

Futur(e)Learning – a strategy for individualisation in learning by e-learning and e- portfolios

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Abstract:

Approaches of learning concepts based on individualisation are discussed: Individualisation according to contents and scenarios, according to places and timetables, social impact on learning and evaluation of individual learning processes. ePortfolios at school can support this individualisation strategies. The acquired competences may further be transferred from school to the world of work. ePortfolios are powerful tools for learning and reflecting.

1 Introduction

“Individualisation in the learning process” has been one of the magic words in education policy of the last years. Teacher-centred instruction as a synonym for the one and only learning organisation is gone. Educational institutions will develop from places of teaching and input-oriented knowledge transfer to a forum of discussing knowledge transfer, attitudes and opinions between the generations and cultures, with clear common responsibilities for the aims of the learning process. The learners should have more freedom to design the mode, the time schedule or the way, how her/his talents are involved in the learning community. The transfer of these aims into the real classrooms is still far from realisation, because the classes brim over with more than 30 students and the environment is not fit for group work or individual learning. But there is common consensus, that information technologies and virtual learning communities are an important part of the individual learning future.

Some approaches towards learning concepts based on individualisation are discussed now:

- Individualisation according to (e)contents and learning scenarios;
- Individualisation according to places and timetables of learning;
- Social impact on learning and self competence;
- Evaluation and assessment of individual learning processes.

The umbrella project of e-learning initiatives to improve learning processes at primary and secondary schools is named “Future(e)Learning Strategy”, proposing a close connection between new learning styles and information technologies. Therefore “Futur(e) Learning” will be introduced before coming back to the main topic of the paper.

2 The Futur(e)Learning Strategy

Since e-learning was introduced at secondary schools in Austria in 1998, notebook classes and learning platforms have been established and after some years clear constructivistic learning arrangements have been realized. This development marks one important milestone on the way to more individualization by introducing e-learning methods at school.

On the other hand the internet loses its pure “publication” function because of newly developed portals and is getting interactive. The web has been changing within a very short period of time not only in a technical way but also in all areas of application and especially in how we use the net. With the next steps of “social software” and “Web 2.0” the internet is changing to a distributing net. In contrast to other mass media it is very easy in a “web by users for users” not only to be a recipient but also appear as a sender and author of messages to an infinite amount of users.

In using the ideas mentioned above a number of targets could be set. It is very important that these quantified objectives are used as indicators for measuring the success of this initiative. The discussion at Austrian educational institutions about quality has led to an evaluation culture visualising activities taken. This will happen in “Futur(e)Learning” as well (Ministry of Education, Vienna, 2007). All of the considerations assume that all schools will be supported in structure and networks to work together (this has been happening since 2002 in two projects, eLSA – “eLearning in daily school live” and eLC “eLearning Cluster”). In an “eCo-operation Project” starting in autumn 2007 today’s 120 locations will be extended to 220 locations which will work according to the outlines of “Futur(e)Learning”.

Futur(e)Learning deals with new forms of learning and learning arrangements which move into another direction, away from classical teacher-centred situations. By using non-directive learning arrangement it should be possible to gain results from group, partner, or single work. Those results are then structured to build a new learning environment.

The MIT professor Seymour Papert (Papert, 1993) got acquainted with a concept called “mindstorms” approximately 15 years ago: children have to prepare their working environment themselves by using appropriate instruments so that they have a chance to develop a “creative, thinking environment”. According to their natural talents young people are in need of a “communication device” which supports them in finding their own ideas, to realise them and to learn important knowledge and behaviour patterns. These tools have to be constantly available for personal use – preferably owned personally and always with them (because the devices are very small in size).

Today most people have a “communication machine”, the mobile telephone (or cell phone). Small devices are getting more and more application areas – a connection to the internet would be a great advantage. It makes no difference which tool you use, a notebook PC, a “classmate” - Subnotebook, a Communicator, a PDA or a webphone, the connection to the internet via an UMTS connection – makes it a “communication machine”! “Web 2.0 goes mobile” is the key phrase! This learning engine has to be very easy to use.

