FE|MALE

DEVELOPING WEB 2.0 LEARNING SCENARIOS - A PARTICIPATORY AND GENDERSENSITIVE APPROACH

Sabine Zauchner

University for Continuing Education Krems
3500 Krems/Austria
sabine.zauchner@donau-uni.ac.at

Heike Wiesner

Berlin School of Economics and Law
D-10825 Berlin
wiesner@hwr-berlin.de

Andreas Steiner-Wiesner

Berlin School of Economics and Law
D-10825 Berlin
awiesner2@web.de

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Abstract

Web 2.0 has increasingly been adopted in education, which is evident from the increase of scientific attention given to this field. However, the professional deployment of innovative, technology-supported learning scenarios lags behind this development. Furthermore, the varying approaches of girls and boys towards new technologies have found little consideration in the pedagogical context.

The research project "female" is devoted to this theme: fe|male places Web2.0 techologies in education in the center of the research focus. These technologies are analyzed under the aspect of gender and also in relationship to their didactical deployment within the framework of a gender-sensitive academic education. This is based on the assumption that Web 2.0 technologies, which comprise the core ideas of the web, namely user-friendliness, standardization, participation and re-utilization will increasingly gain importance and might be referred to as the “passage point” of the technology-gender-discourse. Within the fe|male project nine Web 2.0 projects, which involved 165 students in total were implemented in schools and evaluated with regard to its implications for gender sensitive teaching practices.

The main results ~~in general in~~display that between the girls and boys who participated in the evaluations much more similarities were observable than differences. Further, a tendency is observable, that girls even profit more from Web 2.0 school projects than boys.

Keywords - Technology supported learning, gender, participatory design

1 INTRODUCTION

Being the key term for the second phase of the internet developments, the term Web 2.0 comprises a simple idea: information providers and – consumers no longer asymmetrically communicate with each other but communication more and more becomes symmetrical and interactive. The new technologies provide us with tools which help us to share, communicate in networks, generate contents, or work collaboratively. The basic idea of the internet gains more and more importance: user friendliness,

standardisation, participation and reusability. In October 2005 Stephen Downes [1] was the first to use the term „-eLearning 2.0“ and he described changes through the use of Social Software and Web 2.0 technologies for e-Learning.

In E-Learning 2.0, the basic E-Learning model is altered by the production of content by users. Learning environments are no longer “learning islands“ [2] containing contents and tools which are provided to the users (like in classical E-learning platforms), but they change to portals, providing access to contents and tools in the internet. These portals therefore on the one hand are the starting respectively the orientation point for the information from the internet and on the other hand they have to integrate contents and tools for learning. This leads to the idea of Personal Learning Environments (PLE), a learning infrastructure for the individual organisation of learning processes. This infrastructure accompanies the learner in different contexts, be it formal, non-formal or informal learning [3]. The use of Web 2.0 applications like E-Portfolios or also Wikis leads to “performative” learning. This means that learning is expressed by specific public, observable activities. In consequence group work becomes more transparent: it can be seen who engaged in which way and not only the learning results but also the learning process can be observed. By this, according to Baumgartner [4] E-Portfolios or Blogs make it possible to follow the process of knowledge creation and a kind of meta language can be developed which reflects on the learning process itself.

In Secondary Schools in Austria or Germany actually several Web 2.0 applications (e.g. wikis., weblogs, podcasts, screencasts or E-portfolios) are used for teaching, i.e. there exist several good practice examples. However, a systematic evaluation of the application of these tools is missing and this is especially true if we consider ~~when considering~~ the potential of these tools with regard to gender sensitive teaching. We also need to account for the fact that ~~It has to be considered that~~ technology applied in E-learning is neither didactically neutral [5] nor gender neutral [6, 7]. Baumgartner [5] states that in developing software tools for learning, inherently a specific type of didactic theory is implemented „If for example a complex learning management system primarily implements drill and practice tools and collaborative work is not possible, it is clear that (even though implicitly) one specific pedagogic theory was implemented”.[1]

The notion that technology – and by nature also technology that is applied in teaching – is not gender neutral, has been investigated in gender research in informatics for several years. Technology is influenced by social structures, which means that it is influenced also by gendering processes. These influences may not be immediately visible ~~at the first~~, as abstraction and mechanization processes suggest objectivity and neutrality of the final product. Cecile Crutzen in this context talks about „gender load“[2] of technological products [8, 9 see also 10, 11]. Gender and technology are no stable, fixed categories but interrelated social constructions. This means that on the one hand gendering processes in informatics are observable and on the other hand that informatics and technology play an important role in the construction of gender by e.g. ascribing technical competences to men or defining tasks which are mainly performed by women as non-technical. These interrelations are analyzed under the term „co-construction of gender and technology [12]. Therefore in implementing Web 2.0 applications in education these tools have to be analyzed and evaluated with respect to gender. Without questioning there might be the danger of gender constructions of these technologies that might be passed on to school and can result in reinforced stereotypes. ~~and stereotypes may be reinforced.~~

