

# Acceptance, Chances, and Problems of Mobile Learning in Vocational Education in Enterprises

**Prof. Dr. Marc Beutner**  
Chair of business and  
human resources education II  
University of Paderborn  
Warburger Str. 100  
33098 Paderborn  
Germany  
marc.beutner@uni-paderborn.de

**Rasmus Pechuel**  
CEO Ingenious Knowledge  
Xantener Str. 3a  
50733 Cologne  
Germany  
rasmus.pechuel@ingeniousknowledge.com

## ABSTRACT

The increasing availability of mobile technology and devices like smartphones and tablet PCs leads to the fact that mobile learning (m-learning) is becoming a crucial feature in modern didactics with its focus on learners, situated learning and the use of media. In today's rapidly changing world a modern approach to didactics is necessary. Therefore m-learning also attracts more and more attention in the learning market and in vocational education in enterprises. Taking this as a starting point the following text is focusing on an essential aspect of m-learning in enterprises: Acceptance. According to decision makers in enterprises acceptance is directly related to chances and problems which are identified in the context of m-learning. As a basis for a successful implementation in vocational education in enterprises the acceptance by decision makers and by the learners is critical. That is the reason why we present a qualitative analysis of acceptance and the perceived value of m-learning in 10 German enterprises of different sectors.

## Author Keywords

Mobile learning in enterprises, vocational education, decision makers in enterprises, acceptance of m-learning, chances of m-learning, problems of m-learning, Germany

## INTRODUCTION

With the rapid spread of mobile devices such as smartphones and tablets that take mobile learning potential even further than laptops have ever done it becomes necessary to take a closer look at how m-learning can support further education in enterprises. In order to examine the current situation it is necessary to understand the previous state of knowledge.

The idea of m-learning as such is not actually a new concept but it focusses on the future (Hahn 2008). Various apps, e.g. in the gaming sector, already include fundamental aspects of learning. As such, m-learning has already found its way into mainstream applications and is widely used, especially by younger generations. Fairly new is the focus on complex aspects like virtual courseware. In former times virtual 'courseware' was designed and developed for specific devices whereas today m-learning opens the opportunity to use various devices and therefore opens more situative contexts for meaningful exploitation (for situated learning see Anderson / Reder / Simon 1996 and Cobb / Bowers 1999). The modern chance is to use commonly-available technology which already is in most users' possession paired with a platform that is available to everyone. Therefore m-learning's main aspect is the intersection of small mobile wireless computing and communication devices and e-learning.

Currently, there are many definitions of mobile learning. Most of them refer to learning possibilities in different places and/or at different times or, as Geddes (2004, 214) points out, "mLearning is the acquisition of any knowledge and skill through using mobile technology, anywhere, anytime, that results in an alteration in behaviour". El-Hussein / Cronje (2010, 21) state mobile learning is "any type of learning that takes place in learning environments and spaces that take account of the mobility of technology, mobility of learners and mobility of learning".

With the increasing popularity of mobile devices it is important that adequate learning and educational approaches are developed, especially if benefits of technical devices are used effectively for a better learning. Mobile devices such as tablets (iPad, etc.), laptops or netbooks, and smartphones are used with growing frequency. Freimuth (2002) and Kynäslathi (2003) and Rey (2004) point to elements of mobile services that are crucial for m-learning:

- Efficiency: through learning opportunities at different locations
- Personal sphere: by learning in the personal environment of the learners
- Interaction connection: between learners as well as between students and teachers and also to available databases
- Context sensitivity: the ability to analyze information environment of the learner (situated learning)

- Regarding the argumentation of Kinshuk / Goh (2004) equal / equivalent content should exist on both stationary and mobile platforms.

Different aspects of mobility can be useful for learners. Kynäslähti (2003) identifies three different mobility aspects with: 1. Convenience, 2. Expediency and 3. Immediacy.

Stone (2010) brought up a guide for CLOs and training managers to deal with mobile learning in enterprises. He mentioned the use of getting “support at a critical moment of need.”

