

Has Web2.0 reached the educated top? A Web2.0 alcançou o topo da educação?

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Resumo: Com base num estudo de três anos sobre a competência Web 2.0 entre calouros na Graz University of Technology, discutiu-se a questão: se a Web 2.0 tornou-se comum para os estudantes de hoje ou não. Seguindo os princípios da tecnologia de *Moore's Technology Adoption Life Cycle* e tendo em mente o *Gartner's Hype Cycle*, afirma-se que os tempos dos adotantes estão passados. Essas aplicações Web 2.0 que ainda não estão estabelecidas não vão ganhar mais. As tendências foram corroboradas, mas as novas estão por vir em breve. A mobilidade *on-line* aumentará com o crescente poder de múltiplos dispositivos móveis, bem como a importância das redes sociais sob demanda. Este artigo descreve a progressão de várias aplicações Web 2.0, comuns e incomuns, em comparação com os resultados do estudo, assim como postula as tendências futuras baseadas nelas.

Palavras-chave: Web 2.0, mobilidade, redes sociais.

Abstract: On base of a three years study about the Web2.0 competency among freshmen at Graz University of Technology we discuss the question, whether Web2.0 has become common to students of today or not. Following the principles of Moore's Technology Adoption Life Cycle and bearing Gartner's Hype Cycle in mind we state that the times of early adopters are over. Those Web2.0 applications that still are not established will not gain higher. The trends have been corroborated but new ones are to come soon. Online mobility will rise with the increasing power of multiple mobile devices as well as the importance of social networking on demand. This paper outlines the progression of several common and uncommon Web2.0 applications in comparison with the results of the study as well as postulates future trends on base of it.

Keywords: Web 2.0, mobility, social network.

INTRODUCTION

Since Mark Prensky's article (2001) about "Digital Natives" and "Digital Immigrants" there is an ongoing discussion about how the young generation is dealing with the World Wide Web. Without any doubt technology influences our daily life and changes our behaviors. Since the introduction of Web 2.0 (O'REILLY, 2004) a dramatic increase of user-generated content can be stated as well as the establishment of social networks and social communities. It seems to be obvious that these technologies also influence the

field of education – primarily called e-Learning 2.0 (DOWNES, 2005) or ubiquitous learning (ZHAN & ADIPAT, 2005).

Taking a look at different research studies as well as other popular media channels according to this subject of the growing youth a lot of different terms occur: "Net-Generation" (TAPSCOTT, 1997), "Digital Natives" (PRENSKY, 2001), "Generation @" (OPASCHOWSKI, 1999) or "Homo Zapiens" (PELEVIN & BROMFIELD, 2002). More or less they all describe the same: There is an upcoming generation that cannot imagine living

in a world without digital technologies. Mobile phones, Internet access with high bandwidth or mobile and information about different topics on the fly have already become very common. Oblinger (OBLINGER & OBLINGER, 2005) (OBLINGER, 2005) was talking about different habits of this generation emerging such as multi-tasking and new ways of communicating with each other. Similar Green & Hannon stated (2007), "That the use of digital technology has been completely normalized by this generation and it is now fully integrated in their daily life".

On the other hand it can be shown that most of such publications are lacking of solid data. Because of the short time frame there are just a few extended studies on the behavior or skills of our youth. First studies (CONOLE, 2006) (BULLEN *et al*, 2008) (MARGARYAN, 2008) (NAGLER & EBNER, 2009) gathered data through evaluations to carry out whether freshmen and students of today differ from their older colleagues. All these studies agree more or less with the summary of Schulmeister (2010) who concluded, that there is no significant change detectable as for today's student. Mainly it was shown that the World Wide Web has a great influence on the youth (JIM 2008, JIM 2009) and is observed as a daily-life requisite. But dramatically rising use of Web 2.0 technologies and in consequence IKT competencies could not have been detected yet.

Nevertheless, from a university point of view it is of highest interest, to find out the competences of the new generation of students. The most interesting question is, whether it can be predicted that there is change in the behavior of today's students or it is simply a trend.

Taking a closer look on analyses of trends it can be ascertained that new technologies commonly follow a distinct progression; they are fast rising to an absolute maximum to go down rapidly alike and consolidate afterwards nearly endlessly in the interest of society. Since 1995 the "Gartner Hype Cycle" (Fig. 1) annually describes the progression of new technologies and points out the famous five phases – Technology Trigger, Peak of Inflated Expectations, Trough of Disillusionment, Slope of Enlightenment and Plateau of Productivity. Similar the famous "Technology

adoption lifecycle" of Moore (MEADE & RABELO, 2004) (Fig. 2) shows the different kind of users from innovators to laggards. The notably thing about Moore's lifecycle is, that he "... suggests that for discontinuous or disruptive innovations, there is a gap or chasm between the first two adopter groups (innovators/early adopters), and the early majority." (MOORE, 2002).

