Supporting Person-Centered Learning: Does the Choice of the Learning Management System Matter?

A case study with Moodle, Fronter and CEWebS

Oswald Comber, Renate Motschnig

University of Vienna
Research Lab for Educational Technologies
Vienna, Austria
oswald.comber@univie.ac.at

Zivana Komlenov

University of Novi Sad, Faculty of Science
Department of Mathematics and Informatics
Novi Sad, Serbia
komlenov@dmi.uns.ac.rs

Abstract—**One challenge in the successful implementation of a blended learning scenario is the choice of the appropriate tools. The general question behind our practical approach is: "How well do different eLearning solutions provide functionality to realize a blended learning course, which is designed according to specific educational principles?" To approach a response to this question for our case, one typical person-centered blended learning course was implemented in three different eLearning solutions, namely Moodle, Fronter and CEWebS. The resulting realizations of the course and the necessary actions are documented and compared in this paper. The investigated eLearning platforms provided sufficient functionality to accomplish many of the basic tasks in the daily course routine more or less effectively. For tasks beyond the basic functionality of a solution, either the employment of extensions or customizations were necessary, resulting in an implementation that was in some aspects quite elaborated.**

Person-centered learning; blended learning; learning management systems

I. INTRODUCTION

In our understanding blended learning scenarios should be developed, in the first place, based upon specific learning paradigms and not on what a technological solution can offer. Since we aim to promote *person-centered, technology enhanced learning*, we see ourselves confronted with the question: Do current well known learning management systems sufficiently support person-centered learning designs?

PCTEL or Person-centered Technology Enhanced Learning [1], [2], [3] aims to facilitate a meaningful learning process by combining a humanistic, person-centered pedagogy with thoughtful use of eLearning technologies. In the PCTEL-approach learning is based on the values of humanistic-psychology developed by the renowned psychologist Carl Rogers [4] and on a deliberate use of eLearning-technology.

How does all this fit together? Can the person-centered approach be combined with technology enhanced learning in an enriching way? Learning is more likely *significant learning*, if it involves intellect and feelings [5]. The difficult issue with this concept is that the inclusion of feelings into a learning process does not happen automatically in a classroom environment. Inclusion of the whole person into the learning process is fostered by certain attitudes between teacher, professor or lecturer and his or her students. These basic attitudes are: *genuineness, acceptance* and *empathic understanding* [5]. Through living and communicating those attitudes so that learners can perceive them the teaching person becomes a facilitator who is providing a confident basis for significant learning.

In contrast, an eLearning situation lacks direct personal contact, but it can be employed to reduce administrative and organizational overhead and to make intellectual content easily accessible whenever learners request it [6]. Additionally online environments (e.g. communication boards) can provide space for exchanging ideas, opinions, feelings and meanings within the course community in a way that complements the socially rich but time-limited face-to-face meetings.

To sum up, person-centered scenarios benefit from the employment of eLearning elements by providing learning resources and by reducing administrative costs which allows for more person-centered communication in class, as well as supporting interaction between meetings. Consequently, in our case a central question arose: *"Which learning management systems meet the demands of person-centered technology enhanced learning scenarios best?"* An accompanying question would be: *"What are the major differences between various learning management systems in light of supporting person-centered blended learning?"*

The rest of the paper is organized as follows. Section 2 presents the methodology of this research. Section 3 details the case course structure whose three different implementations are discussed in detail in Section 4. Conclusions and final recommendations are given in Section 5.

II. MIGRATING AN ONLINE COURSE

Instead of analyzing the eLearning platforms with a fixed catalogue of criteria [7], [8] one typical course from the *Research Lab for Educational Technologies* was implemented in different eLearning environments. The underlying purpose of this approach was to focus on the implementation process, rather than on criteria analysis.

The example course was "Project Management", which was conducted in the summer term of 2009 and initially delivered through CEWebS services. For the purpose of this research this course was migrated into a Moodle installation set up on a personal university Web space for testing Moodle, and into a testing course provided by the University's computing centre for testing Fronter.

