

June 26, 2010

How do our students use their PLEs?

by Mostafa Akbari, Maximilian Speicher, Hendrik Thüs

RWTH Aachen University

{akbari@cs., maximilian.speicher@, hendrik.thues@}

rwth-aachen.de

Abstract

When it comes to collaboration, today's students are highly dissatisfied with their current methods of doing online group work. Besides, we do not know how or even if the students at our university build and use their Personal Learning Environments. This paper investigates the status quo concerning link & web content sharing and online collaboration activities by today's students. Our research builds the basis for developing a suitable student-centered environment for learning. To analyze how students perform link and web content sharing and online collaboration, interviews and a survey were realized with students from different faculties. Data and results from the survey are presented. The first outcomes of this survey are as follows: Our students actively practice link sharing and online collaboration, whereas they mostly use traditional ways to do so – these mainly include email and instant messaging. When it comes to link sharing, the majority of the participating students were satisfied with the methods they used and could not think of ways to solve the task more efficiently or effectively. However, they see PLEs as a concept which could improve the experience of link sharing. Online collaboration is not widely spread within the student community. There are a few students who denoted that they use e.g. Google Wave for this purpose. Those were rather satisfied and had less suggestions for improvements for online collaboration, while the other students suggested improvements towards real-time collaboration and better synchronization of their contents. On the whole, the participating students were less active Web 2.0 users as expected. Online collaboration is less practiced for educational purposes. Social Network Services are well accepted by the students; features of those could be a solution for PLE managing services.

1. Introduction – the concept of a Personal Learning Environment (PLE)

Currently, the concept of Personal Learning Environments (Attwell, 2007) represents one of the latest steps in a learner-centered approach to e-learning. PLEs assign the central role to the learner – rather than to an instructor (Harmelen, 2006). The learner may set his own learning goals, manage his learning activities and communicate with others about what he is doing or what he has already achieved. In the context of this paper, a PLE is generally understood to be a composition of interfaces to different Web 2.0 services, such as social network sites (SNS), which are the base for combining and supporting informal and formal learning settings. Here, “informal learning” denotes the process of gaining knowledge and experience through daily activities (e.g. at home or at work), while “formal learning” means structured education in school or university (Attwell, 2007).

June 26, 2010

The following is an approach by Attwell et al. (2008) describing the expected functionalities of a PLE according to the inherent process of learning.

The process of learning (or maturing learning) within a PLE is structured as follows: First, the learner expresses ideas he gained from personal experience or discussions with friends, fellow students or co-workers. After that, the ideas are distributed to different communities, which can happen in forums, blogs, or wikis. Then, with the help of the community, the subjective ideas are given a structure. If pedagogical considerations are taken into account, the created resource can be prepared in such a way that it is suitable for ad-hoc learning and formal teaching. In order to represent an effective framework for this process, a PLE has to provide certain functionalities. First of all, the learner must be able to access and search for information. The retrieved pieces of information are then aggregated and structured within the PLE. Now, the learner can manipulate the aggregated content, which means that he e.g. enriches it with additional information or corrects mistakes. If the learner has edited her data and considers it complete, it has to be analyzed. The analysis of aggregated content can have many aspects, one of which could be its usefulness. This could then be analyzed again in discussions with tutors or other experts. Regularly, the learner has to reflect on his learning, which means questioning and seeking clarification concerning difficult or complex points of the created artifacts. Moreover, there must be the possibility to present the created content to a well-defined audience as well as to represent the content, i.e. make it available to a wider range of people, e.g. in form of an info sheet. Finally, the learners share the content with their friends, fellow students or co-workers, who then use and adopt it and add their own thoughts. Concerning most of these functionalities, networking plays a crucial role in a PLE.