“FutureLearning” intends to open up a connection for all pupils, students, adult learners and teachers to a web driven communication tool and personal learning tools and to adjust the

possibilities to a reasonable learning and school environment. The goals of the initiative are both, visionary and pragmatic but not utopian. Initially, it just requires the ideal contribution of potential catalysers and promoters with societal responsibilities, shirt-sleeved contributions of individuals with commitment, and consequently the financial contribution of sponsors to support well targeted projects.

3 Guidelines in Individualisation

The German Professor of Pedagogics, Hans Brügelmann (Brügelmann, 2004) could show, that homogeneous groups of learners are an illusion; every individual learner “fights” to find a better place in his/her group or community. He develops three theses:

- Heterogeneous groups cannot be avoided - independent of the form of the homogeneous arrangement.
- Integration of different learners is possible – but organisational work must be invested; integration does not come by itself !
- Certain learning arrangements such as top-down or “outside” scenarios do not contribute to useful learning and are overtaxed by educational institutions; therefore in lessons there must be enough space for bottom-up concepts of inner differentiation.

In heterogeneous groups faster learners can help slower learners by tutoring them – there is a lot of empirical evidence to prove that. The development of individual self-competence is no contradiction to socialisation in learning but condition for the successful integration into a community. Gender mainstreaming activities and diversity management follow similar philosophies.

As mentioned above the ideas of pedagogical constructivism and “progressive education” have been re-discovered in our days in the context of e-learning and new media with a highly synergetic potential. In the sense of individualisation and looking at a learner-centred perspective following suggestions can be (re-)introduced:

3.1 New Places

Different places of learning get important (Ray Oldenburg 2002); places of informal learning out of school and virtual places.

3.2 New Approaches

Student-oriented and personally centred methods of teaching should be emphasized (in “classic” approaches this is not evident; therefore there is a special word named “Mathematik”). Interdisciplinary and cross-curricular approaches should be strengthened. Administration will be changed from class-oriented to individual learning paths.

3.3 New Roles for Teachers

The role concept of teachers must be enhanced: additionally to his/her role as an expert in presentation he/she must also take on the role of an evaluator of self-organized processes:

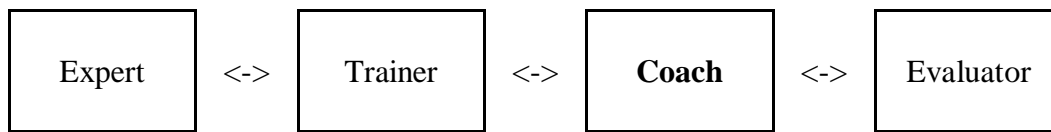


Figure 1 - changing role model of teachers

3.4 New Roles for Students

Also the learning reflection and evaluation concept must be enhanced. First of all students should become qualified to reflect their learning path, to evaluate their own abilities (1) and to give feedback to others(2). Most of the help and fault finding should be covered by the learning community, before teachers evaluate the work (3). Therefore evaluation corresponds to the following pattern:

- The evaluation concept must be enhanced as well. Therefore evaluation corresponds to the following pattern:

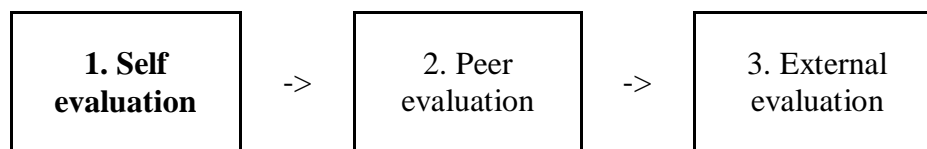


Figure 2 - evaluation of learners

3.5 New Roles of Classroom Community

To optimise this learning process social effects and teamwork should be explicitly enforced. “Copying” others’ work is welcome. Teamwork and community learning is a higher motivation factor for learning than learning as a single person (Lave und Wenger, 1991). With such community learning styles the possibilities of assessing somebody are expanded. A classroom-oriented “knowledge management” with support in every subject should be established (Mandl/Reinmann, 2005). Occurring problems and mistakes will be dealt with during the lessons. learning experiences will be reflected and results presented. On the platforms themselves, fault tolerant places and spaces should exist, which will be administrated by a critical learning community.

