MobiDics – Improving University Education With A Mobile Didactics Toolbox

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Abstract. MobiDics is a mobile didactic platform for smartphones and tablets, targeted at university teaching staff. It eases structuring courses and the targeted application of didactic techniques to support learning, in order to improve the quality of university education. MobiDics enables peer learning through cooperative experience sharing and academic exchange about successfully applied didactic techniques, creating a social network of teaching personnel. Young teachers benefit from expert knowledge and multimedia-based example teaching scenarios. As a social mobile knowledge exchange system, MobiDics is intended to increase satisfaction in teaching and to improve the quality of university education.

Key words: E-Learning, Mobile Learning, Pervasive Education, Didactics, Knowledge Sharing

1 Introduction

Multi-functional smartphones have contributed to a rise of mobile and pervasive learning. These devices enable access to everywhere learning at any time, making learning material accessible in situations where it would otherwise not be possible. This is e.g. important for professional further education in areas with high mobility, e.g. the medical sector [1]. Learning systems on smartphones supports problem-based and experiential learning [4, 1] where other forms of learning would often not be adequate any more. Mobile learning can take advantage of unused time, like waiting at the bus stop. This is e.g. well suited

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for vocabulary tests, that easily can be interrupted and continued ('interruptable learning'). Mobile phones can also be an important instrument for lifelong learning in everyday life [4]. Mobile e-learning is meanwhile well-established in university education, and the educational area in general. However, research on mobile learning so far focuses on systems directly used by students.

We present MobiDics, a mobile learning system addressing *teachers* in higher education, to support them in their function of knowledge transfer. MobiDics extends the scope of classical e-learning applications by pervasive cooperative learning and knowledge sharing, tailored to personal needs. In the following, we introduce the concept of the MobiDics system, summarize its goals and present the functionality and implementation of an initial prototype.

2 Goals

With MobiDics, we support course preparation and structuring and encourage the use of didactic methods by professors, lecturers, PhD students, or teaching assistants. Didactic methods are instruments e.g. to activate students and for adequate support of different learning phases, for example generation of knowledge, levels of learning and understanding, or rehearsal [3, 2]. The use of mobile pervasive learning tools also by the teaching side has the potential to improve teaching and thereby to provide better university education.

Besides the primary goal of improving the quality of teaching, MobiDics supports in a broader perspective the following goals:

- higher satisfaction among teaching staff by more effective course planning and preparation
- the support of further education of academic staff, and creation of mobile learning programs that support ad-hoc needs for learning during work, or the personal wish for improvement
- special programs for mobile acquisition of basic competences (e.g. for young teaching staff)
- innovation in professional education and training, and the integration of professional and academic education
- improvement of social mobility, in order to foster equal opportunities in access to educational programs
- reaching target groups that would not as good be addressable without mobile learning [5].

3 Concept

MobiDics is intended as mobile supplement to professional training courses on didactic methodologies. The incorporated content was provided by the Centre for Learning and Teaching in Higher Education associated with our university. The advantages of MobiDics are, compared to traditional further education courses:

Everywhere Use: It can be used at every time and location, also without internet connection through offline caching, thereby enabling sensible use even of short periods of time (e.g. in the train or at the bus stop, as well as in the lecture hall).

Better Understanding: It incorporates multimedia content (images, animation, video) to illustrate appropriate use of didactic methods, going beyond the possibilities of traditional learning material.

Context Sensitivity: The mobile application enables location- and context-sensitive functionality, e.g. suggestions of appropriate methods according to the room. For example, a substitute methods would be required in case of a room change when the planned equipment is not available. MobiDics includes filtering of didactic methods according to course type, audience size, goals, room equipment, seating, learning phase and more, tailored to specific teaching and contextual needs.

Pervasive Cooperation: Users can add own content and exchange experience with didactic techniques. A comment and rating system allows to report the successful application of methods, and to get feedback and knowledge from experts and experienced teachers. This enables everywhere 'peer learning' and makes MobiDics a growing, vital system.

