards the implementation of mobile applications to test precedence of context further.

In order to test both spatial and temporal dimensions of context; two new mobile applications will be constructed and deployed using Nokia's Web RunTime frameworks, the first using location information coupled with contextual information to deliver relevant RSS updates, and the second using only temporal information. Both these mobile applications will be constructed using a compound of HTML, CSS, XML and JavaScript technologies to download and present the user with information which ultimately supports their learning experience.

The adaption engine which is utilized for the location mobile application relies on the gathering of GPS information to an accurate level to the position of the user. This then compares the received GPS values towards an array of potential information sources positioned the campus environment, with the default channel being the module information from the VLE. The time widget focuses on the inherent clock functions which exist and updates the RSS channels based on the frequency defined by the user's preference.

Once this part of the study has investigated spatial and temporal dimensions of context, the study will continue to investigate if activity, identity and relationships to other entities require precedence or order of practice. Again, to utilize activity, identity and relationships will require the a uniformed style of study, using mobile widgets which gather and deliver information

Understanding how students perceive and prioritise the different dimensions available when using mobile learning in different scenarios can provide insightful information on the precedence

in which context should be incorporated for mobile learning projects. The study could provide understandings into the most efficient and acceptable method of contextual delivery for mobile learning, for which both research and development of mobile VLE systems can be influenced.

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Mobile lerngemeinschaften: beispiele, erfolgsfaktoren und stolpersteine

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Abstract

Was sind mobile Gemeinschaften und welche Erfahrungen gibt es damit in den Bereichen Spielen, Lernen und Gesundheit? - In einem kooperativen Forschungsprojekt der Salzburg Research Forschungsgesellschaft, der Forschungseinrichtung evolaris sowie dem Salzburg NewMediaLab wurde eine Antwort auf diese Frage gesucht. Dazu wurden von April 2010 bis Oktober 2010 Projekte und Erfahrungen mit mobilen Gemein¬schaften zusammengetragen und Besonderheiten herausgearbeitet. In diesem Beitrag werden Beispiele für mobile Lerngemeinschaften und die verwendeten Technologien vor¬gestellt sowie Besonderheiten ihres Aufbaus angesprochen. Die vollständige Studie ist frei zugänglich im Web zu finden.

Keywords

mobile learning, online community, mobile community

1. Die Studie und Forschungsfragen

Zu Online-Gemeinschaften wird seit nun 20 Jahren geforscht. Online-Gemeinschaften (engl. „online community") sind nach unserem Verständnis „Personen mit gemeinsamen Interessen, die Internet- und andere Kommunikationstechnologien nutzen, um sich regelmäßig auszutauschen und/oder gemeinsam Inhalte zu entwickeln, dabei starke Bindungen entwickeln und sich als zusammengehörig fühlen" (Schaffert & Wieden-Bischof, 2009, S. 12). Das Feld der „mobilen Gemeinschaften" (engl. „mobile com¬munities"), also der Gemeinschaften. die vor allem oder ausschließlich mit mobilen Endgeräten, zum Beispiel mit Mobiltelefonen, kommunizieren, ist hingegen ein neues Forschungsgebiet. Mobile Gemeinschaften standen daher im Fokus einer Studie der Salzburg Research Forschungsgesellschaft, der Forschungseinrichtung evolaris sowie dem Salzburg NewMediaLab (alle aus Österreich).

Zwar existieren theoretische Aussagen zum Aufbau und Lebenslauf von Online-Gemeinschaften, dennoch ist es ein weitgehend unbekanntes Feld. Ein angemessenes Verfahren um Strukturen in einem neuen Gebiet zu erfassen ist, Beispiele aus unterschiedlichen Bereichen zu sammeln und diese zu vergleichen. So können Aussagen und Unterschiede entwickelt werden, die für den gesamten Bereich der mobilen Gemeinschaften gelten oder eher nur „Spezialaspekte" sind. Da es den Interessen und Expertisen der Beteiligten entsprach, haben wir die folgenden drei unterschiedlichen Anwendungsgebiete verglichen: den Bereich der Spiele, des Lernens sowie der Gesundheit. Forschungsleitend waren dabei folgende Fragestellungen:

- Was gibt es generell beim Aufbau von mobilen Gemeinschaften zu berücksichtigen?

- Welche Beispiele und Erfolgskriterien lassen sich in den gewählten Themenbereichen (Spiele, Lernen, Gesundheit) finden?

Im Folgenden werden kurz zusammengefasst technische Konzepte und einige Beispiele für solche mobilen Lerngemeinschaften, allgemeine Empfehlungen zum Aufbau sowie spezielle Erfolgskriterien und Stolpersteine vorgestellt.

2. Technische Konzepte für M-Learning mit Gemeinschaften

Für Lerngemeinschaften, die Mobiltelefone nutzen, werden unterschiedliche Systeme und Konzepte angeboten. So haben Lernmanagementsysteme (LMS) mobile Schnittstellen und sind somit auf Mobiltelefonen abrufbar, zum Beispiel Momo für das LMS Moodle oder die iPhone-Applikation Blackboard Learn für das kommerzielle Blackboard-LMS. Darüber hinaus haben eine Reihe von Kommunikations- und Netzwerkanwendungen, die aus dem Web bekannt sind, mobile Schnittstellen und können auch von mobilen Lernge¬mein¬schaften genutzt werden. So kann beispielsweise auch eine Gruppe bei Facebook oder Xing mobil erreicht werden. Auch webbasierte Angebote für Lerngemeinschaften haben oft mobile Schnittstellen. Weiter gibt es auch eine Reihe von Spielen, die beim mobilen Lernen in Gemeinschaften eingesetzt werden können, hier kommen wiederum unterschiedliche Tech¬nologien zum Einsatz. Theoretisch ist darüber hinaus jede webbasierte Anwendung auch über den Handy-Browser erreichbar, praktisch sind die Anwendungen und auch die Verbindungen häufig nicht gut genug, um diese tatsächlich, zuverlässig und regelmäßig zu nutzen (vgl. Woodill, 2010, S. 28).

Auch die besonderen Möglichkeiten der Mobiltelefone wie ortsbasierte Dienste und Aug¬mented Reality werden für das gemeinsame Lernen eingesetzt, auch wenn es noch selten vorkommt (vgl. Colazzo, Molinari & Villa, 2009).

3. Mobile Lerngemeinschaften: Formen und Beispiele

Lerngemeinschaften werden von Bildungseinrichtungen, Unternehmen und Fachorga¬nisationen, aber auch von interessierten Einzelpersonen mit der Absicht initiiert, Lernen zu ermöglichen, also um Wissens- und Kompetenzerweiterung aktiv zu unterstützen. In¬formelle sowie die von Bildungsanbietern organisierten Web-Gemeinschaften tauschen sich in aller Regel nur vereinzelt ausschließlich oder v.a. mit mobilen Anwendungen aus. Es war nicht einfach, Beispiele für Lerngemeinschaften zu finden, die auch oder aus¬schließ¬lich mobile Endgeräte nutzen.

Drei solche Beispiele für Projekte und Anwendungen von mobilen Lerngemeinschaften sind die folgenden:

- Beim Spiel „Priced Out" galt es beim Spielfestival 2008 in New York City, die qualitativ hochwertigsten und preisgünstigen Lebensmittel in Supermärkten und Geschäften in der Umgebung zu finden. Dabei spielen Teams gegeneinander, deren Mitglieder Preise und Qualität auskundschaften und mittels Mobiltelefone Geoinformationen austauschen und sich absprachen, um schließlich möglichst optimal einzukaufen.

- Im Auftrag der Asiatischen Entwicklungsbank im Jahr 2006 und 2007 wurde erprobt, ob und wie im ländlichen Bangladesh die berufsbegleitende Ausbildung von Lehrerinnen der Sekundarstufe durch den Einsatz von Mobiltelefonen unterstützt werden kann (Pouezevara & Khan, 2007).

- SuperClubPlus hat 2006 aufgrund des Befragungsergebnis, dass 75 Prozent der Nutzer der Lernplattform für Kinder von 6 bis 12 Jahren ein Mobiltelefon nutzen könnten, einen mobilen Zugang entwickelt (vgl. Hart & Blomfield, 2006).

Neben diesen speziellen Projekten und Anwendungen wird derzeit vor allem mit Micro¬blogging in Lerngemeinschaften experimentiert. Microblogging-Plattformen sind zwar im Web zugänglich, werden aber in der Regel mit dem Mobiltelefon genutzt. Schon früh wurde mit den Blogs, die nur Postings mit 140 Zeichen zulassen, experimentiert und die Frage nach der Einsetzbarkeit in Lernsettings diskutiert (Ebner & Schiefner, 2008; Grosseck & Holotescu, 2008). Der Einsatz von Microblogs in der Lehre wird damit begründet, dass damit (a) die Interaktivität der Studierenden erhöht wird, (b) es ermöglicht wird auch soziale, gemeinschaftliche Aspekte in die (Massen-) Lehrveranstaltung zu bringen und dass (c) die Infrastruktur sehr geeignet ist, weil es die Geräte der Studier¬enden und verbreitete Software nutzt (s. Ebner, 2010). Natürlich wird an Hochschulen nicht alleine im Rahmen von Lehrveranstaltungen gebloggt. Bei Auslandsaufenthalten im Rahmen des Studiums mit norwegischen Lehrenden und Französisch-Studierenden wird so versucht, mit Hilfe mobil erreichbarer Blogs den Kontakt mit den Daheimgebliebenen in Norwegen aufrechtzuerhalten und Erzählungen im Land der studierten Fremdsprache auszutauschen (Petersen, Chabert & Divitini, 2006).

4. Aufbau von mobilen Gemeinschaften

Für den Bereich der mobilen Gemeinschaften sind die allgemeinen Empfehlungen zum erfolgreichen Aufbau von mobilen Gemeinschaften hilfreich (vgl. Schön, Wieden-Bischof, Schneider & Schumann, 2011): Zielsetzungen müssen geklärt und transparent sein, die Bedürfnisse der Lernenden eruiert werden, die Kommunikation, Kollaboration und Gemeinschaft muss unterstützt werden und allgemein muss auch das Prinzip des „Wachsen Lassens" gelten.

Der Vergleich der Beispiele aus den drei untersuchten Anwendungsgebieten Lernen, Spielen und Gesundheit und der entsprechenden Literatur weist auf zwei Besonderheiten von mobilen Gemeinschaften hin:

Es ist anzunehmen, dass die mobilen Gemeinschaften sich schneller antworten und häufiger kommunizieren. Durch die kleineren Display und die eingeschränkte Aufnahmefähigkeit des Menschen ist es wahrscheinlich, dass die Größe der Gemeinschaften, die durch mobile Anwendungen unterstützt werden in der Regel kleiner sind als bei webbasierten Gemeinschaften. Damit kein Missverständnis entsteht: Es geht hier um Gemeinschaften im sozialwissenschaftlichen Sinne als (kleine) Gruppe von Personen, die sich kennen, natürlich gibt es eine Reihe von mobilen Community-Anwendungen die Tausende von Personen mitwirken lassen.

Bei mobilen Gemeinschaften zeigt sich hier derzeit, dass häufig die Diskussionen über die verwendeten Anwendungen und Strukturen der Gemeinschaft nicht auf den mobilen Plattformen und Anwendungen selbst stattfindet, sondern – offensichtlich auch, weil man dazu längere Texte schreiben muss und auch diskutieren muss – parallel in Webplattformen zu finden ist.

5. Erfolgsfaktoren und Stolpersteine beim Aufbau mobile Lerngemeinschaften

Neben den allgemeinen Empfehlungen für einen gelungenen Aufbau von mobilen Ge¬mein¬schaften gibt es einige spezielle Argumente für den Aufbau von mobilen Lern¬gemeinschaften, die sich insbesondere im Vergleich mit den mobilen Ge¬mein¬schaften in den Bereichen Spiele und Gesundheit ergaben.

Für den erfolgreichen Einsatz beim Lernen erscheint es wichtig, dass die mobilen Geräte bereits ein alltäglicher Gegenstand für die Nutzer sind, damit Lernende darüber mit einer Lern-Community im regelmäßigen Austausch stehen können, vor allem dann, wenn sie selbst organisiert lernen. Der alltägliche Umgang mit dem Gerät ist jedoch notwendig, um auch die Vorzüge nutzen zu können.

Häufig werden Technologien gerade im Schulunterricht eingesetzt um den Unterrichts¬gegenstand oder eine Methode für Schüler interessant zu machen, weil Neuigkeitseffekte erhöhte Aufmerksamkeit versprechen. Das Mobiltelefon wird also nicht nur aus prag¬matischen Gründen eingeführt sondern auch gezielt eingesetzt, um Interesse am Unterricht und am Lernen zu wecken – ein solcher Neuigkeitseffekt ist aber unter Umständen schnell verbraucht.

Auch in den anderen untersuchten Bereichen Gesundheit und Gaming wird berichtet, dass der Aufwand für die Betreuung von mobilen Gemeinschaften häufig unterschätzt wird. Besonders einschneidend sind aber die Veränderungen aber auch für Lehrende wenn sie mit mobilen Gemeinschaften arbeiten, daher weisen wir hier noch einmal explizit darauf hin: Die Betreuung von mobilen Lerngemeinschaften erzwingt eine regelmäßige Teilnahme und Aufmerksamkeit. Erfahrungen zeigen, dass die Lernenden sonst häufig die Lust verlieren, wenn sie merken, dass die Lehrenden ihre Aktivitäten nicht verfolgen.