III. THE SOURCE CASE COURSE – "PROJECT MANAGEMENT"

The source case course for this migration, the course on project management, was conducted in the summer term 2009 at the Faculty of Computer Science of the University of Vienna as a combination of a lecture and lab course. The course was about learning the basic concepts in classical and agile management. Central topics were managing IT and interdisciplinary projects, controlling, cost estimation, risk analysis, organizational techniques and conflict management.

Students had to accomplish single and group assignments. The single assignments consisted of planning a small project, while the group assignments included planning of a bigger project according to predefined milestones and deliverables, and the development of a prototype.

The final student grade was composed of the results of the single assignment, the group project evaluation, several instructor evaluations of milestones, peer evaluations in the lab course and a final exam. A pattern-based blended learning scenario for project management modelled in UML is depicted in Fig. 1. Additional attributes of the patterns or so called stereotypes [6] are illustrated in Fig. 2.

A. Lectures

In the lecture (Fig. 3), lecturers and external guests from the field of project management held their lessons. Besides the presentations in class and publishing of lecture resources (e.g. PowerPoint slides) reaction sheets were employed.

Using the reaction sheets, reactions from students were collected online and taken into account in further proceeding of the course.

B. Lab Course

In addition to brief lab lectures and exercises (Fig. 4) a major task was the group assignment: Students were free to choose a project for being developed in groups of 2 - 5 persons.
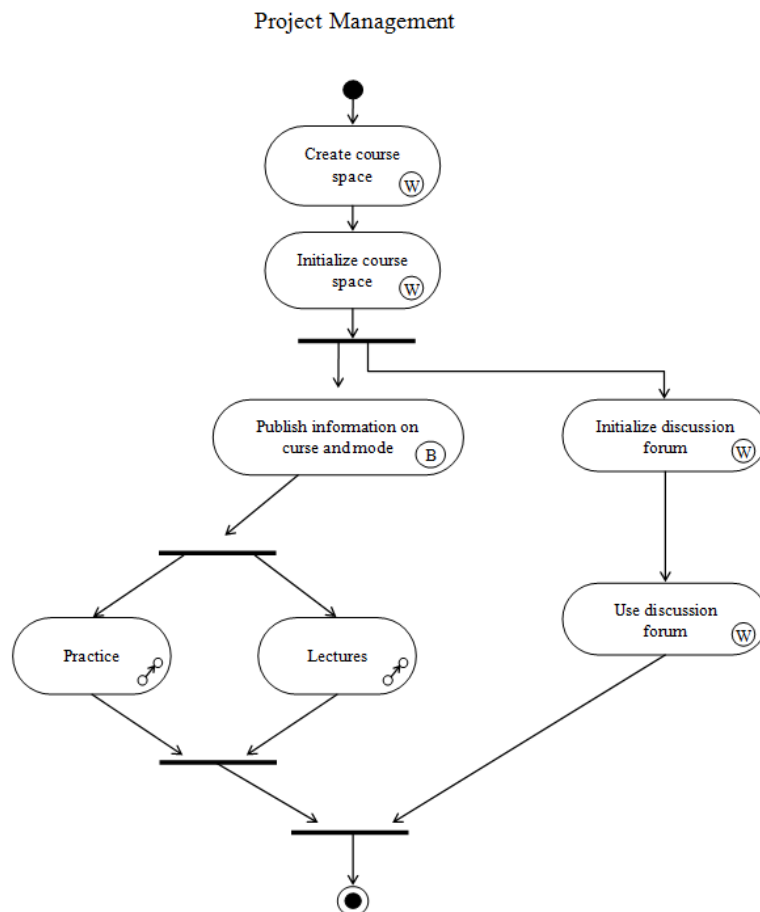

Figure 1. Activity sequence in Project management course

P ... present activities
W ... web based activities
R ... blended activities
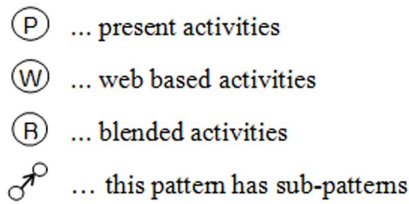♂ ... this pattern has sub-patterns

Figure 2.   Stereotypes and their denotation

After a few weeks of development a peer evaluation was performed. The results of this evaluation were used to improve the reviewed projects. Additionally, each student worked on his or her own single project, which was reviewed by a tutor.