Several studies which are focusing on this important aspect or briefly touching the topic already exist, like the research of Yi / Liao / Huang / Hwan (2009). But they more or less all emphasize quantitative research approaches, either focusing on technology acceptance like Williams (2009), e.g. using the TAM- Technology Acceptance Model of Davis / Bagozzi / Warshaw (1975), or paradigm changes in general educational contexts - Rosman (2008), teacher training contexts - Seppälä and Alamäki (2003), or higher education contexts Habboush / Nassuora / Hussein (2011) and Donaldson (2011). Therefore a lack of information can be found and shown in qualitative research dealing with acceptance, chances, and problems in the field of vocational education via m-learning in enterprises.

All the existing research focuses on how m-learning works and how it can be defined and analyzed. Mobile Learning actually seems to be a promising emerging market for the education industry. But if implementation of m-learning as vocational education in enterprises is desired, the first step has to be a look at the acceptance at individual level with focus on decision-makers and learners.

This gap should be filled a little more by the following qualitative research study (see also Motiwalla 2005).

### **AIM AND RESEARCH DESIGN OF OUR STUDY ON ACCEPTANCE OF MOBILE LEARNING IN VOCATIONAL EDUCATION IN ENTERPRISES**

These arguments lead to the aim of our study. The purpose of this article is to reflect on and understand the position of mobile learning in vocational education in enterprises. Main objective of our research is to clarify which issues are addressed when decision makers responsible for vocational education and human resources management in enterprises of different sectors are reflecting on the acceptance of mobile learning (see also Akour 2009) concerning their educational measures in initial and further education at enterprises. Therefore sub-aims of this study were to illustrate the benefits and problems which are discussed by this target group.

In order to identify the appropriate arguments we decided to run a qualitative research. Data was collected by means of semi-structured interviews based on an interview guideline with responsible decision makers in enterprises. The narrative parts of the interviews are suited to delineate personal meanings (Flick 1998; Strauss / Corbin 1998) and experiences.

Our interviews were documented via audio-recordings, then transcribed and structured via argumentation tables. Content analysis was used to analyze and categorize the data. In order to assure trustworthiness the interviews were randomly assigned and analyzed by the authors. In the field two interviewers acted together to create credibility, validity, and the securing of the identity of the interviewees. Concerning validity it can be stated that all categories that emerged from the data are consistent with the understandings of the participants. The average duration of each interview was 15 minutes after a first informative telephone contact of about 5 minutes. All interviews were conducted in May 2012.

### **RESULTS OF OUR STUDY ON ACCEPTANCE OF MOBILE LEARNING IN VOCATIONAL EDUCATION IN ENTERPRISES**

The interviews focused on ten questions about learning with mobile devices in general and in the enterprise of the interviewees. The decision makers chosen to be interviewed were given the chance of talking about experiences, opinions, plans, and strategy concerning m-learning. The ten guiding questions the interviews were based on are presented below:

- Have you been confronted with m-learning in any way in your company?
- In general, what is the relevance of learning with mobile devices?
- What is the relevance of learning with mobile devices in your company?
- In general, which role will learning with mobile devices play in the near future (next 5 years)?
- Which role will learning with mobile devices play in your company in the near future (next 5 years)?
- Would you say that using mobile learning in companies makes sense or not?
- Which advantages do you see in learning with mobile devices?
- Which disadvantages do you see in learning with mobile devices?
- Would mobile learning fit into your current apprenticeship structure or your further education program?