Gender research has been advocating for openness, usability and participatory design approaches [13, 14]. Be it strategy or research, the gender difference model which regards gender as dualistic conception is being replaced nowadays. Whereas until the nineties dualistic views, linking technology to male attributes and regarding females as technology-distant, dominated the scientific discourse today ~~nowadays~~ perspectives arise which no longer follow these ideas. Web 2.0 might be one of the “passage points“ of the technology-gender-discourse. The impulses derived from Web 2.0 could contain the potential to „engender” the male dominated design of technology. This would mean a democratisation through the back door – both an ~~an as well~~ innovative and ~~as~~ promising idea. However, the interlink between gender and technology inherently carries a paradox and a methodological challenge: in order to change gender inequalities these dualities have to be named and analyzed - but without reinforcing them. A way to deal with this paradox is not to regard

[1] German: “Wenn z. B. ein komplexes Lernmanagement System in erster Linie individuelle Drill & Practice Werkzeuge implementiert und kooperatives Arbeiten nicht vorsieht, so ist klar, dass damit (wenn auch implizit) eine ganz bestimmte erziehungswissenschaftliche Theorie implementiert wurde.“

[2] German: “Genderladung”

technology as a “closed” product but as a process which offers different design options to the persons involved. With regard to this process Messmer und Schmitz [15] explain their approach as follows: “Instead of adapting the user to the technology, our approach in gender and ICT aims at adapting technology to the user-oriented demands.” A decisive issue for the acceptance and the creative use of technology in learning (and also working) contexts is that the users feel comfortable and acquainted to using it. In order to enhance the interest of females in technology, their needs have to be considered. From a gender perspective in this context, participatory design approaches are preferred [16, 17, 18].

The demands to technology used in education with regard to gender sensitive didactics ~~therefore~~ are therefore manifold: they ought to be gender neutral, they shall support learners who substantially differ from each other an they should ~~shall~~ be able to consider different concepts.

2 THE FE|MALE PROJECT

The research project fe|male[3] intends to inspire girls and boys for new technologies: fe|male explores Web 2.0 technologies under the gender aspect and identifies opportunities for their deployment on the basis of the competencies and needs of the students. F~~f~~e|male places Web 2.0 technologies in education in the centre of the research focus and intends to explore and ~~to~~ develop educational programs with a focus on gender aspects. Fe|male hereby~~and to hereby~~ contributes that girls also become interested in technical applications, while taking into account their skills, competencies and content preferences.

Students are integrated into the entire research process from the start[4]. The project takes place in collaboration with three partner schools in Austria and Germany (BG|BRG Purkersdorf; BRG Krems, Marie Curie Secondary School, Berlin/DE). Based on young people’s media-centred everyday life ~~lived in world~~, Web 2.0 applications within kick-off-workshops[5] were analyzed in terms of their feasible deployment in teaching. Based on the students’ ideas on how to integrate Web 2.0 applications in teaching, the following projects ~~in spring 2009~~ were implemented in spring 2009 in ~~the~~ participating schools:

1) E-Function/Mathematics

   The e-function project was a cooperative project of the BG|BRG Purkersdorf (AT) and the Marie Curie Oberschule (GE), which comprised three working phases within four weeks in total: Get to know each other (week 1), collaborative work on different tasks (week 2 and 3) an reflection/feedback (week 4). 33 students aged 16 – 17 years took part in the project. The project was held within regular mathematics classes. The following technologies were applied: Wiki, MSN Messenger.

2) Cells/Biology

   Project performed by the Marie Curie Oberschule and the BG|BRG Purkersdorf. The project was held parallel – there was no direct cooperation between the two classes. 48 students aged 15 – 16 years took part. Technology applied: Wiki.

3) Chemistry Olympics/Chemistry

   At the BG/BRG Purkersdorf, preparation courses for the Chemistry-Olympics with 24 participants aged 15 to 18 years took place. The students produced a “wiki-assistance“ for organic and inorganic chemistry, which will be continuously further developed for/by other students. Technology applied: Wiki.

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[3] The fe|male project is funded by the Austrian Ministry of Science and Research within the “Sparkling Science” programme (http://www.sparklingscience.at) and lasts from October 1st 2008 until September 30th 2010.

[4] Not only the active incorporation of girls and boys in this research project, but also the ability of the students to exploit the insights and to share the acquired knowledge is the third focus of fe|male. Selected and interested students of the respective project teams will be empowered to pass on the jointly developed insight in regard to the didactical and gender-sensible teaching and learning scenario within their own educational context, and also to other participating institutions of higher education by means of presentations and seminars.

