New forms of learning for vocational education: mobile learning – social learning – game-based learning

▶ The Internet has become a staple element of information and communication infrastructures throughout society and culture, including the workplace. Low-cost, high-performance mobile devices coupled with the universal Internet accessibility and simple applications (apps) have brought about marked changes in our information and communication habits. In response to these changes, new forms of learning have emerged in step with these developing technologies. This article introduces several of these new forms of learning – mobile learning, social learning and game-based learning – and reflects on their potential for vocational learning.

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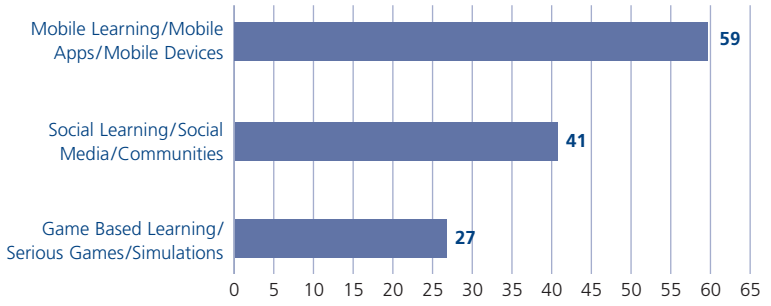
New forms of learning via new technologies

Job-related continuing education and life-long learning increasingly require employees to take the initiative and learn more independently. To complement this development, forms of learning are emerging which can be used flexibly and which facilitate any-time, any-place interaction and communication. Leading market research and consultancy firms see great development and growth potential, particularly in mobile and cooperative learning, over the next few years. Key examples of the new learning trends of relevance to initial and continuing vocational education and training (IVET and CVET) are mobile learning, social learning and game-based learning. According to an online survey conducted as part of the 2011 MMB study, a survey of 76 experts from Germany, Austria and Switzerland, these forms of learning will gain much more ground in company-based IVET and CVET in the foreseeable future (cf. Figure). These trends are not only the most significant, but account for the highest growth as well as the strongest demand.

Learning is a complex process that means acquiring new behaviours, knowledge and skills in order to master situations in everyday life and indeed work-based situations. The use of digital technologies is changing the mode by which some of this learning is acquired, and it is the task of (media) didactics to harness the advantages of the new learning technologies for educational use. Mobile learning, social learning and game-based learning are not completely new forms of learning as such. Books or study materials have long been taken on journeys and used for learning on the move. Social learning as an educational principle has a long tradition for personality development, particularly in schools. Social learning is closely associated with the principle of community (cf. Dewey 1916) and aims to develop interaction and communication skills as well as cooperation and conflict-management skills.

These forms of learning continue to advance in step with the new technologies, however, and are becoming increa-

Figure **The three most important learning trends for the future**



In your view, which three e-learning trends will be of greatest importance in the immediate future? n=64 experts / responses as % of experts who mentioned this trend without prompting/multiple answers possible

Source: MMB-Trendmonitor II/2011, p. 4

singly widespread both in formal and informal contexts. In the following, these three learning trends, which are increasingly relevant for vocational education and training (VET), are considered with a view to finding out:

- which existing learning methods they relate to,
- what potential and added value they offer to foster and support learning processes, and
- what limitations are apparent for work-related learning.

Mobile learning

Alongside blended learning, mobile learning is becoming one of the fundamental pillars of digital learning in German companies (cf. MMB-Trendmonitor II/2011). Mobile devices like mobile phones, smartphones, tablet PCs or hybrid netbook tablets (with touch screens) are always ready for use and are conveniently lightweight with relatively long battery discharge times. In common with e-learning, mobile learning supports learning processes through information and communication technologies (ICT), and by virtue of the extended context provided by mobility it can be understood as a specialisation of e-learning, even if the end devices have different technical features from static, cabled PCs. Their independence from power sources and their permanent network connections make the devices immediately available when needed in the situative context or within the learning process.