By using popular tools like blogs or wikis and services like social networks, the users become producers of content instead of just consuming it. Since those tools are familiar to the users, this can be an advantage because the user does not have to get used to new tools if they can be embedded. Google Wave has the ability to integrate nearly every content that is available on the Web. It is also possible to embed a wave into other Web-based systems. The changes that are made in this wave appear in the Google Wave UI in real-time. Another advantage of Google Wave is the fact that the networking/collaboration part and the social part of a PLE is an already integrated functionality. Additional functionalities can be added to Google Wave by adding Gadgets and Robots. Due to the ability of modern hand-held devices to determine the current position of the user, the collaboration and networking factor can be extended.

In order to provide university students with a new tool like Google Wave to manage their PLE, the first step is to understand how the students learn and work. "Homo Zappiens" (Veen and Vrakking, 2007) and "Digital Natives" (Gasser and Palfrey, 2008) are two of the wordings which are used to refer to today's students. The first step of our analysis was to evaluate if our expectations about how students "learn" is right or not. The focus of the evaluation is the online web-based PLE. At first, detailed interviews were made. Based on those results a survey was created.

2. Detailed interviews

Concerning the context of PLEs, 20 students from different courses and terms of studies have been interviewed in order to determine the content sharing and online collaboration behavior of today's students, which tools they use and whether they are

satisfied with the status quo. All of them voluntarily participated in the survey and have not been paid for participation.

2.1 Demographics

Of the 20 participating students, 13 were male and 7 were female, which represents a distribution of 65% to 35%. Concerning the course of studies, we received the following answers:

<i>course of studies</i>	<i># students</i>
Technical Communication	3
Computer Science	3
Georesource Management	2
Mechanical Engineering	2
Industrial Engineering	2
International Business	1
Business Administration	1
Social Work	1
Computational Visualistics	1
Economic Law Studies	1
Musicology	1
Studies to become a teacher	1
Communication & Multimedia Design	1

Table 1: Distribution of courses of study.

Moreover, the current terms of studies of the participating students have been mapped to the Bachelor or Master level and were distributed as follows:

<i>level of studies</i>	<i># students</i>
Bachelor level	13
Master level	7

Table 2: Distribution of levels of study.

2.2 Interview structure

Each interview was split into three parts:

- questions about link sharing,
- questions about online collaboration and
- one question concerning the usage of Web portals.

Moreover, four scenarios concerning link sharing as well as three scenarios concerning online collaboration have been prepared. Out of these seven scenarios at most four were presented to each student. A scenario was presented between

June 26, 2010

certain questions. Two of the four presented scenarios depended on a previous answer.

2.3 Interviewing procedure & results

The initial question was about how the interviewed student currently performs link sharing or would share a link with friends if he wanted to:

Question #1: *When you find an interesting link (e.g. a newspaper article, a YouTube video) on the web and you think that your friends might find this interesting, how do you share the link with them?*

Upon this question, 35% stated that they use *instant messaging*, while 20% said they use this in combination with *e-mail* and another 15% in combination with *e-mail* and a *Social Networking Service (SNS)* like *Facebook* or *StudiVZ* (a popular German social network for students). Moreover, 15% of the participants use *e-mail* only and 5% respectively said they use their *blog*, an *SNS* or *Twitter*.

Depending on his answer, one of the following scenarios has then been presented to the student:

1) Sandra is a student of Geography in her 5th semester. While surfing the web, she finds an interesting YouTube video about urban development she wants to share with her fellow students. In order to do so, she opens her email application, copies the link into a newly created email and sends it to everyone who might find the video interesting. One after another, Sandra's friends reply to her email to thank her or make comments. She answers to each of them separately.

2) Sandra is a student of Geography in her 5th semester. While surfing the web, she finds an interesting YouTube video about urban development she wants to share with her fellow students. Because she is logged in to ICQ right then, she takes the link and separately sends it to those who are currently online. They thank her and make comments in different separated conversations. Because not all of her friends are actively using ICQ and not all of those who use it are online at that moment, the video is not shared with several of her friends who would have found it interesting, too.