3.6 New Instruments

Instruments reporting and giving evidence of the personal learning progress are important (wikis, “Lear-ner’s passport”, working portfolios). Nevertheless administration software for school management should be more and more student oriented and not class oriented.

4 “First Aid”: Supporting Individualisation by eLearning

The development of social software (learning management systems, wikis, blogs, electronic bookmarks, ePortfolios) is one of the most important driving forces to realize multidimensional learning arrangements for all kinds of groups and individual working styles.

An OECD expert group published a booklet named “e-learning the partnership challenge” (OECD 2001). The publication explores e-learning developments in schools and higher education in terms of market prospects and partnership creation. One of the main impacts of information technology has been reported to be the “choice of learning style” and “individualized tracking and recording of learning”. For this expert group individualisation and e-learning technologies are closely related!

These environments are not a substitution but an enrichment of lessons and instructions. Phases of learning will be productively “lengthened”, lessons and homework of students will be connected in form of comprehensive learning projects. By using virtual lessons, time efficient learning will be possible.

Adult learners try to be very efficient in preparing for exams, sometimes having no patience for open and self-directed learning. Learning platforms (learning management systems and content management systems) can support structured work without losing control over the personal work progress. Therefore LM-systems combined with the ePortfolio are backbones supporting different kinds of a self-controlled workflow.

To illustrate the close connection between advanced pedagogical arrangement and “new media” clearly, three scenarios have been chosen to get some feeling for concrete arrangements:

5 Three Scenarios of Realisation

5.1. Approach Virtual Laboratory

In the last years new concepts of engineering education and e-learning environments in the laboratories have been improved at colleges of engineering in Austria (students aged 14 to 19). Some important elements are studies, whether systems in laboratories and construction lessons can be substituted or even completed by virtual systems and simulations. In a project technical and didactical solutions of virtual laboratory concepts have been approved of. Online labs and laboratory simulations play an important role as an enrichment for theoretical lessons and for preparations of laboratory work of the students.

The following table shows laboratories in their different context:

Table 1: Different arrangement of laboratories (Auer, Pester, 2002):

Experimenter

Experiment	Local	Remote (using Internet)
Real	Real laboratory	Remote laboratory
Virtual	Local simulation	Virtual laboratory and simulation

The advantage of different types of laboratories is that they bridge functions between engineering theory and laboratory practice. Theory and practice need not be separated in space and time. Students can carry out tests, whenever the laboratory is “open”, that means web connected. Students can gather extra experience, and they can do so individually. In regular lessons not only calculations or “dry” theoretical arguments are presented, but also small experiments via the web. The examples can be tried out by students at any place and at any time. On the other hand, virtual laboratories or even remote experiments can be used for preparing real laboratory work, which cannot be substituted, because experience with materials and engine maintenance must be made personally.

At colleges of engineering, where such labs have been introduced, an interesting development could be watched: Both, teachers and students were soon familiar with learning platforms and web connections. So virtual study rooms could be arranged, where experienced teachers could offer support to their students in evening lessons before exams .- exactly at the time, when the students needed information input and some explanations. This kind of individualisation was a perfect example for the time interaction of supply and demand in the learning process.

5.2. Approach Learning Community

The following concept of a learning community is based on the idea of realising all dimensions and operating levels of the competence model: professional, social and self-competence.

