



Contract No. SAS6 - 013635

PARCEL

Participatory Communication Activities on E-Learning

Instrument: SSA

Thematic Priority: Structuring the European Research Area

Final Report

Date of preparation: 30/12/2007

Start date of project: 01/06/2005

Duration: 30 months

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Project coordinator organisation name: Wissenschaftsladen Wien – Science Shop Vienna

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ACKNOWLEDGEMENTS

This report is based on feedback from NGOs who tried out software for technology enhanced learning, which was provided by developers participating in the two NoEs KALEIDOSCOPE and PROLEARN, and on discussions at roundtables with NGO representatives in Austria and the Czech Republic.

Thus it would not be available without those software developers, who provided software for testing:

- Boyan Bontchev, Sofia University
- Alexandra Cristea, Eindhoven University of Technology
- Jean-Pierre David, Equipe ARCADE, Laboratoire CLIPS – IMAG
- Andreas Kaibel, Fraunhofer Institut für Angewandte Informationstechnik FIT
- Leandro Madrazo, Research Group Architecture, Representation & Computation, Department Engineering in Architecture, La Salle-University Ramon Llull
- Erica Melis & Paul Libbrecht, German Research Centre for Artificial Intelligence (DFKI)
- Lydia Montandon and Ana Frutos, Atos Origin
- Jean-François Nicaud, Institute for Computer Sciences and Applied Mathematics (IMAG)
- Jakko van der Pol, IVLOS ICT-Expertisecentrum, Utrecht University
- Kevin Quick, Knowledge Media Institute, Open University
- Olivier Salaün & Serge Aumont, Comité Réseau des Universités (CRU)

And all those developers who could not be named.

It would not be available without those who take the time and resources to try out this software, give feedback on it, participated in the roundtables and contributed to them by giving presentations and sharing their experiences with technology enhanced learning in lively discussions.

Sincere thanks are given to them all.

The PARCEL consortium
Vienna, 30/12/2007

EXECUTIVE SUMMARY

The project *Participatory communication activities on e-learning (PARCEL)* was funded under the Science and Society Work programme of the European Commission's Sixth Framework Programme on Research. The objective of the call, under which the proposal for this project was submitted, was to conceptualise and try out innovative regional science communication activities for large-scale research projects such as Networks of Excellence, which go beyond one-way communication by actively engaging with citizens and their demands. Lessons learned should give future co-ordinators of such projects food for thought to engage in similar activities or to develop new ones informed by projects such as PARCEL to break new ground in science communication.

Conceived as a pilot project to complement the dissemination activities of KALEIDOSCOPE and PROLEARN, the two Networks of Excellence on technology enhanced learning the European Commission has funded recently, the consortium conducted local and regional science communication activities throughout the lifecycles of the NoEs, firstly, to draw out lessons for future local and regional dissemination activities of such large-scale projects for making them more efficient and effective and, secondly, to stimulate the further development of technology enhanced learning by providing input from new and complementary target groups. Besides these objectives, the activities contributed to raising awareness on technology enhanced learning among new user groups and on demands of these groups among developers of applications of technology enhanced learning.

With an eye on lessons learned from the experiences with new ways in two-way science communication, the consortium tried out novel activities and methods, which could be adopted, and reflected on them and appropriate conditions for engaging with citizens to develop good practice for large-scale research projects on technology enhanced learning, so that participatory science communication can become an integral part of such projects in the future.

PARCEL was targeted at small to medium Austrian and Czech NGOs which are actual or potential providers or users of technology enhanced learning and have different clientele. Altogether PARCEL reached out to a broad range of users. The software has been tried out by people of different age (from youth in training to senior citizens), with handicaps (physical, mental, and learning disabilities), with migration background, people with basic to higher education and, often, to people with low financial resources. Generally speaking, PARCEL reached out to groups which, although being quite broad, might be different from the traditional groups of technology enhanced learning, institutions in higher education, larger companies, governmental departments or other organisations with sufficient financial resources and staff familiar with ICT:

- Elderly people,
- People with learning disabilities and children,

- Handicapped people,
- Social groups lacking resources.

We think it can be regarded as an “acid test” for the widest possible usability of a tool, if it is principally – perhaps in different versions or with variable modules – usable by many different groups which do not experience one but several barriers when they want to engage with technology enhanced learning. Under this perspective PARCEL was targeted at groups which suffer from the Digital Divide.

Being a science communication project, the PARCEL activities brought the experiences, opinions and views of a broad range of small to medium NGOs in Austria and the Czech Republic and their different target groups into the development of tools for technology enhanced learning and into debates in the two NoEs KALEIDOSCOPE and PROLEARN. Because these groups are tendentially economically weak they might often be overheard. For this the consortium send developers NGO feedback on their tools and brought them together with NGO representatives.

PARCEL should not be mistaken as a project on usability testing. It was not intended to put tools for technology enhanced learning under systematic testing by NGOs, but to make them known in a potential user group with different needs and demands, different uses for the tools and different resources than those groups for which the offered tools were developed in first place. Since it was a dissemination project with a new approach, it was not a research project either, and not conceived as such, although a lot of interesting aspects have been revealed that would be worth further investigation. Instead of being a research project, PARCEL presents a new approach to integrate different target groups that are not driven by economic needs into the discussions (non-profit groups). PARCEL collected feedback from NGOs, but not in a way that would allow for quantitative comparison or for assessing the value of certain tools. Feedback on those tools should provide developers of software and course material with suggestions for further developments and food for thought. The feedback from NGOs on each single tool was confidentially given to its developers or those who hold property rights on them so that they can use the input. A summarising feedback on all tools was given in a feedback report, and many essential findings are described in this final report.

The offered tools should be attractive for NGOs, because for their time and efforts spent on trying them out they were rewarded with free licenses. The consortium selected software for web conferences, mathematics, discussing and annotating online texts and tagging images with keywords, and for administration and development in technology enhanced learning. (Annex 1 contains descriptions of those tools for technology enhanced learning.)

Within feedback rounds, in individual contacts and at roundtables “test users” reported their experiences. The consortium collected feedback on the tools not only from NGO which tried out tools, but also from those who declined to, because this helped to get information on needs and demands especially of those groups who might experience one or more barriers for using technology enhanced learning. NGOs had several possibilities to give their feedback personally, by phone and/or by mail. Additionally, they were invited to fill in

feedback questionnaires, which were individualised and tailored to the respective situations of those who tried out tools.

Feedback was forwarded to the developers under strict confidentiality. Moreover, six roundtables on technology enhanced learning brought together NGOs with developers and other experts on technology enhanced learning. Those events produced additional knowledge on which technical devices and software groups with special needs and non-profit institutions offering training and education demand and offered insight on how to adapt such applications to the demands of such groups.

This strategy gave valuable insight into where the devil is in the details and how it may be possible to improve the access for often disadvantaged target groups, but also for citizens at large. By reflecting on specific tools, the NGOs often became aware of their opportunities, possibilities or barriers to use technology enhanced learning at all and made their ideas about the pros and cons of applying tools in specific situations more clear and precise. After reflecting on and/or trying out a tool they could inform themselves about the operability by using it and name reasons why something worked or did not. The fact that there is a Digital Divide became clearly visible during the project: the feedbacks touch many issues related to basic technical equipment and conditions that are vital for low-budget groups or groups with special needs. So their feedbacks provide important clues how all citizens may get “more equal” chances to benefit from information and education supported by computers and technical assistance.

Getting into contact with NGOs by offering tools, it became quickly clear that a huge number of NGOs is interested in technology enhanced learning, but actually faces a lot of barriers, so that they cannot make optimal use or no use at all of the various applications. It was only by concretely reflecting on how to make use of certain software offered in PARCEL that a lot of NGOs involved in PARCEL became aware of actually facing one or more barriers that hinder them from starting their activities in technology enhanced learning. Frequently named barriers were lack of appropriate computer equipment or broadband Internet access, insufficient computer skills, limited time for becoming acquainted with a tool and also the number of personnel hours that can be invested in computer training are finite when resources are low. If some support was necessary and information was written in English, then this could create an additional impediment. *Usually one barrier only would hinder a group completely from trying out a tool.*

Accordingly, NGOs often demanded tools that do not require any training time or any support at all, that can be used immediately, and do not require any superior equipment or too much bandwidth for Internet access. Favoured tools are self-explanatory or similar to software and devices the concerned NGOs already use. The advantage of “mainstream” tools that are basically structured and shaped in very common ways lies in the fact that not only less time is needed to learn how to handle it, but also that this time is not wasted in case the related tool is dropped one time, because the acquired knowledge is not exclusively restricted to the tool in question, but it is transferable to other software or other applications, and so it

contributes to the general computer skills of an individual. It is necessary that tools are compatible with other widely used tools to make co-operations smooth. And again it could be those social groups with special needs (who could greatly benefit from special devices and software) that are especially concerned if incompatibilities are created, because they already tend to be excluded from technology enhanced learning, and the development of software or add-ons for special systems will always lag behind the common market.

Although it is evident that some of the demanded technical devices or software are technically feasible - the necessary features exist in technical devices that are available now or were available in the past - there are not many of them available, and only more public funding might trigger developments here.

Very roughly two groups of NGOs were interested in trying out tools for technology enhanced learning: Ones with some experience in technology enhanced learning and plans to expand their activities in this field, and ones being interested but not yet familiar with it. The “uninformed” group sometimes seemed to be quite open when choosing tools, but in the “informed” groups we often meet those who already have a certain set of software and have less flexible ideas about which tools should complement their equipment. We also found out that it is mostly the group that is not confident in technology enhanced learning yet but interested that is often confronted with specific barriers that hinder them to make first steps into it.

The reasons given by these interested groups that did not try out tools for a longer period are much the same as why they cannot make use of any other available tools for technology enhanced learning. We found out that prices – the tools were offered without any direct costs for NGOs - might not be the only reason why it is difficult for low-budget organisations to make use of them

We think that feedback from those groups that could not get deeper into testing might be the most interesting, because these NGOs were seemingly strongly interested in technical support that might facilitate some of their tasks. What they say about those tools reveals that there might be several conditions that hinder many organisation from using promising technical advances and that some of these barriers appear already in a very early phase. Developments that could milder the effect of some of these barriers for low-budget groups might increase the number of people making use of technology enhanced learning. This would not only benefit these groups but also society at large, because education is an important economic factor and this might also create new markets for new products. For the low-budget groups the following issues seem to be central:

- Time resources
- Technical barriers
- Lack of computer expertise
- Frustrating experiences with technical devices
- Specific needs for specific target groups
- Design of the graphical user interface

- Estimated Training time
- Compatibility with already used tools for technology enhanced learning
- Lock-in phenomena
- Language
- Support
- Technical requirements
- Sensitivity to gender, age or ethnicity
- Learning level of tools
- Everyday learning content
- Tools should run on different hardware and/or include special equipment
- Internet access
- Security and data protection
- Tools are too expensive

The project activities opened up perspectives on organising similar communication activities from a developer, user and policymaker angle and on developing applications for technology enhanced learning from a user and from a policymaker angle.

Reflecting the experiences with PARCEL leads us to following conclusions, which might be useful or give food for thought to other communication activities:

Although PARCEL was conceived as quite an open project from the very beginning, it turned out favourably to loosen the project structure even more. Openness seems to be crucial in such a project, not only in respect to various ideas from different social groups but also openness to the different time schedules and structure. The project has to be flexible enough so that different organisations can join or leave. Retrospectively we opine that the project could have lasted four years or longer.

Organising satisfactorily user involvement calls for candid interest in user feedback to create trust in the planned communication activities. This can be shown in lowering the participation threshold as much as possible, e.g. For achieving this objective, applications for trying out should not require state-of-the-art equipment and much time for becoming acquainted with, be compatible with the software of those you try them out, available in a language test users easily understand, accompanied by fair technical documentation, and be of interest for users. Unless one can be sure that an application is self-explanatory to users, good technical documentation pays off in co-operations with users. The language being used should be easily understandable by non-native speakers. Software to be tried out should be compatible with older (7 – 10 years old) technical equipment. To signal that user feedback is welcome and highly appreciated, software should be offered in full versions (not in demo versions), which are fully developed (not in beta or even alpha version) and, because their time is valuable, such users with low resources should be reimbursed for trying out software. Giving software away for free is not sufficient to make such NGOs interested in trying out software, because they incur other costs: staff costs for becoming acquainted with the software,

telecommunication costs, maybe additional hardware costs. Sufficient reimbursement of costs incurred is important here, because NGOs should participate primarily out of interest in the related topic and lacking time or money should not hinder smaller or low funded organisations from participation. Ideally, a large number of NGOs should be able to participate flexibly in projects like PARCEL, and all NGOs should have a chance to participate, but measures should be taken to avoid a selection bias. Being open about evaluation activities and respecting the privacy of “test users” creates trust. We suggest that specialists on gender issues should be given the occasion to comment material that is used in technology enhanced learning to avoid gender stereotypes.