Alle Ergebnisse dieser Studie sind natürlich durch weitere Untersuchungen zu verifizieren und können nur einen ersten Rahmen für weitere Vorhaben bieten.

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section 3 - concrete pointers and examples on mobile learning

Towards contextualized annotations to improve learning in museum

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Abstract

Social constructivism claims that learners best construct their understandings during peers exchanges. In order to instrument those exchanges during mobile learning activities, we propose the use of digital annotations associated with physical objects implicated in the learning situation. To this extent, we introduce the CALM model (Contextualized Annotation for Learning through Mobility). Information about learner's situation are used to contextualize the annotation, in order to facilitate its reuse by other learners in other contexts. We then present CALM-Museum an application of the CALM model in the context of museum visit.

Keywords

Annotation, Context, Ontology

1. Introduction

According to Ogata & Yano (2003), ubiquitous learning differs from standard learning because a learner has more control on the presented information and because of the integration of learning in real world situations. Ubiquitous learning therefore allows learners to construct their knowledge within real world operational activities. Ubiquitous learning activities are then closely related to authentic learning activities defined by Brown, Collins and Duguid (1989) as «coherent, meaningful and purposeful activities». The authentic nature of these activities ensures the relevance and durability of acquired knowledge.

A fundamental issue in the use of ubiquitous computing for learning is to provide learners with tools they can use to communicate during learning activities. From a social constructivism perspective, it is indeed during peer communication that learners can construct their understandings. However, direct communication (e.g. telephone) is not always possible and does not allow the capitalization and exploitation of exchange. Our work deals with this issue of providing tools to facilitate exchanges between learners

In the context of learning with digital documents, the use of annotations is effective to support collaborative exchanges and capitalize these exchanges. An annotation is a content associated with a digital document for a specific purpose. By analogy with the annotation of digital documents, we propose to use contextualized annotation on physical objects. This annotation is a text, a picture or a video, associated with a real world object (e.g. tool, place) and viewable on a mobile device (e.g. smartphone or tablet). The contextualized nature of annotation refers to the integration of relevant elements of the annotator's context. These contextual elements will be shown during the consultation of the annotation to facilitate its understanding.

2. The CALM Model

Our model distinguishes three parts in the annotation: content, anchor and context (see Figure. 1).

The content refers to the title and the body of the annotation. The body of the annotation may use multiple media types: text, drawing, photography, video record, audio record... Current mobile devices have indeed audio and video recording capabilities that enable such annotation. Moreover low usability of text in mobile situation incites the use of other media.

The anchor refers to the physical object(s) designated by the annotation. An annotation can indeed refer to several objects, for instance to make an association between these objects. An anchoring area can be associated with the anchor to specify which part of the object the annotation refers to. This area appears as an ellipse superimposed on the image of the object during the consultation.

The context of the annotation has three categories of information. Episodic information includes the name of the author and the date of the annotation. Semantic information corresponds to relevant keywords selected by the annotator to index his annotation. Those keywords are being referenced in a domain ontology. Finally, circumstantial information specifies the profile of the annotator and his situation in the environment, the condition of the annotated object and the condition of the environment at the time.

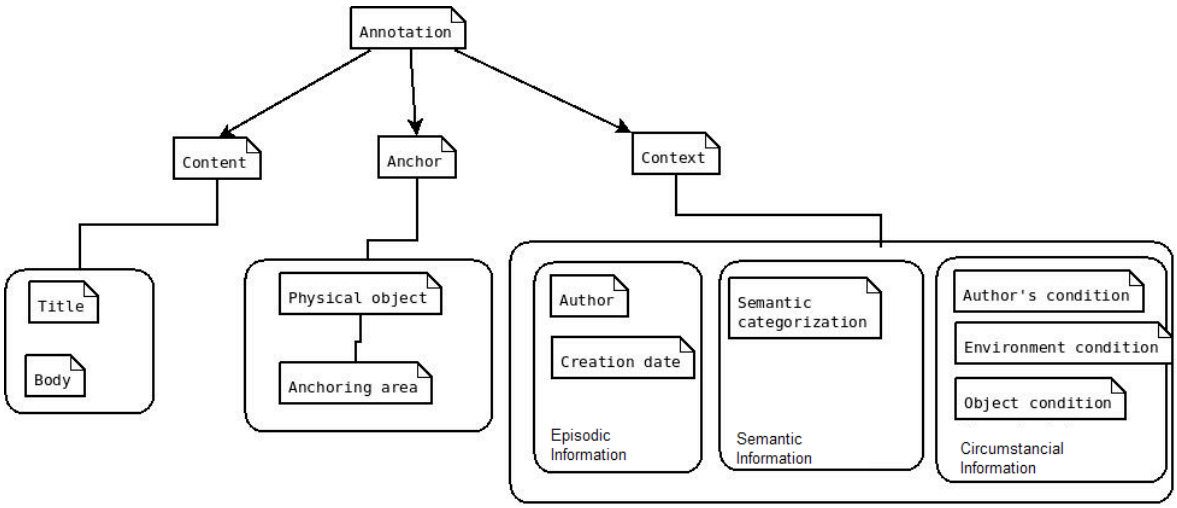

Figure 1: The CALM Model

3. Application to museum visit : CALM-Museum

The role of historical museums in cultural heritage transmission is widely accepted. Historical museums offer large collections of physical objects and information resources about those objects, guiding visitors through complex historical concepts. However, even if exhibition documentation is clear and didactic, museum visitors are still passive listeners of the cultural discourse. Yet social constructivism claims that exchanging and confronting opinions about new notions will help to achieve a better understanding of those notions. In the cultural domain, Stevens & Toro-Martell (2003) have highlighted the role of informal exchanges about artwork to achieve a better understanding of Art. In order to allow those exchanges in the museum context, we are developing the CALM-Museum application, based on the CALM model.

CALM-Museum runs on an Android smartphone and offers visitors to annotate and see other people annotations about cultural artwork. Those annotations are short texts, images or videos that visitors will associate with artworks in the museum while doing the tour. The major issue is then to provide visitors with annotations that will interest them and that they will be able to understand. Within the framework of the CALM model, this problem is addressed by the contextualization of annotations. The context model of the CALM-Museum application includes annotator interests and degree of expertise about museum concepts together with her physical situation. Representing the context of the annotation allows the definition of rules for filtering and transformation in order to adapt the presentation of the annotation to the context of other visitors.

To improve the reusability of our work, we chose a semantic modelling approach of the context. Indeed, ontologies are efficient to represent context and reason about it (Ye, Coyle, Dobson and Nixon, 2007). We are building an ontology of historical and artistic concepts in a museum. This ontology serves to describe concepts referenced by the artwork (characters, places) and to describe the visitors interests and degree of expertise about those concepts. When a visitor makes an annotation about an artwork, she is proposed to choose concepts referenced by the artwork that characterize her annotation. Then, the annotation is automatically completed with contextual elements such as the visitor's profile and relative position to the artwork. Finally, the annotation is saved to be seen by other visitors. When another visitor wants to consult annotations about an artwork, her interests and degree of expertise are used to filter annotations that she will be able to understand. When she consults an annotation, semantic rules are applied to the annotation to adapt it to her context. Among other things, contextual information about the referenced concepts and the annotator point of view are added to the annotation.

4. Conclusion

We presented in this paper a contextualized annotation model and an application of this model to support collaborative learning activity in museum. The originality of this approach is to make it possible for learners to associate annotations to physical objects. Taking into account the physical context of deposit of the annotation facilitates its understanding. In future work, we plan to run fields experiments with students of the "Ecole du Louvre" of Paris, in order to verify that our system is usable in an academic context.

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Use of mobile learning by physician trainees in Botswana

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Keywords

mHealth, mLearning, physicians, resource-limited

1. Background

In parallel with the growth of mobile health (mHealth), mobile learning (mLearning) has emerged as a tool for educating physicians and other healthcare professionals, especially in resource-limited settings. Botswana's health system is burdened by the second highest prevalence of Human Immunodeficiency Virus in the world, estimated at 24.6% of adults aged 15-49 (UNAIDS, 2010). In 2009, the University of Botswana School of Medicine admitted its first class of specialist physician trainees (residents). Residents rotate at referral hospitals in major cities, as well as district hospitals and clinics in remote areas. Access to information technology resources, particularly medical information, at all clinical training sites is crucial. In the capital city of Gaborone, however, access at the referral hospital is limited by low bandwidth, unreliable Internet, and substandard computer resources. In remote areas, gaining access is even more challenging and specialist mentors are not readily available. The growth of mobile networks and mobile devices has circumvented these challenges, fostering the growth of mLearning resources for healthcare providers. mLearning efforts in Botswana benefit from a significant mobile device ownership (Nationmaster, 2010) and an existing network of multiple competing telecommunications companies. We will discuss mLearning efforts with physicians in Botswana, focusing on our smartphone-based mobile learning project.

2. Methods

Seven residents in Medicine and Paediatrics specialty training programs, based at a referral hospital in Gaborone, were provided with Google myTouch smartphones, equipped with Android-based medical information applications, built-in camera, and data-enabled SIM card. Point-of-care applications loaded locally on the phones included Dynamed, Archimedes, ePocrates Rx, and 5-Minute Clinical Consult, in addition to email, web access, and a telemedicine application that allows for the submission of cases to local mentors. Study coordinators conducted an initial training session. Residents were encouraged to use these phones as much as possible, in and out of the medical setting, over an eight-week period. Participating residents were surveyed at four and eight weeks following the distribution of the phones to assess the ease and frequency of use. Results: Between follow-up at 4 weeks and 8 weeks, residents increased their usage of the

phone, which can be primarily attributed to increased opportunity for use and growing familiarity. Residents became familiar with the phone through various ways: initial training session, help from other residents, and spending time alone with the phone. Some residents used the phone not only for access to point-of-care applications in the medical setting, but also for supplementary medical reading while at home. Half of residents desired more access to journals and medical literature. Although most of the residents were unfamiliar with smartphone technology, all of them felt comfortable navigating through the phone by the eight week follow-up session. The telemedicine case consultation program is currently being implemented.

3. Conclusions

Mobile phones loaded with point-of-care tools are effectively utilized by resident physicians in resource-limited settings, both at the bedside and at home. The most commonly used applications include drug formularies and clinical decision-making resources. Residents are interested in having mobile access to evidence-based medical literature. There is a range of user comfort with mobile technology, and training sessions should take this into account. Future Directions: Plans include scaling up the use of the phone in remote clinic sites with residents in other specialties. Use of the telemedicine application for remote consultation of cases could be an effective tool for training and teaching physicians, especially in specialty topics. As data collection efforts increase, mentors will be able to identify medical topics that residents find challenging by evaluating the types of cases being submitted for consultation and the topics being searched for on medical software applications.

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The potential of smartphones to mediate intra-hospital communication and learning practices of doctors. Preliminary results from a scenario-based study.

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Abstract

The article reports on the potential of smartphones to support doctors' intra-hospital consultation and learning practices. Interviews were conducted on the basis of text and video scenarios to explore the doctors' accounts of, and expectations towards smartphone-based consultations including the generation and exchange of clinical images and videos with remote specialists. The participants associate only small changes resulting from mobile-tele-consultation with respect to their learning. They strongly welcome, however, the opportunity to bookmark the multimedia-enriched patient cases generated on their mobiles and share these with colleagues in further informal and formal work contexts to support organisational learning in highly mobile, clinical environments.

Keywords

mobile learning, hospitals, organisational learning, workplace learning, tele-consultation, clinical images and videos, smartphones

Context

While hospitals' first priority is patient care, clinical contexts also provide the basis for doctors' competence development and professional education. To date only a few studies have explored doctors' workplace learning. They show that it is not so much centred on explicit intentions and deliberate practice but closely embedded in daily work processes. Learning is triggered by problems emerging from patient care that are based around complex interactions (Slotnick, 1996). Doctors mainly learn from their cooperation and communication with colleagues and other specialists in daily work routines. (van de Wiel, Van den Bossche, Janssen, & Jossberger, 2010) As specialisation in hospitals requires a continuous flow of people, knowledge, resources or tools across different places in order to accomplish work (Bardram & Bossen, 2005), it becomes evident that doctors work and learn in highly mobile contexts. They cannot exclusively co-operate on site. An essential part of the discussion and consultation processes between them is based on (in-house) telephone calls in order to connect to, and communicate with remote colleagues.

Newer technological developments such as smartphones not only allow voice-based communication but also support doctors' co-operation through the exchange of images, videos and even video streaming. In several studies the smartphone-based exchange of images showing soft tissue injuries and radiological content (CT, MR, ultrasound) was investigated, for example in the fields of surgery and dermatology (Ebner et al., 2006; Ebner et al., 2008; Chung,

Thomas Yu & 2, 2007). Technical requirements and diagnostic quality of the images were found suitable to support remote evaluation and medical decision-making. (Compare for example Hsieh et al., 2005; Tsai, Pong, Liang, PY & Hsieh, 2004; Chung et al., 2007; Yamada, Watarai, Andou & Sakai, 2003; Kim, Yoo, Park & Kim, 2007). It was recognized that images "give substance and life to the description conveyed over the phone" (Lam, Preketes & Gates, 2004). Also, the use of a system capable of videoconferencing between the point of care and a remote consultant has been piloted (Banitsas, Georgiadis, Tachakra & Cavouras, 2006). Only a few studies, however, highlighted learning aspects, for example in the field of "mobile" just-in-time support. Piek et al. indicated that junior doctors learned over time to improve image selection relevant for decision-making by the senior doctors they consulted (2006). Others mentioned the re-use of the documented materials for further teaching and follow-up meetings (Blaivas, Lyon, & Duggal, 2005; Tai Khoa Lam, 2004).

