

The Complementary Character of Microlearning

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Abstract: From the application of microlearning, two striking distinctive features arise. Firstly, it is a new way of information access for the learner, which is an expression of a new learning environment. Secondly, a complementary character becomes self-evident from many different points of view. It is this second aspect that this paper is taking a closer look on. It is the object of this article to make aware the manifold and complementary character of microlearning and to identify the resulting implications for specification, implementation and utilisation of e-learning propositions.

1. Introduction

The well-known quotation by Laotse “A journey of a thousand miles must begin with a single step.” does also apply to microlearning. Too many projects are not realised, because people encounter obstacles that let us flinch from realising them. Microlearning, in contrast, makes us go step by step in the right direction.

Quickly the question arises, in which areas this could be helpful. In this connection, one thing is especially remarkable: the complementary character in many areas. On the one hand, completely new forms, areas as well as markets of learning can be opened up; on the other hand, it also becomes apparent that microlearning alone is often not sufficient.

From which different directions are complementary characteristics evident?

- A. Complementary from the environmental situation of benefit
- B. Complementary for the information landscape
- C. Complementary in education
- D. Complementary in specification, implementation and application

Below, these four areas will be specified in detail.

A. Complementary in situations

It is important for the acceptance of e-learning and, in particular, microlearning to select a precise catalogue of questions and contents. In this connection, it is made use of the situation context of the user, i.e. by taking into consideration particular situations, in which the user is situated, the information to be communicated is controlled with regard to the target group. Especially in microlearning, this precision is of particular importance, specifically since the considered user contexts open up new markets for e-learning. For instance, the following examples can be discussed in this framework:

- **Utilisation of waiting time**
People want to avoid waiting time. Where this is not possible, means for microlearning can be provided in order to use this time in an expedient way. One example would be the waiting time at a petrol station during fuelling: the operation of the air pressure device by the user sheds light on the current environment (e.g. tyre pressure is too low) and is an appropriate device for user input.
- **Education of women in household and family**
Due to their situation, women with multiple responsibilities do not have much time for monolithic learning programmes. Moreover, the need to integrate the computer into the common daily life rises further. This aspect will be discussed below.
- **Utilisation of transport-related passive phases**
The further rising penetration of computers in means of transportation and, at the same time, the rising automation of the journey itself provide for the further utilisation of microlearning during the transport time. The exploitation of location information plays an important role within this domain. First of all, public transport comes to mind (journeys by train, etc.); in the future, automated individual transportation will surely play a role as well.
- **Exploitation of location information**
The information itself of the location of the user provides for a high precision with regard to the contents of microlearning. This refers, for instance, to tourist offers (foreign language offers, information on places of interest, etc.).

Women in household and family. Three examples for this area of education of women in household and family show the enormous scope and potential of microlearning. In the household and the family, women very often perform tasks, which inherently are composed of active phases and phases of waiting:

Example babysitting. Most of the time, children have to be looked after. This time can be used for microlearning. Depending on the place (= children's room) and the time (e.g. in the afternoon) and the saved profiles of the persons involved, learning and laughing together with the children can be achieved in a playful way, since it is by all means possible to combine microlearning with entertainment.

Example cooking. It takes hours to cook the roast in the oven. However, the cook cannot leave the kitchen for a longer period of time. In this situation, waiting time occurs increasingly, which should be made use of. Depending on the place (= kitchen), the time (e.g. at noontime) and the saved personal profile, it is possible to learn new things by way of deserts without leaving the environment. Appropriate input and output devices ensure adequate means of communication (display on refrigerator, etc.).

Example exercise machine. Most often, the exercise machine stands unused in a corner, since the use costs quite an effort and is not very stimulating. During training, appropriate topics can be presented. Depending on the place (= training room), the training situation (duration, heart rate, etc.) and the saved profile, precise questions can be asked.

Generally speaking, one has to be aware of the fact that everything the user does actively or passively on a device, each button that is pressed, constitute more information, to which people can respond in an appropriate way. The example with the exercise machine makes this very clear. Current biometric data, like for example the pulse beat, of the user are known. In this way, the learning programme can even give feedback in the sense of bio-feedback.