Mobile devices serve as an "information source" (e.g. navigation, access to knowledge databanks), as a communication medium (e.g. collaborative exchange with other learners) and as a cognitive tool (production and exchange of notes, photos, videos or mind maps, etc.)" (Döring 2005, p. 325, own trans.) e.g. on real-world excursions or within work processes. Mobile learning processes are defined by Frohberg (2008, p. 5, own trans.) as "pedagogically motivated, sustained practices (learning, teaching, learning support and learning logistics)…, when mobile computer technology is used to a substantial extent in mobile contexts and this clearly adds value or at least causes a significant change in behaviour."

Action-based and on-the-job learning approaches have become established in vocational training practice, which have potential for use in mobile learning scenarios:

- **Situated learning** addresses the complexity of social reality as opposed to abstract content, and supports the learners' authentic activities for the management of problem situations. Having the learning content contextualised in realistic situations establishes relevance to the learners' everyday experience and to applying the content.

- **Problem-based learning** is a learning concept that confronts learners with authentic or comparable problems from their workplace or occupational reality – much like situated learning – but is a more cooperative form of learning which also incorporates reflection on the learning process and learning outcomes.

- **Task-oriented learning** is based on working through task-specific learning content. The selection and structuring of learning content is oriented to the requirements of tasks that the learners have to solve in their day-to-day work. Real work orders are converted into systematically prepared task assignments for the learners to work through.

- **Informal learning** describes all learning processes that take place outside of formalised education programmes and not organised and supported by public or company-run education and training institutions. The purpose of learning is to solve a specific situational requirement or a problem which requires an immediate or urgent solution.

The particular characteristics of the devices and their flexibility with regard to the mobile usage context result in

- steadily growing integration of mobile devices into the (workplace) routine;
- situative and contextualised learning;
- informal learning processes for people who cannot participate in formal education processes due to lack of time;
- micro-learning, i.e. learning in small structured, audio-visual or text-based learning units that can be worked through in periods of "downtime" (e.g. while waiting).

Social learning and social media

Social learning is also a tried-and-tested form of learning in the pedagogical sense. It implicitly depends on the emergence of (learning) communities and on working within these. In relation to new technologies, social learning means learning in social structures and networks via the Internet. The online components are complementary to traditional off-line learning. Social media are based on Web 2.0 technologies and are comprised of social networks on online platforms. Examples of these social networks are the business community platform Xing, LinkedIn, Foursquare and, currently the largest social network, Facebook, while the video platform YouTube also belongs in this category. Users establish personal profiles on these social networks, make contact with others, form interest groups and share ideas and opinions. They also create media content of all kinds, known as "user-generated content" and post this on the Internet which makes it accessible worldwide. The most characteristic features of social media are participation and collaboration.

Among the most popular social media technologies are "WikiWebs", which can be used both on the publicly accessible Internet and inside companies' own intranets. They facilitate the simple production, publication, review and linking of texts, photos, artwork, videos and other multimedia contents by employees. Their purpose is to support the collaborative development and editing of content. This virtual participation in community knowledge is broadened by functions of other social media like "(micro-)blogging", "social tagging", and adding comments, ratings and recommendations.

Micro-blogs are characterised by short, SMS-like messages and a rapid, spontaneous exchange of ideas; Twitter is the most widespread micro-blogging service. In the learning context, micro-blogging enables informal and instant exchange between participants in the learning process. Particularly in IVET within the dual system, which involves a separate workplace and learning venue, the limitations of the classroom can disappear; the trainees can connect with each other via Twitter to solve a particular technical problem and enhance what they are taught with authentic content. Micro-blogging can stimulate discussions and informal information-sharing, but it can also be used for feedback and establishing social networks. "Enterprise micro-blogging" facilitates the informal use of a micro-blog in the corporate context. It is suitable for geographically separated teams or employees in dispersed locations, and supports collaboration and the transparency of work procedures. Social tagging enables the learners themselves to annotate (learning) resources with freely chosen keywords (tags). It acts as an aid to reflection, recall and structuring, for purposes of orientation and exploration, communication and the exchange of knowledge (cf. Lohmann 2010). This gives rise to versatile inter-linkages of learning resources, rendering learning activities collectively usable that were previously more isolated.

Game-based learning

With game-based learning or serious games, the social element is once again an important factor. This form is a combination of e-learning and computer gaming. Whereas "serious games" refers to the games as such, "game-based learning" refers to the associated learning processes in users (cf. Ganguin 2010). Apart from the classic design elements of games such as the game idea or story, the game rules, elements of suspense and challenge, and the setting for the action, additional characteristics of serious games are the digital medium and a didactic concept.