Methods

The study was conducted according to the principles of scenario-based research (see for example Carroll, 2000). A brief story provided a stimulus of how smartphones can support the physicians' clinical consultation and communication practices. First, a written scenario (see also Pimmer, 2009) that was created by doctors on the research team was provided to 13 clinical doctors from a Swiss hospital covering all levels of seniority. The scenario was centred on a smartphone-based consultation process between a junior doctor in the emergency department and a specialist. The emergency department was chosen because of the frequent interactions that take place there with specialists from all clinical departments. The remote consultation described in the scenario entailed the exchange of clinical images and videos. The scenario also showed how doctors marked interesting patient cases and re-used them at a later point in time.

In subsequent semi-structured interviews the participants were asked to provide critical feedback on the scenario presented to suggest further ways in which smartphones could be used and to describe the impact on their work and learning practices. The interviews were transcribed verbatim and divided among three researchers. They independently analysed the data using inductive content analysis. While the "learning episodes" in the scenarios served as points of departure the analysis was essentially grounded in the data.

Preliminary findings

The analysis of the interviews revealed interesting insights into learning associated with existing consultation processes as well perceptions on smartphone-supported consultation and communication processes from a learning perspective. In line with the findings in the literature the data supported the view that doctors consider smartphone-based discussion of patient cases – enriched with clinical images and information – as suitable for increasing both efficiency and quality of their consulting processes with remote experts. They perceive there to be rather neutral effects of the mobile tele-consultation on their learning, however: the visually enhanced consultation with remote specialists was not expected to completely replace on-site investigation by specialists. The on-site investigation of patients through specialists as part of a consultation process was, in turn, seen as a rich ground for learning and teaching practices from which the participants would continue to benefit.

Second, the doctors highly welcome the opportunity provided by the devices to bookmark particular learning experiences in the workplace and carry these into further informal and formal contexts. In particular, the functionality of the devices to capture multimedia-enhanced patient case information at the point of care and to re-use them in other social contexts within their work team, in rapports, for formal teaching purposes or at congresses was seen as highly valuable from

an organisational learning perspective. It also became evident that there are no tools available to document and re-contextualize ad-hoc learning experiences in highly mobile work contexts and transfer them into further "learning" situations. Smartphones were seen as instruments being able to address this gap.

Third, we explored a number of contextual and biographical factors that impact on smartphone-mediated learning such as time (pressure) and workload, interruption-driven environments, experiences and skill levels of junior doctors, trust and personal preferences.

Discussion and outlook

While mobile learning in workplaces is becoming more and more popular in general (see for example Pachler, Pimmer & Seipold, 2011; C. Pimmer & Gröhbiel, 2008), clinical and medical contexts are of particular interest (Kho, Henderson, Dressler & Kripalani, 2006). Portability and connectivity of mobile devices can support and transform organisational information and communication practices of doctors who work in highly mobile work environments. Not only remote but also co-located practices of smartphone-mediated communication have to be taken into account for further research. We also posit that learning technology has to be closely embedded into social work practices so as to be accepted by users in busy clinical environments. In the design and research of mobile learning particular attention has to be paid to the stimulating but also conflicting relationship of learning and work (Stok-Koch, Bolhuis & Koopmans, 2007). From a theoretical point of view we pretend that in order to more fully understand the complex phenomena of mobile learning in hospitals comprehensive conceptual approaches have to be taken into account that not only address cognitive aspects but also comprise the analysis of socio-cognitive, cultural and organisational dynamics of workplaces (see also Pimmer, Pachler & Attwell, 2010).

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Supporting learning on building sites with mobile technologies

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Abstract

This paper presents an approach of how to implement mobile technologies into the work process to support further education. It is part of the Vila-b project ("Virtual Learning on Building Sites") which combines three learning places (home, work, seminar) in terms of "Blended Learning" to meet the challenges within the growing sector of green building. In the following we will outline the project's background, the general technical concept of the Mobile Client and the methodological approach of its development process and report about first experiences from using the system.

Keywords

Mobile learning, building sites, practice

1. Introduction

The building industry is faced with challenges: neither are relevant workers interested in further training, nor does the time and cost pressure allow these time-consuming measures. In contrary, there is an increasing demand to reduce CO2 emissions and new ordinances require detailed documentation of used materials. These challenges are covered by the Vila-b approach. It is based on the didactic concept of linking learning and working within the work process so that knowledge is generated where it originates to develop holistic competencies [1]. This demands a higher level of self-learning competencies and contains processes of active learning and self-reflection within the context of use.

In the project Vila-b (Virtual Learning on Building Sites) – funded by the BMBF – we developed a further education program (see [3]) based on a "blended learning" approach. The training intervention focuses on the ecological and climate-friendly retrofitting of existing buildings. In the project consortium – consisting of TZI and ITB (University Bremen), AKÖH e.V. (Herford) and pm|c (Flensburg) – both the instructional design and learning content as well as the technical design and implementation were realized.

2. Blended-learning approach: An exemplary use-case

During in-house lectures the participants learn basic knowledge on ecological and eco-friendly retrofitting of buildings. Learning with the mobile client in the work process is complemented by the two learning places *seminar* (lessons on domain-specific expert knowledge and usage of Vila-b technology) and *home* (preparation and reflection of work tasks via web-platform and community).

'Learning on the building site' with mobile clients allows for situation-oriented and problem-solving learning by accessing specific contextual information (e.g. about the actual task and current building site) or experience knowledge stored in the database, communicating about unexpected problems with co-workers (e.g. by using the photo functionality of the device) and means for documenting the implementation of tasks.

Use-case:
Being introduced to the basics of insulation within the seminar, each participant gets a specific work task related to this topic, which he has to accomplish until the next seminar.

After a prior consultation with his boss, the worker decides for a building site form his work schedule that fits the requirements of the current task.

At home he prepares the necessary work steps with the Vila-b web platform. For each work step he plans his proceeding and the needed resources (e. g. material). He attaches the contract specification and other relevant document to the work task. For this planning phase, the system offers detailed information about each material and the work processes in general as well as it provides all seminar documents and detailed sample solutions. Afterwards he synchronizes with the mobile client, which will transfer his generated work plan and the attached documents onto the device.

On the building site, he works through the planned work steps. The mobile client does not only show his entered procedure, but provides additional information of material and special communication and documentation features: for example, he takes pictures to document his work process and accesses detailed information about products and their application by scanning the barcode or searching the product database.

After work he uploads the documents from the mobile client to the Vila-b web platform and starts reviewing them, reflecting his solution of the work task. Finally, he shares the documentation with his tutor to get feedback.

3. Development of the Vila-b mobile client

The Vila-b system (mobile client and web platform) was developed based on concepts of participatory design [2] and user-centered design [4] to include users in early project stage and to give them an active role in the development. In addition we conducted contextual inquiries to understand the work tasks and environment. Based on these observations and the results from the focus-groups (experts, skilled workers and master craftsman) we have developed the system requirements for the mobile client. Different prototypes were then discussed in regular focus-group meetings. As a result, the following features derived to support learning within the work context:

1. Detailed work plan (created on home PC beforehand),
2. Taking picture and annotating through drawing,
3. Gathering material and accessing safety and application instructions,
4. Taking audio and text notes,
5. "Virtual meeting": communicating by sending annotated photos to experts.

In addition, the focus group demanded operational features. However, not all of them could be implemented due to the original scope of the project. The final mobile client provides the following operational features:

1. Time registration,
2. Extending a contract with signature,
3. Gathering climate data (e.g. temperature, humidity),
4. Detailed information about the construction site (e.g. contract specification).

The interaction design is optimized for the target group and work context: by using large fonts and buttons with high contrasts to improve readability. In order to focus on the core Vila-b application, it runs in full-screen mode and all other functions are disabled. According to the special requirements of the construction sites (e. g. dust, liquids), we chose a fully-ruggedized device (PIDION BIP-6000, Windows Mobile 6).

4. Evaluation in Context and Results

We have tested and evaluated the Vila-b system within three test groups. Each test group consisted of 6-10 participants (male and female) and included four seminar weekends within a 4-5 month period.

Based on the ideas and the experiences of the participants, the mobile system has been continuously adapted to their requirements, e. g. the navigation concept was modified to allow the users to reach frequently needed features with less clicks. Overall the users were able to learn the application quickly and were satisfied with the design and operability of the user interface.

However, the test revealed that the users, because of its weight and form factor, did not like the full-ruggedized device, despite the original intention. Furthermore the quality of the integrated camera was insufficient, especially in poorly lit rooms. In spite of the poor quality, the participants of the three test groups preferred photos over text notes (photos 40%, text 18,5%, virtual meeting 15,2%, extending contract 8,2%, audio files 0,5%, other documentation 17,6%). The participants appreciated documenting work steps by annotating photos, because it can often describe complex situations on building sites well.

5. Conclusion

For developing mobile technology that supports learning in work context, we recommend considering smart phones with high-resolution camera and bright flash, in order to support meaningful documentation. Balancing operational and learning features is essential in order not to neglect learning as well as provide (operational) benefit for the company.

In general, this approach demands active participation from the learners and thus proactive support by tutors as well as mechanisms to foster acceptance of technology.

Nevertheless, we recommend this approach not only to further education, but also to vocational training.

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otu.lea – potenziale einer online-testumgebung für funktionale analphabetInnen und mobile learning

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Abstract

Online-Testumgebungen werden vermehrt entwickelt und eingesetzt. Vordergründig ermöglichen Online-Testumgebungen die zeit- und ortsunabhängige Nutzung. Doch bietet der technische Fortschritt weitere Potenziale, die für eine zielgerichtete Förderdiagnose und Mobile Learning genutzt werden können. In der Alphabetisierung werden Verfahren der Kompetenz- und Förderdiagnostik traditionell papierbasiert und durch eine Alphabetisierungs-Fachkraft betreut durchgeführt. Dies erscheint notwendig, da häufig insbesondere die Anleitung für die Testaufgaben eine höhere Anforderung an die Lesekompetenz der Teilnehmenden stellt als die eigentliche Testaufgabe. Die Anleitung muss dementsprechend von Fachkräften vorgelesen werden. Die dadurch entstehenden Kosten, aber auch die sich durch die persönliche Interaktion ergebenden Zugangsbarrieren, resultieren in einer geringen Teilnehmerquote an Maßnahmen der Alphabetisierung. Die Online-Testumgebung otu.lea soll für mobile Geräte aufbereitet werden und kann sowohl den Einstieg in die Teilnahme an Maßnahmen zur Alphabetisierung erleichtern als auch technische Möglichkeiten (automatische Datenspeicherung, Einsatz innovativer Itemformate, Anonymität) für eine individuelle Förderdiagnose nutzen.

Keywords

Online-Testumgebung, E-Assessment, Kompetenzdiagnostik, Funktionaler Analphabetismus

1. Problemaufriss

Mit schätzungsweise vier Millionen funktionalen AnalphabetInnen in Deutschland (Döbert/Hubertus 2000, 29) und ca. 20 Prozent der 15-Jährigen laut PISA auf bzw. unter Level 1 (Prenzel et al. 2008, 9) – also einer minimal grundlegenden Lesefähigkeit – bedarf es auch in den nächsten Jahrzehnten größter Alphabetisierungsbemühungen. Ein wichtiger Ansatz dazu ist die Durchführung einer berufsbezogenen und erwachsenengerecht aufgebauten Förderdiagnostik. Im Rahmen des lea.-Projektes (Literalitätsentwicklung von Arbeitskräften; www.workforce.uni-bremen.de) wurde dazu ein mehrdimensionales und hierarchisches Kompetenzmodell für Erwachsene mit äußerst niedrigen Lese-, Schreib- und Rechenfähigkeiten entwickelt, welches den Bereich der Lower Rungs[1] ausdifferenziert. Darauf aufbauend wurde ein förderdiagnostisches Kompetenzmessungsverfahren (lea.) zunächst als Papier-Test entwickelt und empirisch validiert. Dieses wird momentan als E-Assessment aufbereitet und in die Online-Testumgebung otu.lea implementiert. In einem weiteren Schritt soll sie für portable Endgeräte aufbereitet werden.

Aufgrund der Zielgruppe sind die EntwicklerInnen von otu.lea vor besondere Herausforderungen gestellt. Insbesondere ist zu berücksichtigen, dass funktionale AnalphabetInnen eine tendenziell niedrige ICT-Literacy aufweisen (Niesyto 2009, 6). Das bedeutet, sie sind den Umgang mit Computern und mit neuen Technologien wenig gewohnt und bedürfen besonderer Unterstützung, um bei einem computerbasierten Test nicht einen Nachteil aufgrund ihrer niedrigen ICT-Literacy zu haben. In otu.lea werden daher innovative multimediale Itemformate und Unterstützungsfunktionen eingebunden. Dies sind z.B. Audiofiles, (arbeits- und lebensweltbezogene)

Videos und Animationen sowie sogenannte cues, welche z.B. die Orientierung durch Animation eines Buttons erleichtern. Der Einsatz dieser Itemformate und Unterstützungsfunktionen ist für jegliche Personen mit einer tendenziell niedrigen ICT-Literacy denkbar.