Bearing these phenomena in mind it must be seriously asked whether some technologies are simply hype driven by some very motivated people or have they already turned out to be a mass phenomenon. With other words from a university perspective it must be asked, what can be expected from today's learners, what must be done by the university to meet their needs and what is simply a technical bubble that will never overcome Moore's chasm (Fig. 2). For this purpose Graz University of Technology (TU Graz) is carrying out studies since years (NAGLER & EBNER, 2009) (Ebner *et al*, 2008) to investigate different research questions and to prepare TU Graz for the next generation of learners. Therefore we address to the following questions:

- Which trends can be seen towards technological equipments?
- Which trends can be seen towards internet access at study home?
- Which trends can be seen towards communication behavior?
- Which trends can be seen towards the usage of e-learning platforms at secondary school level?
- Which trends can be seen towards Web2.0 competence?

THE STUDY

Technology enhanced learning, briefly called e-learning had been exercised through multiple different initiatives and projects at Graz University of Technology (TU Graz) for many years since the late eighties. Because of several partly political reasons the time for a change has definitely come in 2006. The Vice Rector for Academics, the Office for Life Long Learning, the Institute of Information Systems and Computer Media (IICM) as well

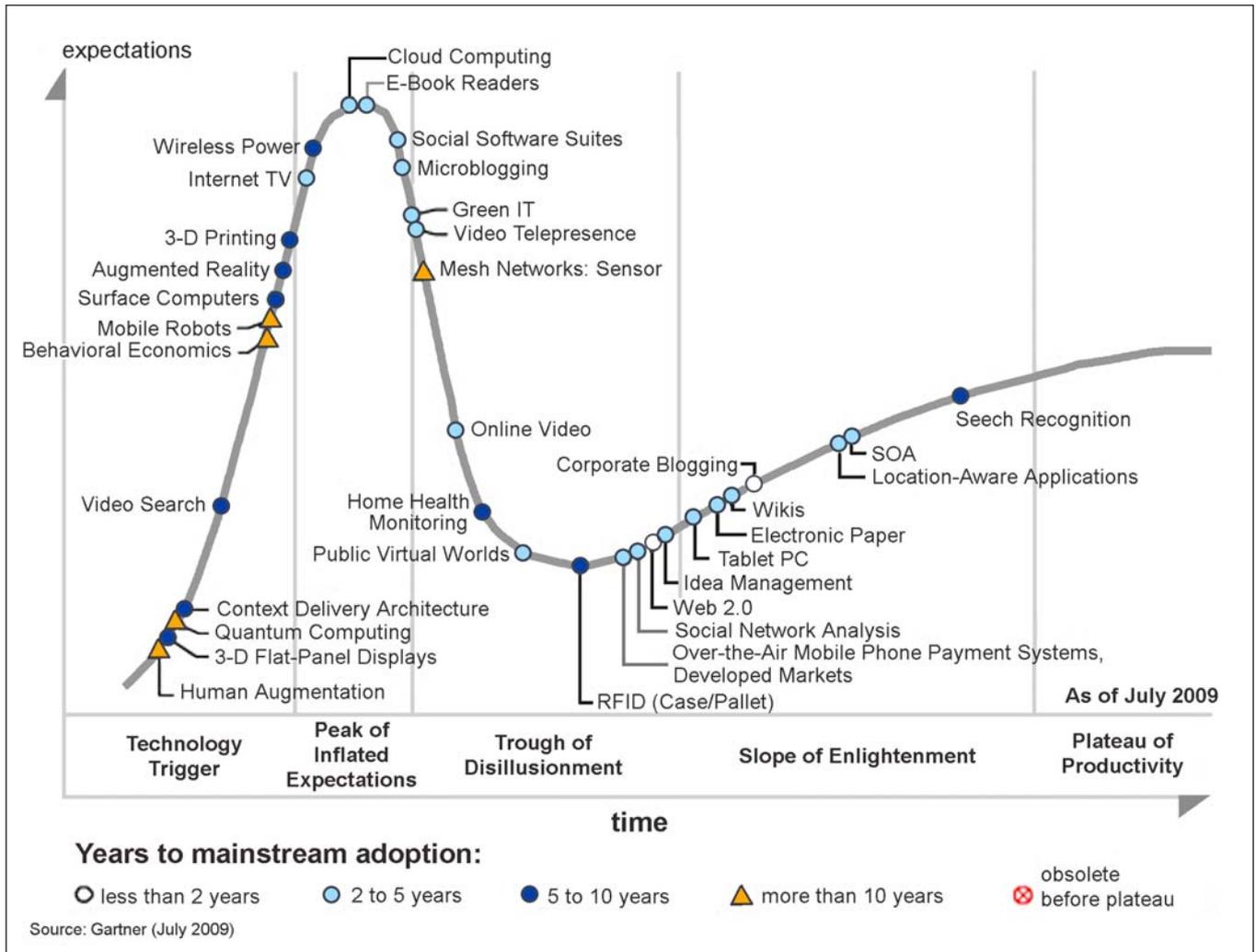


Figure 1: Hype cycle for emerging technologies, 2009 by Gartner (2009)