Learning communities step into an intensive discussion of a determined topic, exchange present knowledge and try to work on common case studies (Seufert, 2003). In the concept of learning communities on hand students work on self-induced learning projects in a virtually supported learning environment (blended learning). This learning project could be based on real (e.g. realistic) problems of the later profession and follows the guidelines of “learning by discovering” (Landwehr, 2001). In this setting knowledge will not be actively presented by the teacher, it should first be requested by the students (knowledge on demand). This system follows the ideas of “scaffolding and fading” in the sense of cognitive apprenticeship as defined by Collins and Brown.

The following figure shows the special guidelines for learning communities and illustrates the processes:

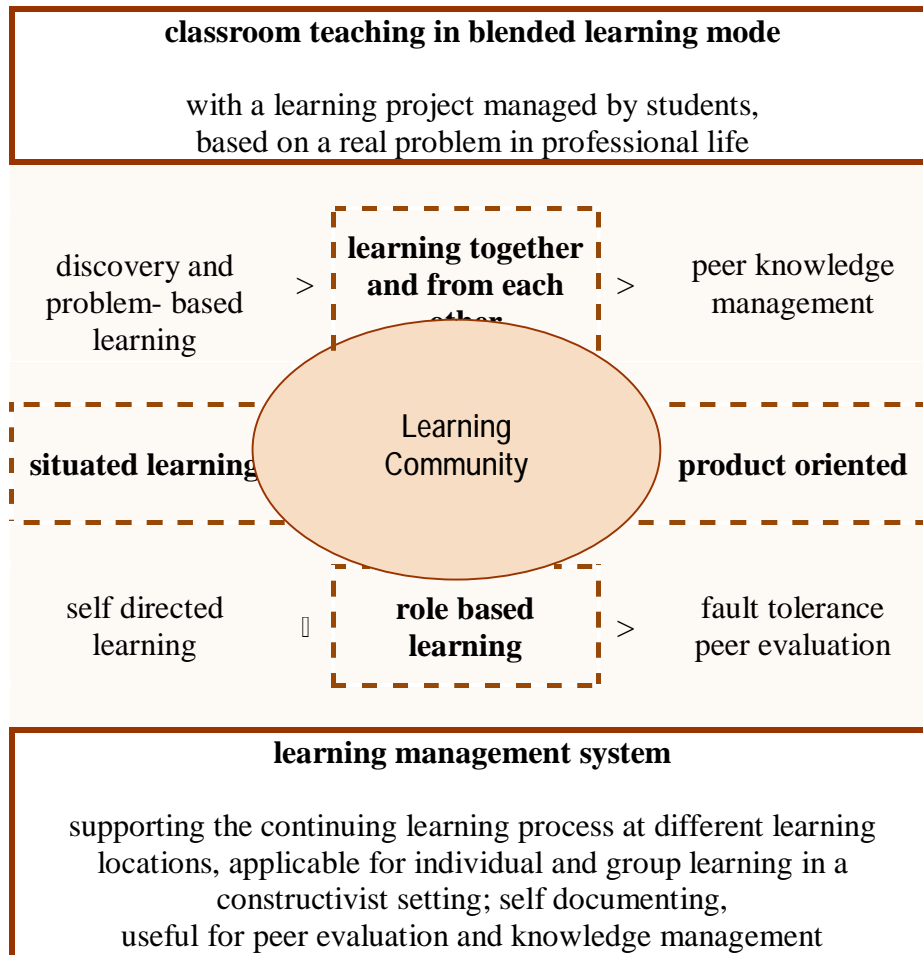


Figure 3 - concept of learning communities

Several students are responsible for each learning project in a special team-oriented management setting. Over the academic year each student should gather experience both in completing the set task and in managing learning objectives in a team. The social setting of the learning environment should be fault-tolerant to encourage students to take on an active role in the community by discussing self-acquired knowledge. Before the teacher evaluates the results, each product should first pass through reflection and feedback processes in the community.