From the perspective of users, who participated in PARCEL, software should require little training time, be intuitively understandable and affordable. These demands could be met by developing software with a customisable range of functions and add-ons to existing software. Several groups also have a demand for affordable robust technical devices that can withstand physical challenges. In summary, the following features of tools might contribute to chances for barrier-free technology enhanced learning: Simple things might be useful enough, not overloaded with features, software should run on different old devices, compatibility is important, too. Optimally new software runs on different old devices and special devices are usable with common cheap software, so that users do not need different devices for different software, which would make them expensive again. The term “barrier-free” (or poor in barriers) relates to Web design and should be defined for and applied to technology enhanced learning, too.

In general it can be said that opportunities for policy are in establishing structures, which support participatory science communication activities and the uptake of societal demands by RTD performers in technology enhanced learning. In the course of the PARCEL project we found indications that competition among software developers, content providers, and contributors negatively impacts on participatory science communication activities. We think it would be worth to investigate more deeply into the structures of the marketplace of technology enhanced learning and its more and less desirable effects, and how to establish a healthy balance between co-operation and competition. Competition may have impacted on PARCEL, too, and might impact future support projects.

Taking into account different time schedules, organisational structures and target groups, project structures should allow a not too tight workplan with sufficient elbow room, also for delays, and be flexible enough so that different organisations can get in and out. This extends to cooperations with other projects. We think a project like PARCEL should be as open as possible to different EC-funded projects. Participants in other EC-funded projects or NGOs becoming interested in participating in a project quite late after it commenced should be given opportunity to take part in such communication activities. Based on experiences in PARCEL, we recommend to allow for a project duration of 4 to 5 years at least. It is essential for success that such duration goes together with open project structures and a workplan with considerable elbow room.

Such activities require standards for real interaction between RTD communities and NGOs, that is, to avoid that engaging with sometimes unfamiliar users is perceived as an obligation one wants to dispense with, is conducted as a pseudo-involvement or that developers consider needs and demands they only imagine as societal demands. Otherwise mainly already marked claims and well-known interests would benefit from RTD.

Such participatory science communication activities should be conducted by external experts, who are trained in qualitative social research and/or cultural sciences, provide clarity by defining clear, transparent roles for users, practical and theoretical experts and their respective expertises, have no vested interests and are not dependent from developers. Thus they can remain impartial and matter-of-factly, and with their expertise and their position, they are in a better position to bring in the views of potential user groups.

To counter unintended effects and an arbitrary selection of NGOs it needs credible institutions, which are not dependent on the developers and their organisations, to act as intermediaries, a sufficient number of highly diverse user groups, and the systematic involvement of social groups with low resources and from society's low-education strata. Measures for embedding NGOs should be designed in a way that they do not narrow down the possible number of involved organisations. To avoid that only the "usual suspects" participate in as many such projects as possible, we recommend the regular invitation and inclusion of organisations not approached so far to sustain fresh and challenging user perspectives. Special emphasis should be given on smaller and low budget groups, which are often overlooked in economy-orientated development.

To find more NGOs, which are willing to try out software despite low time and financial resources, giving software away for free is not sufficient. NGOs with low financial and time resources should be reimbursed for staff costs for becoming acquainted with the software, telecommunication costs, and maybe additional hardware costs. Developers need incentives for being involved in such communication activities. Strict intellectual property rights can adversely impact on communication activities on ready-to-use tools, which have already been licensed, and on taking up societal demands. Systematic research on how intellectual property rights impact on taking up a broad range of societal demands is required.

Structures, initiatives, and projects should be supported that offer sound and individualised information, marketing activities should cautiously be launched.

Neither developers nor participating NGOs must imagine the slightest possibility of risking disadvantages by participating in such open processes. Building trust needs not only time but also sets of rules which are binding and on which all participants can rely. A privacy and confidentiality policy set out in writing should be standard, and all participants should receive it, even if they believe they do not need it – in some situations they might be more open, because of this conformation.

Embedding RTD in society efforts demands the uptake of societal demands. Efforts should

be made to stimulate a broader awareness among scientific communities, funding agencies and RTD initiators of good practice in uptaking such demands in RTD. Research on such good practice is scattered; an integrative perspective on it is missing. To identify good practice research on it should be commissioned.

In the course of the PARCEL project we identified opportunities for policy, which cannot be summarised under science communication alone, but concern technology enhanced learning. Those opportunities pertain to the advancing and sharing of content, gender issues, secondary costs, and funding of basic tools and contribute developing technology enhanced learning poor in barriers.

We think financial, time, staff and technical resources could be saved by stimulating advancing and sharing content for technology enhanced learning. Other regimes of funding and intellectual property rights could contribute to achieve this objective. Similar to open access scientific repositories, content developed under governmental grants could compulsorily be stored in repositories on technology enhanced learning materials and made available under licenses such as Creative Commons that provide a flexible range of protections and freedoms for authors and educators by defining them between full copyright and the public domain.

To avoid hidden sexism and stereotypes in teaching materials and learning surroundings of technology enhanced learning, we recommend that experts on gender issues shall comment on content for technology enhanced learning.

To avoid frustration with technology enhanced learning hidden secondary costs should be avoided or made clear from the very beginning. From a consumers' view there should be standards on presenting such potential secondary costs instead of hiding them.

According to the feedback we received, markets do not provide applications for technology enhanced learning, which are affordable for low-budget target groups and/or people with special needs and meet their demands. Sometimes simple software, adaptations of older hardware or small revisions can yield better results, sometimes a more clearly arranged graphical user interface can. Because market mechanisms fail here, it might be necessary to provide public funding for sensibly priced technical developments or for adaptations of technical devices and software to make the development of barrier-free tools more likely, which are beneficial for low-budget organisations and/or ones being active for a clientele with special needs.

It is worth further investigations, if there is a sufficient number of experts dealing with emerging issues of technology enhanced learning, to what extent user knowledge is based on groups of some highly engaged experts only and on what topics curricula should be developed.

ABOUT THE PROJECT

The project *Participatory communication activities on e-learning (PARCEL)* was funded under the Science and Society Work programme of the European Commission's Sixth Framework Programme on Research. The objective of the call, under which the proposal for this project was submitted, was to conceptualise and try out innovative regional science communication activities for large-scale research projects such as Networks of Excellence, which go beyond one-way communication by actively engaging with citizens and their demands. Lessons learned should give future co-ordinators of such projects food for thought to engage in similar activities or to develop new ones informed by projects such as PARCEL to break new ground in science communication.

PARCEL objectives

- Piloting a new integrative dissemination approaches
- Dissemination of tools for technology enhanced learning and information on KALEIDOSCOPE and PROLEARN activities.
- Bringing the experiences, opinions and views of a broad range of small to medium NGOs in Austria and the Czech Republic and their different target groups into a debate on technology enhanced learning and its future development. Because these groups are tendentially economically weak they might often be overheard.
- Bringing together developers of tools for technology enhanced learning with new potential providers and users of technology enhanced learning.
- Feeding back experiences from these activities to policy makers and (potential) project co-ordinators.

Conceived as a pilot project to complement the dissemination activities of KALEIDOSCOPE and PROLEARN, the two Networks of Excellence on technology enhanced learning the European Commission has funded recently, the consortium conducted local and regional science communication activities throughout the lifecycles of the NoEs, firstly, to draw out lessons for future local and regional dissemination activities of such large-scale projects for making them more efficient and effective and, secondly, to stimulate the further development of technology enhanced learning by providing input from new and complementary target

groups. Besides these objectives, the activities contributed to raising awareness on technology enhanced learning among new user groups and on demands of these groups among developers of applications of technology enhanced learning.

With an eye on lessons learned from the experiences with new ways in two-way science communication, the consortium tried out novel activities and methods, which could be adopted, and reflected on them and appropriate conditions for engaging with citizens to develop good practice for large-scale research projects on technology enhanced learning, so that participatory science communication can become an integral part of such projects in the future.

We hope that the results of PARCEL will stimulate further development of tools for

technology enhanced learning by giving valuable hints from test users how such tools can be improved, especially in respect to usability. In the long term the success of communication activities like PARCEL could translate into improved marketability, acceptance of open source software and public participation in development processes alike. This could open potentials to integrate the needs and demands of citizens on science and technology more often and to a greater extent than it is done presently.

Engaging with new user groups

One cannot engage with the “citizens”, the “public” or the “society”, only with specific groups. PARCEL was targeted at small to medium Austrian and Czech NGOs which are actual or potential providers or users of technology enhanced learning and have different clientele. Altogether PARCEL reached out to a broad range of users. The software has been tried out

Possible target groups of NGOs

People of

- different age (junior and senior citizens),
- with different handicaps (physical, mental, learning disabilities ...),
- with migration background,
- often people with low resources.

PARCEL reached out to groups that may be different from traditional users of technology enhanced learning.

by people of different age (from youth in training to senior citizens), with handicaps (physical, mental, and learning disabilities), with migration background, people with basic to higher education and, often, to people with low financial resources. Generally speaking, PARCEL reached out to groups which, although being quite broad, might be different from the traditional consumers of technology enhanced learning, institutions in higher education, larger companies, governmental departments or other organisations with sufficient financial resources and staff familiar

with ICT, e. g., public kindergartens, schools or universities, private enterprises, managers, or members of other professions may be the groups for whom these tools were developed in the first place. They can differ fundamentally from NGOs, e. g., in regard to their structures, their resources, needs and demands.

There are several reasons why the feedback of NGOs is not applicable to all other potential users. It might quite differ in some respects from the feedback of the primary target groups of R&D activities on technology enhanced learning. Nevertheless there might be some other groups than NGOs whose feedbacks may be the same as far as they share some characteristics: for example, there may be many SMEs or educational bodies in a similar low-budget situation as many NGOs, or there may be enterprises interested in employing people with special needs. Hence, this report can be useful for developers who want to broaden the potential scope of their target groups. If they take some aspects of the feedbacks into account and adapt their products accordingly, successively markets for technology enhanced learning may develop where people with all kinds of individual needs can find a much broader set of tools that are useful for them.

We have chosen NGOs, because we could expect new insights from them. NGOs are interesting for projects on technology enhanced learning, because they are often identified as “interfaces” between different societal groups, the government, the media and other institutions. In this role they may be sensors for societal developments, and often they are also opinion leaders. Because they work with or for “the citizens” they are – at least in theory - good distributors for innovative approaches and technical improvements.

NGOs are also interesting, because they are inhomogeneous and because they often work with or for very different social groups, some of which may have special needs. Their members or their clientele may be different age groups, like children, elderly, adult or they may be orientated towards gender and/or migration issues. They may work for with people in different professions and level of education, for people without or with one or multiple handicaps. Thus they work with/for people at different stages of their lives, situations and conditions, in each of which the possibilities and outcomes of technology enhanced learning might present quite differently. Blind adult people may need other things than children with visual handicaps that have to fight with other handicaps at the same time. It may still be different, if they live either in remote rural environments or in the centre of a large city, and so on. There are endless combinations of life situations, and establishing NGOs can answer some of these diverse demands flexibly. NGOs can tailor their offers to the actual needs of their clienteles or individualize them in a relatively short time, because they neither have to follow the forces of the economic market as enterprises have to, nor they structured as rigidly as governmental departments.

NGOs are an interesting target group, because they very often are involved in education. They may be involved directly, by offering education classes, either low budget and/or for special groups. Or they may educate indirectly, because they want to educate on a certain health condition or a environmental or social problem. They can make divers use of tools for technology enhanced learning. They may not only use it for their external education objectives, but also inside their own organisation in order to educate their stuff members. Education by communicating on an international level, exchanging ideas with organisations in other countries and comparing the ways to work becomes more and more relevant in times of globalisation and becomes technically feasible.