3) Sandra is a student of Geography in her 5th semester. While surfing the web, she finds an interesting YouTube video about urban development she wants to share with her fellow students. Because she is an active Delicious user, she takes the link and shares it using the social bookmarking service. Additionally, she uses the provided linkroll tool to display her latest bookmarks on her personal website. Sandra's friends thank her and make comments using email and Twitter. Unfortunately, not all of her friends are also using Delicious or regularly check Sandra's website, so the video is not shared with several of her friends who would have found it interesting, too.

At this point it has to be noted that the students who answered with *blog*, *SNS* and *Twitter* have been presented the third scenario, as it was the most similar one. After having read the according scenario, the student has been asked the following:

Question #2: *a) In your opinion, is this way of link sharing optimal? b) Can you think of ways to realize link sharing more efficiently/effectively?*

To the first part of the question, 65% of the participants answered with *yes*, 20% said *maybe* and 15% said *no*. Similar to these answers, 85% stated that they cannot imagine ways for more efficient or effective link sharing while 5% respectively said they want to use *Twitter*, *more than one channel* to spread the link or *one platform*

June 26, 2010

combining several channels. After this question, the following scenario has been presented to the interviewed student, that shows up distinct properties of a centralized Personal Learning Environment (what we call a centralized PLE is a system which enables access to all of the components of a PLE from within one place on the Web):

4) Sandra is a student of Geography in her 5th semester. While surfing the web, she finds an interesting YouTube video about urban development she wants to share with her fellow students. She opens the UI of her Personal Learning Environment (PLE) and adds the link, which is then automatically uploaded to her Delicious account and thus also to the Delicious linkroll tool she uses on her website. Because several of her friends use the same PLE system, she just shares the link with them. The remaining friends discover the video at Delicious or her website. Sandra receives thanks and comments about the shared link via a threaded discussion as well as automatically imported Twitter messages, both directly within her PLE.

The subsequent question to reading this scenario was:

Question #3: *In your opinion, do you think PLE-based approaches can help making link sharing more efficient/effective?*

In fact, 80% of the participating students were convinced that a PLE-based approach can help making link sharing more efficient or effective, while another 15% said *maybe* and only 5% said *no*.

The next part of the interview dealt with online collaboration and started with the following question about how the student – together with one of her learning groups – performs this task:

Question #4: *When you have to work on a resource (e.g. a Word document or a Power Point presentation) together with some of your fellow students, but you have no time to meet, how do you perform this task?*

Upon this question, 50% of the interviewees answered *e-mail*. Another 20% said they use *instant messaging* or *instant messaging* in combination with *Monitor View*. Moreover, 10% stated that they use *Google Docs* while 20% use *Google Wave* or a combination of *Google Wave* and *Dropbox*. After this questions, the interviewed student had to read another scenario, again depending on his previous answer:

5) Christian, Susan and Kathryn are law students in their 2nd term. Every week, they have to hold a presentation about a chosen real-life lawsuit. To prepare these presentations, they use Word and Power Point documents they edit separately and emails for communication. In this way, it often happens that two of them work on the same version of a document and the resulting new versions have to be merged grindingly. Moreover, they always have the feeling that there is a lot of communication overhead.

6) Christian, Susan and Kathryn are law students in their 2nd semester. Every week, they have to hold a presentation about a chosen real-life lawsuit. To prepare these, they use text documents and presentations within Google Docs. Coordination takes place partly within these documents as well as by email. Unfortunately, as Google Docs does not fully support real-time collaboration, there are sometimes collisions and misunderstandings when two of them try to edit the same part of a document at the same time.