IV. THREE EQUIVALENT SOLUTIONS?

We briefly introduce the three eLearning solutions that are the subject of the case study. The course on project management had originally been developed for use with CEWebS and, vice versa, CEWebS had long before that been originally developed with PCTEL support in mind. Accordingly, we start with presenting the CEWebS implementation (Fig. 5) and proceed by discussing the transformations into Moodle and Fronter, respectively.

A.   CEWebS

CEWebS stands for *Cooperative Environment Web Services* and was developed at Department of Knowledge and Business Engineering and the Research Lab for Educational Technologies at the University of Vienna [9].

The CEWebS-approach to provide an eLearning solution differs from the approach employed in the development of other learning management systems: *"Instead of relying on a central learning solution provider, we try to foster the exchange of tools and ideas on the organizational level"* [10].

CEWebS is a "homegrown" solution and it is built and adapted to the specific needs of the Department of Knowledge and Business Engineering and the Research Lab for supporting courses in a way to support person-centered, but also other interactive blended learning courses. Since the winter term of 2003 more than 100 courses (their eLearning components) have been delivered in CEWebS.

B.   Migration to Moodle

Moodle is Open Source software and licensed under the GNU General Public License and therefore it might be altered, which makes it easy to be adopted or expanded for one's own purposes. The migration of the case course to Moodle was performed using version 1.9.5+.

While transferring the course on project management to Moodle we had to analyze the possibilities of this platform to support various aspects of person-centered learning and the development of specific activities needed for our case course.

- *User roles:* Standard user roles in Moodle match the following roles in CEWebS: the *Administrator* and

Course Conductor are one role in CEWebS and correspond to the *Administrator* role in Moodle; other user roles in CEWebS are divided into two possibilities – either a user is assigned to a group, then the user-role is comparable with the *student role* in Moodle or if the user doesn't belong to a group, he or she is treated as guest. Additionally, Moodle allows the creation of a custom hierarchy of roles that can be assigned to users at the site, course or individual activity level.

- *Basic information providing - Wiki, Webpage, Lessons:* The basic idea of providing information in CEWebS is realized through a Wiki. In Moodle either a Wiki, linked Webpage or the Lesson module can be used for this purpose. The Lesson module seems to be the most appropriate one, because of its richest text-design possibilities.

- *Grouping of content:* Grouping of content in Moodle can be achieved by adding a Webpage resource, which offers links to the corresponding resources. To avoid that too much information is displayed, content can be placed in outlying sections (e.g. the course admin can create some reaction sheets in *section 7* and then limit the number of topics to two, so only *section 1* and *section 2* will be displayed – still the reactions sheets are available and can be referenced by a hyperlink). There are also some third-party plug-ins that can provide course structures which serve the similar purpose a bit more automatically.

- *Participants – Groups:* For sending mass-mails the most appropriate Moodle functionality is "add/send message" available in the overview of the participants.
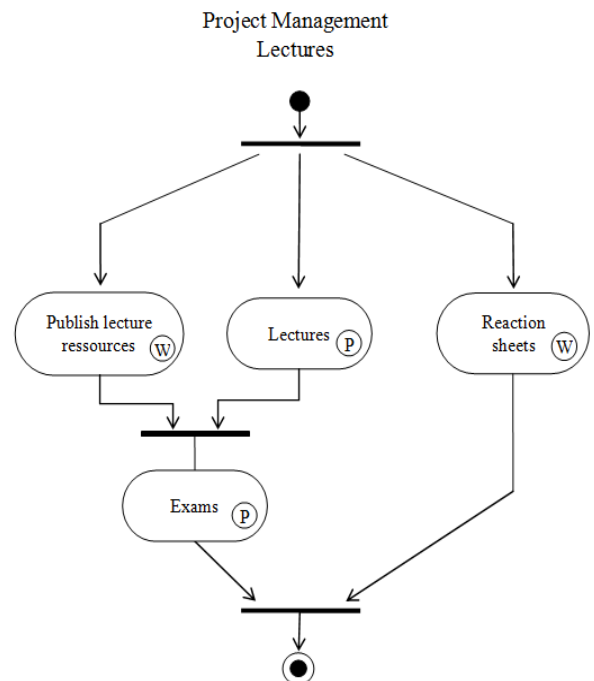