[5] A publication on the results of these workshops is in preparation.

4) Biology Laboratory Labor (AT)

   17 students aged 14 – 15 years of the BG|BRG Purkersdorf participated in the project. Selected topics of biology classes were prepared by student-tandems. Technology applied: Wiki.

5) The Fall of the Berlin Wall/German

   Project of the Marie Curie Oberschule (GE) with 28 students aged 14 to 15 years. The history of the fall of the Berlin Wall was documented and interviews with inhabitants from Berlin were made. Technology applied: Wiki, YouTube Videos.

6) Mathematics Course/Mathematics

   14 aged 16 to 17 years students of the Marie Curie Oberschule participated in the project. The students collaboratively worked on specific topics in mathematics. Technology applied: Wiki (including formula editor).

7) Atomic Power: No Thank You?/Physics

   The atomic power project was a cooperation project of two classes from the Marie Curie Oberschule (GE). The project was a complete online project without face to face phases. The students were supported by teachers through the discussion pages of the wiki applied. 24 students aged 15 to 16 years took part in the project. Technology applied: Wiki.

The projects of the partner schools were evaluated qualitatively and quantitatively by the participating students and teachers. The evaluation focused on didactical and gender-specific aspects relating to the expedient deployment in education. In the following the main results of the implementations of Web 2.0 applications in the participating schools with regard to gender aspects are presented.[6]

3 RESULTS

The results presented in the following are based upon a questionnaire survey which involved the participating students (n= 165; 85 male, 76 female). Further, nine group interviews were made with the students at the end of the projects and the nine participating teachers were interviewed along a semi-structured interview guideline.

3.1 Quantitative data

The questionnaire consisted of 19 questions which focussed on

1) the general like/dislike of the project,
2) the effects on learning,
3) organisational aspects,
4) recommendations for further projects.

In general in between the girls and boys who participated in the evaluations much more similarities were observable than differences: The projects quite well met the needs and expectations ~~as well~~ of the participating girls and boys. The only differences were stated with regard to the general like/dislike of the project and the like/dislike of the need for self organisation within the projects showing a tendency that girls even profited more from the projects than boys.

In Fig. 1 the percentages for the answers to the question how the students liked to participate in the project are presented. T-test results (T 2,806; df: 162) show a significant difference of p = .006 between the genders. The girls in general liked the participation in the projects more than the boys.

[6] Results with regard to organisational, topic, project or country specific issues will be presented in further publications.

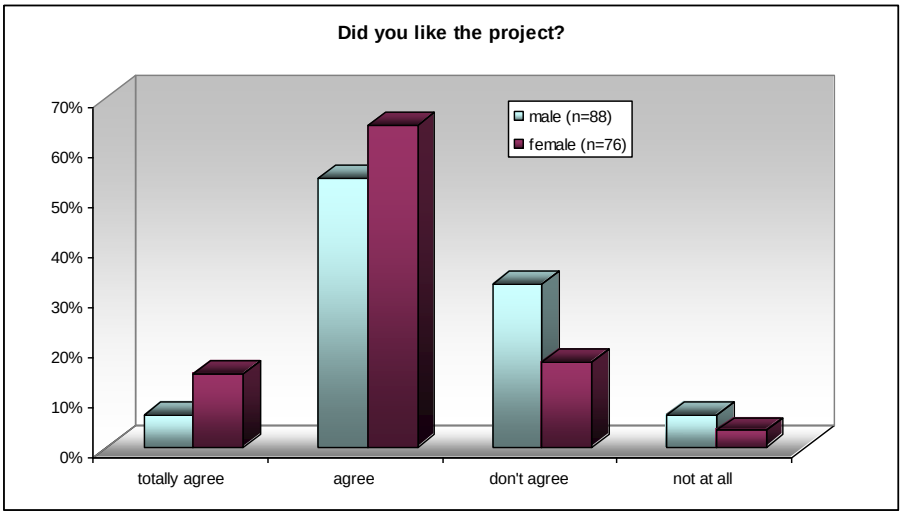

Fig. 1: Differences between girls and boys in the general like/dislike of the school projects.

In Fig. 2 the significant difference in the like/dislike of the need to self organisation is shown (T 2,647;,df: 162; p= .009). As with the general like/dislike of the project, the participating girls liked this aspect of the projects more than the boys.