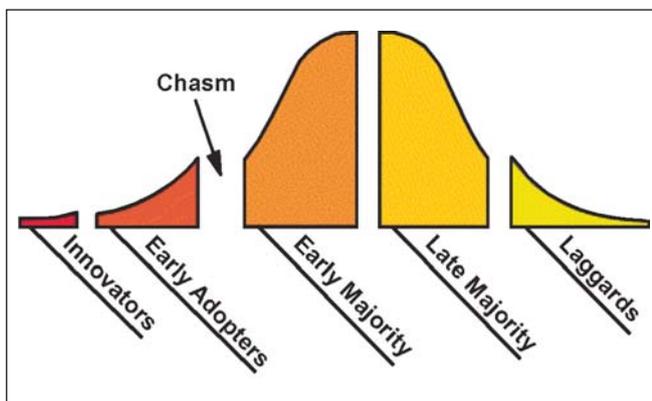


Figure 2: Technology adoption lifecycle by Moore taking the gap in between into account

1st of September 2006 the team “Social Learning” (SL) was set into being as a new part of the CIS. The team quickly established and grew to a new division of the CIS. Main focus of SL is to implement network based, communication oriented teaching and learning in a meaningful didactical sustainable way. Especially for a university of technology it is a must to support them students with latest technological, pedagogical and didactical teaching and learning possibilities. To meet the requirements of this target it is (amongst others) essential to survey the status quo of today’s students according to their ability to handle modern ways of communication and education.

as the Computer and Information Services (CIS) – all departments from TU Graz – decided to bundle those individual activities for to become e-learning at TU Graz a centralised service. On the

For this reason SL has undertaken a freshmen survey since three years in series. At the beginning of a new study year at the end of September new students had the opportunity to meet the so called

“Welcome Days” lasting two days where they were introduced to main facts and possibilities of their study life at TU Graz. In the course of their university debut the students were asked to go through a paper pencil survey about their Web2.0 competences as well as their technological equipment regarding computers and mobile devices with a view on their communication behaviours using that equipment. By this year’s evaluation a sample of $n=757$ questionnaires had been analysed. Together with $n=821$ collected in 2008 and $n=578$ from 2007 we can compare a total of 2156 data sets. That is quite a good basis for an analysis of trends. On base of that analysis we can optimize the service and prepare future learning in time. The following chapter describes the results of this year’s study and outlines trends and findings considering all three years to answer the questions addressed in the introduction.

RESULTS AND FINDINGS

Which Trends Can be Seen Towards Technological Equipments?

The first question covers the interest in the technological equipment to get an overview which devices are used by students. Figure 3 displays the results. Multiple answers were possible. Due to a misleading question the results according to the selections “Mobile + www” and “Mobile no www”

cannot be compared within the three years. There are some remarkable notices. First of all the decrease of simple iPods and MP3-players can be for sure explained by the raise of iPhone, iPod touch and mobile smartphones which are able to play mp3 files as well as videos. Besides a very constant laptop ownership (about 80% of our students independent of their chosen study) Personal Computers (PC) are decreasing for more than 10%. The trend to mobility can also be seen in the fact that mobile phones with Internet access are owned by about 40%. Together with iPhones (7%) and other mobile phones with Wi-Fi (17%) about 65% (two third) of our students have the possibility to get mobile access to the Internet using their phones. This is not only to be attributed to the fact that new mobiles technically are Internet compatible by default, because the number of those having smartphones more than doubled whereas the number of those having mobiles with ordinary Internet access increases a bit – please note that 2007th value for “Mobile + www” cannot be compared, because the selection “Mobile no www” had not been asked, as well as 2008th high value for “Mobile no www” cannot be taken seriously because of misleading questioning – double answers were given. Anyway, the trend according to their technological equipment definitely heads for more mobility and better equipped devices. We can not state with significance that netbooks already have an effect on the distribution of laptops.