June 26, 2010

If the interviewee had answered *Google Wave* before, he did not have to read one of these scenarios, as none had been prepared for this case. Subsequently, the participants have been asked:

Question #5: a) *In your opinion, is this way of collaboration optimal?* b) *Can you think of ways to realize collaboration more efficiently/effectively?*

To the first part of the question, 80% answered with *no*, 5% with *maybe* and 15% with *yes*. While not seeming spectacular at first sight, the answers to this question yield a more interesting outcome. When splitting the respondents into two groups – students who stated earlier that they use *Google Wave* ("Wave Group") and students who did not use *Google Wave* ("non-Wave Group") – the answers are distributed as follows: 75% of the Wave Group said *yes* while only 25% said *no*. In contrast, 94% of the non-Wave Group answered with *yes* while only 6% answered with *maybe*.

Furthermore, the members of the Wave Group had less suggestions for improvement: 25% said they want a functionality of *Google Wave* in the form of a *desktop application* and another 25% said they want the possibility to *synchronize files of any type*. On the other side, only 44% of the non-Wave Group had no suggestions for improvement while 25% wanted *real-time collaboration*, 13% wanted to use *Google Docs*, and 6% respectively suggested *two-way synchronization*, *Dropbox* and a *merge tool*. In the following, a last scenario has been presented to the interviewed students, which again showed up distinct properties of a centralized PLE (see above):

7) Christian, Susan and Kathryn are law students in their 2nd semester. Every week, they have to hold a presentation about a chosen real-life lawsuit. To prepare the presentations, they use their Personal Learning Environments (PLE). Within these, they have created a shared space in which they can edit their text documents. Moreover, they use embedded presentations. Because the PLE system is capable of live collaboration they can always see who is editing which part of a document. In this way, collisions are very unlikely. Coordination takes place within threaded discussions which are integrated into the shared space.

Subsequently, the student then had been asked:

Question #6: *In your opinion, do you think PLE-based approaches can help making collaboration more efficient/effective?*

Upon this question, a whole of 100% answered with *yes*. After that, a final extra question has been posed:

Question #7: *Do you use a personalized homepage (e.g. iGoogle, Netvibes) or any other web portal where it is possible to collect, manipulate or share data and information?*

Here, 95% of the participating students said *no*, while only 5% stated that they use *iGoogle*.

The results of the interviews show that most of the students are not using the Web in an innovative way. E-mail, Social Network Sites and instant messaging are the main communication and collaboration tools. Web 2.0 tools which support collaboration or educational tasks are not common. The general survey focused on these observations.

3. General survey

251 students from various courses of studies took part in the general survey. Since this survey was conducted online, it could not be assured that all the demographic data would be distributed equally.

Of those 251 students who took part in this survey, 79 were female and 172 were male. This is a distribution of 31% to 69%, which is approximately the same distribution at RWTH Aachen University where 32% of the students are female.

The faculties of studies were very evenly distributed if one classifies them into technical (~49%) and non-technical (~51%) fields of study.

The current terms of studies were distributed a bit wider than in the detailed interviews. The range varied from 1 to 20 with an average of 4.76 and a median of 4. The average of the year of birth was approximately 1987, which is also the median. Here, the range varied from 1979 to 1991. The sample of students who answered the questionnaire is valid for the purpose of the survey.

Not every participant had to answer to every question. Some of the questions were only applicable for some of the participants due to previously answered questions, e.g. the question if they have a data-plan for their mobile-phone is obsolete if they do not own a mobile phone.

3.1 What do the PLEs of today's students look like?

The survey shows that most of the participants do not use collaborative tools or websites to work with fellow students. In fact, many tools are unknown to the students.

As an exception, wikis are reasonably known to students - only 38% do not know this concept. But on the other hand, only 36% of them use wikis at least once a month. Altogether, those tools are unknown to about 79% of the participating students. The question *With whom do you use the following tools of collaboration?* (cf. Table 3) has shown that most of the previously mentioned tools are not used for collaboration at all. Only approximately 23% of the participants answered this question, the others do not use these tools for collaboration.

Personalized Web portals are also not often used by the students (cf. Table 4). Those are one of the common approaches for managing the PLE.