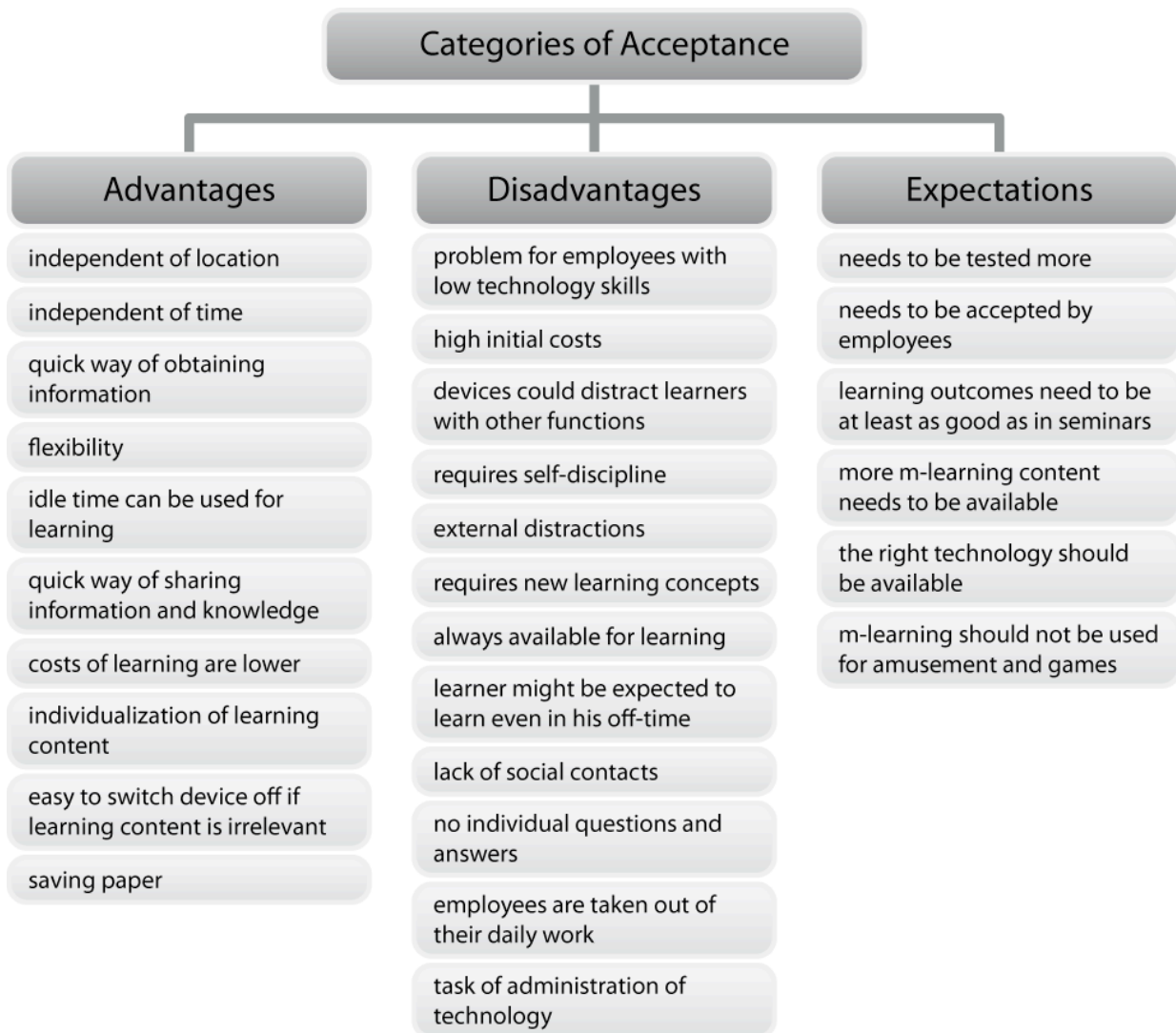
- Please describe an example of how the integration of learning with mobile devices into your company could make sense.

One of the first things that became obvious was that an overwhelming majority (90%) expected m-learning to become very important, not only in their company but in vocational education in general. However, at the same time only 10% of the companies are currently using mobile devices for learning, and even the examples that exist are still on a very basic level, given the potential that m-learning offers.

This situation demands a closer look at the reasons behind the hesitance to implement m-learning in enterprises. Half of the companies have stated that mobile devices (mainly smartphones) have already become part of their daily work and are used extensively in many areas. The main use of smartphones seems to be staying in touch with mobile employees and the main use for tablets seems to be presenting products or information to clients. So why haven't mobile devices found their way into the education programs of these companies yet?

**Acceptance of m-learning in enterprises**

A direct answer can be found in most of the interviews: Since learning through mobile devices is such a new concept most decision makers lack the knowledge of how these new approaches could work or how they could be implemented. A more indirect answer to this question can be obtained by taking a closer look at the acceptance of mobile learning in companies. In order to get a more complete picture of how these companies feel about m-learning we have grouped the statements into categories that have a critical influence on the acceptance level of mobile learning. These categories are the advantages, disadvantages, and expectations associated with the use of mobile devices for learning. An overview of the items in each category is given below. The items are loosely sorted by how frequently they were mentioned with higher frequencies at the top.