B. Complementary in information environments

Corresponding to the ever rising rate of availability of information during the last years, the offers of information media are also becoming more sophisticated. This applies also to e-learning propositions. It is now possible that microlearning can further promote the availability of information by the exploitation of user conditions in particular situations, at the same time enhancing the quality of the information by the potential precision.

Microlearning can also supplement non-linear information accesses, like for instance encyclopaedias. This is also one of the means to close the gap between knowledge competence and implementation competence further.

Information is made available to the user in manifold ways, but most often also to a too large extent. The offer forms a wide information landscape with only few sign posts. Therefore, the decisive challenge is to obtain the right information at the right time. The user can respond to this challenge with the application of microlearning.

Microlearning takes on an active role in the filtering and the supply of information. With the help of the knowledge about the learning context of the user, microlearning can offer and initiate interesting information.

The precision of questions can also be enhanced by providing the user with possibilities of intervention. This makes it possible for the user to respond accordingly to imprecise questions. The programme is always learning and the hits are becoming more precisely.

In this way, current information of the present information landscape is used and linked to the context information about the user and the learning situation and is subsequently presented in an appropriate way.

However, one danger has to be mentioned here: with this kind of approach, only a sub-optimum can be created for the user. Even though further optimisations are possible in the framework of the known context, but modifications of the user profile, for instance, could be hard to reproduce. Therefore, it is nearly impossible to implement the will of the user, if the user has not (yet) selected his/her preferences. Most often, users are looking for something and do only know what they were looking for when they have found it. In these cases, conclusions by analogy for other topics have to be tested on relevance on an ongoing basis.

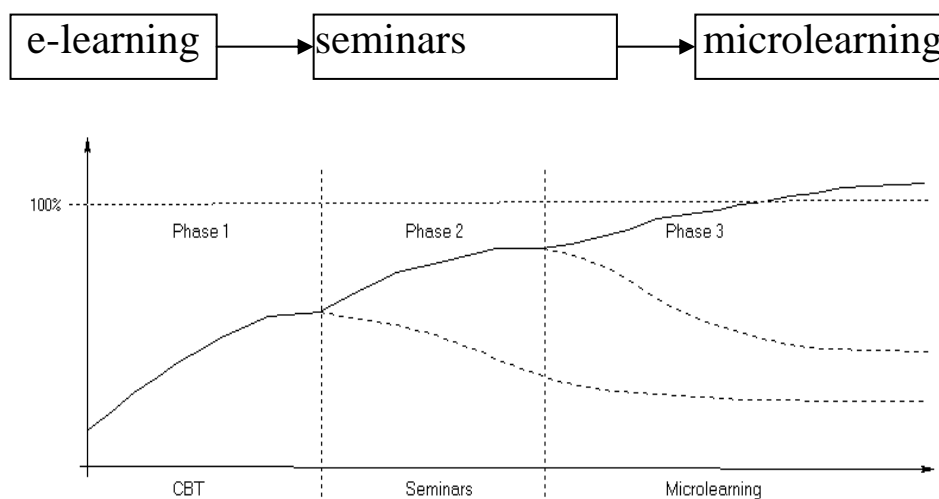
C. Complementary in education

Microlearning can supplement existing education systems in many areas. It ranges from presence seminars, which gain a persistent character by microlearning, via supplements for professional journals to school and university, where the implementation competence is especially promoted. Here, it becomes evident that microlearning alone is not sufficient in most of the application cases.

One example for the complementary character of microlearning is an extended form of blended learning. The originally harmonic interaction between conventional e-learning and presence seminars is supplemented by the component microlearning.

This results in a structure with three levels. Each level is characterised by different objects. One classification could be the following: conventional e-learning is applied in phase 1 to introduce the learner to a field of knowledge, to level the basic knowledge and to make particular difficulties visible. Subsequently, further knowledge is imparted in presence seminars, in which the results of the first phase are further developed. Until this point, the first phase creates basic knowledge and the second phase creates “main knowledge”.