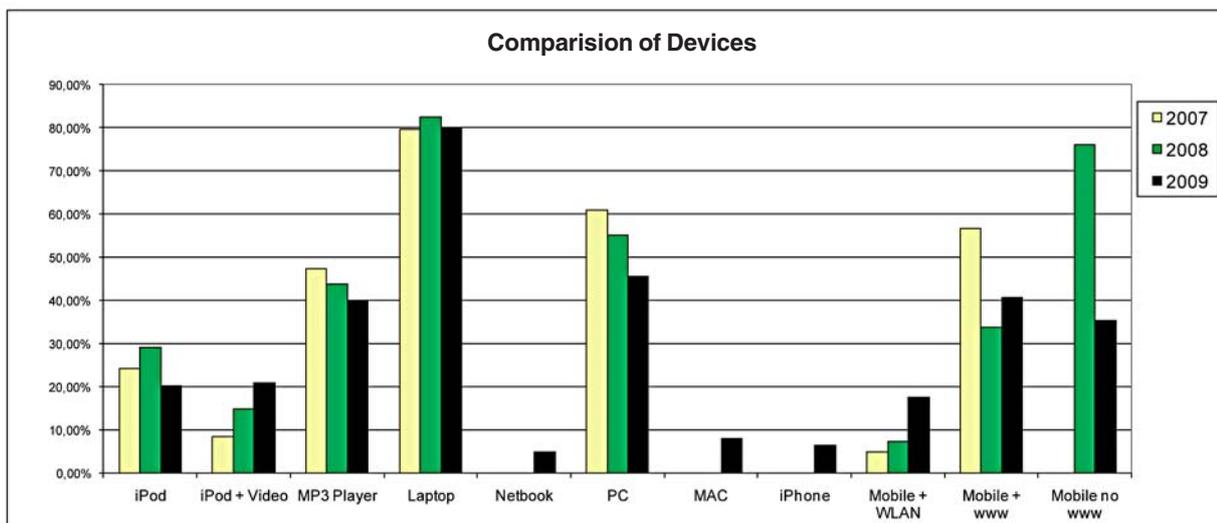


Figure 3: Comparison of devices used by first year’s student at TU Graz between 2007 and 2009; “Mobile no www” had not been asked in 2007 which effects a falsified high value for 2007th “Mobile + www” Selections “Netbook”, “MAC” and “iPhone” had not been asked in 2007th and 2008th survey

Which Trends Can be Seen Towards Internet Access at Study Home?

The next question concerns the Internet access of students at their study home. Looking at three years on data there is a remarkable difference between modem access and access with high bandwidth (ADSL) (Fig. 4). Furthermore Figure 4 shows that the mobile access is increasing constantly, from more than 15% in 2007 to nearly 35% nowadays. 2008th fluctuation of the "ADSL" value can be taken as a result of the abnormal high value of "No access" in that year which can be explained by a earlier time of questioning than in the other years; so students not being Graz residents may not had established their Internet connection till then.

Due to the fact that the summary of all access possibilities is much higher than 100% it can be stated that there are a couple of students with multiple access to the Internet. No access to the World Wide Web can be more or less excluded – the student of today entering our university is connected to the Internet. So the trend according to Internet access is pointing at a constantly increasing mobile one. This underlines and correlates very well with the results from the research question about technological equipment. Furthermore we see that there is no peak or hype towards any of the selections offered.

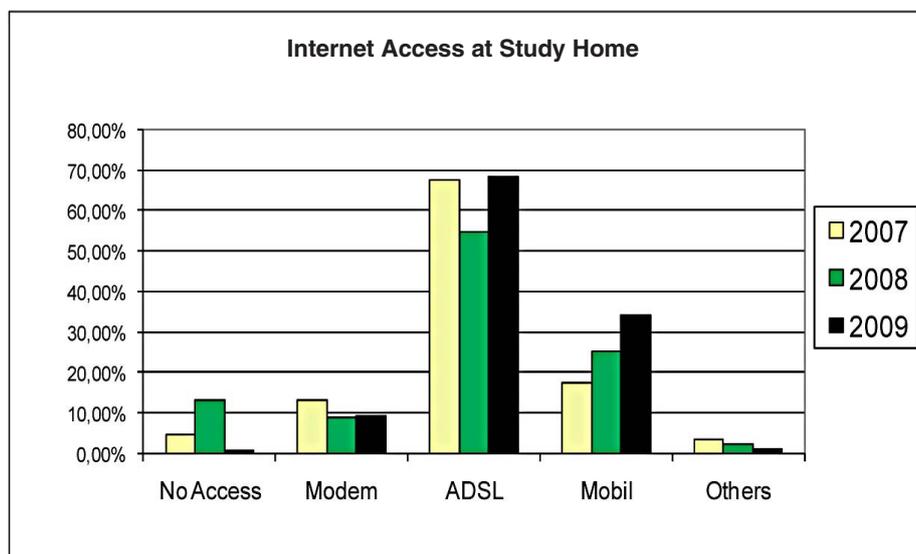


Figure 4: Comparison of Internet access at study home of first year's student at TU Graz between 2007 and 2009

Which Trends Can be Seen Towards Communication Behavior?

Another very interesting question deals with the communication behavior of freshmen. The students had to specify which ways they use for their digital communication and to what extent. They had to decide between "never", "rarely (several times in a month)", "often (several times in a week)" and "daily" for each way of communication. Because we were interested in the intensive use of communication ways, for the bars displayed in Figure 5 only the "often" and "daily" hits were taken. In case the selection "rarely" would have been added to the figure, there would be no significant difference to the shown results in relation but the portion of interest could not be presented obviously. Furthermore it must be pointed out that the selection "Others" does not include the possibility of Short Message Services (SMS) or MMS (Multimedia Messaging Service).

