e-learning: replacing teaching with learning

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Trends identified by the ACTeN project

ICT brings rapid changes and continuous advancements to our everyday life which creates new opportunities for a next generation of widely shared applications. Practically non-existent in the past, ICT driven training opportunities are now at the centre of every domain of training and education. The Internet is powering a new wave of training methods that custom fit work schedules, budget, and training preferences through innovative technologies, flexible delivery methods and engaging multimedia content.

The process of learning is being transformed by the digitalisation of our society. Though e-learning in fact is not more and not less than "actually learning", it still takes advantage of the multi-channel communication of multimedia contents driven by the latest technological developments. This makes technology the major driver of e-learning developments. Some trends can be distinguished:

- consumer access to broadband Internet connections is showing an exponential growth and a dramatic drop in price;
- pervasive computing, in which computing, connectivity and communications technologies connect small, multi-purpose devices;
- wireless solutions enable underdeveloped and remote areas quickly to take advantage of various web-based services in all areas of application;
- digital convergence, by merging capabilities of the ubiquitous infrastructure of telephone, radio, television and other electronic devices;
- agreements on technical standards for content development and sharing, which are expected to advance the development of web-based learning environments;

- adaptive technologies, that combine speech recognition, gesture recognition, text-to-speech conversion, language translation and sensory immersion will change the very substance of network-enhanced human communication;

- equitably available and affordable technology brings down the barriers of social, economical and geographical inequality.

Trends in e-learning, being very technology driven, heavily depend on ICT developments, including extended broadband access, wireless computing and the convergence of digital devices. Ultimately, teaching could well be replaced by life-long, self-directed e-learning for the consumer market.

The ultimate vision of lifelong learning and the knowledge society would in fact replace teaching with learning, enabling life-long, self-directed and flexible learning supports. There has been a shift among providers of education and educational technologies towards a greater emphasis on lifelong learning and entertainment/consumer learning. The largest potential demand for e-learning is likely to be in the consumption and entertainment sector, with employee learning as a good second, and students as the third largest markets. The opportunity for customer e-learning is now estimated to be much greater than employee e-learning.

AMBIENT LEARNING project

The purpose of the AMBIENT LEARNING project is to explore the tools, applications, hardware and software platforms needed in creating networked context aware environments for ambient services and to test them in the eLearning area.

The Survey report 2002 "Quality and eLearning in Europe" revealed some disastrous facts about eLearning: "***61% of all respondents rated the overall quality of eLearning negatively - as 'fair' or 'poor'. Only 1% rated it 'excellent'and only 5% rated it 'very good'***." The report is based on a web-based survey with 433 respondents that was carried across Europe. According to recent studies by IT Skills Research Programme and consulting firm OvumHolway the take-up of eLearning in Europe has been rather slow. The reasons for e-learning's slow growth is a combination of factors/barriers. The main barriers for successful take-up and deployment of eLearning are:

- Fear of miss-investment due to lack of established solutions, companies, standards etc.
- Lack of time for eLearning
- Lack of expertise to use eLearning solution
- Inadequate accessibility (barrier free access) and usability (interoperability)
- Lack of a customised, tailored eLearning service
- Failure to integrate eLearning with the work and life process
- Inadequate (restricted) low-quality learning content
- Doubts about eLearning benefits and expected expensiveness of eLearning solution

Another survey commissioned by the European Directorate General Education and Culture, called "Lifelong learning: a citizen's view" identified the main obstacles to lifelong learning: **time and money**. "*Although European citizens recognise the personal and social benefits of learning, they underline that lack of time due to job and family commitments is an important obstacle. […] This suggests that implementing lifelong learning effectively must find ways to enable people to combine activities in ways that* ***suit them practically and personally***".