2. Potenziale der Online-Testumgebung otu.lea für die Förderdiagnostik funktionaler AnalphabetInnen und Mobile Learning

Die Online-Testumgebung kann sowohl von funktionalen AnalphabetInnen als auch Kursleitenden zur Diagnose und Förderung genutzt werden. Sie ist online zugänglich und in der Alphabetisierung mit folgenden Optionen nutzbar[2]:

Niveaudifferenzierte Teilnahme im Bereich der Lower Rungs: Bisherige Diagnoseverfahren für literale und mathematische Kompetenzdiagnostik wie beispielsweise PISA (Programme for International Student Assessment) und IALS (International Adult Literacy Survey) beginnen auf einem Niveau, welches grundlegende literale und mathematische Fähigkeiten voraussetzt. Dem in otu.lea implementierten E-Assessment liegt ein empirisch erprobtes Kompetenzmodell zugrunde, welches den Kompetenzbereich unterhalb des Level 1 – die Lower Rungs – ausdifferenziert[3].

Unmittelbare Rückmeldung des Lernstandes durch die Generierung individueller Reports: Die Reports werden sowohl speziell für Teilnehmende als auch differenziert für Kursleitende aufbereitet. Eine vollautomatische Auswertung erlaubt direkte Rückmeldung für die Teilnehmenden und ist insbesondere für einen förderdiagnostischen Anspruch wichtig. So kann aufgrund der sofort zur Verfügung stehenden Auswertung einerseits eine Kompetenzfeststellung erfolgen. Andererseits können unmittelbar individuelle Fördermaßnahmen abgeleitet werden, zum Beispiel entsprechende Übungsaufgaben ausgewählt und in einem Trainingsmodul angeboten werden.

Ableitung individueller Fördermaßnahmen: Wie auch die Pädagogische Diagnostik ist die Förderdiagnostik am individuellen Lernenden orientiert. Ziel ist, die Entstehung von Lernschwierigkeiten zu ergründen und bei Bedarf Veränderungen von Lernprozessen zu initiieren (vgl. Rittmeyer 2005; Suhrweier/Hetzner 1993). Aufgrund der individuellen differenzierten Lernstandsdiagnose können gezielte Fördermaßnahmen abgeleitet werden.

Mehrmalige Teilnahme auf unterschiedlichen Niveaus: Für jede Dimension werden unterschiedliche Diagnoseniveaus angeboten. Durch eine Selbsteinschätzung wählen die Teilnehmenden das Niveau, mit dem sie beginnen möchten. Zudem werden Teilnehmende motiviert, mehrmals an der Diagnose teilzunehmen. Einerseits wird der Report nicht defizitorientiert formuliert, andererseits kann auch selbst die Diagnose einen Lernfortschritt zur Folge haben, so dass die Teilnehmenden bei mehreren Durchläufen einen Lernerfolg erzielen können.

Erstellung individueller Wachstumsverläufe: Im Kontext förderdiagnostischen Handelns wird davon ausgegangen, dass Entwicklungs- und Lernfähigkeit des Lernenden dynamisch und veränderbar sind. Die Förderdiagnostik ist deshalb immer über einen längeren Zeitraum, in dem mehrmals Lernstandserhebungen vorgenommen und Fördermaßnahmen abgeleitet werden, durchzuführen (Petermann/Petermann 2006, 2). Die Einbindung in laufende Feedbackprozesse fördert sowohl den Lernerfolg als auch die Lernmotivation (Nicol/Milligan 2006, 65). Die mehrmalige Teilnahme in otu.lea ermöglicht die Abbildung des individuellen Lernprozesses. Zudem unterstützen wiederholte Einblicke in den eigenen Lernverlauf die Entwicklung selbstregulierter Lernstrategien im Sinne eines Self-Assessments (vgl. Zimmermann et al. 2007).

Einbettung in das reale Umfeld der Teilnehmenden: Die Einbindung des realen Umfeldes ist darin begründet, dass sich viele relevante Informationen aus Beobachtungen in Alltagssituationen gewinnen lassen. Damit ist gemeint, dass insbesondere das Umfeld des Teilnehmenden berücksichtigt wird. Förderdiagnostik ist also nicht nur Lernprozessdiagnostik sondern auch Situationsdiagnostik (Breitenbach 2007, 25; Rittmeyer 2005, 20).

Die Einbettung in das reale Umfeld der Teilnehmenden ist zwar nur bedingt durch einen exemplarisch hergestellten Bezug möglich. Doch ist in otu.lea ein Storyboard eingebunden, welches einen Arbeitsweltbezug zur potenziellen Zielgruppe herstellt. Der Arbeitsweltbezug soll die Identifikationswahrscheinlichkeit erhöhen. Zudem können authentische Frageformate zur Validitätssteigerung beitragen.

Implementierung innovativer Itemformate: Visuelle oder auditive cues dienen zur Unterstützung der Navigation und Orientierung sowie zur Steigerung bzw. Aufrechterhaltung der Motivation und Aufmerksamkeit. Dadurch sind Erhebungen nicht nur in kontrollierten bzw. beobachtbaren Umgebungen sondern auch in einem nicht kontrollierten Umfeld möglich (Boyle/Hutchison 2009, 306). Im E-Assessment-System von otu.lea sind die Itemformate mit multimedialen Hinweisen, sogenannten cues oder prompts, angereichert, um den Einfluss der ICT-Literacy auf das Antwortverhalten zu reduzieren.

Anonyme Datenerhebung und flexible Einsetzbarkeit: Die Gewährleistung der Anonymität ist für die Zielgruppe von großer Bedeutung. So berichten funktionale AnalphabetInnen von einem Schamgefühl, sich einer anderen Person in einer Testsituation zu stellen bzw. das Aufsuchen einer Institution wie der VHS wird als ähnlich belastend wie Besuche bei einer Behörde empfunden (vgl. Döbert/ Hubertus 2000; Schladebach 2007). Eine flexible Einsetzbarkeit ist insbesondere für das mobile Lernen von Bedeutung (vgl. Pachler et al. 2010). Die Diagnose kann anonym erfolgen, jederzeit unterbrochen und zu einem anderen Zeitpunkt fortgesetzt werden. Insbesondere für funktionale AnalphabetInnen ist darauf zu achten, auch kurze Diagnose- und Fördereinheiten zu ermöglichen, um keine Überforderung zu erzeugen.

Hinweise auf „Best Practice“: Die institutionsbezogenen Daten können Erkenntnisse über institutionsspezifische Lernerfolge liefern. Hieraus wären Hinweise zur erfolgreichen Gestaltung eines Lernprozesses ableitbar.

Über diese Optionen hinaus soll das E-Assessment zusätzlich für portable Geräte mit Touch-Screen aufbereitet werden. Dies birgt neben der ortsunabhängigen Nutzung den Vorteil, keine Tastatur nutzen zu müssen[4]. Berührungssensitive Benutzungsschnittstellen (Touch-Interfaces) auf mobilen Tablets (z.B. Apple iPad, Samsung Galaxy Tab) ermöglichen eine möglichst intuitive Bedienung.

Zudem bietet otu.lea weiterreichende Potenziale für das Mobile Lernen: Die Technologie hinter otu.lea ist systematisch aufgebaut und ermöglicht die Itemerstellung auch für Nutzerinnen und Nutzer, so dass in die Items eigene Lebenswelt- und Arbeitsweltkontexte eingebunden werden können.

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Notes

1. Lower Rungs bezeichnet den Kompetenzbereich des formalen Bildungsstandes unterhalb der Mindeststandards (http://blogs.epb.uni-hamburg.de/lea/abstracts/)(5.1.2011).

2. Für eine ausführliche Beschreibung von otu.lea und den theoretischen Hintergründen vgl. auch Wolf/Koppel/Schwedes 2011.

3. Die Kompetenzmodelle für die einzelnen Dimensionen Lesen, Schreiben, Sprachempfinden und mathematisches Grundwissen sind unter folgendem Link abrufbar: http://blogs.epb.uni-hamburg.de/lea/downloads/ (11.2.2011)

4. Ergebnisse eines Paper Prototyping-Experiments haben ergeben, dass der Transfer zwischen Eingabe auf der Tastatur und dem Monitor für manche Personen nur schwer oder gar nicht herstellbar ist (vgl. Wolf/ Koppel 2010).

Mobile learning in der lehrveranstaltung “industrielles projektmanagement” - Unterstützung selbstorganisierter und kollaborativer lernprozesse durch iPods

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Abstract

The objective of university studies is to make a sustained positive influence on the way students think about their subject and act within their profession. Besides building competence within their respective subjects students are meant to build key competences during their studies at university. Self-organization and collaboration are important elements of this skill set, which cannot be ‘transmitted’ in lectures but need sophisticated constructively aligned educational concepts. In this paper we outline the shape of a doctoral research project which focuses on how mobile devices can support development of self-organization and collaboration.

Keywords

iPod, Mediendidaktik, Hochschule, Selbstorganisation, Kollaboration, Projektmanagement

1. Selbstorganisierte und kollaborative Lernprozesse in Lehrveranstaltungen

Im Zuge lebenslangen Lernens gewinnen Selbstorganisations- und Kollaborationskompetenzen zunehmend an Bedeutung. Insbesondere in studierendenzentrierten und kompetenzorientierten Lehrveranstaltungen, in denen Studierende in Gruppen weitgehend selbstständig Praxisprojekte bearbeiten, müssen diese ihre Lernprozesse selbst organisieren und sich aktiv in die Teamarbeit einbringen. Vielfach verfügen Studierende jedoch nicht über die notwendigen Kompetenzen, die ein derartiges Veranstaltungskonzept erfordert. Sie benötigen deshalb Unterstützung durch Lehrende. Schwierigkeiten bereitet die Unterstützung vor allem dann, wenn Studierende und Lehrende über einen längeren Zeitraum räumlich voneinander getrennt sind. Ob in einem derartigen Lehr-Lern-Setting der Einsatz von Mobile Learning dazu beitragen kann, Studierende in Projektphasen in den Bereichen Selbstorganisation und Kollaboration zu unterstützen, wird im Rahmen eines Promotionsprojekts am Beispiel der Lehrveranstaltung „Industrielles Projektmanagement“ untersucht.

2. Didaktisches Konzept der Lehrveranstaltung „Industrielles Projektmanagement“

Die Lehrveranstaltung „Industrielles Projektmanagement“ wird in den Masterstudiengängen Logistik, Wirtschaftsingenieurwesen und Maschinenbau der Fakultät Maschinenbau an der Technischen Universität Dortmund angeboten. Sie zielt darauf ab, dass die Studierenden die Merkmale industrieller Projekte kennen und Methoden und Instrumente des industriellen Projektmanagements in typischen beruflichen Situationen im Projektkontext auswählen und einsetzen können. Zu den angestrebten Lernergebnissen gehören auch Zeit- und Selbstmanagement, die für die kollaborativ

angelegten Lernprozesse ebenso erforderlich sind wie für die spätere berufliche Tätigkeit. Die Lehrveranstaltung gliedert sich in zwei Phasen: einen einführenden Grundlagenworkshop und eine anschließende Projektphase, in der die Studierenden in örtlicher und zeitlicher Unabhängigkeit von der Hochschule ein Projekt direkt in der Unternehmenspraxis bearbeiten (vgl. Jungmann, Kühn & Nimsch, 2010). Diese Phase stellt besondere Anforderungen an die Selbstorganisations- und Kollaborationskompetenz der Studierenden.

3. Mediendidaktische Umsetzung

Im Kontext der Lehrveranstaltung „Industrielles Projektmanagement" finden Selbstorganisation und Kollaboration in Wechselwirkung statt. Die Studierenden müssen die mehrwöchige Projektarbeit in ihren Alltag integrieren und Arbeitsorganisationen mit ihren Gruppenmitgliedern, den Lehrenden und den Unternehmen abstimmen. Hierbei soll die Studierenden der Einsatz von iPods unterstützen. Dafür sind jedoch geeignete Applikationen, die von den Studierenden genutzt werden sollen, notwendig. Im Vorfeld wird aus der Vielzahl angebotener Applikationen für die Studierenden eine Vorauswahl getroffen. Die Studierenden haben aber zusätzlich die Möglichkeit, weitere Applikationen auszuwählen und ebenfalls zu nutzen. Kriterien bei der Auswahl sind neben der Eignung für die jeweiligen Einsatzzwecke die einfache und intuitive Bedienung der Applikationen ohne mit unnötigen Features abzulenken. Durch die Arbeit mit den Applikationen entsteht mobiler Content, der es ermöglicht, Arbeitsmaterialien jederzeit parat zu haben, zu vertiefen, zu ergänzen und auszutauschen (Nutzung kurzer Zeitspannen, Abrufen von Inhalten in wechselnden Lernkontexten).

Im Folgenden werden exemplarisch drei Lernsituationen dargestellt, in denen den Studierenden durch iPods Möglichkeiten der Selbstorganisation angeboten und durch flexible Kommunikations- und Arbeitsformen Kollaboration erleichtert werden:

(1) die Planung und Steuerung der Projektarbeit, (2) die Dokumentation und Reflexion der Lernprozesse und (3) die Entwicklung von Lerninhalten durch die Studierenden für nachfolgende Gruppen.