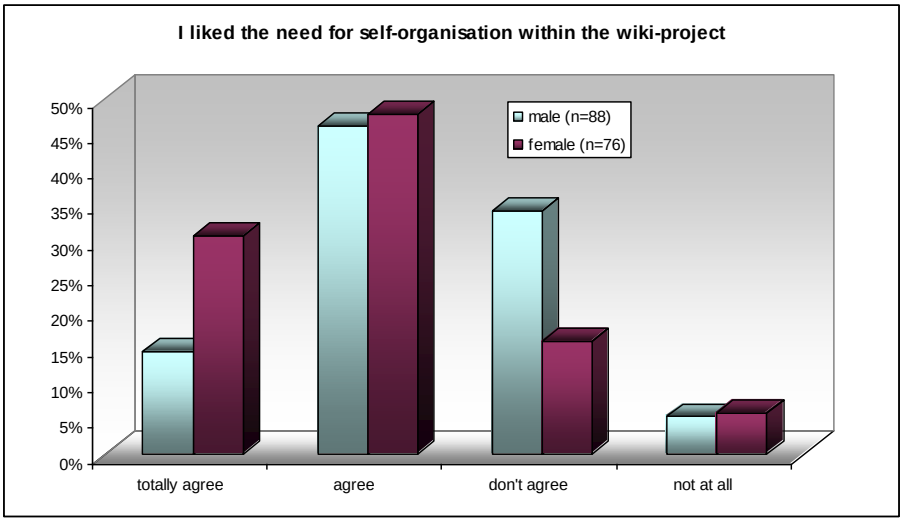

Fig. 2: Differences between girls and boys in the general like/dislike of the need for self organisation within the school projects.

3.2 Qualitative data

The interviews and the group discussions focussed on organisational, technological, didactic and gender specific questions. The results form quantitative data with regard to gender aspects are to a high degree supported by the results from the group interviews and the interviews with the teachers, who were responsible for the implementation of the projects.

Girls and boys found the projects positive in general. Activities in the projects of boys and girls were quite similar between girls and boys to the view of the teachers:

> "*Some girls and boys were very, very good. They helped each other very well. They intensely worked on the project, some found it easier than other, but this was not gender specific."*[7] *(male teacher)*

However, in some of the projects evaluated, the girls turned out to be more motivated, more active and more communicative than the boys:

> *„(…) the girls liked the projects very much, they were much more motivated than the boys. Though one has to tell, that the girls in my class normally are not that much engaged in technology – but they were totally involved into the project*".[8] (female teacher 1).

Though one teacher had expected the boys to be more attracted by the project, the girls to her observation~~s~~ were more engaged in the project, made more experiments and found out how to work with the wikis:

> *"… they experimented much more in order to get good results"(female teacher 2).*

Students asked if they think that the projects were as well liked by boys and girls stated that to their view this depends on the like/dislike of the respective topic and secondly is strongly related to their general affinity to technology:

> *"For girls who work a lot with the computer this is of course much easier than for the ones who are beginners*".[9] (girl)

4 CONCLUSIONS

The quantitative and the qualitative evaluation of the fe|male project showed that the school projects were regarded positively by the students and the teachers. In general the projects were as well appreciated by the girls and the boys. However, with regard to motivational aspects, their activity in the projects and the appreciation of the need for self-organisation within the projects the girls seem to profit to a slightly higher degree than the boys from Web 2.0 tools. With regard to this it can be assumed that Web 2.0 technologies – in case of the fe|male evaluations of wiki technologies – may serve as a passage point for the gender-technology discourse.

However, one has to consider that the enhancement of technical interest is related to affinity to technology and individual experiences of the students with ~~with the~~ school projects. Different – and this always also means gender specific – affinities for technology, skill levels or competences with regard to self organisation therefore have to be considered ~~when wanting~~ if we want to sustain Web 2.0 projects in schools. Our results show that it is the boys who seem to have a higher need for support in this context. The fe|male project therefore in a participatory design approach, based upon

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[7] German: *„Manche Mädchen und Jungen waren sehr, sehr gut. Es wurde sich dabei sehr gut geschlechtergemischt geholfen. Den großen Unterschied gab es für mich hier nicht. Sie haben alle intensiv dran gearbeitet, manche haben sich leichter, manche schwerer getan, aber nicht geschlechterspezifisch."*

[8] German: *"(...) die Mädchen sehr stark angesprochen, deutlich motivierter als meine Jungs. Aber man muß dazusagen, dass gerade meine Mädchen zum Teil eigentlich technisch nicht so begeistert sind, und total eingefangen wurden!"*

[9] German: *„Für Leute, die viel mit dem PC machen ist das natürlich immer leichter als für diejenigen, die sich erst damit auseinandersetzen müssen."* (Mädchen)

the results of the evaluations of the Web 2.0 projects and further development workshops with students and teachers will consequesntly develop transfer models in order to ~~sustainaby~~ implement sustainable gender sensitive Web 2.0 projects in schools. Besides the gender aspect, these models will focus on the evaluation results of organisational, didactic and class/topic-specific aspects of the school projects.

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