NGOs have in common that they act by definition for “non-profit” goals. Although this does not exclude them en bloc from potential purchasers - there are of course NGOs that are able to buy tools for technology enhanced learning – there are some differences to other institutions, like governmental organisations or enterprises. NGOs may be less likely to spend too much money on software or gadgets that are useful for technology enhanced learning. Many of them work on a low-budget scale. Often NGOs are fulfilling valuable tasks for society, but cannot recruit human resources in the same way as other organisations. They frequently depend on volunteers. If they can employ staff, they rarely can pay them generously so that person hours have to be calculated sparingly, often they do not have much office space, because they cannot rent too large premises, a lack of necessary equipment and infrastructure is characteristic. Even if they are well funded, they are morally

and legally obliged to economize and to spend their budgets in accordance with their non-profit goals, they may work for or with a clientele that may have special needs or they offer free or cheaper courses, so that people with low income can afford education and training. They might not “invest” like an enterprise in future technologies in anticipation of economic long-term profit, but they might need to see a reasonable cost-benefit ratios in a quite short distance. Otherwise they risk to cut money from their societal goals or from the clientele they work for. In our experience, NGOs in general tend to use their funds thoughtfully and cautiously.

Apart from being inhomogeneous in each country, as shown by research, NGO landscapes vary in several respects from country to country. We cannot give final answers to this question on base of bi-national observations, but perhaps some research could be done on the issue, as it may impact on projects that involve NGOs. The situation can be drafted as following:

In Austria there is a tradition of organised civil society, and it could prosper in the second half of the twentieth century. Nowadays civil initiatives, advocacy groups, cultural associations, and service organisations create a vivid and multifaceted NGO landscape which is appreciated as an indispensable for political and social life. Many NGOs can work very professionally for and with different social groups, and so often NGOs are involved in public health care and education. Because there are so many organisations, there are even organisations and enterprises that have specialised on services for NGOs.

The situation in the Czech Republic may be quite different. We see a much smaller number of NGOs in the Czech Republic compared to Austria. We can only speculate about reasons and we can assume that the differences in history can have an impact on NGO landscapes for many years. But we do not know which characteristics can be attributed to the existence or fall of the Iron Curtain, because there may be other reasons too: NGO landscapes often differ not only quantitatively but also qualitatively between countries, because of different legal and cultural conditions for NGOs, and because they tend to complement the activities of governments and public entities, i. e., they are reacting to the (momentary) needs of a certain society and different social groups. We presume that there may be some differences how NGOs in the Czech Republic and/or Austria perceive technology enhanced learning, how much information they have about it, by how far they plan to increase their activities in technology enhanced learning in the next years and, last but not least, how much they suffer from barriers that do not allow them to make use of it. Additionally there might be differences in the strategies of different governments to encourage the uptake of technology enhanced learning in education, which again would directly impact on how NGOs react to promotion of technology enhanced learning.

All these traits make NGOs interesting for projects on technology enhanced learning. Because a lot of them work for disadvantaged people and/or important societal goals, we think that NGOs should be more often considered as primary target groups whose special needs are taken into account when tools for technology enhanced learning are developed.

Also, there is some consensus among experts that technical computerised aids do carry the potential to improve dramatically the learning situation for many social groups that are still largely excluded from education.

The NGOs we particularly paid attention to were low-budget or even groups with no budget at all. Of course we did not drive away well funded NGOs, but the focus remained on those many groups that work with narrow financial scope. They reveal us many fundamental aspects of technology enhanced learning, many of which might be transferable to the use by the (wo)men in the street. When addressing NGOs we address a very broad spectre of “people in the street” who often may not be anticipated as potential users when applications for technology enhanced learning tools are developed. The term “special target groups” suggests small and marginalised groups, but in fact they make a huge part of the population, if not the majority: the average person exists as a statistical factor only, in reality almost everybody is special in one or more ways.

Because “NGO” includes rather a wide spectrum of organisations, among others environmental groups, welfare associations, trade unions, interest groups, but also religious cults, political activists, groups of amateurs, it had to be specified which groups PARCEL should address and which groups it should not take into its focus. Because the boundaries between different kinds of organisations and their objectives are blurring, a selection procedure was consented to build up a data base with small to medium organisations with social and/or educational goals. The preferences of developers, which had expressed their interest in receiving the opinion of certain target groups was taken into account, too (a feedback questionnaire had been sent out before). Aside from NGOs working with/for special target groups, NGOs specialising exclusively on education issues received an entry in our address databases. A large group were the “Volkshochschulen”, which are adult education centres. They are partly publicly funded non-profit education centers for the general public and traditionally offer low-cost education. We did not only address “Volkshochschulen” in the cities but also those in rural and remote areas. Most of these institutions were nonreligious, but some were maintained by churches, too. Other important groups we addressed were organisations that target children, youth, senior citizens, women, migrants, deaf communities, different groups with handicaps like people with acute or chronic diseases, persons suffering from impairments or learning disabilities. The feedback from organisations working with/for broad spectre of people with special needs promised to broaden the view on using technology enhanced learning for various purposes and special target groups.

Trying something new in science communication on technology enhanced learning

Being a science communication project, the PARCEL activities brought the experiences, opinions and views of a broad range of small to medium NGOs in Austria and the Czech Republic and their different target groups into the development of tools for technology enhanced learning and into debates in the two NoEs KALEIDOSCOPE and PROLEARN. Because these groups are tendencially economically weak they might often be overheard.

For this the consortium send developers NGO feedback on their tools and brought them together with NGO representatives.

To avoid some misunderstandings, some words on what PARCEL was not about. Because NGOs gave feedback on software they tried out, PARCEL should not be mistaken as a project on usability testing. It was not intended to put tools for technology enhanced learning under systematic testing by NGOs, but to make them known in a potential user group with different needs and demands, different uses for the tools and different resources than those groups for which the offered tools were developed in first place. Usability testing is conducted in highly specialised laboratories, where the behaviour of testing persons is closely monitored. And ideally test subjects have not seen the software or device before they use them in the artificial testing environment, because otherwise learning effects and preconceptions become uncontrollable factors that will slant the results of these highly elaborate and expensive procedures.

Several people asked us to do comparative testing of tools, but this is neither what PARCEL is about nor do we think that this would be technically feasible in view of the requested number of samples, and the “testing” organisations, which share comparable traits not only in testing behaviour, but also in needs specific to their situations, available hardware, software experience, resources, individual wishes, and that are willing to spend considerable time on testing a set of tools. It is not possible to compare the quality or usefulness of the

Activities to get NGO feedback

- Promote tools for technology enhanced learning developed by KALEIDOSCOPE and PROLEARN partners
- Get information what tools are needed and demanded
- Collect feedback as well from NGOs that try out tools and those that cannot or do not want to try them out: Feedback questionnaires, email, phone, face-to-face meetings
- Find topics that NGOs want to discuss
- Organise several roundtables on these topics with experts (preferably with participants in PROLEARN and KALEIDOSCOPE) + practioneers + interested laypersons from NGOs

offered tools by comparing feedbacks. No ranking, no benchmarking was intended and applied. We think such approaches would be over-simplifying, and, besides it seems technically infeasible to do this, we doubt that such approaches would yield good results in terms of more available and improved tools for technology enhanced learning.

Since it was a dissemination project with a new approach, it was not a research project either, and not conceived as such, although a lot of interesting aspects have been revealed that would be worth further investigation. Additionally, in order to attract more NGOs, for some tools it was necessary to offer extended support like translations and/or consulting – which in some ways this altered the original tool.

Dissemination activities are principally in deep conflict with impartial research: even the slightest suggestions on the quality of tools would influence those who are interviewed or

answer the feedback questionnaires. If the project had been conceived and conducted as a research project, we would have set up completely different structures and applied methods that avoid all influence. If it would have been orientated towards quantitative research, it would have needed a random sample of a defined population and depending on the research questions eventually also a control group. If it would have been orientated qualitatively, it would have aimed as much as possible at the full scope of possible views and it would avoid bias by previous promotion.

Instead of being a research project, PARCEL presents a new approach to integrate different target groups that are not driven by economic needs into the discussions (non-profit groups). PARCEL collected feedback from NGOs, but not in a way that would allow for quantitative comparison or for assessing the value of certain tools. The feedback from NGOs on each single tool was confidentially given to its developers or those who hold property rights on them so they can use the input. A summarizing feedback on all tools is given in feedback report, and many essential findings are described in this final report.

Activities to promote e-learning tools

- Dissemination of a brochure in Czech, English and German to present them
- Several direct mailing campaigns (databases with more than 2.000 Austrian and Czech NGO addresses)
- Collaborating with NGO umbrella organisations to disseminate information on PARCEL
- Send out press releases to media, newsletters and NGO portals on the WWW
- PARCEL Website
- More than 100 personal contacts with NGOs: phone calls and meetings

NGOs were contacted several times in order to invite them to try out tools or to participate in a roundtables.

Feedback on those tools should provide developers of software and course material with suggestions for further developments and food for thought. We hope that disseminating the experiences and desires from NGOs and their various target groups will be taken into account in the future and integrated into the development of technology enhanced learning.

In June 2005, at project start, firstly the consortium released a call for participation to developers in KALEIDOSCOPE and PROLEARN to offer applications on technology enhanced learning they have developed for being tried out by NGOs. Developers were requested to provide some information on the tools they would be able to offer (among others, technical requirements, necessary and offered support, and estimates of the required computer skills and the time for becoming acquainted with the tool) and on the conditions they would be able to give NGOs for testing the tools (e. g., free licences for a certain number of organisations, courses or individuals) and in which target groups they would like to have their tools tried out. We recommended to offer them under a free license to provide favourable conditions for trying them out. Developers offered a broad range of interesting applications for video conferencing, mathematics, content management and development, and tools for collaborative working with texts and images. The consortium discussed their usefulness for NGOs and categorised them.

In a second step the consortium informed NGOs about those applications. Available in print and for download from the PARCEL website, a brochure in Czech, English and German with descriptions and screenshots informed about the tools: what they are good for, their technical requirements, the offered license, their developers and the NoE the developers participated in. We launched several direct mailing campaigns to more than 2000 Austrian and Czech NGOs, informed media having NGOs as their target group such as newsletters, blogs, online portals and magazines by press releases, and consulted NGOs on appropriate tools. NGO umbrella organisations supported our efforts by informing their members on this initiative. Each NGO has been contacted several times.

The offered tools should be attractive for NGOs, because for their time and efforts spent on trying them out they were rewarded with free licenses.

Tools for web conferences

We offered three tools for web conferences, Flashmeeting, Hexagon and Open Classroom. For all these tools was strong interest, but at the same time we felt the direct competition to Skype and similar established applications. Some features we experienced as very helpful also in our own work, when we held our consortium meetings. Because server overload was not an issue, as is not always the case with more popular tools, the connectivity of online meetings was reliable.

Mathematics tools

Interest was high, the feedback mostly enthusiastic. Mathematics is not favoured by all pupils and students, and often seems to be difficult to teach. We think that technology enhanced learning can make such “dry” subjects more colourful. Math tools seem to be highly welcome by teachers, pupils and students.

There was very positive feedback on a tool that covers almost all areas of school math and where fractions was tested.

Another math tool with smaller scope only existed in French and English. In order to make it testable for interested NGOs, the Science Shop Vienna translated it into gendered German. We think that tools like ActiveMath or Aplusix might substantially raise the attraction of mathematics for pupils and students.

Tools for discussing and annotating online texts and tagging images with keywords

Applications such as Annotation System and IMAGEnet are about deepening understanding, be it by discussing and annotating online texts or by tagging of images with keywords and discussing those tags. They are targeted at institutions in higher education.

Tools for administration and development in technology enhanced learning

Sympa, GenDoc, ARCADE, MOT and Atenea are targeted at staff in network administration, course management and content development. These applications tend to be more specific than tools for learning and teaching mathematics or web conference tools, which can be

used by a very broad range of users. Nevertheless, there have been interest in and test users for some of them.

(Annex 1 contains descriptions of those tools for technology enhanced learning.)

Some of the tools met more general demands, but many of them were tailored to special purposes and target groups. Hence, groups with very specific needs were offered tools for other specific purposes. Nevertheless, almost for all tools we found some interest, but only a few percent of contacted potential users tested immediately. Hence, maybe all tools could be tested and some more, if projects like PARCEL would be carried out at a larger scale and over several years, if specific offers are to meet specific needs, large numbers and long project duration have better chances for match making.