Figure 3.   Activity sequence for reading lectures (VO) in Project Management course

April 14-16, 2010, Madrid, SPAIN

IEEE EDUCON Education Engineering 2010 – The Future of Global Learning Engineering Education

Forums can also be used for distributing important bits of information to all subscribed students (students who opted for receiving copies of all the posts from particular forums via e-mail).

In Moodle there is a built-in tool to create groups. With the experimental feature called *"groupings"* groups within groups might be created. An even more differentiated group management, which is similar to the CEWebS group management, is achieved by using an additional Moodle plug-in [11]. With the help of this plug-in users are able to assign, move and remove themselves to/from groups. In order for students to assign or remove their colleagues to/from groups slightly stronger editing privileges concerning user accounts have to be assigned to them at the course level.

- *Assignments:* In our course on project management students have to upload their work, so that it can be reviewed by the lecturer, tutor or course conductor. Therefore a service is provided in CEWebS. In Moodle this task is achieved by using the *Advanced Assignments* activity module, where single user uploads are possible either as individual assignments or as uploads of a solution for whole groups. Group uploads might be carried out by all group members, but with an extra plug-in, with a possible limit to one upload per group [12].

Although Moodle's Assignment tool seems to be the best match for any assignments at the first glance, this instrument cannot provide a feature that allows students to take a look into other students' solutions. This can be solved by using other built-in tools like *Workshop* or *Database*. Workshops are particularly convenient if peer assessment amongst students is to be conducted.

- *ePortfolios:* ePortfolios can be implemented in Moodle using a plug-in provided by Exabis Internet Solutions [13]. Unlike in CEWebS, when using this plug-in students can decide whether they want to share their portfolios with other course participants or not.

- *Reaction sheets:* CEWebS provides a comfortable way to collect the reactions of course participants. In Moodle reaction sheets are either realized by using *Online text* assignments or using the *Feedback* module. This is a third-party module that will be included in the standard package in version 2.0. It is quite suitable for creating different kinds of more or less complex questionnaires. It also enables the students to view the results of these questionnaires, not only the teachers. If reaction sheets are implemented as simple online text assignments they cannot be displayed to all students.

- *Discussions:* A discussion is simply realized by using a forum. If more forums are needed they might be grouped as described under *Grouping of content* as one initial menu item.

Once the user is accustomed to the amount of options and features, Moodle is easy to use and straightforward. However, special adoptions in the course design to meet communicative and person-centered-supporting requirements are sometimes a bit tricky. Nevertheless, additional modules or plug-ins can be installed easily. Further customization is possible by altering or extending the source code, though rather resource-consuming. Therefore, the preferable method of fulfilling this platform with all features needed to implement a course like Project management is the smart use of built-in features together with various extensions. Including useful plug-ins in the platform or integrating external applications can contribute to success, but it certainly leaves a lot of potential for further improvements on this platform [14].

C. Migration to Fronter

The migration of contents to Fronter was conducted with Vienna University's Fronter Installation provided by the ZID [15].