Exactly at the above identified obstacles starts the AMBIENT LEARNING project. The objective of the project is to provide a pragmatic, easy-to-use eLearning service, which allows any time, any where and any how access to personalised, high quality learning content. The main distinguishing features of the AMBIENT LEARNING services to other eLearning approaches are the following:

- **Multimodal Broadband Access** which allows the user access to eLearning objects any time, any where and any how.
  Explanation: The user can use the eLearning system via different existing broadband networks (e.g. LAN at the office, WLAN at a specific hotspot, GPRS/UMTS on the move) employing the most suitable modality (interactive learning objects on the Office-PC, text-to-speech read-out while driving in the car, mobile PDF while sitting in the train etc.).
- **Context Management** enables the provision of eLearning objects based on the context of the user.
  Explanation: The context of the user includes factors like schedule, tasks, personal profile, know-how and interests etc. Based on the context; learning content, which suits the user perfectly can be delivered according to the context using the above mentioned multimodal broadband access.
- **Content Integration** allows access to existing knowledge catalogues and eLearning resources.
  The system can integrate already existing eLearning objects and other high-quality content. Within the project the resources of Press-Catalogue are included, which embraces the content of some 20.000 European scientific and professional magazines. Especially for the training of busy and experienced people this approach is suitable

The AMBIENT LEARNING services are demonstrated along three use cases:

Use Case 1: It is well known that busy professionals lack time for vocational training. Moreover the busy professionals prefer articles out of scientific or professional magazines as their main source for vocational training. Exactly this problem is addressed within the first application example of the AMBIENT LEARNING project.
Example 1: Mrs. Tailor is a partner in a consulting company, which is specialised in high-technology consulting. Due to her busy schedule and her attempt to achieve a good work-life and private-life balance, and because of her private assignment to assure a good upbringing of her children, she lacks time for vocational training. The AMBIENT LEARNING service allows her to structure and define her personal training needs. Based on her context (a situation like driving with her car to a customer) and her personal interest the learning content is downloaded from a scientific magazine database to her mobile device and is read to her with a TTS engine (text-to-speech) while she drives to her customer. The AMBIENT LEARNING service allows Mrs. Tailor to actively train and improve her knowledge in a concurrent approach, which does not negatively affect her daily schedule. If she has a free evening she can study from home using a secure broadband access to the AMBIENT

LEARNING service and choose ad hoc which type of media (e.g.: SCORM-based interactive learning unit, PDF, WWW-based learning unit, TTS, Flash) she wants to use for her learning activities.

Use Case 2: Innovative software based solutions and applications are not widely deployed in European SMEs. This is mainly due to the digital illiteracy and lack of financial resources to employ consultants, which could tailor the software applications to the specific needs of the SMEs. The second example tackles this issue.
Example 2: Mr. Frey is a trainer for a small software house and instructs customers how to install, adapt and use innovative information management solutions. Due to lack of qualified consultants, his employer is not able to deploy the useful information management solution to the European market. The AMBIENT LEARNING service allows to deliver an interactive learning unit to potential customers, where the functionalities of the information management solution are explained. An integrated assessment tool allows for interactive testing of the customers know-how and suggests context-based in-depth training or repetition of specific areas.

Use Case 3: Service employees which are mainly on external duty, have often no time and possibility to participate in standard training activities or state-of-the-art eLearning applications due to their different and often changing environments (different devices, different communication networks etc.). The AMBIENT LEARNING allows context-based access to important learning units, like new functionalities or services.
Example 3: Mr. Fernando is a travelling salesman for a mechanical engineering company. His company is able to implement innovations quite quickly into the machines. Therefore Mr. Fernando can always offer highly innovative products, which are described in technical specifications. Du to his extensive travelling with different means of transportation he needs to learn about the new functionalities of the machines using different modalities. If he is travelling by train the technical specification is downloaded from the Intranet as a PDF-document to his Notebook. During the train-ride he has the chance to read the specification. If he is travelling by plane, the technical specification is converted to mobile flash and he can access the learning content on his PDA, while he is flying to the customer. If he is on his way by car, he is informed about the main new features via TTS (text-to-speech).