At some points the objectives of getting unbiased feedback for the developers on the one hand and presenting tools in a favourable way to NGOs on the other hand were conflicting. Where it was possible, we tried to get uninfluenced feedback. But at the same time, dissemination was the main goal of PARCEL, and this gave some priority to presenting tools in an attractive way to special target groups inside of NGOs, and to involve them in way that would be agreeable to them.

In view of the narrow time resources of many NGOs with a societal goal, it was sometimes necessary to give them additional support, e. g., by translating tools, adding technical documentation and in several cases personal assistance had to be given. Some tools did not provide sufficient support for the NGOs, which started to try out tools, so that understanding how the tool might work, would have over-proportionally extended their orientation phase and training time and could have discouraged them or left them unsatisfied. Because the support is part of a tool, contributing to the support meant to some extent altering the tool. We informed the respective developers and licence holders that the feedbacks were not fully countable then – and that, in our opinion, technical documentation and help functions should be given more weight. (Developers might be too confident with their tools to estimate correctly the significance of support and technical documentation)

Within feedback rounds, in individual contacts and at roundtables “test users” reported their experiences. The consortium collected feedback on the tools not only from NGO which tried out tools, but also from those who declined to, because this helped to get information on needs and demands especially of those groups who might experience one or more barriers for using technology enhanced learning. NGOs had several possibilities to give their feedback personally, by phone and/or by mail. Additionally, they were invited to fill in feedback questionnaires, which were individualised and tailored to the respective situations of those who tried out the tools. Possible situations were:

- Representatives of NGOs who try out tools on their own and give feedback
- People who educate others on tools and give their feedback in their role as trainers and on behalf of their students
- NGO members who looked through the tools but could not find anything to try out

immediately.

The feedback questionnaires contained mainly open questions, and users were encouraged to write down in their own words their impressions, experiences and ideas.

Feedback was forwarded to the developers under strict confidentiality. Moreover, six roundtables on technology enhanced learning brought together NGOs with developers and other experts on technology enhanced learning. Those events produced additional knowledge on which technical devices and software groups with special needs and non-profit institutions offering training and education demand and offered insight on how to adapt such applications to the demands of such groups.

PARCEL was conducted by four organisations from Austria - Wissenschaftsladen Wien - Science Shop Vienna (project co-ordinator) and the Centre for Social Innovation -, Bulgaria – the Centre of Information Society Technologies at Sofia University St. Kliment Ohridski -, and the Czech Republic – Predika s.r.o., and pooled a diversity of expertise and backgrounds such as technology enhanced learning, social sciences and the humanities, software development, science communication, marketing, adult education and vocational training.

As partners in PROLEARN, respectively KALEIDOSCOPE, the Centre for Social Innovation and Sofia University St. Kliment Ohridski operated as intermediaries between the two NoEs and PARCEL. They contacted developers of applications for technology enhanced learning in those NoEs to offer them for being tried out by NGOs, say, by organisations, which are not the target groups those applications are tailored to. This could result in insights about expectations and demands new user groups have of technology enhanced learning and stimulate new technical developments to increase the take-up of technology enhanced learning and improve the marketability of such applications. For promoting the applications offered by developers Wissenschaftsladen Wien – Science Shop Vienna and Predika contacted NGOs, organised roundtables, collected feedback on the applications and reported it to the developers.

This strategy gave valuable insight into where the devil is in the details and how it may be possible to improve access for often disadvantaged target groups, but also for citizens at large. By reflecting on concrete tools, the NGOs often became aware of their opportunities, possibilities or barriers to use technology enhanced learning at all and made their ideas about the pros and cons of applying tools in specific situations more clear and precise. After reflecting on and/or trying out a tool they could inform themselves about their operability and name reasons why something worked or did not. The fact that there is a Digital Divide became clearly visible during the project: the feedbacks touch many issues related to basic technical equipment and conditions that are vital for low-budget groups or groups with special needs. So their feedbacks provide important clues how all citizens may get “more equal” chances to benefit from information and education supported by computers and technical assistance.

SUMMARY OF FEEDBACK & ROUNDTABLE REPORTS

During PARCEL we intensely promoted tools for technology enhanced learning in the non-profit community in Austria and the Czech Republic. Many NGOs know now about the project and possibilities of technology enhanced learning, and we also draw attention to the fact that there are two large NOEs and many innovative activities at EU level. There are some NGOs that are already active users of technology enhanced learning, and they name often the same tools, which are frequently used. Apart from that, there seems to be a much larger number of NGOs that might be potential users of technology enhanced learning, but who meet some intrinsic barriers and who also might need certain tools. Getting into technology enhanced learning costs resources, and we do not know exactly how many NGOs might stay with it after they have received initial aid. Because technology enhanced learning should not happen for the sake of it, its objectives should be evaluated: the NGOs involved in PARCEL estimated the potential for software and technical aids to help them achieving their goals as quite high. Often NGOs lack financial and time resources, and as the devil sits in detail, there are often some other barriers that hinder them from implementing this innovation. Hidden and long-term costs should not be underestimated. They become visible when those who are responsible budget for their NGOs and might discourage NGOs from getting into activities on technology enhanced learning.

Especially the communication tools may possess a high potential for NGOs to learn from each other and enhance the chances of disadvantaged people to get education, training and first-hand information from long-distance trainers and experts. Virtual conferences may carry the chance to minimize effects of low mobility: handicapped people, people living in remote regions, people with sparse time because of family duties (which is often a gender issue), and people who do not have the financial resources to travel (which also is often a gender issue, too) can have better chances to participate in virtual meetings, exchange of ideas and development of concepts. Additionally, exchange of ideas can be individualised, because less long-term planning is necessary, if the “students” do not need to travel.

In PARCEL the tools were also tried out by persons for whom they were not intended. Nevertheless the feedback of testers was mostly positive, but sometimes tools turned out to be inappropriate for a group, which could lead to frustration and some negative feedback then, too. But the feedbacks were not always consistent: what creates a barrier for one group may not create a barrier for another. The offered tools were useful to determine what was missing from very individual perspectives. To see what is missing is easier if there are concrete tools that are reflected and sometimes tried out, instead of posing more abstract questions to people that may not have been in the issue yet.

Getting into contact with NGOs by offering tools, it becomes quickly clear, that a huge number of NGOs is interested in technology enhanced learning, but actually faces a lot of barriers, so that they cannot make optimal use or no use at all of the various applications not

only in our brochure, but available as a whole on the economic market or even for free. Altogether there seems to be a general lack of certain tools for those who are economically weak, for those who are more or less EDV-illiterate and also for those who have special needs, by suffering from physical handicaps, learning disabilities, migration background or else.

Mainly for two reasons we give special attention to those NGOs who seem not to profit from actual technology enhanced learning applications and development efforts:

- The groups for which technology enhanced learning does not work (yet or not yet optimally) is more likely to bear a growing market potential, a market that might be less saturated than the market for demanders that are already well supplied with tools that work for them.
- The groups for which technology enhanced learning does not work (yet or not yet optimally) partly overlap with those groups with special needs, that might experience a great boost of education chances if technical assistance was optimal: More easily they could receive higher degrees, attain information and/or learn to manage their daily lives. The groups concerned are people with handicaps, in very young or old ages, people with migration background as well as those who are economically weak.

We can read the barriers from many NGOs' behaviours: Some looked through the offered tools thoroughly, but did not find what they searched and gave us feedback on what for them actually would be useful, which (see below) were often quite simple and modest desires. Many NGOs started an attempt and tried out one or more tools, but gave up after quite a short time, because they met difficulties, that might seem quite small to many of us, but which can become huge barriers for some social groups.

Several potential users remained inconclusive about testing, others had decided to try out a tool but never seemed to find the right starting point. The most frequent reason they gave was lack of time, and so they postponed testing from one week or month to the next, and so trying out a tool often happened half a year or a year later than the NGO had scheduled. This gives us a hint, how much time has become a rare and valuable resource and which special attention it deserves when it comes to developing applications for technology enhanced learning.

It was only by concretely reflecting on how to make use of certain software offered in PARCEL that a lot of NGOs involved in PARCEL became aware that they actually face one or more barriers that hinder them from starting activities in technology enhanced learning. Frequently named barriers were lack of appropriate computer equipment or broadband Internet access, insufficient computer skills, limited time for becoming acquainted with a tool, and also the number of personnel hours that can be invested in computer training are finite if resources are low. If some support was necessary and information was written in English then, this could create an additional impediment. Usually one barrier only would hinder a group completely from using a tool. Accordingly, NGOs often demanded tools that do not

require any training time or any support at all, that can be used immediately, and do not require any superior equipment or too much bandwidth for Internet access. Favoured tools are self-explanatory or similar to software and devices the concerned NGOs already use. The advantage of “mainstream” tools, that are basically structured and shaped in very common ways, lies in the fact, that not only less time is needed to learn how to handle it, but also that this time is not wasted in case the related tool is dropped one time, because the acquired knowledge is not exclusively restricted to the tool in question, but it is transferable to other software or other applications, and so it contributes to the general computer skills of a n individual. Nowadays it is necessary that tools are compatible with other widely used tools or software in order to make co-operations smooth. And again it could be those social groups with special needs (who could greatly benefit from special devices and software) that are especially concerned if incompatibilities are created, because they already tend to be excluded from technology enhanced learning, and the development of software or add-ons for special systems will always lag behind the common market. Although it is evident that some of the demanded technical devices or software are technically feasible - the necessary features exist in technical devices that are available now or were available in the past - there are not many of them available, and only more public funding might trigger developments here.

Very roughly we see two groups of NGOs were interested in trying out tools for technology enhanced learning: Ones with some experience in technology enhanced learning and plans to expand their activities in this field, and ones being interested but not yet familiar with it. The “uninformed” group sometimes seemed to be quite open when choosing tools, but in the “informed” groups we often meet those who already have a certain set of software and have less flexible ideas about which tools should complement their equipment. We also found out that it is mostly the group that is not confident in technology enhanced learning yet but interested that is often confronted with specific barriers that hinder them to make first steps into it.

In the course of the PARCEL project the consortium searched for experts on issues of technology enhanced learning NGOs named as of being especially interesting for them. Although we contacted many very different organisations by applying a snow ball system, in the end we received the names of a handful of experts only. It is up to further investigations, if there is a sufficient number of experts dealing with emerging issues of technology enhanced learning, to what extent user knowledge is based on groups of some highly engaged experts only and on what topics curricula should be developed.

Identification of barriers for using tools for technology enhanced learning

By actively encouraging NGOs to try out tools, we got much insight in how difficult the situation actually is for many NGOs. Because many reflected on testing and made concrete steps, we saw where the concrete barriers to testing one or more of the offered tools are and the NGOs became more aware about potential barriers. Being vaguely interested in technology enhanced learning, many of them actually recognised then what they lack before technology enhanced learning can take place.

In the following we differentiate between barriers that are outside the offered tools and barriers that might be removed in updated versions of the tools, in case the developers want to broaden the target groups and meet the more special needs of NGOs. We experienced that one barrier only can be sufficient to prevent an organisation from trying out a tool or being able to make use of technology enhanced learning.

The reasons given by these interested groups that did not try out tools for a longer period are much the same as why they cannot make use of any other available tools for technology enhanced learning. We found out that prices – the tools were offered without any direct costs for NGOs - might not be the only reason why it is difficult for low-budget organisations to make use of them

We think that feedback from those groups that could not get deeper into testing might be the most interesting, because these NGOs were seemingly strongly interested in technical support that might facilitate some of their tasks. What they say about those tools reveals that there might be several conditions that hinder many organisation from using promising technical advances and that some of these barriers appear already in a very early phase. Developments that could milder the effect of some of these barriers for low-budget groups might increase the number of people making use of technology enhanced learning. This would not only benefit these groups but also society at large, because education is an important economic factor and this might also create new markets for new products. For the low-budget groups the following issues seem to be central:

Time resources

Many NGOs did not find the time to realise testing although they expressed the hope that appropriate tools could help them with certain problems and save time, too. We saw that the time schedule can be very dense for many groups, and lack of time becomes a vicious circle. Under stressful conditions many groups cannot even properly inform themselves about potential saving of resources by, among others, engaging with technology enhanced learning.