3.1 Projektplanung und –steuerung

Während der Projektplanung und –steuerung sind organisatorische Fragestellungen zu beachten und Absprachen (gruppenintern und mit den Unternehmen) zu treffen. Inhalt und Abfolge von Arbeitspaketen müssen geplant und gesteuert, Ressourcen festgelegt und Lösungswege gemeinschaftlich gefunden werden. Zur Unterstützung bei diesen Aufgaben sind Applikationen notwendig, die es ermöglichen, Projektabläufe zu planen (To-Do-Listen) und zu visualisieren (Projektplan) oder Lernzeiten und –orte festzulegen (Kalender, Stundenplan). Durch einfaches Austauschen von Daten (E-Mail, Dropbox) können sich die Studierenden jederzeit auf denselben Informationsstand bringen, was besonders in der Planungsphase von enormer Wichtigkeit ist. Zusätzlich ermöglichen Applikationen, die synchrone/asynchrone Kommunikation (Messenger, Videotelefonie) und kollaborative Arbeits- und Feedbackprozesse unterstützen (virtuelles Whiteboard, gemeinschaftliches Schreiben), dass es für die Studierenden nicht mehr zwingend notwendig ist, für jede Besprechung ein Präsenztreffen einzuberufen. Dies spart Zeit, die für den Arbeitsprozess genutzt werden kann.

3.2 Dokumentation und Reflexion des Lernens

Die während der Projektbearbeitung entstandenen Ergebnisse müssen dokumentiert und reflektiert werden. Wohingegen beispielsweise bei Applikationen zur Projektarbeit Planung und Dokumentation Hand in Hand gehen, werden für Dokumentationen von Arbeitstreffen und die

Reflexion der Lernprozesse weitere Applikationen benötigt. Eine solche Form der Dokumentation und Lernprozessreflexion kann nicht nur in Form eines Protokollwesens erfolgen, sondern auch durch ein multimediales Lerntagebuch. Neben Texten können dort auch Fotos, Videos oder Sprachmemos eingefügt werden. Die Mobilität der iPods ermöglicht es, die Dokumentation und Reflexion zeitnah der jeweiligen Lernprozesse vorzunehmen und multimediale Inhalte so direkt mit den iPods zu erstellen (beispielsweise das Video eines Produktionsprozesses, der im Projekt verändert werden soll). Durch den leichten Datenaustausch können individuelle Dokumentationen und Reflexionen Lernpartnerinnen und Lernpartnern zwecks Feedback zugesendet werden. So können auch Gruppenreflexionen entstehen.

3.3 Entwicklung von Lerninhalten

Im Sinne des von- und miteinander Lernens sollen die Studierenden im Zuge der Lehrveranstaltung Lerninhalte für nachfolgende Gruppen generieren. Der didaktische Nutzen besteht darin, dass sich die Studierenden detailliert mit einem thematischen Bereich auseinandergesetzt haben müssen, um anderen Studierenden didaktisch wertvolle Aufgaben stellen zu können. Die Entwicklung von Lerninhalten führt jedoch nicht nur zu nachhaltigen Lerneffekten auf der Entwicklerseite, sondern auch bei den Nutzerinnen und Nutzern des Contents. Durch die integrierte Kamerafunktion und durch Applikationen für Sprachmemos ermöglichen die iPods ohne hohen Entwicklungsaufwand die Erstellung sogenannter Educasts, also Audio- und Videodateien für Lehr-/Lernzwecke (vgl. Zorn, Auwärter, Krüger & Seehagen-Marx, 2011). So können die Studierenden typische Situationen aus dem Projektmanagement (beispielsweise Besprechungs- oder Konfliktsituationen) in Form eines Rollenspiels nachstellen und videografieren. Solches audiovisuelles Material über die Lösung einer Konfliktsituation im Projekt erzielt einen höheren Lerneffekt als beispielsweise ein Text, der das Thema lediglich verbalisiert.

4. Fazit und Ausblick

Die in diesem Beitrag beschriebenen Lernsituationen zeigen auf, wie sich mobile Endgeräte ohne hohen Entwicklungsaufwand didaktisch sinnvoll, also mit einem Mehrwert verbunden (Unterstützung von Selbstorganisation und Kollaboration, Lernen nach individuellen Bedürfnissen), in studierendenzentrierten und kompetenzorientierten Lehrveranstaltungen einsetzen lassen. Bei aller Selbstorganisation darf jedoch nicht vergessen werden, dass auch solche Lehr-/Lernsettings ein gewisses Maß an Betreuung und Lernsteuerung durch die Lehrenden benötigen. Gerade in derart dezentralen Lernsettings können Lehrende die Lernprozesse nicht im herkömmlichen Sinn (face-to-face) steuern und betreuen (vgl. Frohberg & Schenk, 2007). Die iPods ermöglichen jedoch die Aufhebung physischer, räumlicher und zeitlicher Grenzen und damit die orts-und zeitunabhängige Kollaboration der Studierenden untereinander sowie die Interaktion mit den Lehrenden. Die technologischen Möglichkeiten des Endgerätes wie zum Beispiel Pushbenachrichtungen von Messengern, E-Mails oder auch Videotelefonie eigenen sich in besonderer Weise zur Lernsteuerung und Betreuung. Beispielsweise können die Studierenden die Lehrperson bei Fragen mittels Videotelefonie in eine laufende Diskussion einbinden und so die räumliche Distanz überwinden.

Ob Mobile Learning sinnvoll in die Hochschullehre integrierbar ist und welchen Einfluss mobile Endgeräte auf studentische Kompetenzentwicklung haben, ist Gegenstand des Promotionsprojekts. Erste Ergebnisse sind im Winter 2011 zu erwarten.

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Personalized mobile learning for people with special needs

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Abstract

The domain of learning context for people with special needs is a big challenge for digital media in education. Usage of mobile technology is growing, and it affects other technologies by bringing in new innovation and methods. The reason for this growth is not only ease of use and mobility, but also improvements in interaction and functionality in different contexts. Meanwhile, the difference between cell phones and handheld computers is becoming less and less evident. Such convergence offers the opportunity of ubiquitous learning "anytime, anywhere". Mobile learning can be seen as a bridge between higher level of abstracted knowledge and practical experiences.

In order to build extendible models, mobile learning concepts are stated and models of learning processes used by teachers of students with cognitive disabilities are analysed and conceptualized. This approach takes into consideration workplace learning situations like small sequences of learning units for training of a certain skills, guided training for a particular machine, or workflows training for a specific task. This system should support or enable the autonomous accomplishment of given tasks in order to foster the experience that cognitive complex tasks can be completed autonomously.

Keywords

Mobile Learning, Personalization, Interactive Learning Environments, Inclusive Design

1. Mobile Learning

Mobile technology is becoming a focal point of new technologies, which provide new designs, new interfaces, and new interactions. Mobile learning is a widely accepted term for describing a learning process with mobile technologies. Many researchers believe that mobile learning is situated in the future of learning (Druin 2009; Keegan 2005; Sharples et al. 2007), ubiquitous learning (Rogers et al. 2005) and seamless learning (Chan et al. 2006).

Mobile learning is neither an extended version of e-learning nor a portable Computer-Based Training (CBT). It has its own characteristics and didactical methods as well as direct interaction between learners in context. This mobile activity is embedded in a didactical framework. One leading aspect of this framework is that mobile learning is adapting to a specific context. In this context the social interaction becomes meaningful to cognition. Not only social contexts but also relationships to objects become an important part of the context. Mobile learning can influence both the individual and community at large. Therefore, these tools impact two-way learning between groups and individuals. Learners are no longer limited to one place. Moreover, mobile devices support personalized and collaborative learning. They also let the learner interact with others face to face, instead of sitting at a personal computer.

Due to conditions of people with special needs, mobile learning can be considered as self-paced learning and they are able to control partly their personalized learning process in relation to speed and content on their own. This can provide an easier way for the target group to reach the learning goals in real contexts, although learning by current mobile technology is affected by many constraints that enforce us to limit the user interface design in specific cases.

2. Personalization

Personalization is one of the principles in the design of this study, which is modelled from traditional learning that occurs in informal ways. Traditionally, successful trainers using this method by differentiate between a learner's attitude and behaviours and through receiving learner feedback.

Personalization means fitting specific content or presenting information according to an individual learner's needs. It is the capacity to tailor learning content and interactions to match learner abilities and needs that make the use of mobile technologies unique. In customization, the control of process is from the learner side and learners select material and leaning processes according to their own interests. Figure 1 depicts the differences between personalization, individualization, and customization.

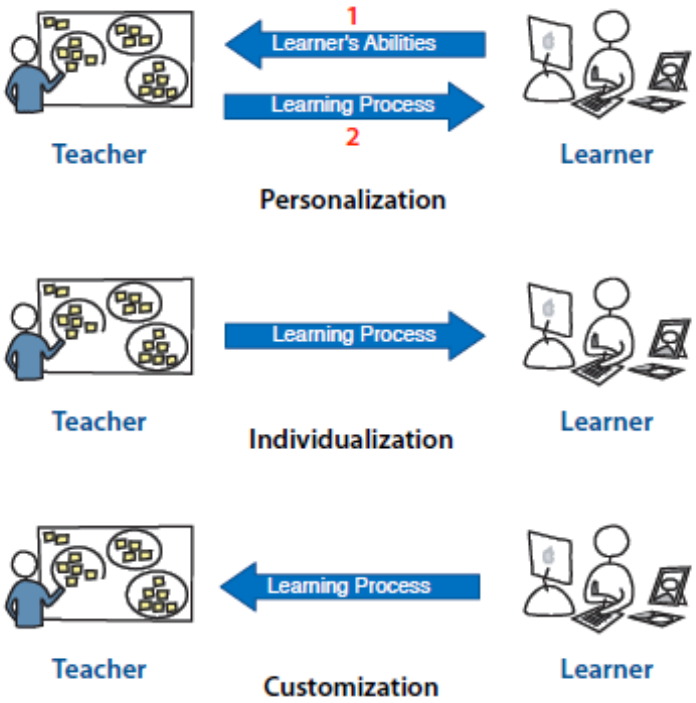

Figure 1. Personalization, Individualization, and Customization (Zare 2010).

In non-personalized systems, learners may receive high level, redundant or irrelevant blocks of information, which causes disinterest and boredom. A personalized mobile learning system identifies an individual's profile and history as it designed to provide appropriate learning patterns and interactions based on the learners' profile. The tool is set to meet the individual needs at a time and place when and where the learner needs it. The suggested methodology defines a comprehensive learning model for the mentally disabled to support them in formal and informal learning. This study is part of a broader collaboration with learners and teachers for a development process with specific requirements of an engineering process.

Personalized learning contains key components that have direct affects on the learner's psychological, cognitive and social abilities. An optimal personalized learning system should focus on the importance of user autonomy, self-motivation and self-management. Learner autonomy can be greatly increased as learners improve their feelings about what they learn in their own personalized learning environment. In learning technologies, models of personalization and adaptation according to the learning process on mobile devices are discussed. The following five aspects implement the model of personalization in our approach:

- A profile that is defined at the beginning (including the initial analytical criteria).
- An update-functionality coupled with a monitoring of user behaviour and feedbacks on tests.
- A specific algorithm for analysing the users outcome according specific developmental models.
- Given developmental tasks by teachers according the specific individual need of a specific student.
- Specific learning material composed of units according an individual profile and adapted to the specification of an individual development of a specific student.

In recursive implementations, experts and students have evaluated the mentioned aspects. The experts were mostly interested in the aspect of orientation and the self-confidence aspect had impressed the students. We believe that a deeper study on psychological aspect such a perception and conceptual learning can improve this model of personalization.

The suggested methodology defines a comprehensive learning process for the people with mental disabilities to support them in formal and informal learning. This study is part of a broader collaboration with learners and teachers for a development process with specific requirements of an engineering process. The aim of this process is to generalize all the specific requirements of the targeted field and the actions of the target group. The goal is to enable existing practices with digital media and along with establishing media that provides opportunities for a new user-appropriate practice.

The monitored learner behaviours can be analysed according to different learning patterns. The system can use different patterns and will recognize which one is suitable for a specific learner to promote better performance. The successful learning patterns can be reused and enhanced for subsequent learning sessions. In addition, via a teacher portal, different possibilities can be added to the criteria of a learner's profile, such as ethnic, cultural background or gender.

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The use of iPhones in medical education

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Abstract

This 'sandpit' session will introduce participants to the background and activity framework of a large-scale mobile learning project in an under-graduate medical education context. Participants will be invited to experience the use of the technology from a student perspective and contribute to the research design through discussions focussing on the existing project plan and theoretical frameworks currently being explored. Data methods and findings to date will be presented and collaborations will be invited to broaden the perspectives and extend the range of investigation of the project.

Keywords

mobile learning, practice, implementation, medical education, assessment, evidence, research, framework, collaborations

1. Background

In September 2010 The School of Medicine, University of Leeds provided all of its 4th and 5th year medical students with iPhones (totaling over 500 users) as part of a two year mobile leaning project. These cohorts spend the majority of their time away from the university and out in clinical placement. Many students are accommodated in these settings. Students have traditionally encountered problems on placements with access to technology, limiting the availability of services provided on campus such as library resources, tutor contact and email.