<i>tool</i>	<i>unknown to x% of the students</i>
Wikis	38
Google Docs	59
Google Wave	64
VNC	65
Teamviewer	66
SVN	70
git	81
Etherpad	86

June 26, 2010

Mozilla Bepin	88
Mercurial	88
CoOffice	90
Zoho	91
Gobby	92
Colabedit	90

Table 3: Diffusion of collaboration tools.

<i>Tool</i>	<i>unknown</i>	<i>known, but not used</i>	<i>known, and used</i>
iGoogle	31,47%	53,78%	14,74%
Netvibes	90,44%	9,16%	0,40%
Symbaloo	93,63%	6,37%	0,00%
Pageflakes	92,83%	7,17%	0,00%
My Yahoo!	41,83%	55,78%	2,39%
Windows Live Personalized Experience	64,14%	33,86%	1,99%

Table 4: Usage of personalized web portals.

Social networks like Facebook or the already mentioned StudiVZ are regularly used by the participants. Approximately 42% of them visit the StudiVZ website every day and about 29% of them do the same with the Facebook website. There were other social networks mentioned in the survey that are reasonably known in Germany. These are *MeinVZ*, *SchülerVZ*, *Xing*, *Jappy* and *Wer-kennt-wen*. But since they do not have such a degree of popularity, they are only used by approximately 2% of the participants on a daily basis.

Social bookmarking services like Delicious are used even less, while Twitter counts a bit more (~6%). This shows that web-based PLEs are rather used for networking purposes than for collaboration with other people. These social networks are used to get to know people and to keep in touch with friends. This is emphasized by the number of friends the participating students have in a common social network. Most of them (~32%) have between 101 and 200 friends while only 26% have less than 50 friends.

<i>service</i>	<i>Yes</i>	<i>no</i>
Twitter	11,95%	88,05%
Google Buzz	1,99%	98,01%
MySpace	8,76%	91,24%
YouTube	31,87%	68,13%
Google Maps	13,55%	86,45%

Delicious	1,59%	98,41%
Digg	1,20%	98,80%
Flickr	5,98%	94,02%
Dropbox	10,36%	89,64%
Doodle	6,37%	93,63%
Mister Wong	0,00%	100,00%
Yigg	0,40%	99,60%
StumbleUpon	1,59%	98,41%
Reddit	0,40%	99,60%
Technorati	0,00%	100,00%

Table 5: Do you have an active account with these services?

Table 5 shows that the students are less active online than we had expected before the survey. The figures shows how many students have an actively used account on a service, maybe less are using those Web 2.0 services on a daily basis.

3.2 How do today's students access their PLEs?

As mobile devices are becoming more and more popular among students – approximately 92% of them own a laptop, notebook or netbook – the use of PLEs seems to be shifting towards mobile access. Additionally, 92 of the 251 students, approximately 37% of them, own a smartphone which is capable of accessing the Internet via WiFi or UMTS. As mentioned in section 2.2, the services mostly used amongst students are those that focus on social networking. According to Oschatz (2010), the number of mobile users of Facebook has grown by 300% from 2008 to 2009. Furthermore, more than 25 million users accessed the mobile version of the Facebook website in January of 2010. This correlates with the fact that 184 of 229 students, approximately 80%, use their mobile devices for social networks like Facebook or StudiVZ or for social tools like Twitter, e-mail or instant messaging. Those mobile devices are more and more important for daily communication. On the other hand, 64% of the owners of such a smartphone do not have a data plan to access the Internet on the go. Only 29% can access the Internet without distinct limitations. The question *Which mobile Internet connection do you use and how often?* showed that the most common method to go online is to use a WiFi connection, while UMTS is not commonly used: 66% – or 138 out of 210 people – do not access the internet via UMTS. Mostly, private WiFi at home or at friends' is used; 140 out of 225 – or 62% – use it every day. Also, the WiFi infrastructure at universities (e.g. "Eduroam" in the case of RWTH Aachen University) is actively used to access the Internet. 68% – or 156 out of 228 students – use it more than once a month but only approximately 25% use it on a daily basis.