The results are not very surprisingly except the one remarkable increase of selection "Others" and the very low use of the microblogging platform Twitter. Email is used intensively by about 90% of the students consistently; nearly 100% use it in any way. Email still remains the main communication way. A slight increase regarding the use of the instant messaging application Skype at the expense of other instant messaging tools can be

assumed not least because of a similar slight increase of "rarely" used VoIP technology ("rarely" parts are not shown in Fig. 6). So there are no relevant changes according to those variants of communication ways; no hype trends but smooth progressions with little significance.

In contrast really unexpected is the result for the use of Twitter. Although the "Overall usage of Web2.0" (Fig. 7) levels the low values for Twitter use to what we would have assumed it is a fact that about 60% stated, they even do not know Twitter (Fig. 7).

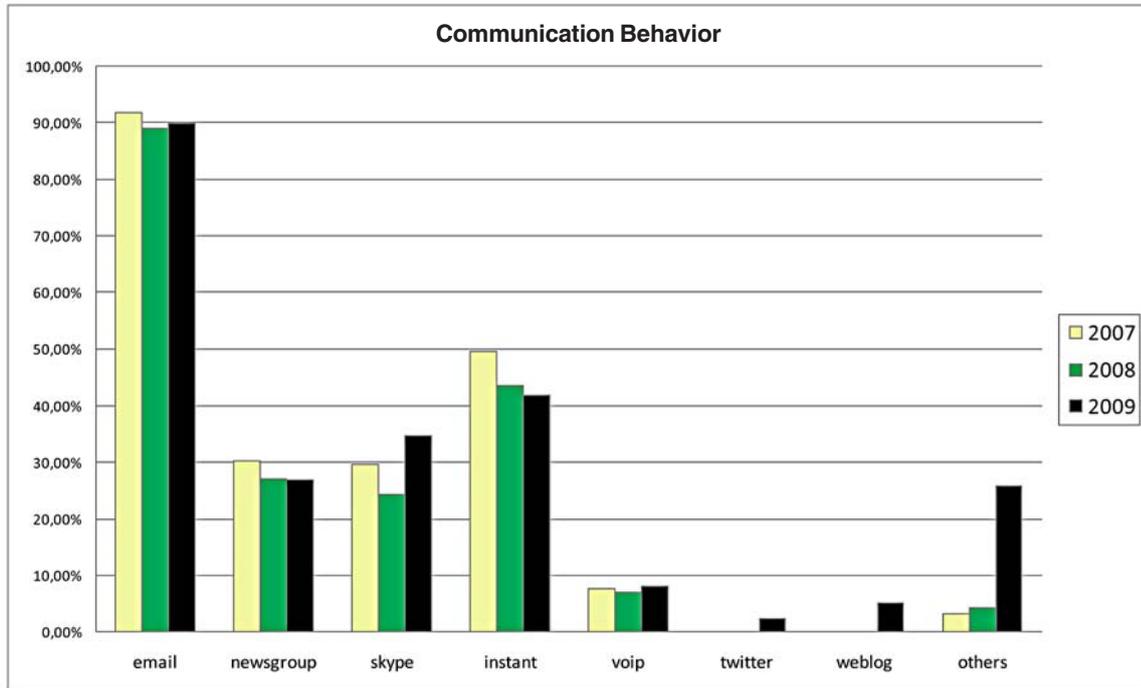


Figure 5: Comparison of communication behaviour of first year’s student at TU Graz between 2007 and 2009
 Values similar to answers given for “often” plus “daily” use
 Remarkable increase of selection “Others” in 2009th survey
 Selections “Twitter” and “Weblog” had not been asked in 2007th and 2008th survey