This concept tries to break up the “knowledge monopoly” of teachers: Students are responsible for the setting and arrangement of their work. These “third” places of learning (neither controlled by teachers nor parents) should be fault-tolerant, should use the principle of learning from mistakes, but should have clearly defined responsibilities for the end result including the final presentation or the presentation portfolio (see below). Personal reflection and peer evaluation come before the teacher’s or expert’s assessment.

Teams and groups, where these principles work, also have the possibility to use the world wide web to get information in anonymous expert web newsgroups; thus extending the peer

learning community into virtual space. If you get some information from these communities, you should after a while also supply information to this group. With students developing software in technical colleges the use of newsgroups and web communities is one of the most important steps to find their own working attitude.

5.3. Approach “ePortfolio” Monitoring the School Career

Working portfolios have some tradition in teacher-training in Austria: For ten years “academic courses” in special psychological or pedagogical subjects have been held at the “Pädagogischen Hochschulen” in different provinces. Topics are supervision, professional upgrading in the respective fields of engineering, informatics, e-learning and e-teaching, and others. The successful completion of the one- or two-years courses postulate a working portfolio (an examination does not seem adequate for a teacher’s work), including a teaching diary, a documentation of lesson modules, reports on personal reflection and an evaluation of teaching and learning processes with different instruments (questionnaires and others). The experiences are positive, the courses are well established in in-service teacher training in Austria.

Introduced by workshop conferences of “Salzburg Research” from 2005 to 2007 a transformation of concepts is being discussed in a twofold way:

- The portfolio concept should be applied to document the student’s learning and working progress. There are some open forms of learning in secondary education and the students have to manage project work during the end of their secondary education (e.g. “Fachbereichsarbeit”, engineering projects in teams, entrepreneurship experiences in business schools, tourism concepts and others). This progress at secondary level has also manifested itself in a change of regulations for the school leaving exams (“Reife- und Diplomprüfungsvorschriften” in the Austrian VET-sector).
- The portfolio should become an electronically hosted portfolio. Students have the chance to collect different solutions, oral and visual presentations and seminar papers at any time and place. The presentation of your own portfolio can be arranged, if desired and possible (maybe on excursions to other countries, in laboratories, during visits at or from partner schools or during internships). The working portfolios will later be transferred into presentation portfolios of school graduates and can be continually updated during university studies and practical work in companies.

In practice, some secondary schools of the e-learning Cluster Austria (eLC-Austria) decided to adapt the five-to-five model of Helen Barrett (Barrett, 2001) to introduce the ePortfolio idea to their students. The portfolio development starts with a structure analysis, afterwards a working portfolio is applied. The content is continuously reflected by students and teachers and a connection to other sources and digital work is made till - at the end of secondary education - a presentation portfolio has been established.