In placement settings students are predominately engaged in near patient learning. This is traditionally led by speciality clinicians and healthcare staff with groups of students. This learning incorporates formative assessments which are completed on paper by the clinician and provide students with an on-going record of their development. Every student has to complete 5 formative assessments in every placement rotation.

Universities are also inexperienced in the development of applications to support learning in a mobile context. A strand of the project is also developing mobile applications which are intended to support student need and learning. It is intended that these applications will not only be available to support students across the later years of the course but will also be applicable to students across all years of the course.

The aim of the demonstration and ensuing discussion is to engage participants in the use of the devices, share frameworks for research and further investigation and invite collaboration.

2. Usage

The devices are intended to:

- Provide students with access to medical information through a range of publications delivered through the 'Doctor Companion' application, access to NHS Evidence and the internet.
- Enable students to be formatively assessed by clinical supervisors through the use of specially designed applications. The completed work-based assessments are sent back to the students' personal e-portfolio space. The Progress File.
- Encourage students to reflect by using the 'Progress File' application which, when completed, transmits any completed thoughts back to the e-portfolio space.
- Save staff time and reduce reliance on paper-based resources reducing the environmental impact of the university.
- The School is further developing its range of mobile applications to enhance the student experience and has recently launched the 'The Learning Suite' application to students. This application will enable students to complete short formative multiple-choice questions, receive instant feedback and store a record of this feedback in their e-portfolio.

3. The Session

For this 'sandpit' session participants will be provided with an e-portfolio account and will experience the use of the device and its applications from a student perspective. Participants will be encouraged to complete the work place-based assessments, complete learning exercises using the 'Learning Suite' application and access information provided to students. After using the devices we will present out current research and evaluation plan and preliminary findings.

It is not our intention to discuss technological issues but to explore theoretical frameworks drawing from work-based learning and cultural ecology perspectives on which to base the on-going research of the project and to present current findings and approaches to the project.

The current plan is centred around 4 themes:

- The student-led research into mobile technology (SLEMT Project): Investigating the project from a student perspective. Which issues are vital to students, their experience and learning.
- The pedagogical impact: How does the use of the mobile device promote learning? Does the use of the mobile device enhance near patient learning? How are the devices being used? What types of applications promote learning?
- Return on Investment: Does the use of mobile devices represent any savings in staff time or a reduction in the production of paper-based resources?
- Implications for teaching and work-based learning: How do we incorporate and embed the use of mobile devices in teaching activities? Does the use of the mobile have any impact in the work-based learning environment? What are the perceptions of teachers and patients? How do students react to these perceptions?

3.2 Current findings

3.2.1 Student-Led Evaluation

Students in the 4th year of the course have completed a student-designed questionnaire exploring the use of the iPhone and the perceptions of staff and patient in clinical settings. Student-led Focus groups have also take place investigating these themes in more dept. Another group of students have participated in a student-led focus group identifying their use of applications and which areas of their learning would benefit from further application development.

3.2.2 Academic-Led Evaluation

A further sub-group of students have agreed to participate in the 'Learner Journey' study exploring students' changing use of the iPhone over a 6 month period. Quantitative data will enable the team to explore the range of formative assessments being completed, incorporating both skills being assessed and the numbers of assessments being completed by each individual student. This data will also enable us to measure the students' use of the e-portfolio system and level of evidence collection.

We would then invite participants to contribute to our work and/or make suggestions about the types of research the community would find beneficial. In particular we would like to invite research from different perspectives and paradigmatic frameworks to broaden the output of the project.

4. Session Outline (Timings Approx)

Introduction to the project (15 minutes)

Hands on session (30 minutes)

Research and Evaluation strategy (15 minutes)

Discussion of frameworks and methodology (45 minutes)

Invitation to contribute (15 minutes)

Near and far contemplating (NFC) the future trends in mobile and what's happening right here right now

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Abstract

Andy building on his well known forty gadgets in forty minutes of general technologies to support learning presentations' will give it a mobile twist. Using mobile technologies already available in mobile device or the cloud will demonstrate and involve the audience in examining the existing offer and how they as educational and technical professionals will see it develop.

- Technologies examined will be QR and other 2d tags in development
- No see um tags the hidden messages within for example click2c technology
- Near Field Communication (NFC) with specific reference to use of embed readers in mobile devices and Ultra High Speed technologies (UHST) of NFC such as Jet stream
- Augmented reality
- Augmented memory
- Location: Location the role of GPS in mobile and ways of increasing accuracy
- Over the air deployment of software and services

The presentation will draw strongly on commercial non academic work such as Gartner Hype cycle report (various) and the horizon report 2011.

Keywords

formal education, informal education, emerging technologies, pragmatic approaches

1. Introduction

There is very much a paradox presented by the rapid development of technologies in the mobile field and incredibly high level of technologies failing to be adopted in the mass market or quickly superseded. There are technologies such SMS that when originally invented where seen of little or no practical or commercial value but have emerged as the cash cow of the telecoms market. Within the workshop emphasis will be on exposing participants to a raft of technologies and working with participants on where and how widely they may be utilised in learning in a formal or informal context.

2. Background

The rate of technologies occurring and eventually disappearing is shortening. In the non mobile field the cassette tape existed since 1962 till effectively early 2008. The CD since 1982 and thought by many pundits to meet its demise well before the end of the current decade This workshop will quickly introduce the existing range of mobile technologies starting to be deployed in education and will examine technologies now appearing in the commercial and entertainment space and look at how education may utilise them. The recent change in hardware pattern with launch of the iPhone or the shift in operating systems with rise of IS04 and Android and decline in symbian platform are just two examples. It appears from much of the early work in Mobile that its real effects (though difficult to measure) have been in informal learning outside formal institutions and structures of learning. So during the workshop participants will be exposed to how some existing technologies are being used in education and future likely technologies. Participants will be asked to examine the trends and technologies against these questions

So what will trends do for:

- Informal versus formal take up adoption of mobile learning
  Some of the technologies showcased in the workshop and emerging generally (for example Near Field Communication) seem to have obvious applications in formal educational setting (bill payments, library withdrawals authentication). So: Is the informal aspects of mobile in education being caught up with by the formal?

- Blurring the virtual and the real, the public and the private
  Technologies such as augmented reality and powerful geo-location and geo contextualisation tools are starting to blur the virtual and the real and the public and the private.

- What really is a mobile device Star trek communicator of Phaser (phones set to stun)
  Finally the hardware is evolving so fast as how do you define a mobile device is increasingly difficult. Is it a phone, is it eye-wear or is it a tablet?

- App Mania versus the Browser
  The current app-mania gripping developers and the pundits saying apps are a diversion a temporary thing. The long term future answer is the mobile browser and HTML 5

- The cloud versus on device application deployment information storage
  Issues of reliability ownership and security

- Inclusion
  Are the approaches/devices/technologies likely to lessen or increase the digital divide?

3. Concluding summary

The thoughts ideas and reactions of participants will be collected and ways they think we can collectively look at adopting trailing these technologies and sharing both success and failure. We might even collectively try to pick some technologies that may gain widespread adoption in the education space.

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Offline mobile learning with Copyleft hardware

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Abstract

This paper reports on work in progress on a pilot study investigating the deployment of previously unexplored low-cost open-source mobile devices to enhance students' understanding of the limitations and constraints when writing software for embedded devices. The study was conducted with the postgraduate students over a period of fourteen weeks in Thames Valley University, UK. We introduced the Wikireader, a handheld reading device and Nanonote, a lightweight pocket computer, developed using a copyleft approach. The devices do not ship with any RF communication capabilities therefore its applications fall under the category of offline mobile learning. In this paper, we present the rationale for choosing open-source platforms and discuss some of the challenges we faced working with these devices. Overall, this exploratory study aims to showcase alternative open hardware solutions to more restrictive proprietary solutions which are currently dominating the mobile landscape.

Keywords

Copyleft Hardware, Offline Mobile Learning, Nanonote, Wikireader, Open-source Technology, Mobile Usability

1. Introduction

The pilot study is currently underway in Thames Valley University with a small group of full-time students studying the Mobile Application Development module which is a part of the MSc Network and Mobile Computing course. In this course, it is important for students to gain some experience designing and structuring binary network protocols. Therefore, students are required to learn Packedobjects – a data encoding tool that provides high-level bit-packing on low-level devices (Moore, 2010). The selection of the open-source mobile platforms for this study was based on the requirement of this module which is to enhance students' understanding of the limitations and constraints when writing software for embedded devices. We also wanted to provide an offline access to learning resources that students could access anytime anywhere without incurring extra cost. As part of the module, students were given Nanonote and Wikireader devices to take away and use until the end of the term. Wikireaders were customised to provide offline access to relevant software manuals. The Nanonotes were also loaded with manuals in PDF format and were open to customization to provide hands on experience of packing data and communicating it across different kinds of hardware. Due to the specialised nature of the course, students were encouraged to customize their devices as necessary. This paper further discusses the copyleft approach, the initial assessment of open-source platforms we used and the challenges we faced during our exploratory study.

2. Copyleft Approach

The mobile industry is dominated by proprietary locked-down technologies and this situation is mirrored throughout academia. Similarly, the emergence of "app stores" provide a platform where small applications are exchanged for small amounts of money without any requirement to share code. We believe in an approach which encourages sharing of knowledge and therefore believe in using mechanisms such as copyright law to enforce this approach. The approach is known as "copyleft".

As the cost of hardware reduces we are beginning to reach a point where it will become possible to replace a USB flash storage device in your pocket with a small computer. This style of ubiquitous computing provides some interesting learning opportunities but also poses significant technical challenges. Nanonote by Qi Hardware is a sub US$100, an ultra small form factor copyleft hardware device. The device is however not designed to be mass marketed consumer electronic product and at the moment, it is targeted at developers, so that it can be turned into something useful as necessary. The sub US$100 Openmoko WikiReader is an offline non-wired mobile text reading device and its open-source software platform is also freely customizable. Previously, Openmoko also created mobile phones ("Neo 1973" and "Neo FreeRunner") with an open software stack. While benefits of open-source software are well established, consumer hardware based on an open-source copyleft designs are yet to be seen. Weiss (2008) highlighted, "as it has happened with open source software, though, it may take some years and test cases for legal clarity to emerge in open source hardware". There are also several challenging questions that open source hardware faces such as how would business benefit from open sourcing hardware and who is really going to make their own device? (Weiss, 2008)

3. The Challenges

Our students never used these devices and were only familiar with Windows based systems. Lack of Linux experience and novice programming knowledge meant students faced even greater challenges to understand the concepts and learn the embedded programming. Research shows that only through adequate practice and training can expertise be obtained in the field of programming (Bruhn & Burton, 2003; Ala-Mutka, 2004) and thus learning should go beyond classroom/lab environment. Due to the lack of dedicated Linux-based Mobile and Networking lab in the university, we setup each computer with a dual boot Ubuntu and Windows operating systems in one of the lab. But, university did not allow students to install necessary software. Therefore, by introducing these mobile devices, we were hoping to relax such constrains and provide total freedom for students to practice programming in the university and also outside institutional contexts. Initially, we configured Nanonote with lightweight Jlime Muffinman Linux distribution which also included already configured stripped-down versions of applications such as PDF viewer and dictionary and also copied the necessary PDF manuals to the device. Due to the specialised nature of the module, students were encouraged to customise their devices, such as changing the default distribution and adding multimedia content. At this stage, however, we did not anticipate the level of difficulty that students could face to further customise the devices to use it for hands-on experience. Full-time students are busy with studying other modules and have assignments deadlines and we found them less motivated to learn the device so that they can use it for supporting the learning. Wikireaders were also customised to provide an offline access to resources including freely available Wiki based content. To customise the Wikireaders, we needed to upload the content from the course wiki to the device, which required importing an XML dump to be compiled and copied to micro-SD cards. Due to lack of flexibility of the existing VLE, we had to setup a new Wiki site using an open-source Mediawiki, add the necessary resources and imported the XML dump from the site.

4. Conclusions

The aim of this exploratory study is not to evaluate the impact on learning programming and also not meant for generalising to a larger population due to small number of students involvement in the short period of the pilot study. Rather, this study is an evaluation of open-source mobile platforms to support programming teaching and learning practices in higher education by understanding how students perceived and used the devices, and limitations of the selected open-source platforms and the challenges of setting up the pilot study, so far, we are encouraged by students' adoption of these devices for learning programming. We are currently in the process of analysing the data and this pilot study may help us to identify the affordances of the open-source Wikireader and Nanonote devices and also to understand the ways to improve the further use in learning and teaching practices.

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The case for audio in mobile learning

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Abstract

In mobile computing the perspective of audio-based applications[1] is promising. Be it for visually impaired or disabled users, for those who for some reason cannot interact with a graphical user interface, or those who just find mobile sound more practical than carrying around large screens, audio-based applications are an emerging field of interest. Especially in pervasive applications such as city-/museum-guides and mobile games, auditory displays benefit from freeing users' attention from a screen, and thus directing the concentration to the physical environment rather than diverting from it.

However, only a few studies look into the act of listening and cognition of speech, sounds and or music in depth, and therefore design guidelines and best practices for an effective audio-design in learning applications are so far scarce. This paper refers to an ongoing thesis for the Master of Science degree in Digital Media, which will contribute to filling this gap of research. In particular, it adopts findings from cognitive psychology and research in multimedia learning to both make a case for museum-guides to use audio as the main information delivery channel and derive implications for the instructional design of them.