"Fronter is a virtual building, structured into rooms. Each room is equipped with the tools required to empower the collaboration and learning activity in that room. The room owner invites members and assigns rights according to each member's role in the room." [16]
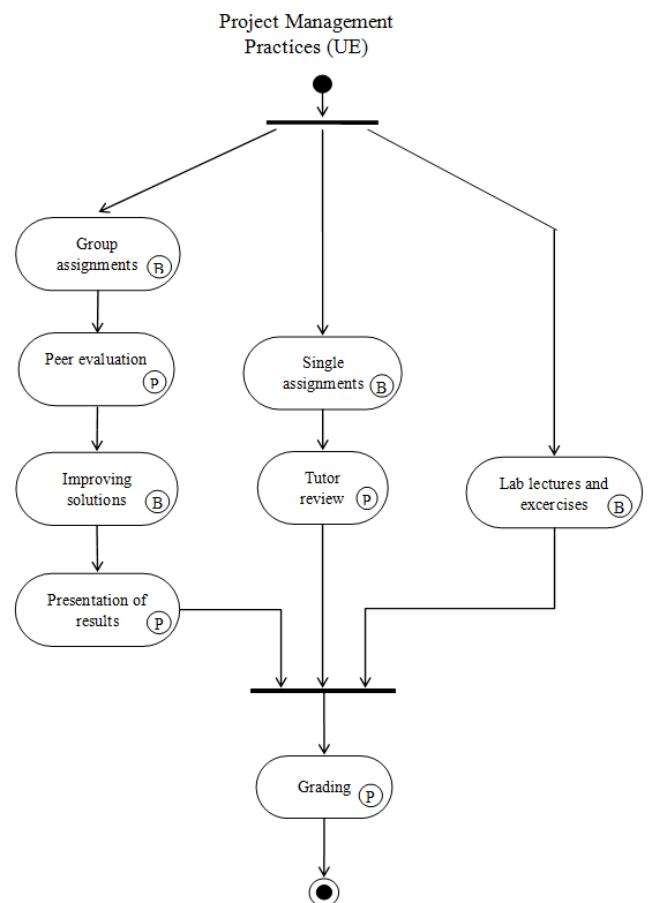

Figure 4.   Activity sequence for practice (UE) in Project Management course

While transferring the course on project management to Fronter the possibilities of this platform to support various aspects of person-centered learning were analyzed in detail.

- *User roles:* The user roles in Fronter are, at least in the configuration from the ZID, divided into *lecturers, students* and *tutors.* Tutors have in the default case the same privileges as lecturers.

- *Basic information providing - Wiki, Documents:* Information can be provided as a page, article message or wiki. Sites might be designed and placed within the content-frame in different positions. It is also possible to add and remove site elements.

- *Grouping of content:* Fronter has the ability to use folders within many tools (e.g. discussion boards, resources) so grouping is done in a similar way as with CEWebS and more easily achieved than in Moodle.

- *Participants – Groups:* The participant information can be explicitly displayed in Fronter under the specified menu-item. Mass-mails can also be sent easily to all course participants.

- *Assignments:* User uploads are realized with the specialized tool. Users simply upload their solutions and lecturers are provided with the possibility to comment and rate the uploaded solutions.

- *ePortfolios:* Fronter's ePortfolio feature allows unrestricted visibility of the attainments of all course participants (not only teachers can see them or students who share their profiles with each other). The emphasis lies on a reporting functionality, but a satisfying handling of achievements is possible as well.

- *Reaction sheets:* Although Fronter has some features to upload text (for collecting reactions) or to conduct surveys these tools are not sufficient to manage those tasks in a straightforward way. Especially the survey tool cannot be used to implement questionnaires. So in this respect Fronter is not applicable.

- *Discussions:* A discussion is simply realized by using a forum. Different forums are easy to create and might also be organized in folders.

In general Fronter is easy to use and designed properly. However, Fronter is limited to its set of features and cannot be customized or extended as it is proprietary software, although it is presented as *Open Source* in the brochure published by the manufacturer [16]. Fronter, in our perception, lacks the ability to collect reactions from students in a *straightforward* way.