Technical barriers

Some groups do not have sufficient computer equipment that would allow for testing any of the offered tools. For some user groups the usual computer equipment might not be optimal

anyway. For low-budget organisations there is a lack of software that runs on old hardware, because theirs can be several years old. It is possible that there exists some software they could use, but then information is lacking, which would run on cheaper or special equipment in a satisfactory way.

Lack of computer expertise

Many NGOs we contacted were only users and there was nobody in reach who could help them to install the new software or who could even make an informed decision on which of the tools might be useful for them.

Frustrating experiences with technical devices

Looking at how RTD is presented in the media sometimes, it seems that many challenges of daily life can be answered by technical solutions alone. Some of those promises may be true, nevertheless, often they are tremendously exaggerated. Think about mobile phones for senior citizens: Although there was demand for it, they were not available at all for many years, now, as there are few models available, they are sold at rather high prices. Or think about word processing software of which only a comparatively small fraction of its features is used. Or think of software which is not compatible with other software because it is based on proprietary instead of industrial standards or which introduces keyboard shortcuts, which can be confused with common ones.

Frustration might be high among people that are not computerfreaks or have professionally to do with computers. There are more and more technical solutions available that seem to be useful for technology enhanced learning. Many of these solutions seem to be suboptimal or worse - at least the ones affordable for groups with low resources. NGOs may have already experienced time-consuming and frustrating attempts to find appropriate software or devices for technology enhanced learning. Potential “testers” informed us that they experience that things do not work out as promised, that most of them are too expensive and that it would be time consuming to try out all sort of different technical solutions. There are many parallels between technical devices and software for technology enhanced learning. Although the demand for technical devices and software exists among many social groups – perhaps partly because it has been already awakened, because there is much promotion - there is a abundance of offers. But people experience since one decade that many of these things are either extremely expensive or are not functional for them.

Such experiences can strongly reduce the readiness to take the risk to try out further software or devices. They are less reluctant to give a general comment or to participate in roundtables. But before they try anything new, they want to be very sure that it works in the way it is presented. For this reason, access to technology enhanced learning and success on the marketplace sometimes may not be a question of developing a perfect tool but also of building trust. Experiencing that applications of technology enhanced learning substantially do not live up to expectations built up by marketing can be frustrating und result in not further engaging with information and communication technologies. If social groups are targeted as potential users, who already have built up mistrust against innovations because they have

had some frustrating experiences with software or technical devices, then promotion might not help. Perhaps it is necessary that the tool is promoted by organisations, which are highly credible for them and make public the tools they work with and their experiences with them in different settings. This might be most important for tools that require some time or financial resources from buyers and that have to compete with products that are already widely used. Those organisations should not be mistaken as so-called lead users (Eric von Hippel¹), who are using such tools a considerable time before they become a success, but as trusted users, because they are not necessarily pioneers for a specific product.

Specific needs for specific target groups

Some groups reviewed the offered tools and had already specific tools for specific purposes in mind. In such cases they could not always find anything that was appropriate for their clientele or their level of education according to a certain curriculum, at least at the given moment.

Design of the graphical user interface

Test users often gave feedback on the GUI design. They preferred clearly arranged graphical user interfaces, which are self-explanatory or close to the ones they are used to.

Estimated Training time was among the very first questions NGOs posed before they decided on trying out a tool. Tools that can be used immediately and do not require any training time were clearly preferred.

Compatibility with already used tools for technology enhanced learning

Groups that were already engaged in technology enhanced learning or starting to use it, already worked with a certain set of software or have certain applications in mind. They mostly did not want to replace but only want to complement what they already have. They just wanted to have those features added, which they miss in “their” software or they wanted certain features improved.

Lock-in phenomena

We also saw here classic lock-in phenomena, i. e., what people already possess usually has a strong advantage in competition with anything new: In the calculation of cost and benefit people take into account the already spent resources on the implementations of the software and/or devices they already use. This is relevant in terms of time and also in terms of money. In view of the cost-benefit-relation of the addressed NGOs, trying out something completely new only makes sense, if a new tool reliably promises to work far better than the tools they are already use and presumably only in cases where the advantage is very evident. Because competition is high, for a user, who is confident with another, similar tool, there might not be many innovations that would outshine the already existing. Even if there are objective

¹ Eric von Hippel, *Democratising Innovation*, Cambridge, Mass. – London: MIT Press, 2005 and *The Sources of Innovation*, New York - Oxford: Oxford UP, 1988, also available for download at <http://web.mit.edu/evhippel/www/books.htm> (last access 30/12/2007)

improvements, there is a high value in knowing a tool well. New tools have small chances to compete with a tool that does not require training but is used habitually, perhaps for years.

Moodle, for example, was named several times, and for some groups Moodle compatibility was more or less a condition for trying out additional tools. When we promoted web conference tools many NGOs asked us why they should use anything else but Skype.

Thus we conclude with caution that new tools might have a better standing if they are compatible with those tools that have conquered the market and/or if promotion places much emphasize on features of the tool that are superior to already existing software or devices.

Language

Most information on tools for technology enhanced learning is in English. Although we provided information material there always remained specific questions. Many NGOs asked us, when they did not understand something, and we had to consult and inform almost all NGOs individually before they would try out tools. We also translated a tool from French into gendered German. Nevertheless we suppose that some groups might not have contacted us, because they might not have looked closer when they saw a text or a website in English. From Internet behaviour research we know that the frustration tolerance has become very low in navigating the Web. Thus, providing most information in several languages, to give more visual information, also presenting short films and comics and trying to make the tools as self-explanatory as possible might be useful for promoting new tools.

Support

The test users generally preferred self-explaining tools that do not need any support. Even if support was offered, they were reluctant to come back to it. People preferred tools that are understood immediately. They did not want to read manuals or attend courses to learn how to handle a tool.

Technical requirements

In the group of those who are not yet experienced with but interested in technology enhanced learning we often found organisations lacking very basic infrastructure such as technical equipment or Internet access, which hindered them to test a tool.

Tools sensitive to gender, age or ethnicity

Many NGOs are aware of social issues and some of them would have liked to have more gender-sensitive tools. Age, handicaps and different migration backgrounds could be an issue, too.

Learning level of tools

The offered tools were too difficult for the clientele of some NGOs. Several times tools for simpler language learning, math tools for pre-school or mentally challenged children were demanded.

Everyday learning contents

Tools would be needed that are close to everyday reality such as tools for managing cost of living, to calculate interest rates of savings and to increase understanding of the Euro,

Tools should run on different hardware and/or include special equipment

Although some of the software demanded by NGOs exists, it may not run on the inexpensive old hardware of the NGOs. For them, low level versions of the tools might be favourable, if they also run on outdated systems. Sometimes tools could not be tried out, because they require new hardware. Groups that work with special target groups often need special devices, more robust hardware. Older inexpensive computers may be more appropriate, because children with behavioural or motility disorders or very young children cannot work with too fragile equipment. Special devices like the OLPC² or other developments might also be helpful. For many it is crucial that they are not costly and do not need to be replaced every few years.

Perhaps new inexpensive devices could be developed together with the tools, or they could be adapted for the use on very old hardware, like old computers or PDAs, or special versions could be developed. This might greatly enlarge the potential groups of users, because the relation between hardware and chances to use technology enhanced learning was closer than expected. For example, for a learning group technology enhanced learning is only practicable, if there are sufficient numbers computer workplaces. A too low computer-student-ratio will lead to waiting time and frustration. For low-budget groups it might be impossible to buy several computer stations. Thus, developing new or adapting existing state-of-the-art tools for old inexpensive or special equipment might bridge a gap in the market.

Internet access

Some tools are only available as online versions, which hindered some groups from choosing them. Broadband access is expensive for some groups, and often NGOs did not have possess enough broadband connections or bandwidth. At home many of their trainees have only dial-in access to the Internet. Hence, digital communication is reduced to exchange of emails and sending documents, but online cooperation in real-time is not possible. For these groups it is a severe barrier, if there are no desktop versions of a tool. If the tool depends on Internet access, the feedbacks say that bandwidth does matter. It is likely that a tool loses value for those whose Internet access does not allow to run it with reasonable speed.

Security and data protection

Some social groups may not be comfortable about security issues and protection of personal data. Doubts are based sometimes on realistic fears, in some groups they may arise

² The developer project *One Laptop per Child* wants to create a portable computer for children in non-industrialised countries that is not only low-cost but also optimised for the infrastructure there (see also <http://www.laptop.org/index.de.html>). (last access 30/12/2007)

because the user is not confident enough with information and communication technologies to estimate the risks.

Tools are too expensive

This finding might seem paradox at first sight and in view of the fact that the tools were given to NGOs for free.

It turns out that giving the tools to NGOs for free does not mean at all that the tools are de facto free of costs for the NGOs. In reality the donation of software only relates to the primary costs. It varies to what extent these primary costs of buying a tool cover a small or a large part of the total costs that are connected with using technology enhanced learning on a regular basis. The current expenses might be related to

- broadband Internet access
- replacing outdated computers every few years
- buying additional technical equipment
- employing personal confident with computers, trainers or other professionals³
- charge for support

Secondary costs can by far exceed the costs for buying some software or a device. In software development, the commercial exploitation of a new development might even be based on exactly this idea to give away the software cheaply or free of charge and to generate revenues by selling support, or licensing software to computer equipment manufacturers. But we found out that in the case of non-profit organisations the secondary costs appear as real costs that might be really too high and so create a very real barrier for participation in technology enhanced learning. Additionally, the multiple possibilities to interconnect primary and secondary or short and long term costs may even create additional barriers, because they reduce cost transparency. NGOs usually have to calculate very close to their budgets, because they are non-profit per definition and often there is no financial scope that would allow for expenses that cannot be predicted accurately.

Groups excluded by facing several barriers to technology enhanced learning

PARCEL addressed NGOs that work with special target groups. It is widely acknowledged that many of these groups could greatly benefit from technology enhanced learning. By offering them specific tools for trying out, we found out that they still can meet a lot of challenges that prevent them from accessing the full scope of possibilities new technologies might provide. Adapting tools to the needs of special groups could not only benefit them but also society at large, because this may raise the level of education, improve the quality of social services and health care and even integrate more people into the labour market.

³ Doing-yourself is not a solution, even if possible, when time resources are scarce.

Additionally we can regard it as an “acid test” for the widest possible usability of a tool, if it is principally – perhaps in different versions or with variable modules – usable by many different groups who do not experience one but several barriers when they want to make use of technology enhanced learning.

Elderly people

Some groups might be easily scared of technical aids than others. Senior citizens seem to be scared off easily. They would have been very interesting participants, but even if we pro-actively tried to convince them, they inevitably abandoned trying out software for technology enhanced learning finally.

For example, the chairwoman of a senior citizen group showed precautious interest at the beginning, but her daily challenges with well-known and widely used word processing software took her the nerve for any further engagement with any new software. Many other seniors told us from the beginning that all this new stuff would be too complicated for them. We think that more senior citizens could participate in and benefit from technology enhanced learning, if there would be more software and technical devices that are tailored to their needs and demands, with less functions, e.g..

For several reasons elderly people might become more easily frustrated, if they experienced that technical innovations do not work out fine for them after they have tried them out. Additionally many elderly people might need special devices that are easy to handle in spite of geriatric handicaps. Many of them belong to the low-income group that cannot afford either a computer of the latest generation or a broadband Internet access. The level of some of the tools might have been too high for beginners.

People with learning disabilities and children

Other potentially excluded groups we spoke to were groups working with very young children and handicapped people. We contacted many NGOs working with or for these groups and found out that they would like to have some technical support for their educational work. Many educational tasks extremely challenge the patience of a trainer. The learning task in question can be extremely simple and monotone for the trainer, because it has to be repeated again and again. Thus, some of the desired tools would be quite simple, but don't seem to exist anyway. Additionally cheap special devices might be of help that are easy to handle and quite robust against physical challenges. Groups working with children that perform bad on motoric coordination or people with low frustration tolerance will logically not equip their trainees with fragile expensive computers. Hence, if there is a computer, typically is in the office and testing would have to take place there and with assistance of a social worker or nurse. There is often nothing that would allow their clientele optimal and independent training.