Keywords

mobile learning, audio, audio-guide, multimedia, museum

Audio in mobile learning applications

The evolution of hand-held mobile computers into location-aware, networked and multimedia-capable devices promises the potential to revolutionise learning. It has prompted the digital media community into conducting wide-scale research to enhance their use as mobile learning tools. Several examples reveal the many functions of an elaborate audio-design and hence show the potential of audio to deliver content that one can enjoy, sense, share, interact with, navigate according to, and associate with visual artefacts (Kristiansen, 2010; Heller, Knott, Weiss & Borchers, 2009, amongst others). However, no evidence can be found that these approaches benefit meaningful learning.

Acting on the assumption that "students learn better from words and pictures than from words alone" ('multimedia principle'; Schnotz, 2005; p. 60), the thesis to which this paper refers looks particularly into the following questions: (a) How far can sounds, that may concretise audio narratives and support imagination, enhance learning efficiency compared to pure audio narration and (b) How to best arrange sounds within narratives to foster meaningful learning. Results are applied and tested in a possible field of application. An audio-guide, designed as part of the thesis, will lead visitors through the German Maritime Museum Bremerhaven and convey information about the preserved Hanseatic Cog that is exhibited on-site. The museum-guide serves as the basis for user tests in order to investigate the potential of a didactic audio-design in general and how it could be utilised in the context of a museum.

Balancing exhibits' annotation with the physical environment

Museum-guides are one means to bring artefacts to a public and, thus, they should neither distract, both sensory and imaginary, from a visitor's appreciation of the physical artefact and its ancient aura imbued to it. The museum environment can be busy and distractive; it usually presents a lot of information in many different forms and sensory modalities[2]. It is then desirable to have museum-guides that are solely based on audio and thus reduce cognitive load by leaving the use of technology playing a minor role and freeing the users' visual channel to sense the environment and its artefacts. Furthermore, as an adequate audio-design has the ability to also address emotive and motivational aspects they are well suited to bringing alive what is known about the context of the exhibited objects. This is an important factor for immersion and enjoyment.

Closer look into cognitive science and multimedia learning

Without doubt, the degree of immersion and enjoyment is one important factor for successful learning. However, doubts about the effectiveness of 'augmented audio-narratives' are referred to empirical studies, which commonly tend to reveal that integrating sounds and or music in learning applications do not support, or even have a negative effect on learning (Moreno & Mayer, 2000). In order to find hints leading to requirements and implications for an adequate audio-design it is promising to have a closer look into findings arising from the field of cognitive science and their practical application in multimedia-based learning.

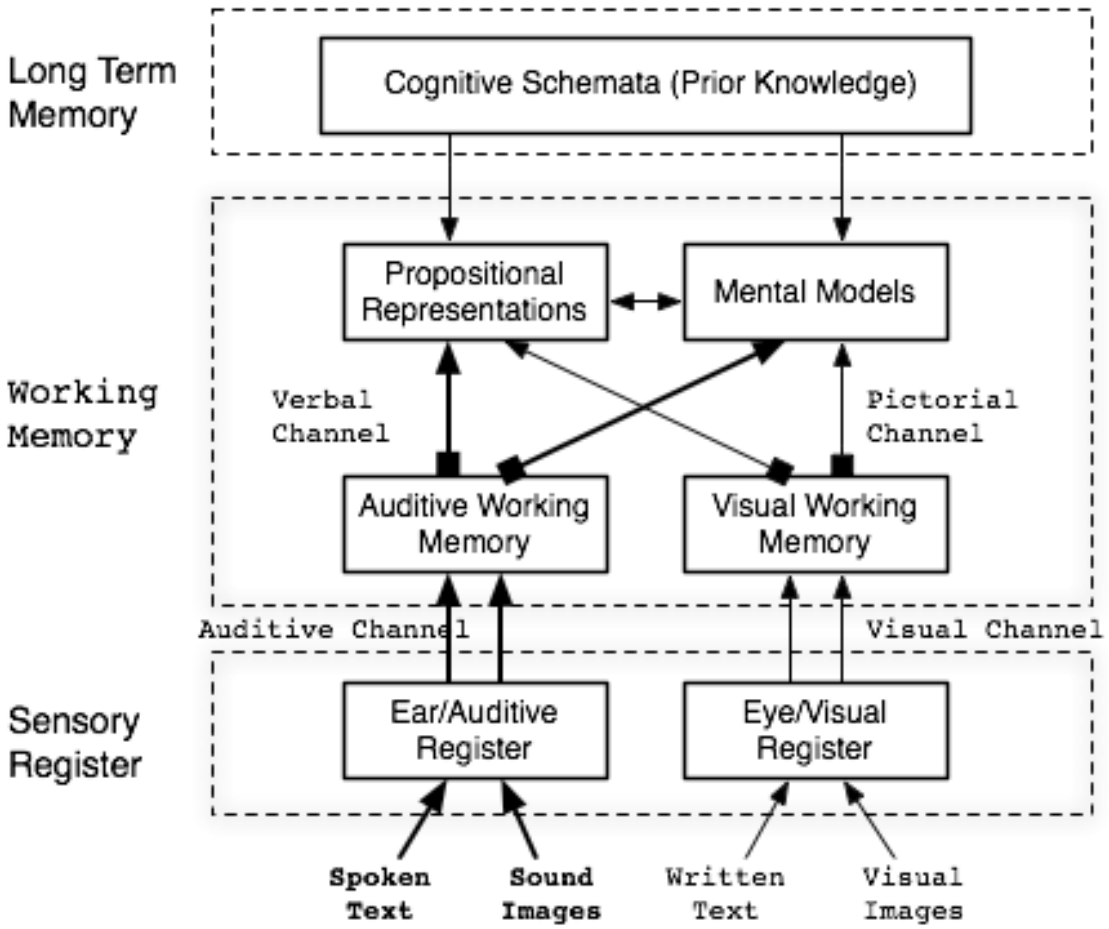

Figure 1. Integrated Model (ITPC) according to Schnotz (2005)

With respect to the cognition of audio, most elaborated assumptions can be found in the integrated model of text and picture comprehension (ITPC) (Schnotz, 2005). By utilising different findings, such as the limited capacity assumption of working memory and the dual-coding theory (mainly Baddeley, 1986; Paivio, 1986), this model aims to predict under which conditions a combined use of text and pictures (aural and visual) will be beneficial or detrimental for learning. Compared to the better-known cognitive theory of multimedia learning (CTML) (Mayer, 2005) the ITPC model makes some further suggestions as it associates pictorial information not necessarily with the visual modality as 'sound images' can be also conveyed (see Figure 1). Even though the model incorporates the concept of sound, its implications only find empirical evidence in the consideration of written-, spoken text and visual pictures. The inherent nature of audio, which differs from its visual equivalent to a large extent, necessitates a thorough investigation in how far the cognitive processing of visual images are transferable to them of sound images.

Consequences for designing audio-guides – theoretical implications

On the basis of the ITCP and CTML models following hypotheses and requirements for the design are derived:

- To prevent cognitive overload of the auditory channel due to *capacity limitations of the working memory*, sounds have to be integrated economically, i.e. sounds have to be relevant and shouldn't be intrusive.
- From the *coherence condition*, i.e. words and pictures need to be semantically related to each other, it follows for sounds to be arranged in a one-to-one correspondence with the related text in a way that they can be easily associated with each other. This requirement demands the design of clear, and recognisable sound.
- The *contiguity principle* suggests that words and pictures need to be presented closely together in space or time because the working memory requires simultaneous availability of corresponding information. It can be reasonably assumed that verbal and related non-verbal audio information should be presented in high proximity as well.
- Whereas the combination of pictures and written text leads to a *split of visual attention*, the synchronous use of different audio information is not well-investigated yet. Unlike visual information, the memory structures audio chronologically, hence makes it possible to deliver spoken text and sounds simultaneously without leading to split-attention[3]. However, this work suggests to present verbal and related non-verbal information in a rather consecutive way due to possible interferences of the auditory information and the capacity limitations of memory.
- Different to the *picture-text sequencing effect*, which suggests presenting pictures before the corresponding text[4], this work rather sets the requirement to present sound images after the related text unit. Sounds being decoupled from their actual source and place cannot describe a subject matter detailed enough, and therefore risk priming inappropriate schemas, which is detrimental to learning. Text provides necessary context to enable a later relation of the more visceral sound, which stimulates the listeners' mental picture of the subject matter and thus provoking a 'deeper experience'.

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Notes

1. Audio-based applications refer here to applications being based solely on audio or using audio as a main delivery channel of content. Also auditory display.
2. Be it through text labels, experts informing about a topic, interactive exhibits or multimedia-guides
3. For example, additional to speech a bell-tower can be heard at the same time.
4. If for example a picture is too complex so that the contiguity principle can't be observed.

Providing training handouts for corporate learning as ePUB files for mobile devices and e-reader

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Abstract

For preparation before and after seminars handouts are provided as printed text or PDF file. With the increasing availability of e-readers and mobile devices these handouts could be made available on those devices as well. We need to investigate how providers and learners could use currently available tools for creating and reading digital text in a corporate learning environment. An example is provided how a training handout could be converted and delivered as an ePUB file for mobile devices and e-reader.

Keywords

ePUB, reading, content, mobile learning, practice

Reading text as ePUB-file on Smart Phones, Tablets and E-Readers

More and more learners have access to a PC and mobile devices like smart phones, tablets and e-readers. The acceptance to read digital text is growing due to better screens and dedicated e-reader devices, which use the E-Ink technology for a better digital reading experience.

On those devices the ePUB file format enables the optimized representation of text. The text is reflowable and is scaled to the screen resolution. The ePUB format published by the International Digital Publishing Forum (IDPF) is available for use without licensing fee. A text can be delivered in a single file for use on different devices.

Creating ePUB-files

PC users could use software tools for converting, validating and testing ePUB files without programming. In some cases it is required to modify some text formatting before converting as not all formatting is available in an ePUB file.

ePUB files could be created from a word processor (with tools like Aspose, OPDToEpub or acrobat.com). Alternatively files could be converted (with tools like epubgen.jar, Calibre or OpenContent) or opened in an editor software (like Sigil or Atlantis) and saved as ePUB file. An ePUB export option could be added to existing Content Management Systems.

The ePUB-file could be tested on a PC with software tools. EpubCheck-Validator (epubcheck.googlecode.com) checks the formal structure of the generated file and reports errors. The file could be opened and tested on a PC with reading tools like Adobe Digital Editions, Sony Reader Library or Calibre.

Reading ePUB files

ePUB files could be distributed as attachments or from a webserver and protected like other digital files. Most e-Reader devices are using the ePUB file format for displaying text. On SmartPhones and Tablets a reading software is required for opening ePUB files, like iBooks or Stanza on an Apple iPhone or iPad or Aldiko on Android devices. The advanced features for reading text on devices are provided by the reader software and depend on the device's features.

Limitations of ePUB files

The currently available ePUB file format is limited to reading of reflowable text on different devices. Advanced features such as video, audio and links, are not officially supported and are not available on each device. The features of enhanced books with the new possibilities for reading text with interactive elements or social reading features are not available with the ePUB format. ePUB files are providing text for linear reading without any interactions only.

Training material and ePUB files

For digitized learning material a high level of interactivity and flexibility for the user is expected. The current ePUB format can't meet these expectations. Providing ePUB files to learners gives them access to these material in different contexts and locations. This may be a benefit for a learning design. An ePUB file is not an alternative to other interactive learning objects and learning environments.

A few limitations with text formatting must be accepted when converting text files into ePUB files. A reflowable text without colors is required. Multi column layouts, diagrams and tables can be used with restrictions only und need to be replaced with reflowable text before converting. Due to these limitations some training material may be not suitable for ePUB files.

Benefits for providers

Providers may benefit from lower distribution costs for shipping training handouts as digital files. The development of other technologies, like native apps, for different devices takes a lot of efforts. Using the ePUB file format for providing content on different devices could save providers money and enable delivering of content to mobile devices.

Benefits for learners

Learners get access to learning content on their mobile device. As they may carry this device for other purposes, they have the opportunity to read learning content at other locations without carrying printed handouts.

The use of ePUB files requires some user skills for transferring and opening the files on their own device. Different learners will use and require different features for reading text on a device. While most users will be soon able to read text with a reader software, some may require faster browsing, adding annotations or highlighting text. As the basic reading features are supported well there's still need for improvement on the usability of these advanced features.

The disadvantages like missing page numbers, citing rules or problems with different Digital Right Management (DRM) formats are not critical in a corporate learning environment.

Summary

Due to the rapid spread of mobiles devices and eBooks more learners will be able to read digital text and will demand training handouts on mobile devices. Publishers using the currently available ePUB format will be able to provide a cost effective solution for learning content on mobile devices.

Mobile learning isn't one flavour or one approach it's a whole grocery store

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Like a swiss army knife, mobile phones are already being used across the planet to solve many everyday problems. From vote monitoring in Nigeria to micro-loans in South America. From parenting advice in China to sex education in India.

Educators are slowly starting to adopt the same mobile ideas to enhance learning, and a growing number of m-learning projects in both UK and Europe are showing marked successes in reaching new learners.