**Figure 1. How decision makers in enterprises see the acceptance of the use of m-learning**

While many advantages speak for the use of mobile learning in enterprises decision makers see a number of disadvantages that in their perception haven't been addressed yet. They also have expectations that need to be met before they actively plan the introduction of m-learning.

A closer look at the advantages and disadvantages listed reveals that many decision makers might be thinking of m-learning as simply moving their current learning methods like seminars and handbooks to mobile devices. This is very evident when considering items such as "easy to switch device off if learning content is irrelevant" and "no individual questions and answers". However, modern m-learning approaches can take advantage of advanced smart technology like taking the learners to the appropriate level of learning content that they need and supporting them according to their individual skills. Very few of the decision makers thought of new educational approaches with m-learning like "individualization of learning content", one of the advantages listed. This could be either because they aren't aware of solutions that exist or because the solutions they need in their enterprise aren't available yet. In any case, this is a clear challenge for m-learning providers to become active and either develop the right m-learning methods and content or to keep decision makers better informed about their products.

The expectations show that there is also uncertainty if the new approaches work ("needs to be tested more") and if they can provide learning results that are as good as the current approaches ("learning outcomes need to be at least as good as in seminars"). One of the expectations ("m-learning should not be used for amusement and games") even shows plain doubts that new approaches which come with m-learning like serious games could actually be a good alternative way of learning. All of this shows how important it is to evaluate m-learning approaches and methods scientifically and find out how effective these approaches are, at least until enterprises have had enough time for practical experiences. This would be the challenge for the scientific community, especially universities.

The uncertainty of decision makers also highlights the need for showcases and best practice cases. The situation indicates that m-learning in enterprises is still in its infancy, and it will take an effort on several levels in order to turn it into an important part of further vocational education.

#### **Chances for enterprises that make use of m-learning**

Several decision makers pointed out that mobile learning would be most beneficial for large enterprises. When looking at the aspect of "chances" which are seen by the decision makers in companies, three categories can be distinguished. On the one hand, respondents list chances in the category usability and aims. This category can be characterized as chances concerning main future company goals and aspects which create additional usefulness future. On the other hand the decision makers focus on chances which can be summarized under the category of organization. The chances they see under this category have in common that these are all aspects that improve the processes and organizational structure of measures, courses in the field of initial and/or further education in enterprises, and learning environments. Last but not least the respondents emphasize chances which can be grouped into the category learning. The indicated chances in this category refer to learning contents and learning aims as well as an improvement of the learning process of the users of mobile learning.

The main statements outlining the chances that mobile learning provides for these companies are summarized in the order of their frequency, grouped by category, below:

##### *usability and aims*

- making use of company's online resources
- attracting new generations
- saving money

##### *organization*

- good way of putting information (handbooks, presentations) in the hands of employees
- use of smartphones as a quick way of distributing information
- essential for keeping mobile employees connected
- good for preparing learners for seminars and for providing material after seminars
- making information available that's up to date
- could replace the mandatory seminars
- employees can take device home and have learning content available

##### *learning*

- good for learning about company's products
- individualized content for learners
- good for learning languages

- lets users provide feedback
- using simulations to make understanding easier

Once again it becomes clear that the dominant way of understanding m-learning in enterprises is the transfer of established education methods to mobile devices (“good way of putting information (handbooks, presentations) in the hands of employees”). However, ideas of new approaches are starting to appear as well (“individualized content for learners”, “lets users provide feedback”, “using simulations to make understanding easier”), even if decision makers admit to not knowing very much about these approaches. One of the very interesting chances seen by decision makers is the opportunity to make the company’s apprenticeship program and its further education more attractive to young generations that are more used to mobile devices. This is seen as a good way of attracting high potential employees to the company.