3-level structure of blended learning with microlearning:



Depending on the learning efficiency, the learner has acquired enough knowledge of the topic by the end of phase 2. Naturally, it cannot be expected that all participants know 100% of the learning matter. Furthermore, how many percent of the learning matter are considered sufficient depends on the domain. Moreover, the knowledge will disappear slowly after the seminar, unless it is repeated and practically applied. A consequent aftercare is seldom pursued. This results in a situation in which much of the acquired knowledge disappears again and in which the relation between learning effort and benefit is very poor.

This is where microlearning comes in. Based on the results of the conventional e-learning phase and the presence seminars, the learning matter can be repeated continuously. Gradually, the knowledge curve will rise to 100% and the knowledge will stay in the learner's memory.

Microlearning can be seen as one form of e-learning aftercare as it were. The curve can even rise above the original 100%, if the persons responsible for the context are able to integrate further knowledge in the aftercare phase.

Naturally, this kind of aftercare does also work in combination with conventional e-learning without presence seminars.

D. Complementary in specification, implementation and application

The specifications of traditional e-learning projects are characterised by a low extent of formalisation. Microlearning contents, on the other hand, are predestined for frameworks formalised to a larger extent. Frequently, a dynamic model is necessary to generate the contents and put them into a framework, which has more static characteristics. As a matter of fact, the supplementation with microlearning contents results in great modifications in both project implementation and utilisation.

Specification

A number of different ways of characterisation is suited for the specification of e-learning contents. [Ei04] A wide arc can be described from methods with a rather low extent of formalisation, like user stories and requirement lists, to methods with a rather large extent of formalisation, like formatted specifications or even formal specifications. Whereas forms like user stories and requirement lists are better suited for conventional e-learning, these specifications can be supplemented in microlearning by formal ways of characterisation. Kappel assess the suitability of different ways of characterisation with the characteristics precision, easy to test, effort, suitability for laypersons, and scalability. [Ka04] We will follow this system here:

- **Precision.** With regard to the necessary precision, they correspond more to the needs of microlearning.
- **Easy to test.** Concerning the testing, it has to be mentioned that even though the validation of individual micro steps may be trivial, the awareness of the whole knowledge landscape, i.e. the interrelationships between the individual “knowledge atoms”, is rather complex. Suitable visualisation and validation tools are indispensable.
- **Effort.** The effort for the content preparation can vary considerably for each domain. Generally, the effort is notably less than with conventional e-learning applications, though.
- **Suitability for laypersons.** A special advantage of microlearning with regard to the content specification is the particular suitability for laypersons, i.e. professional experts can contribute their knowledge to the content without having to have special design or programming knowledge.
- **Scalability.** Another advantage is the very easy scalability of the contents.

In conclusion, one can say that the specification of microlearning contents is more formal than the specification of more conventional methods. Specifications can also be carried out with high precision and little effort by professional experts. An additional advantage is the high scalability of the content. However, the difficulty of validation remains virulent.

Implementation

In contrast to other application implementations, the implementation of traditional e-learning contents is also characterised by the fact that persisting data is already created in the development phase of the application and not only after its utilisation.

In microlearning, on the other hand, the time span in which the contents are implemented is extended. On the one hand, contents are still created during the development phase, but on the other hand, it is possible and intended to integrate further contents in the content stock also after the completion of the application. The point in time for the creation of contents tends to be relocated towards the direction of utilisation again and supplements the creation of conventional e-learning contents very well with regard to the time flow.

Application

The application of microlearning is probably the greatest difference with regard to traditional e-learning forms. This aspect is part of the peculiarities of the compatibility described under A-C and therefore the reader is referred to these sections.

Conclusion and outlook

In conclusion, one can say that the complementary character appears in so many ways that the additional benefit becomes apparent. IVG Data, for instance, is testing at the moment in how far microlearning is suitable for the aftercare of highly interactive application trainings, since it is not yet clear how highly interactive contents can be transferred to the reduced presentation possibilities of microlearning.

One disadvantage of the complementary character lies inherently in the fact that microlearning is not sufficient in many application areas. That is why the limits of microlearning have to be shown precisely so that this access to e-learning can be applied in appropriate cases.

References

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- [Ka04] Kappel, G.; Pröll, B.; Reich, S.; Retschitzegger, W. (Ed.): Web Engineering - Systematische Entwicklung von Web-Anwendungen, dpunkt.verlag, Heidelberg, 2004; pp. 34.