In Moodle even slighter shortcomings were solved with workarounds or extensions. In Fronter this is, thanks to the closed source policy not possible. However, if a learning scenario fits in with the technological possibilities offered by Fronter, the latter can be very productive. Still, we pose the question: Is it appropriate that the availability of a technological solution should guide the learning design?
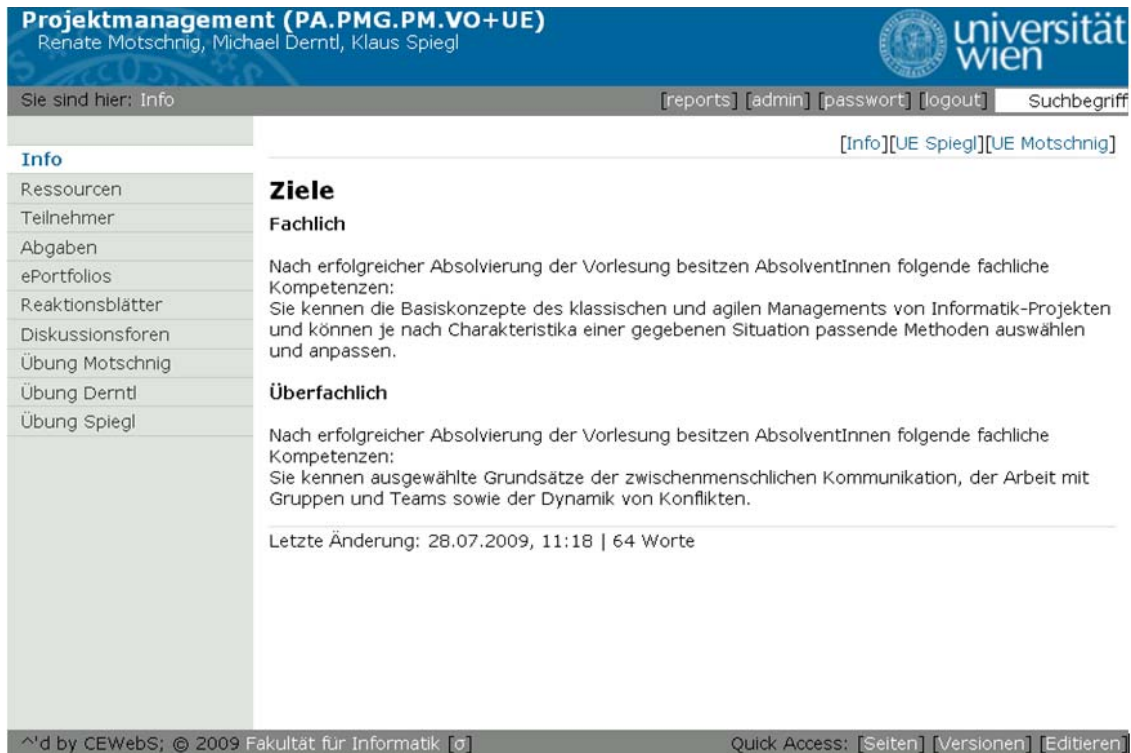

Figure 5. Screenshot of Project Management course in CEWebS

V. CONCLUSIONS

A successful implementation of a blended learning scenario according to the pedagogical and didactical principles of a person-centered approach was found to be - in an effective way - dependent on the choice of an appropriate eLearning solution.

Implementing an actual course in the field of project management was, from a technological point of view, in Moodle fully and in Fronter partly successful. Moodle provided several features and a good level of configuration for workarounds. Thanks to Moodle's Open Source license and numerous community contributions a course in Moodle was technically equal to a course in CEWebS. Fronter lacked some features, like the reaction sheets and was, because of its proprietary license, neither adaptable nor extensible. Fronter still might be a good choice for many standard blended learning scenarios.

From a practical point of view, however, the realization of the course on project management in Moodle and in Fronter did not completely satisfy the specific needs of a person-centered course design. Indeed Moodle provided enough features and usability, so that from a student's perspective, there would be – except from different interface design – no big difference. Nevertheless, an instructor would have to use some elaborated workarounds and customized extensions. All in all a lot of work had to be done to realize such a course. In Fronter not too much extra workload for the course designer arose, because a one-to-one implementation of the course was not fully possible.

Fronter provides well designed learning workflows and many specialized easy-to-use tools. As such it seems to be optimized for a defined learning purpose. Even if such a learning purpose is broadly and well defined, it cannot cover all learning approaches. In our case a person-centered approach was not completely implementable in this environment. In general it seems that for non-standard learning approaches the flexibility and openness of Open Source solutions remains indispensible.