Handicapped people

Groups of or for handicapped people showed much interest in the offered tools. They saw a high potential in technical aids for improving their social situation. Handicapped people are

still discriminated at the labour and education market. Theoretically they could get all certificates they want, but when in practical life they try to attend schools or universities, they meet so many barriers that it is often not possible for them. Many people of this group also live in remote regions and might greatly benefit from anything that helps to solve mobility problems by learning, retrieving information or communicating online.

Social groups lacking resources

A great deal of barriers are related to a lack of financial means and time resources. We suppose that many of those who can properly use such tools are in a position to try out different things and their situation may allow a playful approach. Sometimes technology enhanced learning is generously integrated in higher job positions or people have enough leisure time and money to spend on this form of education. Many groups cannot access it in such a relaxed way. As we found out, this is a very severe point. All groups that tend to be socially weaker may partly be excluded from using tools for technology enhanced learning.

PERSPECTIVES

Our lives are largely and increasingly effected by applications of science and technology, but nevertheless the demands of a high number of citizens are neglected in the development of technologies. Raising awareness on the benefits of science and technology by giving them a higher profile is one thing, but bringing them closer to society is another, because it asks for a dynamic interchange between participants from different stakeholder groups. From a perspective informed by social studies of science and technology and/or by philosophy of science, these relations are conceived as determined by an asymmetry in expertise, authority and application. The project did not aim at closing a knowledge gap by instructing NGOs on the benefits of technology enhanced learning, but at addressing this asymmetry. The PARCEL consortium did not address «the citizens», «the public» or «society», but specific target groups: small to medium NGOs, and among them those which are potential users and providers of technology enhanced learning. This project should make a difference by allowing those potential users and providers of technology enhanced learning to express their needs and demands from it and to give feedback on tools for technology enhanced learning and on technology enhanced learning in general in order to allow an improvement of tools. On the one hand, this should help to raise awareness on technology enhanced learning among those NGOs and, on the other, on demands from its tools among developers.

Organising similar communication activities: Developer and user perspectives

In the following we present lessons learned from PARCEL and what we believe are some general requirements for conducting similar activities.

Such participatory science communication activities as they have been piloted in the PARCEL project differ from the usual dissemination activities in large-scale research and co-ordination projects. Instead of giving presentations of project results or disseminating interesting news the PARCEL consortium brought small to medium non-governmental organisations into the development of applications for technology enhanced learning. By aiming at becoming an integral part of development activities, they went beyond dissemination. The communication activities have been carried out throughout the lifecycle of the project, last, but not least, to contribute to anticipate tomorrow's issues on technology enhanced learning and to start tackling them already within these two NoEs, whose dissemination activities the PARCEL project supported. Consequently their focus was not on the international but the local and regional level in Austria and the Czech Republic. Bringing

together the local, respectively regional, experiences from Austria and the Czech Republic allowed for breaking out of the local. Because these activities required regular contact with users who tried out tools and/or discussed their experiences with technology enhanced learning, there was a dynamic interchange between actors. So they require more time than classic science communication, but such an involvement of citizens in the development and assessment of technology creates a situation to the benefit of all: to consumers, who get better products, to companies and researchers, whose products might have improved their marketability, and to scientists and technicians, who receive valuable feedback, which stimulates the improvement of technologies or even the development of new technologies.

Project structure

Such communication activities are interwoven with the other project activities. For engaging with users in the way the PARCEL consortium did, a thorough preparation already at project planning stage is a prerequisite for success. Being an integral part of the other project activities, such communication activities cannot simply be “added” to them. Because you have to know at which stages of the project you want to have user input and how to feed it into development processes, they have to be well-embedded in a not too tight workplan with elbow room, also for delays.

Although PARCEL was conceived as quite an open project from the very beginning, it turned out favourably to loosen the project structure even more. Openness seems to be crucial in such a project, not only in respect to various ideas from different social groups but also openness to the different time schedules and structure. The project has to be flexible enough so that different organisations can join or leave.

In PARCEL often we have been faced with users having low financial and time resources, no state-of-the-art computer equipment and no native speaker-like fluency in English. Thus, one should not expect it when organising similar communication activities. The PARCEL consortium opines that barriers to technology enhanced learning are less of technical than of financial, organisational, administrative and individual nature. They cannot be overcome by technical means only.

Organising satisfactorily user involvement calls for candid interest in user feedback to create trust in the planned communication activities. This can be shown in lowering the participation threshold as much as possible, e.g. For achieving this objective, applications for trying out should not require state-of-the-art equipment and much time for becoming acquainted with, be compatible with the software of those you try them out, available in a language test users easily understand, accompanied by fair technical documentation, and be of interest for users. To signal that user feedback is welcome and highly appreciated, software should be offered in full versions (not in demo versions), which are fully developed (not in beta or even alpha version) and, because their time is valuable, such users with low resources should be reimbursed for trying out software.

Time and duration

PARCEL was first planned for a project duration of three years. The evaluators of the proposal had it shortened to 27 months, which was prolonged to 30 months again. Retrospectively we opine that the project could have lasted four years or longer. For PARCEL, there was calculated a longer starting phase. First of all, potential participants - those who can provide tools or those who could be interested in trying them out - need time to learn to know about the project. Secondly, when they decide to participate, it should not be underestimated how much time for preparation and conceiving they need. Classical dissemination strategies do not work here. In individual consultations it should be assessed how the software could be useful to potential test users. For this, among others, an understanding of the organisational and computer equipment, the objectives, the target groups and the computer skills of the potential test users is required, so they get an idea what is available to them when they test software. Also one should not expect that NGOs start immediately with trying out software and/or give immediate feedback.

If the project duration is too short, it does not allow for sufficient flexibility to cope with the different time frames, organisational structures, goals, project objectives and demands of developers and NGOs. Not only the NGOs need time. Many developers work under stressful conditions. This makes anything that is related to trying out a very sensitive issue and some developers might be reluctant to have their products tried out if they have to decide quickly and do not have sufficient knowledge on the objectives of such communication activities and how they will be conducted.

The NGOs - frequently poor in resources - have to squeeze participation into their often narrow schedules, and they have to know and plan several months in advance. Developers need time not only to find out if or which tool they can offer, they also have to become confident in the process: that the outcomes really remain confidential and to get a picture, because they risk sub-optimal promotion of their work, if confidentiality is not granted. Confidentiality is very important here, because such communication activities have nothing to do with usability testing as it is conducted by specialised laboratories; they are also not about benchmarking, establishing rankings or other quick judgements on tools; they are about openness, exchanging ideas, bringing in new perspectives, and bringing the needs and perceptions of otherwise neglected groups into the discussion by collecting feedbacks from NGOs.

Reimbursements

Giving software away for free is not sufficient to make such NGOs interested in trying out software, because they incur other costs: staff costs for becoming acquainted with the software, telecommunication costs, maybe additional hardware costs.

In order to involve more NGOs with low time and financial resources an instrument should be

found to involve more of them. Otherwise a selection bias is likely, because only those can participate or give their opinions, mostly the NGOs in a better economic position, which often are larger and well-embedded in other structures, for example, governmental, religious, and economic ones. Ideally, a large number of NGOs should be able to participate flexibly in projects like PARCEL, and all NGOs should have a chance to participate. Sufficient reimbursement of costs incurred is important here, because NGOs should participate primarily out of interest in the related topic and lacking time or money should not hinder smaller or low-funded organisations from participation. As a rule of thumb, reimbursements for NGO could range from 1000 to 3000 € per organisation. (This estimate is based on the EC's Marie Curie grants.) Perhaps 30, 50 or 100 NGOs could try out content and software and/or contribute their experiences and well-founded comments. The position of the NGO should not be that of a partner, because this would narrow down the possible number of involved organisations and build such projects around a circle of comparatively small groups, but they might be involved as subcontractors for small project periods. If many NGOs want to participate, there should be a selection scheme, targeting especially those who seldom have occasion to participate in opinion-making processes.

Technical documentation

Unless one can be sure that an application is self-explanatory to users, good technical documentation pays off in co-operations with users. Difficulties in understanding how a tool works can postpone a decision for trying out software and consume over-proportionally much testing time before people would even start to work with the tools, so that not too much feedback on the concerned tools can be expected. In PARCEL often it turned out that fair technical documentation was highly appreciated to become easier acquainted with software. We think it pays off to provide additional handouts with a synopsis of the tool.⁴

Language

Because the feedbacks name language surprisingly often as a challenge for users, more efforts should be taken to enhance comprehensibility. For international use, much software and information is available in English only. But good fluency in English is not as widespread as it may seem and making software available in English only can create a barrier for potential users.⁵ There are several ways to create more usability in terms of language: Providing most information in several languages, to give more visual information, using commonly recognised icons, also presenting short films and comics and trying to make the tools as self-explanatory as possible might be useful for promoting new tools. If there are no

⁴ To be on the safe side, the PARCEL partners responsible for user contacts prepared additional handouts on the tools.

⁵ In PARCEL the project co-ordinators translated software into German on request of an NGO interested in trying it out.

sufficient resources for translating software and manuals, the language being used should be easily understandable by non-native speakers, at least, following recent research on comprehensibility which can lead to standards for international communication in the future (as suggested by Barbara Seidlhofer, e.g.⁶).

Hardware requirements & costs

In PARCEL not all test users had state-of-the-art computer equipment. Often their computers have been fairly old. Therefore, the PARCEL consortium tested each tool available for trying out with different hardware and under different operating systems. Broadband access to the Internet is still no standard office equipment of many NGOs. Some NGOs had special devices that are not compatible with interesting software. This should be reflected before conducting such activities. Hardware requirements are an issue in technology enhanced learning. Software to be tried out should be compatible with older (7 – 10 years old) technical equipment.

Privacy

Being open about evaluation activities and respecting the privacy of “test users” creates trust. In PARCEL developers, who made an online application available to test users, wanted to evaluate their activities to improve the algorithms the application is based on. Test users have been asked about this. Before they did not know that their online behaviour could be observed. They appreciated having been asked and agreed to the evaluation activities.

Gender issues

In contrast to gender stereotypes, women are as capable as men to use computers, the Internet and other technologies. There is no need for special software, devices or courses (unless women feel more comfortable in a female learning surrounding). Nevertheless there are some important gender issues in the field of technology enhanced learning:

If developers are not specialised on and engaged in gender mainstreaming, the hidden sexism and stereotypes that are frequently found in other teaching material and learning surroundings can be found in technology enhanced learning, too. Without integrating profound gender expertise we do not think there will be any essential improvement of the situation. Gender stereotypes are perpetuated by deeply ingrained habits of perception and by unconscious preconceptions. Hence, we suggest that specialists on gender issues should be given the occasion to comment material that is used in technology enhanced learning, so gender-related standards might develop in tool development.

⁶ See ELF, English as a lingua franca, <http://www.univie.ac.at/voice/index.php> (last access 7/12/2007)

Developing applications for technology enhanced learning: User perspectives

Software requiring little training time

Feedback suggests that time is a central resource for NGOs which they have to economize. Lack of time and lack of financial means often were observed as a couple, which makes the idea obsolete, that those who are poor in financial power would at least dispose of plenty of time. After all this is not too surprising, because those who cannot afford delegating work have to do everything on their own. But also well-funded NGOs will economize with their resources because they (hopefully) feel obliged to optimise their budgeting in order to meet their higher objectives. Further reasons may be related to some target groups.. When NGOs deal with people that are not employed at the labour market and not paid, there is often the preconceived assumption that such people have a lot of leisure time. In some groups the opposite may be true. Handicapped people or senior citizens often need more time to cope with daily affairs, housewives are often unpaid but not unemployed with family duties, unemployed people have to search for jobs or they are in education. On the other hand, people and organisations with more financial means can hire professionals to set up computers. pay support and training. Thus in many cases lack of financial resources equalises lack of time resources.

Demanded / preferred software

- Easy to learn in a short time, inexpensive
- No external support necessary, self-explanatory
- Training function is integrated (simplified versions for beginners, etc.)
- Well-known graphical user interfaces and structures
- Add-ons and complements to widely used applications
- Improvements to tools already in use
- Special devices, simple and robust
- Software with low technical requirements (runs on old hardware, different technical devices and with different interoperability barriers)

Software users intuitively understand

In view of time-economy, it seems to be advisable for developers to create self-explanatory tools that do not force users too frequently to look up in manuals or auxiliary programmes how it works. Many menu items, icons, etc. have become more or less common characteristics in widely used applications. They are recognised easily by those who work with mainstream office software or have finished ECDL courses. It seems to be strongly advisable to stay very close to these already established features (as far as this is not connected with an essential devaluation of an application) because most people are familiar with them and therefore reduce training time. Objectively, there may be lots of other solutions that would be equal or better, but it may be almost impossible to compensate for the

advantages of those applications that have achieved the status of standard, that are well-known and thus save training time and money. It seems to be advisable to restrict all innovations to those features that considerably and for user discernibly improve the value of a tool.