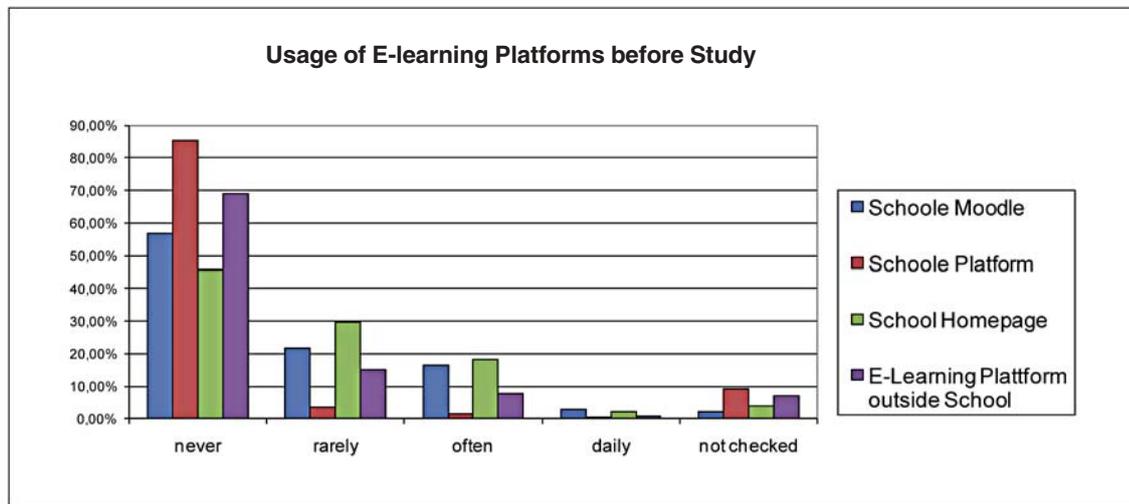


Figure 6: Usage of e-learning platforms of first year’s student at TU Graz in 2009

This is noteworthy insofar Twitter has gone through Gartner’s life cycle peak at the end of June this year (Fig. 1) in correlation with the death of Michael Jackson. According to Gartner’s life cycle Twitter should decline from now on, but still enjoys increasing popularity worldwide which can be seen easily at any webpage traffic stat analysis site (such as alexa.com). Taking a look at new Twitter accounts and their user’s behavior

Gartner’s phase of disillusionment is already dawning (Sistrich, 2009).

Another even more astonishing fact is the booming increase of other communication ways. One of the main findings of the survey is the enormous increase of social communities in general and of Facebook in particular. Because today’s social community platforms offer a lot of

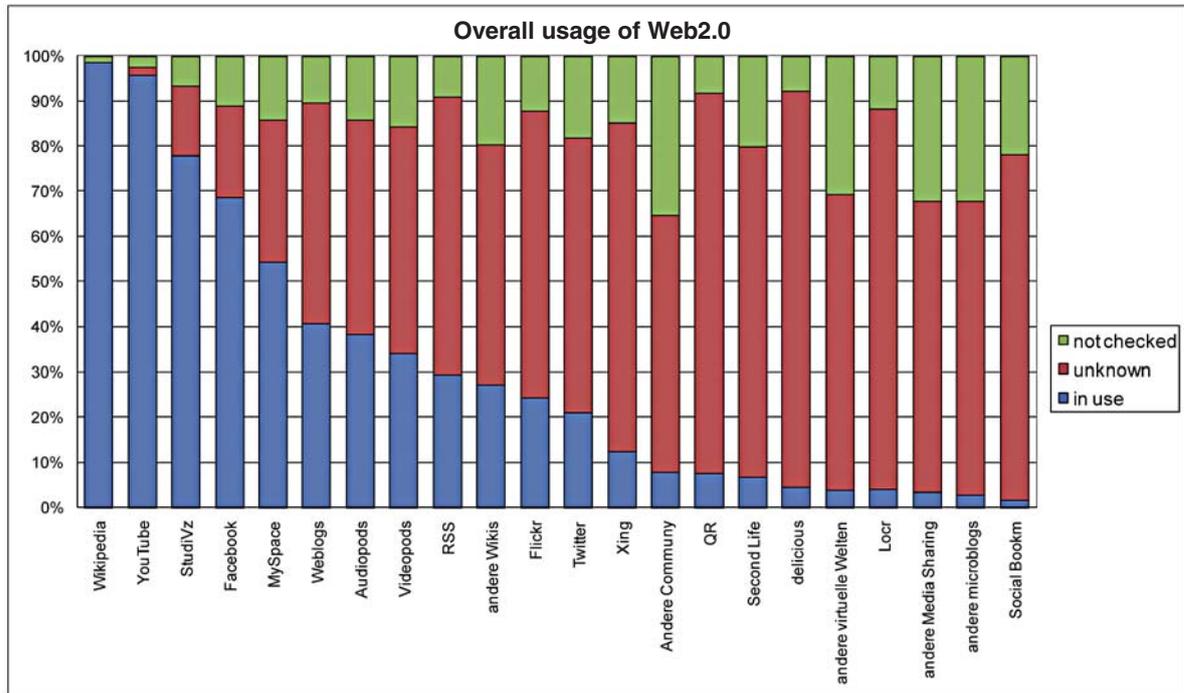


Figure 7: Overall usage of Web2.0 of first year's student at TU Graz in 2009.

different possibilities to contact and communicate with each other the peak of "Others" can be argued by that. For there is no general decrease according to the rest of the communication behavior we assume that young students communicate more and like to use multiple ways to do so. Future studies will show whether social communities will have the power to displace traditional ways of communication just like email and instant messaging or not.

Which Trends Can be Seen Towards the Usage of E-learning Platforms at Secondary School Level?

The next question addresses the use of e-learning platforms in schools and in general. The students had to state their usage of e-learning platforms. In comparison to last years surveys (2007 and 2008) there is no significant difference. The usage of e-learning platforms at secondary schools is still no widespread standard. Even the free and open e-learning platform software Moodle did not cause a hype of e-learning platforms used in secondary schools, although it is a fact that in case a school uses an e-learning platform it is no other than Moodle. Academic homepages are still more popular than e-learning platforms at all.

