CONCEPTUALIZING AN M-LEARNING SYSTEM FOR SENIORS

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ABSTRACT

In accelerating fast changing knowledge-based and information societies such like the European Union technology dominates most facets of our everyday lives, and learning activities as well. Unfortunately, particularly seniors and elderly people suffer the risk to be left behind, and that the digital divide becomes bigger. This is problematic because seniors and elderly can benefit massively from using new media, particularly in the field of learning. Therefore, this paper presents an approach that shows how bite-sized learning units can be structured in a thought through way, and how such a structure can be applied to an innovative m-learning tool. As a closure, we will present and discuss evaluation results with seniors that had insights into the concepts.

KEYWORDS

Mobile learning, learning nuggets, Micro Units, learning design, structuring learning materials.

1. INTRODUCTION

We are living in a knowledge-based and information society in which technology dominates most facets of our every-day lives including learning, and it is on us to harness its potentials in the best way possible. This determines an accelerating fast change in society in general and education in particular, as new forms of education and approaches to learning have to be developed. Such approaches often rely on digital activity, like sharing information online. Thus, the beneficial participation in such a change requires new skills and competencies (cf. Galarneau, L./ Zibit, M. 2007, p. 60f., 82). Young learners often do have these necessary skills, as digital media has always been an integral part of their everyday lives and their learning activities (cf. Kearny, P. R. 2006, p. 39). But for most of the people of today's generation thirty-five-plus, and particularly for elderly this has been different as digital media or computers were neither an integral part of their educational nor everyday activities (cf. Martens, A. et al. 2008). Therefore, seniors and elderly are typically not comfortable with new technology, which is why they suffer the risk to be left-behind. In consequence, the digital divide grows as the changes are accelerating (cf. Kiel, J. M. 2005, p. 22). Besides this, studies have shown that elderly are generally receptive to new technologies, and that they can benefit massively in multiple ways from using new technologies like e.g. increased independency and decreased symptoms of depression due to opportunities for socializing (cf. Kiel, J. M. 2005). In the Erasmus+ project 'OPALESCE – Online Portal and Active Learning System for Senior Citizens in Europe' (2014-1-PT1-KA204-1044) the partners aim to conceptualize, realize, and evaluate an online portal, and especially an m-learning app that aims to realize such positive impacts by providing the elderly with bite-sized learning units and possibilities for social interactions as well. The focus is on mobile devices, as touch-screen are intuitive to handle, and they have been proven as beneficial for people with impaired manual dexterity or arthritis suffers (cf. Salaffi, F. et al. 2009, p. 464).

ISBN: 978-989-8533-49-4 © 2016

2. THE OPALESCE PROJECT

In September 2014 the OPALESCE project has been launched under the Erasmus+ program with the overall objective to conceptualize, develop, implement, and evaluate both an online portal, and an application for mobile touchscreen devices. Whilst the online portal is for information purposes and browsing the learning content available only, the user of the mobile app can access learning content. The OPALESCE team designed the application and its user interface bespoke to the needs and requirements of seniors and elderly, and the didactical concept behind the learning contents is tailored to the targets group's educational needs. To realize this project experts in the field of gerontology, adult and senior education, didactics, and innovative e-learning solutions from all over Europe collaborate for 36 months, namely: RUTIS (coordinator, PT), N.C.S.R. "DEMOKRITOS" (GR), Emphasys Centre (CY), Ingenious Knowledge (GER), and the Chair for Business and Human Resource Education II of the University of Paderborn (GER).

2.1 Micro Units

It is undeniable that e-learning and m-learning solutions are still a growing and evolving field. But, they often lack in quality (cf. Pechuel, R./ Beutner, M. 2011, p. 575). A major reason for this is the abstinence of "guidelines for analyzing, designing, developing, supplying, and managing e-learning materials pedagogically." (Alonso, F. et al. 2005, p. 218) Thus, we decided to create a structure based on three theoretical main pillars: (1) cognitivism and constructivism, (2) Assumptions about adult learners and their preferences, and (3) The Cognitive Theory of Multimedia Learning (cf. Alonso, F. et al. 2005, Knowles, M. S. 1973, 1989, Mayer, R. E. 2005).

As a result of the theoretical reflection, the scientific literature research, 10 qualitative half-structured interviews and the discussion process we created the so called Micro Unit approach which is, to a certain extent, comparable to the learning-nugget approach by Bailey et al. (2006). Generally, Micro Units are defined as concise learning courses with clear learning goals that focus on a practically relevant topic or narrow problem. They can either be used in a stand-alone way, or they can be embedded into a Microteaching Setting. Here, several Micro Units are combined to a more encompassing session in which they build up one on another. Each Micro Unit needs to adhere a pre-defined phases-schema and has an approximate time-structure of 15 minutes max, to safeguard their didactical soundness, and to foster learning best:

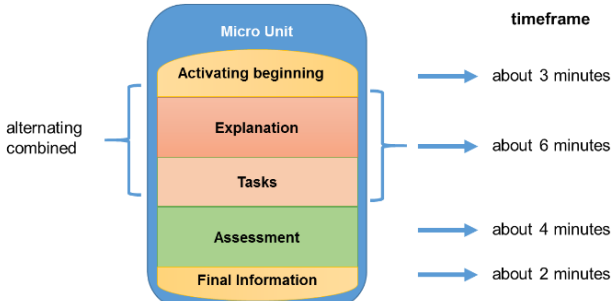

Figure 1. Micro Unit-phases schema

In the *activating beginning* the author introduces himself and familiarizes the learners with the learning goals. He furthermore provides an overview about the following learning contents. In the alternating combined phases of *explanation* and *tasks* the focus is on conveying the actual learning contents, and their immediate application in real-life contexts, to foster learning transfer. The assessment provides the learners with self-evaluation opportunities; it is not our intention to mark them, to avoid demotivation. Moreover, the results will help them to self-determine their following learning path and pace. For this purpose, we designed different interactive assessment formats, to actively recall and repeat the contents. As the learners are intended to practice, forums related to each Micro Unit will not only provide socializing but also peer-assessment and –feedback opportunities. Lastly, the final information phase provides the learners with a

short reflection of what they learned, and it should guide them to succeeding Micro Units so that the learners can orient themselves better.