A web-based front end (see Fig. 1, right image) makes MobiDics accessible for conventional desktop use e.g. on the laptop or in the office. It supports more traditional learning scenarios, and more comfortable data and feedback entry.

4 Implementation

The didactic content is stored on a central server and accessible by MobiDics clients, running on smartphones or tablets, as well as through an AJAX web interface. The mobile client interface is implemented on Android, supporting a resolution-independent experience on a broad basis of devices, using intuitive smartphone interaction (e.g. swipe navigation and pinch zoom). The content is downloaded to the mobile devices and made available offline on first use. Additions and changes are automatically updated. Content can be searched-as-you-type using free text and predefined filter categories to reduce necessary user input. Users can also create favorites of frequently used content. The user interface on mobile devices can be seen in the left two screenshots in Fig. 1.

User accounts allow managing personal settings and private content. Users can add own content like method extensions, comments, experience reports or entirely new didactic methods, and either save it for personal use, or share it with the community. Updates are automatically downloaded upon the start of the application. Through the login with personal credentials, information is synchronized between mobile device and the database, so that MobiDics is always consistent when e.g. changes are made on the smartphone or the web interface. User-generated content is always marked as such, to distinguish it from built-in methods created by teaching professionals.

5 Conclusion

We have presented MobiDics, a mobile didactics toolbox for the smartphone, targeted at professors, lecturers, PhD students, and teaching assistants. MobiDics

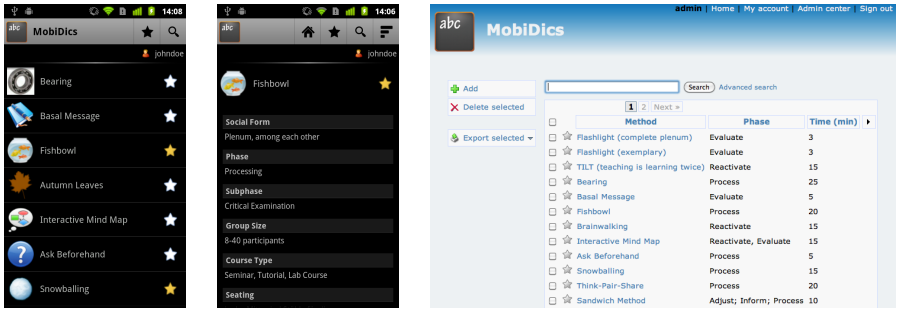

Fig. 1. Left: The catalog of didactic methods in the main screen of the MobiDics application (here running on a Nexus S smartphone). Frequently used methods can be starred and viewed in a favorite list. Middle: Techniques are categorized by application criteria and can accordingly be searched. Right: The web interface for comfortable method editing and management.

provides comprehensive information about didactic techniques, and enables their usage targeted to specific teaching situations through filtering didactic methods e.g. by room equipment, course size, adequacy for individual learning phases, and more. The mobile platform supports flexible use in location and time. MobiDics supports professional exchange through feedback, reports and the addition of own content, and lets teachers benefit from each other's experience. MobiDics is a peer learning platform and a social mobile knowledge exchange system, with the potential to improve teachers' satisfaction and the quality of education.

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References

1. Holzinger, A., Nischelwitzer, A., Meisenberger, M.: Mobile Phones as a Challenge for m-Learning: Examples for Mobile Interactive Learning Objects (MILOs). Pervasive Computing and Communications Workshops, IEEE International Conference on 0, 307–311 (2005)
2. Light, G., Calkins, S., Cox, R.: Learning and teaching in higher education: The reflective professional. Sage Publications Ltd (2009)
3. Ramsden, P.: Learning to teach in higher education. Routledge Chapman & Hall, London/New York (2003)
4. Sharples, M.: The design of personal mobile technologies for lifelong learning. In: Computers and Education. vol. 34, pp. 177–193 (2000)
5. Wains, S.I., Mahmood, W.: Integrating m-learning with e-learning. In: Proceedings of the 9th ACM SIGITE conference on Information technology education. pp. 31–38. SIGITE '08, ACM, New York, NY, USA (2008)