Despite these successes, there is no simple formula for ensuring an m-learning project will succeed: Equipment vendors are often biased. Technical solutions are often locked to a specific device or supplier. Many current m-learning projects and m-learning suppliers use non-standard solutions that make it hard for another institution to build on those for themselves and further the knowledge gained.

These technical considerations make it challenging for academic reviewers to abstract out a solid theoretical basis for success, or failure. Successes (and failures) might be due to matching the right pedagogical approach to the right learners, but might also be due to technical considerations. And given the rapid evolution of technical tools and mobile devices, it is equally likely that the technical impossibilities of last year are the mainstream accepted norms of this year.

How then to learn valid lessons from last year's projects, and build educational models that can flex and adapt as the tools themselves evolve.

The authors are in the final stages of a multi-national review of mobile learning, and would like to propose that despite the vast array of different project, nations, approaches and technologies - mobile learning is actually reaching a convergence point of accepted best practise and technological approach.

On the one side are projects that have set about to work "within the system", building on the current infrastructure - both technical and conceptual - to add richer learning experiences to traditional learner groups. This would include school classes given PDAs or iPads to enrich their learning, as well as software solutions to connect mobile learners with traditional e-learning systems, like VLEs

On the other side are the more open ended explorations, adding a wider range of technologies, often described as "disruptive", to places where mainstream class-based learning isn't happening. These projects span a much wider range of technologies, and learning approaches. They include high tech solutions like virtual worlds for rehabilitating war wounded and 3-D visualisations of motors to support aircraft mechanics on the job. They also include mid-tech solutions like mobile portfolios

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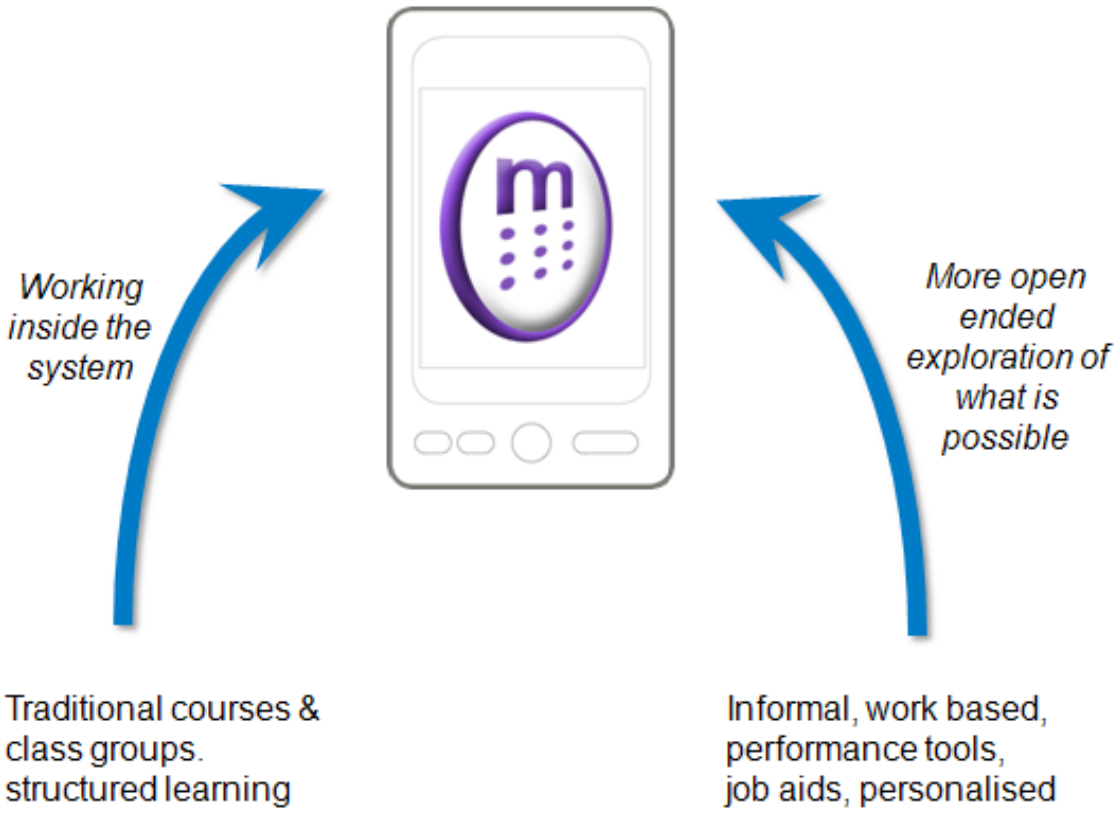
accessed by a learner's own phone, language training for deployed soldiers on their iPods and skills training for taxi drivers on their phones while waiting for the next job. Low tech examples would include radio-lessons to Indian children missing school on market days.



We would like to propose that these two types of m-learning that historically have operated in different pedagogical frameworks, are in fact converging into a single model. That the technologies in use are becoming increasingly unified, that the tools for working with them are moving slowly into the mainstream, and that the best ways to integrate them into educational interactions are becoming agreed and shared.

In discussing this, we will take a step back from a UK-centric view of m-learning to look more broadly at solutions from across the world and to draw out key success criteria, as well as exploring some of the more significant differences to see what Europe can learn from our international friends.

The authors have been actively involved in a broad range of mobile learning programmes across countries (USA, Africa, UK, Europe), sectors (schools, work-based, FE, military, charitable) and languages. They will be demonstrating some of the technologies and pedagogies used, as well as providing unique insights into both their successes and their failures. Projects covered will include:

- m-uBuntu: working with impoverished South African schools to improve English Literacy (so successfully that students and teachers were invited to the USA to share their knowledge with the Whitehouse and US schools). The project derives it's name and purpose from the African word "uBuntu", meaning "I am what I am because of who we all are". The vision is to work with teachers, helping them work with other teachers, and their students to inform and improve all of their skills. All the schools involved are in impoverished neighbourhoods. Some urban. Some

very rural. They have each adopted their own approaches to mobile learning, with a range of devices and many different techniques underpinned by the uBuntu philosophy. http://www.m-ubuntu.org

- SMS examination of range of project from across the world. For example using SMS in a simulation replicating environmental hazard disaster responses to flood and Volcanoes. This work from University of Aberdeen by Sarah Cornelius; Phil Marston. http://www.slideshare.net/jiscrscyh/real-time-simulations-using-sms-university-of-aberdeen

- Using SMS response systems to check if drug for sale in markets are counterfeit is a interesting and homegrown system in Nigeria http://mobileactive.org/no-fake-drugs-battling-pharma-counterfeiting-sms-and-mobile-tech

- QR codes for a range of situation in education to Library inductions in UK Universities. For example allowing learners to scan QR codes on book and save the book details to there phone or scan a code to download a audio tour and floor plans of library. This example is from the university of Bath http://www.bath.ac.uk/library/services/qrcode.html

- Bloom: working with taxi, bus and truck drivers across Europe to deliver multilingual, mobile access to learning. Working with adult learners working in the transport industry. The Bloom learners were selected because they were not actively doing any learning at all. The project aims were to find new, motivating channels to reach these hard-to-reach people via their own phones, and to re-awaken their enthusiasm for learning by making it a viable way to spend their down-time while waiting for their next job. http://www.bloom-eten.org/component/option,com_frontpage/Itemid,1/lang,english/

- Mole-project: working with the US Government and 22 nations to provide mobile learning for medical issues at the point of need to relief workers and other remote learners. None of the countries included, which includes USA and UK, use any form of mobile on-the-job learning when deploying their people for humanitarian or disaster relief, even though the rapid changing information landscape would make these invaluable tools.

The examination of this range of approaches in a wide variety of context using mobile will make participants think of model frameworks that can be applied to mobile and how these model frameworks change over time and space . This will possibly expose the mobile paradox of educationalists wanting to formalise mobile application a media that by its very nature and usage patterns is anything but formal and static.

Using mobile devices to support careers advice, information and guidance

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Abstract

Web 2.0 and mobile devices have changed the way people interact and have profound implications, potentially, for the delivery of Careers Advice Information and Guidance. However, they have barely begun to impact on the way guidance services are delivered. The need to begin to align new technologies with service delivery is becoming more urgent.

This paper examines research on the use of new technologies and mobile devices for careers guidance and describes work in progress to develop a Careers Dashboard allowing users access to advanced labour market information.

Keywords

Open and linked data, mobile devices, careers guidance

1. Introduction

This paper is based on research carried out into the impact of technologies and particularly Web 2.0 and mobile devices on the future of Careers Information, Advice and Guidance (CIAG) in England and on the subsequent development of the design for a mobile application to support CIAG, particularly for the use of labour market information (LMI).

2. Background Research

The research was based on a literature review, interviews with 6 managers and 11 Careers Personal Advisers (PAs) and on focus groups with 46 young people (Bimrose, Barnes & Attwell, 2010). The research indicates that technology has already influenced, not only the ways in which guidance services are accessed by clients, but how they could be used. The research examined the skills and competencies that will be needed by PAs to develop their practice in the area of internet-based guidance, including the use of mobile devices, and gave young people a voice to identify how they wanted guidance services to use technology in the future.

2.1 Use of Mobile Devices

The research looked at the present use of internet and mobile technologies by young people. All research participants were able to access the internet. All had access to a mobile phone, most being responsible for paying for their own phone charges of around £20 a month. Most used mobile phones for accessing music, as well as for text and voice calls. Internet use by phone varied (only 26% accessed the internet on their mobile phone); costs being a major factor. Many, however, expected that in the future they would use mobile devices as their main way of accessing the Internet. Most of the young people were in favour of an increased range of internet-based guidance services, but not at the expense of face-to-face services. Research showed that young people have high levels of engagement with ICT for various purposes, so this points positively to providing services in this way.

2.2 Internet based Guidance Services

The research examined the current use of internet-based guidance services and examined a range of services that are, or could be, used to deliver guidance.

These included the use of the internet and mobile devices for providing:

- basic service communication, such as booking appointments and reminders;
- notifications of training programmes, job vacancies or other opportunities;
- chat room facilities;
- email query services;
- access to information about careers, including multi-media and games;
- access to tools, such as online Portfolios; and
- access to LMI.

The research suggests that although Web 2.0 and mobile devices have changed the way people interact and have profound implications for the delivery of guidance, they have barely begun to impact on the way guidance services are delivered. The need to begin to align new technologies with service delivery is becoming more urgent.

2.3 Research Conclusions

The research concluded that an important first step in delivering effective and efficient internet-based guidance services would be agreement about a common language to describe exactly what it comprises. Organisational support is necessary to support effective internet-based guidance. Whilst the development of the skills, competencies and confidence of PAs may be a necessary pre-requisite for the introduction of effective internet-based guidance services, it will not be sufficient. Particularly important is clarity of objectives: Which internet-based guidance services are to be delivered, by whom, to which groups of young people and for what purpose and what technologies should be developed? Also critical is a genuine commitment from senior management and a technological infrastructure that is fit-for-purpose

3. Careers Dashboard

Further discussion and development work has focused on the potential of using the internet, especially mobile devices to access contextualized labour market information as part of the CIAG process. Labour Market Information is seen as important in allowing young people to make informed choices about future careers and in helping those considering career changes or retraining.

The aim is to develop a 'Careers Dashboard' providing access to LMI, accessible through a computer or through mobile devices, founded on the idea of open and linked data. The dashboard could allow advanced querying based on occupations and / or location and provide information including:

- Occupational profile;
- Occupational videos;
- Possible progression routes and career pathways;
- Qualifications and skills required;
- Education and training opportunities;
- Pay rates;
- Costs of training;
- Employment opportunities at local, regional and national level; and
- Related occupations.

3.1 Open and Linked Data

Linked Data describes a method of publishing structured data, so that it can be interlinked and become more useful. It builds upon standard Web technologies, such as Http and URIs - but rather than using them to serve web pages for human readers, it extends them to share information in a way that can be read automatically by computers. This enables data from different sources to be connected and queried (Berners Lee).

Open data refers to the growing movement in many countries for government data and data collected by public bodies to be opened for query and reuse. An open data store – data.gov.uk - has been launched in the UK with over 5,400 datasets available, from all central government departments and a number of other public sector bodies and local authorities. There has also been significant change to the Crown Copyright under which most UK government data is licensed with the new Open Government Licence encouraging the use and re-use of data and information.

3.2 Significant Issues

However, whilst there is much LMI available there are significant issues in accessing and interpreting such data:

As yet little of the labour market data is available through the government open data store. However there is an API to the NOMIS service provided by the Office for National Statistics. Whilst the API, and indeed the NOMIS query engines, provide access to only a limited range of labour market statistics, there is probably sufficient to build of a Careers Dashboard demonstrator. For now, advanced services may be dependent on downloading statistics and accessing them from a local server.

Even then there remain serious issues as to which statistics are to be linked and how to present or visualize such data. Raw statistics alone will probably have little meaning for most users and there will still be a need for help with interpretation and relating the information to individual context. Visualisation and design issues are compounded by our desire for the Careers Dashboard to be accessible on mobile devices with a limited screen size.

4. Early Conclusions

The research revealed the urgent need to begin to align new technologies with service delivery in CIAG. It also suggested a number of choices and opportunities. Subsequent work on developing a Careers Dashboard has confirmed the possibilities of creating new tools and modes of service delivery, including through mobile devices. However these also raise a number of socio technical issues in designing and delivering such services that will require ongoing collaboration between researchers, developers and careers professionals in order to progress.

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