### **Problems for enterprises that make use of m-learning**

While decision makers were quick to point out disadvantages they only came up with very few things that they consider real problems for the introduction of m-learning in their companies. Problems which go hand in hand with m-learning in the assessment of the decision makers in companies can also be structured in three categories. The respondents differentiate between purpose-related problems, cost-related problems, and problems concerning the acceptance and ability in enterprises to deal with matters of m-learning. Their biggest worries are summarized, grouped by category, in the order of their frequency below:

#### *cost efficiency*

- the costs for the technology would be very high
- the costs for the content could be high

#### *purpose adequacy*

- uncertain if results will be good enough to replace current learning methods or if it can just be an addition
- no content available for company’s purposes
- no technology available for company’s purposes

#### *ability and acceptance*

- m-learning will be tested but it is a question of acceptance by the employees
- willing to introduce m-learning but company doesn’t have the knowledge

The problems mentioned are definitely not insurmountable obstacles but they are currently keeping the interviewed companies from embracing m-learning immediately. Solving these problems would require a good cooperation between companies and the providers of m-learning solutions, especially when it comes to developing employee-friendly solutions, creating products with convincing learning results, and designing cost-efficient solutions.

### **CONCLUSIONS**

In general it becomes clear that companies expect mobile learning to become very important in the coming years. Most of them are eager to build up something but most decision makers also admit to not knowing exactly how since mobile learning is relatively new. The chances that are seen in mobile learning in enterprises are still very simple implementations, with independence of location and time or the quick distribution of information as the main ideas. These ideas are based on traditional education approaches and take into consideration the value that can be added through the electronic devices. Few decision makers are familiar enough with m-learning potential to imagine how this approach can change the way of learning. As one of the rare examples for this, individualization of learning content was pointed out. The chance of reaching new generations through m-learning also plays a big role in the companies’ willingness to give m-learning a try in the near future.

However, at the same time decision makers are also hesitant to make use of m-learning immediately for various reasons. In order for m-learning to find its way into enterprises it will be necessary to educate decision makers on how mobile learning could work for them. Currently they are aware that it exists but in most cases only have a vague idea what it could look like. Ideas that exist remain on a relative simple level of taking advantage of the m-learning potential, such as providing a way of finding information quickly or the use of podcasts. At the same time there seems to be a lack of good solutions on the market and providers of mobile learning solutions are called on to offer more educational products that can be used for m-learning.

Acceptance of m-learning as a future way of further educating the workforce is surprisingly high. Apparently decision makers are open to innovation in this area if they see that mobile learning solutions can fulfill three critical requirements:

#### *Acceptance by the learners*

Depending on the industry the workforce is expected to accept the use of mobile devices or electronic devices for learning more or less. With younger generations decision makers expect the acceptance to go up quickly and even predict that mobile learning will be a lot more attractive than holding seminars.

#### *Good learning results*

If an enterprise relies on mobile learning the learning results should be at least as good as the results of current methods like seminars. This of course demands scientific studies of effectiveness and showcases to convince decision makers.

#### *Acceptable costs*

The costs involved should not be higher than the current costs of educating the workforce. Many decision makers are under the impression that m-learning would be expensive because of the high costs of the technology involved. Saving potentials are rarely seen. In order for m-learning to be accepted in enterprises cost advantages will have to become more apparent.

The first step of a practical solution to overcoming the main barriers of adoption could be the creation of showcases in which different partners work together on implementing a mobile learning approach in a company, study the results, and publish them. This would require a company willing to try new learning approaches, an academic partner to study the results, a provider of mobile learning solutions, and, ideally, a dissemination partner like an association or a government organisation. The second step would have to be informing the decision makers. The showcase would provide interesting facts to prove that m-learning is a viable alternative, and this would have to be supplemented with information on how other companies could get started with their own m-learning projects.

It is important to remember that the study only shows the current situation in Germany. Further studies would be needed to expand the result to a European view or even a more global view. The role that mobile technology plays in various countries suggests that enterprises are in different situations and at different stages of introducing m-learning into their vocational education and their on-the-job training. Similar studies in other countries would allow an interesting comparison.

Since the development of mobile devices proceeds at a very high pace and the role of mobile devices in people's daily life increases rapidly the result of the study is only meaningful for a short time. It would make sense to repeat the interviews every year and examine how the acceptance and the use of mobile devices for learning purposes in enterprises change.