This shows that if there is a good WiFi infrastructure that is reliable and cheap or for free, smartphones are used more often to access the Internet. There is a great potential in creating a PLE for such mobile devices.

4. How do our students use their PLEs?

The data gained from the survey and interviews yield the results described in the following.

4.1 What the PLEs of today's students look like

PLEs consist of a wide range of different subsystems. However, although it is the age of the Ne(x)t Generation Learner (Seufert and Brahm, 2007), today's students more likely rely on social networking sites and on "traditional" and long-established ways of online communication, such as e-mail and instant messaging, for both content sharing and collaboration. In contrast, collaborative services and applications – such as Zoho – are used very rarely and are unknown to the vast majority of students. Also, the use of Web 2.0 services like Twitter is rather uncommon. Thus, it can be stated that the PLEs of today's students are rather focused on *facebookeing* (which means social networking using websites like Facebook rather than micro-blogging tools like Twitter) and communication than on using collaborative tools.

4.2 Satisfaction with the used PLEs

Concerning e.g. link sharing, students are mostly satisfied with this status quo and have only few suggestions for improvement, although the majority of them thinks that a PLE-based centralized approach could improve the experience of sharing. In contrast, when it comes to online collaboration, the satisfaction with the used tools is significantly smaller. However, this finding does not fully apply to students who use Google Wave for collaboration, which are more likely satisfied with the tool of their choice. Furthermore, the suggestions for improvement made by those who do not use this collaborative tool by Google in parts lead to certain features already included there, such as support for real-time synchronization and a rich text editor similar to that in Google Docs. Finally, students would highly appreciate a PLE-based centralized approach concerning the task of collaboration. Altogether, these outcomes give the hint that the infrastructure and functionalities provided by Google Wave might be worth the try to use them as a basis for a learner-centered centralized PLE, like the one proposed in the scenarios no. 4 and 7 in Section 2.3, in order to improve the content sharing and online collaboration experiences of today's students.

4.3 How students access their PLEs

The survey shows that today's students make high usage of their mobile devices like notebooks or smartphones when it comes to accessing social networks and keeping in touch with other people. It is obviously getting more common to use such devices rather than stationary PCs. However, the potential of notebooks and especially smart-phones is currently not fully exhausted. Only a minority of the students takes advantage of the possibility to access the Internet at any place (cf. Figure 1). An exception is the use of GSM/UMTS, which is commonly preferred when owning a smartphone. Compared to the number of smartphone users (92 students), the use of GSM/UMTS is comparatively high (cf. Figure 1). There might be a high potential concerning the use of mobile PLEs if students were able to use their tools everywhere for free or for favorable prices and not only at home or at university. A given WiFi infrastructure does not necessarily mean that it is used on a daily basis. There has to be a need to use such a PLE in a mobile way.