The very basic element of Micro Units are ´Views´, which can be described as what the learners see on one screen when they are browsing the learning contents. Views, however, are based on Elements which are defined as ways and formats of how information and learning content can be prepared and presented to the learners. Overall, the authors can choose out of eight different text, graphic, audio, and video elements which are narrowly defined. As a specialty, each ´Element´ has a ´Learning Support Function´. The learners can access this function by applying a circle-gesture to the devices' screen, and in consequence, the content is presented in a way that fosters learning and recognition better.

The learning contents are provided on a voluntary basis by any interested party, and the learners have a section on the online portal where they can mentioned topics they would like to have covered by a Micro Unit. The partners provide an initial stock of contents, and they will take care of the platform after the project duration.

3. EVALUATION RESULTS

In June 2015 the Micro Unit concept has been presented to ten Portuguese seniors and elderly, as information about the perceived usefulness and quality of the concept are of utmost importance. Overall, six men and four women aged between 60 and 85 participated in the evaluation, varying in their educational level and attitude towards new technologies. The interviewer visited all participants at home, and they got a general verbal introduction into the project and the Micro Unit approach. Following, he provided the seniors with a questionnaire consisting of closed and open-ended questions. As all participants have had no or only a very basic command of English, the interviewer translated the questions into Portuguese. Hence, the participants had the opportunity to ask questions as well. Afterwards, he engaged the participants into an unstructured discussion about the project to gather essential constructive feedback. Please note, that we translated all answers and statements to English.

The answers to the closed questions are promising. Eight seniors agreed, and two seniors strongly agreed that the Elements and their Learning Support Functions are chosen and designed appropriate to the target group. Additionally, seven seniors agreed, and three strongly agreed that the Learning Support Function are useful to enhance learning experiences, and to support the learning processes. The answers given to the open-ended questions show that the seniors have a positive attitude towards the project, but that the development of an app bespoke to the target groups needs seems demanding as well.

On a general layer the seniors have been asked to outline if the Micro Unit approach meets their expectations regarding the claimed innovativeness of the project, and one of the seniors answered: "In my opinion this project is very important and useful. For me it is important that it is simple" (S6_Q29). Similar answers that show a positive attitude towards the concept and its perceived usefulness are ubiquitous (S4_29, S7_29, S8_29). In the succeeding discussion, the participant mentioned, "All elements and support functions are very well thought through and it is visible that there was care in the design so they can meet our needs."

We were also interested in the preferences of the seniors regarding the delivery method of the information and learning contents, and therefore which Elements should be used to prepare the Micro Units. Generally, there is a clear preference towards the use of images, audio, and video elements (S2_Q29, S3_Q29, and S10_Q29). Text elements, in contrast, should be used cautiously (S3_Q29, S5_Q29). This could be reasoned by visual impairments seniors often suffer from. Besides this, it seems crucial to reduce the range of different Elements and thereby delivery methods combined in one Micro Unit might distract and confuse seniors, and therefore it may hinder learning (S1_Q29, S7_Q29). Other seniors have also stressed this position in the discussion.

Regarding the requirements that need to be met by an m-learning tool for seniors and the provided learning as well, we were able to get valuable statements that show the heterogeneity of the target group. One of the seniors mentioned that he might have difficulties to access the support functions as he suffers arthritis, which needs to be taken into account when designing the user-interface and when thinking about a gesture to apply to the device. Moreover, an elderly from a rural area outlined that some seniors did not go to school which underlines the necessity to focus on practically oriented problems, and that all information should be conveyed in a format easy to follow.

4. CONCLUSION

It is a unique approach to “bite sized”-learning that contents need to strictly adhere pre-defined elements, each of whom with a unique learning support function offered by the mobile-application. Micro Units face the often-recognized lack of consistency of mobile offered learning materials, and their structure safeguards pedagogical and didactical soundness. Thus, the approach addresses one of the recently most important topics in e-learning. First impressions and estimations from seniors show that they are positively attached and open minded to the Micro Unit approach. Nevertheless, further evaluations are a necessary step to realize the concepts’ potentials, which is why questionnaire-based evaluations with e-learning experts are currently pending.

As these first evaluation results show, the user-interface has to take the needs of persons with impaired vision or manual dexterity into account. Thus, it is inevitable to create the user-interface together with the target group, and to put emphasis on evaluations early in the conceptualization and development process. Questionnaires like QUIS or SUMI and think-aloud-tests will be used.

The major advantage of the presented structure is its easy transferability into other contexts. It is adaptable to any other target group, and in non e-learning contexts with minor changes only. The main limitation of the concept is the time needed to create a high quality Micro Unit. Due to the pending evaluations, we cannot povide any statements concerning the effectivity and perceived usability of the Micro Units by the learners now. But in the first internal testings we got positive feedback on both aspects.

ACKNOWLEDGEMENT

This paper is supported by the ongoing Erasmus+ project ‘OPALESCE – Online Portal and Active Learning System for Senior Citizens in Europe’ (2014-1-PT1-KA204-1044). Please do also not that all original evaluation data and documents are accessible over the projects website (http://opalesce.eduproject.eu).

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