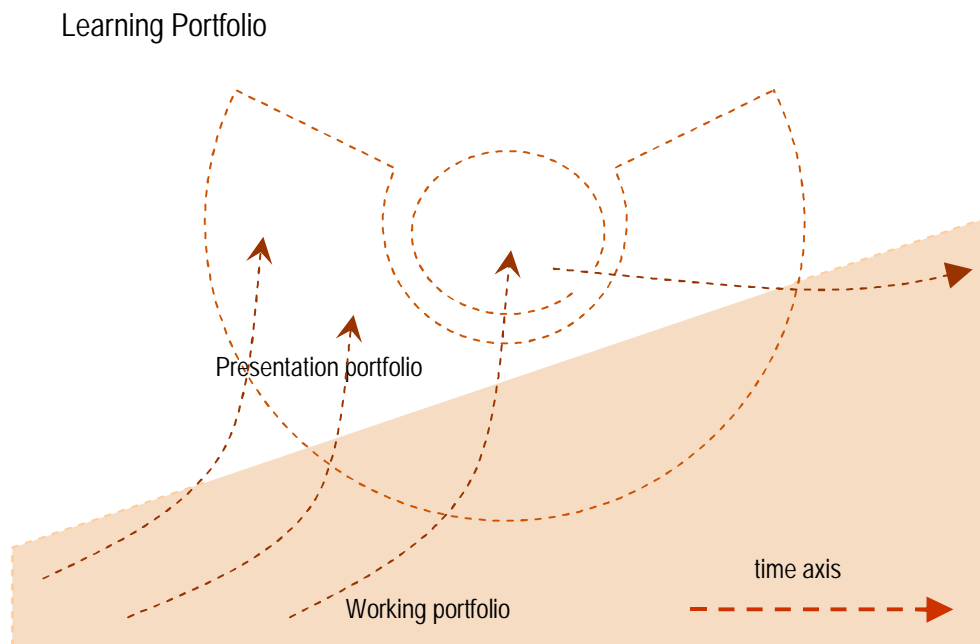


Figure 4 - Development of learning portfolios

There is a discussion going on with school inspectors and principals, if parts of the portfolio should be reviewed, for instance with the help of digital signature procedures.

A software environment can help to develop portfolio structures easily. Now, within the eLC-project of the approximately 100 participating schools, software tests are made. Up to now, no portfolio software fulfils all requirements, therefore function analysis must be continued. After first practical experiences with 15 upper secondary schools in 2007 it can be assumed, that without nationwide common service structures portfolio approaches are too different and cannot be compared. So work has to be done to create a technical platform, designed commonly but hosted separately. Simple schemes like Wiki-lists or learning platform courses are under discussion as well as more complex structures like LMS – portfolio environments with special export functions. Benefits of the web 2.0 transformation like social software or learning community tools are tested to establish a useful culture also for university demand. The portfolio module has been realized within the well known Moodle Platform with a special plug-in named “Exabis portfolio” by Andreas Riepl (www.schulportfolio.com). In this way, it is now possible for students to collect learning material and document and reflect their own learning path – for all their enrolled courses.

6 Summary

As shown in this paper the implementation of innovative and expanded learning strategies could now be realised at an undefined dimension by using digital environments and devices. Futur(e)Learning intends to encourage pioneers and settled teachers as well.

References:

- [1] BARRETT, H.C.; (2001) *ePortfolios in K-12 and Teacher Education*, ISTE-Presentation, Anchorage.
- [2] RAVET, S.; (2005) *ePortfolio for a learning society*, eLearning Conference, Brussels, May 19-20 2005, http://www.elearningconference.org/key_speaker/ravet.htm
- [3] BRÜGELMANN, H.; (2001), *Heterogenität, Integration, Differenzierung: empirische Befunde-pädagogische Perspektiven*, in: *Befunde der Forschung - Perspektiven der Pädagogik*, Universität Halle-Wittenberg, am 27.9.2001.
- [4] OLDENBURG, R.; (2000). *Celebrating the Third Place: Inspiring Stories about the "Great Good Places" at the Heart of Our Communities*. New York: Marlowe & Company.
- [5] LAVE, E.; WENGER, E.; (1991) *Situated Learning. Legitimate peripheral participation*, Cambridge.
- [6] MANDL, H.; REINMANN-ROTHMEIER, G. (2000). *Wissensmanagement, Wissenszuwachs – Wissensschwund*; Oldenburg
- [7] OECD (2001). *E-Learning, the partnership challenge*, Paris(www.sourceOECD.org)
- [8] MINISTRY OF EDUCATION; (2007). *Futur(e)Learning – die successful next development of the eFit-Initiative, Vienna*.
- [9] AUER, M. PESTER A., (2002) Web based simulation tools for virtual Labs. Proceedings of the Workshop ICL2002, Villach/Austria, 25-27.
- [10] SEUFERT, S.; (2003). *Virtuelle Communities gestalten*; <http://elearning-reviews.com/seufert/docs/virtuelle-communities.pdf>.
- [11] LANDWEHR, N. ; (2001). *Neue Wege der Wissensvermittlung* ; Sauerländer, Schweiz
- [12] PAPERT, S.; (1993). *Mindstorms: Children, Computers and powerful Ideas*, Basic Books, Boston.

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