There is little use of non academic e-learning platforms. Figure 6 displays the results.

Which Trends Can be Seen Towards Web2.0 Competence?

The most interesting question of the survey covers the Web2.0 competences of the young students. For the several Web2.0 applications they first had to state whether they actually know about it or not. In case they do know they had to give precise answers about their usage. They could choose between "unknown", "passive (just reading)" or "active (writing and uploading)" usage as well as a usage for learning purposes. Figure 7 and Figure 8 display the results of this question. The pattern "in use" in Figure 7 comprise "passive", "active" and "for learning".

In general we can say that Web2.0 applications are more used than in the two years of the study before (EBNER *et al*, 2008) (NAGLER & EBNER, 2009). The active usage has declined a bit whereas the passive use strongly increased. That means that the awareness level of Web2.0 applications has been strengthened but was no sufficient reason for more intensive usage. Overall Wikipedia and YouTube are still the most used Web2.0 appli-

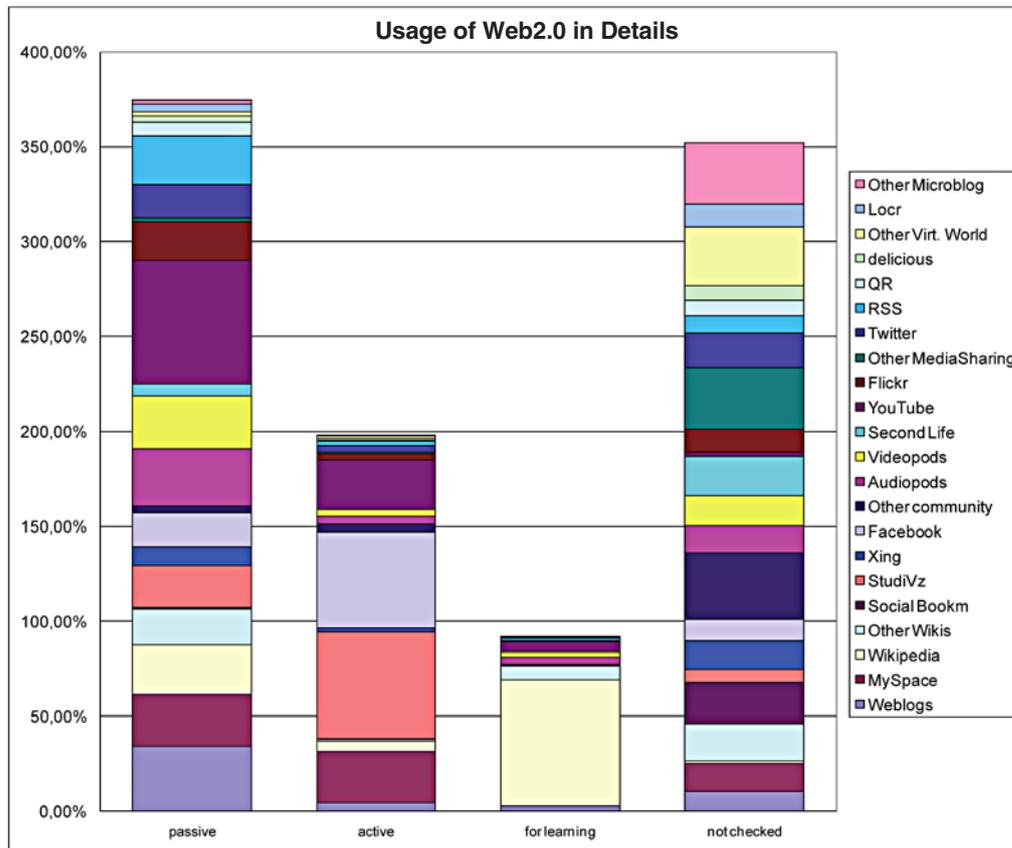


Figure 8: Usage of Web2.0 in details of first year's student at TU Graz in 2009.

cation in that context closely followed by social communities. Rather uncommon media sharing-, microblogging- as well as social bookmarking-platforms are of least interest to our new students although they are even better known than higher ranked applications.

If a look is taken at the passive use at all we found out that YouTube is used most frequently (65%) followed by weblogs (33%) and podcasts (video as well as audio, each 30%). For the first time we can state that Wikipedia is more often used for learning efforts than Youtube in a passive way and that Wikipedia is passive more used than other wikis at all. Flickr doubled its passive usage (25%) as well as the one of the RSS technology did. There is a tiny pleasant increase according to the usage for learning purposes whereas the diversity in that category suffers a bit. Only Wikipedia is used by 66% (44% in 2008)) of the polled students for learning efforts; other wikis and YouTube hardly reached a 7% but such as videopods and audiopods they doubled in a year. All other applications are to be neglected for

learning efforts. Nevertheless this again is a signal for teachers that Wikipedia should be taken serious for common search and knowledge acquisition as well as online media sharing slowly gains in importance.