The authors' personal conclusion regarding the migration to Moodle is that many elements of a course can be realized right away, but if you need more than a usual learning management system can offer, a more or less time consuming search for additional solutions becomes necessary. This fact was indeed an enriching experience. However, in certain stages the knowledge of experts turned out very helpful to accelerate the solution of problems and to point out new, even more elegant and practicable solutions. Moodle is without doubt a valid alternative to a specialized platform like CEWebS, but as long as the best fitting solution is supported and updated regularly, there is no need to "change the winning team". Trying to generalize our findings for a broader audience, differences in usability would even weigh more if students and instructors had less technical expertise.

Although eLearning technologies underwent a rapid development in the last years, the choice of an adequate solution is still an essential step in a successful and effective realization of a blended learning course. Especially in the field of eLearning technologies, the knowledge of experts proves once again as a time-saving and enriching enhancement to own efforts.

REFERENCES

[1] R. Motschnig-Pitrik, "Person-centered e-learning in action. Can technology help to manifest person-centered values in academic environments?," *Journal of Humanistic Psychology,* vol. 45, pp. 503 - 530, 2005.

[2] R. Motschnig-Pitrik, "Technology Enhanced Learning auf Basis des Personzentrierten Ansatzes," in *E-Learning an der Universität Wien*, A. Mettinger, Ed. Münster: Waxmann, 2006.

[3] B. McCombs and D. Vakili, "A learner-centered framework for e-learning," in *Teachers College Record.* vol. 107 New York: TCR, 2005, pp. 1582–1600.

[4] C. R. Rogers, *Freedom to learn; a view of what education might become.* Columbus, Ohio,: C. E. Merrill Pub. Co., 1969.

[5] C. R. Rogers, *Freedom to learn for the 80's.* Columbus, Ohio: C.E. Merrill Pub. Co., 1983.

[6] M. Derntl, *Patterns for person-centered e-Learning.* Vienna: Thesis University of Vienna, 2005.

[7] P. Baumgartner, H. Häfele, and C. Maier-Häfele, "Evaluation von Lernplattformen," 2005.

[8] R. Barnebeck and J. Björn, "Systematische Auswahl einer Open Source Lernplattform," 2007.

[9] M. Derntl and J. Mangler, "Web services for blended learning patterns," in *IEEE International Conference on Advanced Learning Technologies*, Joensuu, Finland, 2004, pp. 614-618.

[10] J. Mangler and P. Beran, "CEWebS - Cooperative Environment Web Services," Vienna, 2007. [Online]. Available: http://www.cewebs.org [Accessed: June 10, 2009].

[11] D. Mudrak, "Group selection. A Moodle group selection plugin.," 2005. [Online]. Available: http://moodle.org/mod/data/view.php?d=13&rid=2206&filter=1 [Accessed: June 26, 2009].

[12] Moodle Plugin, "A Moodle upload plug-in for uploading files only once per group," 2009. [Online]. Available: http://moodle.org/file.php/5/moddata/forum/117/437180/uploadsinglegroup.zip [Accessed: June 10, 2009].

[13] Exabis Internet Solutions, "Exabis e-portfolio module." [Online]. http://www.moodlekurse.org/mod/resource/view.php?id=442 [Accessed: June 10, 2009].

[14] P. Ghislandi, A. Mattei, D. Paolino, and A. Pellegrini, "Designing online learning communities for higher education: possibilities and limits of Moodle," in *ED-MEDIA 2008 - 20th Annual World Conference on Educational Multimedia, Hypermedia & Telecommunications*, Vienna, Austria, 2008, pp. 670-678.

[15] "Central IT Services University of Vienna - Computer & Netzwerke | E-Learning," Wien. [Online]. Available: http://www.univie.ac.at/ZID/elearning/ [Accessed: Sept. 9, 2009].

[16] Fronter, "Fronter brochure," 2009. [Online]. Available: http://fronter.info/downloads/Fronter_Brochure_COM_lowres.pdf [Accessed: Sept. 10, 2009].

April 14-16, 2010, Madrid, SPAIN
IEEE EDUCON Education Engineering 2010 – The Future of Global Learning Engineering Education

890