The software market seems to be rather saturated and full of tools that might be valuable, but we experienced that if it takes even a little more time to understand how a tool works, people become reluctant to try it out or become more quickly frustrated. People seem also reluctant to invest much training time for a tool that is not established in society and would not enhance computer skills at large. The invested time would make them dependant from this tool (which did already happen with those tools, that have become “standard”) because it would be a complete loss in case of switch to a different tool. If people spend time on education, we can assume that they want to enhance their “human capital”.

Software with a customisable range of functions

We experienced that there were only for those tools realistic chances to be tried out that took few minutes only to get into it to use them. Hence, more complicated tools may need a special focus for developing dissemination strategies and tackling the challenges how to make training times less repelling. It may be a strategy to split the necessary learning efforts into small pieces that can be more easily digested. The benefit for the user must be very present from the very beginning: not many may be willing anymore to spend time on learning a tool just for being able to use it. Another strategy might be to create small versions that function as learning tools. When beginners become acquainted with a smaller number of functions or a simplified version, they can opt for more functions. So they would start to use a tool step by step. The usefulness of the tool needs to be present at all small versions, so that users can concentrate her/himself on becoming acquainted with the tool to the extent s/he wants to, stop or progress at any given time without risking lost training efforts.

Development of add-ons

There is some kind of software, which requires little training time, users intuitively understand and, if integrated in a software suite by users, customises the functionality to user demands: add-ons, software for often very specific functions, which integrates itself into existing software. Think of popular web browser Firefox. Customising it by add-ons, which are have been developed by a large developer community and can be downloaded even for free, users increase its functionality with software for downloading web sites as a whole, blocking advertisement and managing bookmarks, just to name a few. The user interface stays the same. Thus, if intellectual property rights, other commercial interests and technical specifications do not interfere, developing add-ons to widely accepted software could be promising.

Demand for simple tools

Implementation of technology enhanced learning goes beyond purely technical aspects of tool development. Many tools, which are most useful for different social groups, might already have been invented decades ago and even be sold on the market, but most of them might still carry smaller or larger barriers for many social groups to buy them and to use them. As described above, we found out that financial resources and time resources are often intermingled and crucial for NGOs. Additionally we learned that many people cannot benefit from tools for technology enhanced learning because they lack basic pre-requisites. Or they have special devices that are not compatible with interesting software. Under these circumstances it might make more sense to adapt existing products. Sometimes this may be fulfilled with small corrections, like adding or diminishing of features. Sometimes a more clearly arranged graphical user interface would do. Simple software, re-building older PDAs or computers, or adapting existing software to make it usable for some more social groups cannot be sold as big innovations – although they are. We suspect that here markets alone will not provide what people need and demand. From some developers' feedback we see that they often have to produce with economic utilisation in view, organise funding and compete on an international level.

Demand for robust tools

Available technical developments for people with special needs are mostly too expensive, sometimes too fragile, altogether not usable for them. For example, when it comes to people, who are afraid to touch a computer or a PDA, because they are afraid to ruin it, then the availability of expensive devices that might break into pieces when they fall to the floor is of minor help only. Also children will need equipment that can endure many more physical challenges than most of the available technical devices, like water, mud, grease and/or physical stress. This is not a technical problem, because such devices exist since many years and are mostly in use by professionals, for using them for outdoor activities or in special surroundings. Also what senior citizens, e.g., demand from technical devices, be it PDAs, mobile phones, computers or software seems to be quite simple: big keys and buttons, reduction to few necessary functions only, limitations of functions to a few essential features, no automatic assignment keys, clear audibility of sounds, good visibility of all elements, some robustness and some stability of operating systems. These are not technical challenges. Nevertheless, there is still a meager assortment of such devices only and optimal technical solutions at reasonable prizes are still missing.

Demand for affordable tools

“Affordable tools” does not mean prices only. – Apart from pricey applications, sometimes apparently cheaper or even gratis tools might be costly too: not too expensive to acquire, but too expensive to maintain using them. The financial barrier is not always visible at first sight,

but becomes evident, when looking closer. Software that relies on special devices, on newest computers, PDAs or smartphones, which are between few hundred or more than thousand euro, probably is not the best medium for triggering technology enhanced learning in society at large, but will create a total barrier for those who are disadvantaged.

Secondary costs also can appear as necessary high access to the Internet, need for charged special support or if personal hours have to be spent on exploring manuals, reading tool descriptions and attending computer courses. And when we deal with low-budget training providers, we also have to take into account that some of these costs have to be multiplied with the number of students that would usually use infrastructure and equipment at the same time, be it in their own homes or at the NGOs' premises. Hence, what can be afforded by larger enterprises or even by public bodies might be out of reach for many NGOs.

Setting standards for tools poor in barriers

The term "barriers" refers to obstacles mostly people with special needs experience when they navigate the WWW. It makes sense to avoid as many obstacles as possible, but it is not possible to make the Internet completely barrier-free as the example of blind and deaf people show; obstacles can be completely different for different social groups. At best limited, respectively low, barriers can be achieved ("barrierearm" in German, that is: "poor in barriers").

Tools can be considered as poor in barriers, when these software and technical devices still remain low cost, when not only the act of buying is regarded, but also all those expenses are taken into the calculation that are necessary for using a tool in the longer term. Attempts to offer tools at no cost or for free but to receive earnings on support for installing or servicing software fail here because when financial resources are scarce, unexpected hidden costs can be a serious issue and also among those who take them into account they can create frustration.

Tools could be tried out and/or were commented on positively if they did not need any support at all. People like self-explaining software that is quick to learn, with comprehensible menus that are not overloaded with functions enigmatic to them, but easy to understand and use.

For instance, in a group with learning disabilities, any time spent on learning how to use a special software is time that will be missed for learning essential skills for everyday life. Training schedules are narrow in this field, and trainers prepare lessons carefully, because they are aware that they calculate not only with their time but also with the time of their disadvantaged trainees who might need even more time than other people to get confident with a tool. Hence, we think that if trainers are not certain, if a tool will be quickly understood and adopted by "their" group, then they will not risk one, two or more learning units for trying out a new tool instead of advancing their curriculum.

Building confidence in a tool is not a question of promotion or dissemination only. If mistrust against new technical devices or software has been build up because of some frustrating experiences with software or technical devices in the past, then only promotion might not help. Triggering the use of technology enhanced learning in some groups might need more profound information from a trusted source. Mostly this could be NGOs working in the same field with a good reputation. Disseminating the experiences of such NGOs with tools for technology enhanced learning and labelling them as appropriate for low-budget and special target groups after such trusted NGOs assessed them positively, might trigger their use, their discussion and thus they might be successively ameliorated. Systematic dissemination and exchange of NGOs' experiences might have more impact than traditional promotion. There should be remuneration budgets for NGOs with small resources when they are among the first to try out new tools, because otherwise some of the targeted disadvantaged users might be excluded from participation – which is a vicious circle. Because it cannot be promised that a tool is barrier-free in advance, the tool itself can be gratification after testing, but not before. Before the usability for low-budget groups is assessed, the tool is not a gratification but a risk for losing resources. Because on the market there may be many more tools that do not work for groups and people with low budgets and special needs than tools that do work, extensive testing would be irrational for them.

The term “barrier-free” (or poor in barriers) relates to Web design and should be defined for and applied to technology enhanced learning, too. In summary, the following features of tools might contribute to chances for barrier-free technology enhanced learning: Simple things might be useful enough, not overloaded with features, software should run on different old devices, compatibility is important, too. Optimally new software runs on different old devices and special devices are usable with common cheap software, so that users do not need different devices for different software, which would make them expensive again.

Assessment of barrier-free tools by NGOs would give NGOs that work with/for people with different needs better insight in what kind of technology enhanced learning might be helpful for them in different contexts.

In the preparation phase the PARCEL team tried out the provided tools for testing with different hardware equipment, on old to state-of-the-art in office computer equipment and on different operating systems. Outdated operation systems on older computers might be more widespread than expected by software developers and dealers. While offices in large enterprises or professionals working with computers might have some fairly good reasons to update their equipment regularly, this cannot be assumed for all other organisations or for individuals. NGOs often work with people who usually do not replace their computers every few years and for a lot of NGOs it would be quite difficult to install for their clientele several computer places that are fairly state-of-the-art.

Organising similar communication activities: Policymaker perspectives

In the following, we present aspects of the participatory science communication activities, which have been conducted in the PARCEL project, that provide opportunities for policy. The listed aspects are grouped under three topics. Two of them are on such activities, the third one is on technology enhanced learning and presented in the next subchapter. To each listed aspect we give practical recommendations, which, if implemented, could boost the effectiveness of such science communication activities. Neither do not assume that all those aspects and recommendations constitute a comprehensive statement, nor do we expect their easy realisation. As a consequence, we recommend conducting and integrating research on such communication activities: their potential, limits, and barriers.

In general it can be said that opportunities for policy are in establishing structures, which support participatory science communication activities and the uptake of societal demands by RTD performers in technology enhanced learning. We do not think that the statements below can be generalised to participatory science communication activities as a whole, but they could provide food for thought when designing them.

Structures that support more co-operation and less competition among developers, content providers, and contributors to technology enhanced learning

In the course of the PARCEL project we found indications that competition among software developers, content providers, and contributors negatively impacts on participatory science communication activities.

Easing project structures, building bridges between projects: Taking into account different time schedules, organisational structures and target groups, project structures should allow a not too tight workplan with sufficient elbow room, also for delays, and be flexible enough so that different organisations can get in and out. This extends to cooperations with other projects.

Rethinking innovation and competition: Structures may favour competition but not co-operation among producers and/or distributors of tools, software, and contents for technology enhanced learning. In order to survive competition, institutions have to present original and innovative ideas. In view of funding possibilities and market dominance, sharing ideas might not always be advisable, but without freely sharing ideas co-operation efforts are toothless. Competition might have made some tool developers and/or distributors more cautious and reluctant to give their tools for testing or discuss openly weaknesses that could be improved. Actually, we cannot completely rule out that market and funding structures do not favour the less cooperative behaviours. At least there are no visible advantages for frequent

cooperation. As it is now, many feel pressed to demonstrate what is called “excellence” and unbroken success. We think it would be worth to investigate more deeply into the structures of the marketplace of technology enhanced learning and its more and less desirable effects, and how to establish a healthy balance between co-operation and competition. Competition may have impacted on PARCEL, too, and might impact future support projects.

Structures that support participatory science communication activities

Such activities require standards for real interaction between RTD communities and NGOs, that is, to avoid that engaging with sometimes unfamiliar users is perceived as an obligation one wants to dispense with, is conducted as a pseudo-involvement or that developers consider needs and demands they only imagine as societal demands. Otherwise mainly already marked claims and well-known interests would benefit from RTD.

To counter unintended effects and an arbitrary selection of NGOs it needs credible institutions, which are not dependent on the developers and their organisations, to act as intermediaries, a sufficient number of highly diverse user groups, and the systematic involvement of social groups with low resources and from society’s low-education strata.

Support for such participatory science communication activities should focus on

- providing incentives for developers of tools for technology enhanced learning,
- the involvement of researchers in the social and cultural sciences with expertise on collaborating with NGOs,
- stimulating the deliverance of accurate information on tools to users,
- developing project structures and durations,
- setting standards for the involvement and reimbursement of NGOs and for confidentiality in such communication activities, and on
- developing a broader understanding of science communication.

Extending participatory science communication activities to several projects in parallel: We think a project like PARCEL should be as open as possible to different EC-funded projects. Participants in other EC-funded projects or NGOs becoming interested in participating in a project quite late after it commenced should be given opportunity to take part in such communication activities.