These are underpinned by considerations of how learning can be associated with positive feelings. By merging the previously separate spheres of play, learning and work, the aim is to make informal learning processes easier. Playing games together satisfies social needs for interaction that may be based on the desire for competition, companionship or recognition (cf. Bonfadelli 2004).

The ability of the individual players to cooperate is vital to success in many computer games. In a large number of online games, particularly multi-player games, social cooperation and mutual assistance are made necessary by design. Social competences that are becoming increasingly important in the world of work are fostered; e.g. competences with a bearing on teamwork, conflict management or cooperation, or having to take charge of certain special functions. Moreover there are certain leadership qualities which can be read as social competences, such as assertiveness, flexibility or taking responsibility (cf. de Witt/Ganguin 2011). Kerres/Bormann/Vervenne (2009) see good learning outcomes when the game is embedded in a didactically adapted learning situation and when learning tasks are integrated into the game. In complex game worlds, the players must apply rules, on the one hand, and on the other hand generate new knowledge in certain situations. The authors emphasise that in digital games, the learning that takes place is predominantly implicit, and the trained behavioural repertoire is carried out repetitively. Explicit learning becomes necessary soon as the person gets stuck and has to find out how to solve new problems (ibid.).

The Internet portal qualiboxx provides a series of learning games to foster generic competences for the workplace as well as job-specific occupational competences.

Table **Overview of the three forms of learning**

	Mobile learning	Social learning and social media	Game-based learning
Characteristics	Any-time, any-place learning; ubiquitous access to information; social networks and digital tools; personalised learning environments	Participation; collaboration; user-generated content	Combination of learning and play
Didactic potentials	Extending the places and times of learning; situated learning; contextualised learning; informal learning; micro-learning	Learning in social networks and communities; informal learning; collaborative learning	Social and emotional learning; situated learning; exploratory learning
Potentials for VET	Linking learning venues and workplaces; improving cooperation between learning venues	Active co-authoring; collaboration between employees in dispersed locations; transparency of work procedures	Fostering social skills and occupational competences
Limitations	Imparting and acquiring complex learning processes without integration into broader learning contexts	Traditional corporate cultures	Acceptance of games as a learning element
Applications	Location-based services; augmented reality; QR codes; micro-blogging/social networking; GEO-tagging; RFID/NFC	Micro-blogging; social networking; social tagging; wikis	Online/off-line educational computer games; serious games
Technologies	Smart phones; Tablet PCs; e-book readers; mobile media players	Community platforms; micro-blogging tools	PCs; Internet-based learning platforms

Even if game-based learning is enjoying increasingly positive acceptance as a form of learning in the IVET and CVET sectors, as the above-mentioned examples show, there are also critical aspects to weigh up concerning the instrumentalisation of computer games for vocational education. Despite new technologies there is no avoiding the contradiction between play and work or training. It also emerges that gamers associate gaming with relaxation from the stress of work, and are not necessarily keen on seeing their game instrumentalised for work-related purposes.

Opportunities and limits of new forms of learning

It is becoming easier and easier to access knowledge and information on the Internet. New mobile phone standards like LTE (Long-Term Evolution) will bring significantly higher download rates. "Ubiquitous learning" will replace learning tied to one location. Irrespective of that, all learning resources, personal notes and social contacts will be available to the learners at all times. Social and game-based learning will increasingly come with dedicated apps for mobile devices, allowing employees to synchronise their various learning apps via their personal smart phones.

The significance of informal learning and the need for cooperation and collaboration in companies and workplaces are increasing by the day. Didactically tailored forms of learning are therefore called for in the VET sector to prepare learners for these requirements. Mobile learning and social learning, in particular, facilitate learning within the work process and cooperative interaction between learners who are often dispersed across locations. Micro-learning, small multimedia learning units, combined with micro-blogging will play a part in influencing the instructional design and continuing development of job-related learning. However, learning-on-the-fly situations are not best suited to internalising knowledge for the long-term and committing it to memory. In many cases the distractions during train journeys or waiting times are too great, and the information accessed cannot be processed into meaningful knowledge. ■

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