It is essential to study how new technologies like m-learning can contribute to improving the quality of education (cf. Laurel, 1995). Since teaching and learning processes both involve teachers and learners it only seems logical to expand the scope of this study and include the views of both groups. This would add to the impressions provided by the decision makers by using the results and categories of this study as a starting point for future interviews and surveys. In addition it would be useful to find out how current and future generations of employees want to learn, how easy it is for them to accept m-learning, and what their expectations of further education provided by their employer are.

## REFERENCES

- Akour, H. (2009). Determinants of mobile learning acceptance: An empirical investigation in higher education. Unpublished dissertation. Oklahoma State University.
- Anderson, J. R. / Reder, L. / Simon H. A. (1996): Situated Learning and Education. Department of Psychology. Dietrich College of Humanities and Social Sciences. 1996 Paper 1. In the Internet: <http://repository.cmu.edu/psychology>, 02.04.2012.
- Cobb, P. / Bowers, J. (1999): Cognitive and Situated Learning Perspectives in Theory and Practice. Sage: Educational Researcher, Vol. 28, No. 2. (Mar., 1999), pp. 4-15.
- Davis, F. D. / Bagozzi, R. P. / Warshaw, P.R. (1975): User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. Management Science 35, no. 8, 1975.
- Donaldson, R. L. (2011): Student Acceptance Of Mobile Learning. Dissertation. The Florida State University College of Communication & Information. In the Internet: [http://etd.lib.fsu.edu/theses/available/etd-05312011-074842/unrestricted/Donaldson\\_R\\_dissertation\\_2011.pdf](http://etd.lib.fsu.edu/theses/available/etd-05312011-074842/unrestricted/Donaldson_R_dissertation_2011.pdf).
- Flick, U. (1998): An introduction to qualitative research. London: Sage.
- Freimuth, N. / Meier, R. / Reichwald, R. (2002): Die mobile Ökonomie – Definition und Spezifika. In: Reichwald, R. (Hrsg.): Mobile Kommunikation. Wertschöpfung, Technologien. pp. 3-16. Wiesbaden.
- Geddes, S. J. (2004): Mobile learning in the 21st century: benefit for learners. Knowledge Tree e-journal: An ejournal of flexible learning in VET, Vol. 30 No.3, pp. 214-28.
- Habboush, A. / Nassuora, A. / Hussein, A.-R. (2011): Acceptance of Mobile Learning by University Students. American Journal of Scientific Research, Issue 22(2011), pp.119-122.
- Hahn, J. (2008). Mobile learning for the twenty-first century librarian. Reference Services Review, 36(3).
- Kinshuk, M. / Goh, T. (2004): Getting Ready For Mobile Learning. ED-Media, pp. 56 - 63. Lugano.
- Kynäslähti, H. (2003): In Search of Elements of Mobility in the Context of Education. In: Mobile Learning (eds. H. Kynäslähti & P. Seppälä) pp. 41–48. IT Press, Helsinki.
- Laurel, B. (1995): The Nature of Computing. Educom Review 30, 4, pp. 36-42.
- Motiwalla, L. F. (2005). Mobile learning: A framework and evaluation. Computers & Education, 49(3).
- Rey, A. (2004): Mobiles CSCL in der universitären Lehre. Best Practices und kritische Erfolgsfaktoren. Winterthur.
- Rosman, P (2008): M-learning-as a paradigm of new forms in education. E+M Ökonomie a Management, vol. 1, pp. 119-125, 2008.
- Seppälä, P. / Alamäki, H. (2003): Mobile learning in teacher training. Journal of Computer Assisted Learning (2003) 19, pp. 330-335
- Stone, T. (2010): Enterprise Mobile Learning and Development. Enterprise Mobile Learning and Development Rochester/ Surrey /Toronto / New Dehli.
- Strauss, A. / Corbin, J. (1998): Basics of qualitative research: Techniques and procedures for developing grounded theory. 2nd ed. Thousand Oaks, CA: Sage.
- Williams, P. W. (2009): Assessing Mobile Learning Effectiveness and Acceptance. Dissertation at the Faculty of The School of Business of the George Washington University
- Yi, C.-C. / Liao, P.-W. / Huang, C.-F. / Hwan, I.-H. (2009): Acceptance of Mobile Learning: a Respecification and Validation of InformationSystem Success. World Academy of Science, Engineering and Technology 53 2009, pp. 726-730