As mentioned before there is an outstanding raise of social communities to be noticed with Facebook strongly booming. To indicate values, studiVZ which is still the most popular community in Austria (and German speaking countries as well) hiked from 70% in 2008 to 80% this year, Facebook rockets from 16% last year to incredible 67%, MySpace gained to 55% from 45% as well as Xing from 5% to 12% which is interesting for people assumed to be not involved into the working environment so much yet. Even other communities enjoy a doubling up to 8%. If a closer look is done we find out that Facebook is actively used in nearly the same amount as studiVZ already. With 50% and 55% they leave the other Web2.0 applications far behind. Only MySpace with 27% and YouTube with 26% of active usage have appreciable results, which is as much as a

passive usage of Wikipedia (26%). Compared to the Austrian wide active usage of Facebook which ranks about 10% (WIESE 2009) we can state that on the one hand Facebook currently hypes among the young generation and on the other it seems to be established among the general population. So the most frequently active usage of Web2.0 applications are social communities by far.

But there are some more remarkable results. Although Twitter is apparently minimal used for communication efforts (Fig. 5) the overall usage of Twitter has powerfully increased to 20% from 2% in 2008. From that point of few the hype cycle of Twitter can be comprehended but remains controversial. QR-codes still are not booming as generally predicted as well as rather specific tools like the international very popular bookmarking platform "del.icio.us" or "locr" for media sharing with geotagging mainly used in German speaking countries (compare SCHULMEISTER, 2009). So after three years of investigation for some of the applications questioned we slightly can predict that there will be no hype in future among our students. Furthermore trends have been approved such as the steady increase of videopods, audiopods and weblogs in general or the elapsed hype of virtual realities.

DISCUSSION AND CONCLUSION

It is a fact that TU Graz offers its teachers and students a lot of different possibilities to execute a technology enhanced driven teaching and learning with focus on Web2.0 using multiple devices at the classroom or outside (EBNER *et al*, 2010). To optimize these services and prepare for future ones annual surveys among freshmen take place. In summary we can state that today's students are not only very well equipped and have increasing mobile access to the Internet but the general tendency clearly indicates more mobility and more smart devices like mobiles with WLAN account of rather simple devices like ordinary mobiles or iPods without video functionality as well as MP3 players. The trend to more mobility can also be seen if a look is taken on the internet access at student's home. Secondly there is a very distinct trend to social communities over the last

three years. Whereas virtual worlds like "Second Life" have definitely never really boomed yet among the polled students although those realities are well know by a majority. Exemplarily QR-codes (FALAS & KASHANI, 2007) neither have reached common popularity in Austria yet nor are known among this year's freshmen. This means in general that although some technologies follow the typical lifecycle by Gartner and enjoy high approval in one part of the world, it may bomb in another part and will not break Moore's chasm to reach the phase of majority.

The general booming of Facebook can be affirmed exceedingly for freshmen of TU Graz as well. But it is not only Facebook that takes it all, all surveyed social communities (studIVZ, MySpace, Xing as well as others) gain a high increase. The growing is a constantly one except for Facebook that has quadrupled within one year. It does not seem that Facebook already peaked out or even has reached the climax; according to Gartner's hype cycle there is a little delay (NITZ, 2009) (ANDEREGG, 2009). But there is another effect the strongly intensified sympathy for Facebook evokes. We can document a very high increase of using "other communication ways" than those asked by name. In context with the outstanding rise of Facebook we can assume that communication using social communities has become very popular and is therefore breaking new grounds. Nevertheless there is no significant decrease of using standardized ways of communication like email, instant messaging or newsgroups. Because Facebook has been clever enough to open its platform for other common Web2.0 applications and makes it easy to integrate them individually a further side effect of the boom is that people slowly get used to work with those Web2.0 achievements like microblogging or smart media sharing habits as well as embedding items from different sources following mashup philosophy (KULATHURAMAIYER & MAURER, 2007). This means that students get used to online editing practices more and more; the acceptance of Web2.0 is strengthened, the way for an online desktop working environment is being paved, cloud computing seems to switch from concept to practice. University teaching should take care

about those results and work with social communities in an educated way. There are several publications telling us how to do so (EBNER & MAURER, 2009).

The survey approves common trends in communication and Web2.0 behaviour. Popular Web2.0 applications and habits have been established, too specific ones will not in future; some are constantly used, some pass through a

hype cycle currently. The way of communicating seems to be in flux as well as the way of using mobile devices. If a university takes care of its students this study again outlines the importance for universities not only to pay attention to those facts and progresses but to integrate them into everyday teaching and learning life for to reach the Plateau of Productivity.

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