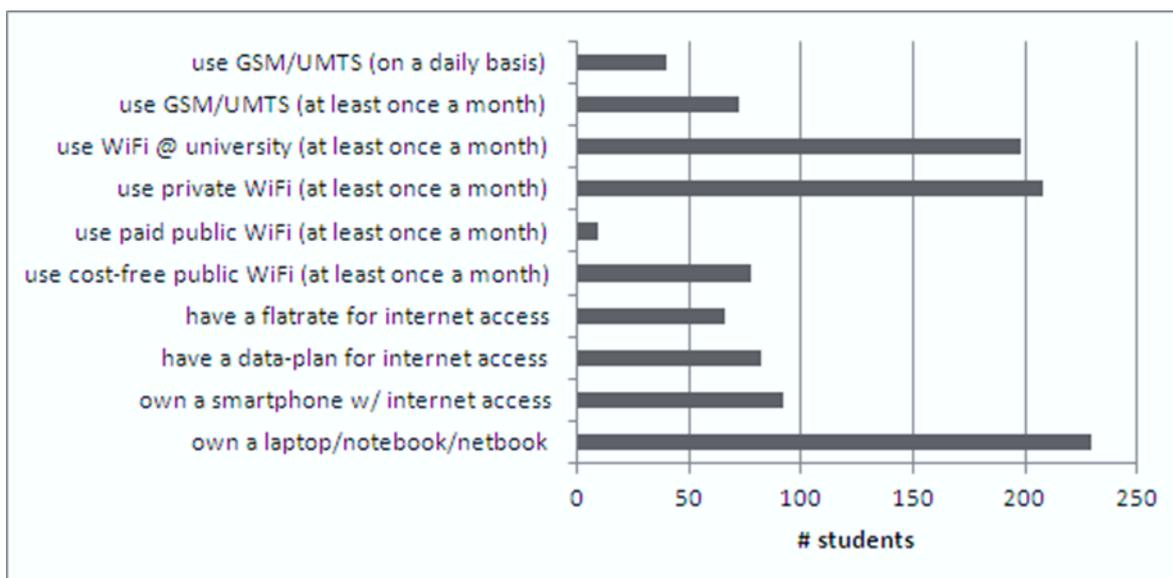


Figure 1: Use of mobile devices and mobile Internet access.

5. Conclusion

As online collaboration and the use of Web 2.0 tools is not that common in higher education, there is still a lot of potential concerning online PLEs. New tools could be likely to be used by students, as students use only a low amount of other tools.

On the other hand, the concept of an online PLE is not widely spread. The reason for this low usage of online tools could be that those do not fit into the daily studying procedures of the learners. More research is necessary to understand the students' actual behavior and how they, their teachers and lectures could be supported. Social network services or other services which facilitate social interactions could be an opportunity for building an online PLE. Therefore, a rather *Social Learning Environment* could be a better approach than the *Personal Learning Environment*.

Google Wave could be used as a framework for implementing a centralized PLE. This collaborative tool innately brings social network features and supports real-time editing. Other SNS and instant messaging tools could be integrated into Wave. In this way, students' actual online PLEs would be enhanced with additional features. Maybe it is easier for the learner to get started with a more collaborative and social learning environment. However, even if the learner is being provided new tools and features, there have to be new ways of teaching and learning implemented at universities.

References

- [1] Attwell, Graham. 2007. Personal Learning Environments – the future of eLearning?. *eLearning Papers* 2, no. 1.
- [2] Attwell, Graham, Jenny Bimrose, Alan Brown and Sally-Anne Barnes. 2008. Maturing Learning: Mash-up Personal Learning Environments. *MUPPLE '08: Proceedings of the first workshop on Mash-up Personal Learning Environments* 78–86. Maastricht: CEUR Workshop Proceedings.
- [3] Harmelen, Mark van. 2006. Personal Learning Environments. *ICALT '06: Proceedings of the Sixth International Conference on Advanced Learning Technologies*.

June 26, 2010

[4] Oschatz, Alex. 2010. *Facebook Mobile und weitere Social Networking-Fakten*. <http://ilikemymobile.de/2010/05/24/facebook-mobile-und-weitere-social-networking-fakten/>. Accessed 2010-06-10.

[5] Palfrey, John and Urs Gasser, eds. 2008. *Born Digital: Understanding the First Generation of Digital Natives*. New York, USA: Basic Books, Inc.

[6] Seufert, Sabine and Taiga Brahm. 2007. *'Ne(x)t Generation Learning': Wikis, Blogs, Mediacasts & Co. - Social Software und Personal Broadcasting auf der Spur*.

[7] Veen, Wim and Ben Vrakking, eds. 2007. *Homo Zappiens: Growing Up in a Digital Age*. London, UK: Network Education Press Ltd.