Incentives for developers of software and other tools for technology enhanced learning to take up societal demands: Taking up demands from a broad diversity of social groups by engaging with them in such communication activities PARCEL has pioneered, contributes to make tools for technology enhanced learning more inclusive. Furthermore it has the potential of raising awareness on technology enhanced learning among groups not already engaged with it. Developers need incentives for being involved in such communication activities. Further research could bring to light how such incentives should be like. Strict intellectual property rights can adversely impact on communication activities on

ready-to-use tools, which have already been licensed, and on taking up societal demands. Developers under strict intellectual property rights regimes might be in the position to offer demo versions only, simply because they do no longer hold the rights on the tools, but receiving such versions only might deter NGOs from trying out software for weeks or months. Often such strictly protected tools might be the most interesting. When developers are under strict intellectual property rights regimes, we see only a chance for having such tools tried out by NGOs before third parties sell licenses on them. There is a window of opportunity when the tool is ready but not already commercialised and merchandised by third parties, but this window might be too small for having such tools tried out by NGOs. Systematic research on how intellectual property rights impact on taking up a broad range of societal demands is required. Up to now, research is scattered.

Engaging experts for participatory science communication activities:

Such participatory science communication activities are not secondary to RTD. They should be conducted by external experts in cooperation with developers and require complementary special expertise on participation. This is the domain of those trained in qualitative social research and cultural sciences. With a more generalistic approach and expertise on bringing together different groups of participants and forms of knowledge they provide clarity by defining clear, transparent roles for users, practical and theoretical experts and their respective expertises. They are trained to be cautious with conclusions and have learned how quickly pseudo-results seem plausible in a multi-factorial social reality; they know that everything depends on interpretation. Usually they do not ignore the limitations of their methods, especially if they are applied isolated, whereas lay persons overestimate the possibilities of questionnaires, interviews, group discussions, content analysis, etc.

For being successful the communication activities require external experts, because they have no vested interests and are not too deeply involved in the developers' networks, that is, dependencies among developers. Thus they can remain impartial and matter-of-factly. With their expertise and their position, they are in a better position to bring in the views of potential user groups.

Ensuring the participation of a broad range of NGOs: Reimbursements are one measure to counteract selection biases in favour of NGOs in a better economic position, which often are larger and well-embedded in other structures, for example, governmental, religious, and economic ones, is likely. All NGOs should have a chance to participate primarily out of interest and try out software and/or contribute their experiences and well-founded comments. Special emphasis should be placed on smaller and low budget groups, which are often overlooked in economy-orientated development. These NGOs should not participate as consortial partners because we think of as many as 30, 50 or 100, depending on the respective tool. If a high number NGOs wants to participate, there should be a selection scheme, targeting especially those who rarely have the occasion to participate in such activities. Measures for embedding NGOs should be designed in a way that they do not narrow down the possible number of involved organisations. To avoid that only the "usual suspects" participate in as many such projects as possible, we recommend the regular

invitation and inclusion of organisations not approached so far to sustain fresh and challenging user perspectives.

Confidentiality a *conditio sine qua non*: Confidentiality is a basic condition for an open exchange of ideas. Neither developers nor participating NGOs must imagine the slightest possibility of risking disadvantages by participating in such open processes. Building trust needs not only time but also sets of rules which are binding and on which all participants can rely. A privacy and confidentiality policy set out in writing should be standard, and all participants should receive it, even if they believe they do not need it – in some situations they might be more open, because of this conformation.

Reimbursing NGOs: Reimbursing NGOs for their expenses makes a participation of small to medium NGOs in such participatory science communication activities more likely, because low resources may hinder them from participation. To find more NGOs, which are willing to try out software despite low time and financial resources, giving software away for free is not sufficient. NGOs with low financial and time resources should be reimbursed for staff costs for becoming acquainted with the software, telecommunication costs, and maybe additional hardware costs. As a rule of thumb, reimbursements for NGO could range from 1000 to 3000 € per organisation. (This estimate is based on the EC's Marie Curie grants.) Reimbursing such NGOs for participating in such science communication activities should be encouraged. Uncomplicated financial administration of reimbursing a higher number of NGOs should be established (e. g. settling the costs as "Other costs" or with a new type of "subcontracting").

Time and duration: Such science communication activities require a considerable duration to take place successfully. Both developers and those interested in trying out tools need some time for preparations for participation. Among others, an understanding of the organisational and computer equipment, the objectives, the target groups and the computer skills of the potential test users is required, and very often only in individual consultations it can be assessed how a specific software can be useful to potential test users. Also one should not expect that NGOs start immediately with trying out software and/or give immediate feedback. An additional challenge are different time frames, organisational structures, goals, project objectives and demands of developers and NGOs. Stressful conditions for developers makes anything that is related to trying out a very sensitive issue. Some developers might be reluctant to have their products tried out if they have to decide quickly and do not have sufficient knowledge on the objectives of such communication activities and how they will be conducted. A longer duration allows NGOs and developers to become acquainted with the science communication activities and to believe in them. Based on experiences in PARCEL, we recommend to allow for a project duration of 4 to 5 years at least. It is essential for success that such duration goes together with open project structures and a workplan with considerable elbow room.

Accurate information instead of marketing sales information only: There are some areas where marketing is counterproductive, and we think that technology enhanced learning is one, because in the long term only consumer satisfaction will lead to a positive image.

Presenting the positive sides of a product only can lead to exaggerated and deceived expectations, which can damage the image of technology enhanced learning and negatively impact on its uptake in the long term, because the unsatisfied users have lost time or money. In our opinion all end user, who cannot and do not want to become specialists in technology enhanced learning, should have easy access to very accurate information on which solutions for technology enhanced learning could be the best choice to fulfill a specific purpose in a specific situation. Structures, initiatives, and projects should be supported that offer sound and individualised information, marketing activities should cautiously be launched.

A broader understanding of science communication: Formerly science communication has been understood as communication within a specific scientific community by demonstrating scientific experiments in the presence of peers, giving lectures and speeches and publishing on conducted research only. This understanding of science communication has been extended to communication with a larger public. Science communication, as we know it today, still mainly consists of giving lectures, presenting results and demonstrating experiments, although often in a more entertaining way and with media support. Although scientists and researchers emphasize process over outcome, science communication mostly stays on outcomes without much consideration of the RTD processes leading to them. Outcomes are typically easier to communicate, which makes such a restriction understandable, but say nothing about processes for achieving them. Striking outcomes do not go hand in hand with RTD excellence as inconspicuous outcomes do not go hand in hand with substandard RTD processes. Successfully embedding RTD in society demands a communication of RTD processes, too, to get outcomes across, and the uptake of societal demands. Efforts should be made to stimulate a broader awareness among scientific communities, funding agencies and RTD initiators of good practice in uptaking such demands in RTD.⁷ Research on such good practice is scattered; an integrative perspective on it is missing. To identify good practice research on it should be commissioned.

Developing applications for technology enhanced learning: Policymaker perspectives

In the course of the PARCEL project we identified opportunities for policy, which cannot be summarised under science communication alone, but concern technology enhanced learning. Those opportunities pertain to the advancing and sharing of content, gender issues, secondary costs, and funding of basic tools and contribute developing technology enhanced learning poor in barriers.

⁷ The report on the mid-term assessment of the European Commission's science and society activities 2002 – 2006 makes a similar point. See p. 51.

Stimulating advancing and sharing content for technology enhanced learning: During a roundtable held within the PARCEL project in Vienna, there was agreement that technology enhanced learning would benefit from sharing content across projects but usually prevailing funding regimes and competition do not allow this. Instead of optimising existing resources the wheel is reinvented again and again. Sometimes it would be a project of its own to use such third party resources developed under government or similar grants. Maybe this contributes to the fact that teaching and learning material is sufficiently available but differs in regard to quality considerably. We think financial, time, staff and technical resources could be saved by stimulating advancing and sharing content for technology enhanced learning. Changing regimes of funding and intellectual property rights could contribute to achieve this objective. Similar to open access scientific repositories, content developed under governmental grants could compulsorily be stored in repositories on technology enhanced learning materials and made available under licenses such as Creative Commons that provide a flexible range of protections and freedoms for authors and educators by defining them between full copyright (all rights reserved) and the public domain (no rights reserved). Authors have to be given full credit, hence such licenses do not leave them much vulnerable to exploitation, when others can build on their work and, hopefully, advance it by combining it with other teaching material or by adapting it to their needs otherwise.

Gender issues: Being as capable as men to use computers, the Internet and other technologies, women do not need special software, devices or courses (unless women feel more comfortable in a female learning surrounding). To avoid hidden sexism and stereotypes in teaching materials and learning surroundings of technology enhanced learning, we recommend that experts on gender issues shall comment on content for technology enhanced learning.

Females more often than males lack financial and time resources, and frequently women are less mobile than men, which both is in most cases due to lower wages and unequal share of family duties, so that women have less chances to benefit from the opportunities technology enhanced learning. Therefore we believe that all measurements that support the development of tools, which can be more easily used by people with low resources and/or low mobility, will improve the usability for women, too, which we of course only would see as complementary strategy and not as a solution of the underlying problem of gender inequality, which is still expressed by low female wages and work overload by unpaid family tasks.

Setting standards for secondary costs: To avoid frustration with technology enhanced learning hidden secondary costs should be avoided or made clear from the very beginning. According to discussions at roundtables, users feel betrayed if they acquire a tool for free or inexpensively, but then face additional costs, which they had not anticipated, but which seem to be necessary for making use of the related tool in a satisfactory way, like additional software or technical equipment, support or manuals. From a consumers' view there should be standards on presenting such potential secondary costs instead of hiding them. As it is the case with air fares. (In PARCEL such "bad surprises" were prevented, because all tools

were carefully tried out and conditions were consented, before they were accepted and offered to NGOs).

Funding adaptations of existing tools and making them available at low prices:

According to the feedback we received, markets do not provide applications for technology enhanced learning, which are affordable for low-budget target groups and/or people with special needs, and meet their demands. Many tools which are most useful for different social groups might already have been invented decades ago and even be sold on the market, but most of them might still carry smaller or larger barriers for many social groups to buy them and to use them.

Available technical developments for people with special needs are mostly too expensive, sometimes too fragile, **altogether** not usable for them. For example, when it comes to people, **who** are afraid to touch a computer or a PDA, because they are afraid to ruin it, then the availability of expensive devices that might break into pieces when they fall to the floor is of minor help only. Also children will need equipment that can endure many more **physical** challenges than most of the available technical devices, like water, mud, grease and/or physical stress. This is not a technical problem, because such devices exist since many years and are mostly in use by professionals, for using them for outdoor activities or in special surroundings. Also what senior citizens, e.g., demand from technical devices, be it PDAs, mobile phones, computers or software seems to be quite simple: big keys and buttons, reduction to few necessary functions only, limitations of functions to a few essential features, no automatic assignment keys, clear audibility of sounds, good visibility of all elements, some robustness and some stability of operating systems. These are not technical challenges. Nevertheless, there is still a meager assortment of such devices only and optimal technical solutions at reasonable prizes are still missing.

As described above, we found out that financial resources and time resources are often intermingled and crucial for NGOs. Additionally we learned that many people cannot benefit from tools for technology enhanced learning because they lack basic pre-requisites for them. Or they have special devices that are not compatible with interesting software. Under these circumstances it might make more sense to adapt existing products to user demands. Sometimes simple software, adaptations of older hardware or small revisions, like adding or reducing features, can yield better results, sometimes a more clearly arranged graphical user interface can. - These are not spectacular innovations – although, from a social point of view, they are.

From some developers' feedback we learned that they are not in a position to meet such demands because they often have to produce for broad markets, organise funding, and compete on an international level. Because market mechanisms fail here, it might be necessary to provide public funding for sensibly priced technical developments or for adaptations of technical devices and software to make the development of barrier-free tools more likely, which are beneficial for low-budget organisations and/or ones being active for a clientele with special needs.

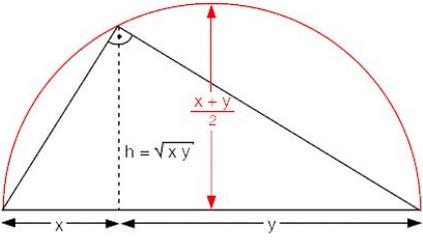
Tackling emerging issues of technology enhanced learning: It is worth further investigations, if there is a sufficient number of experts dealing with emerging issues of technology enhanced learning, to what extent user knowledge is based on groups of some highly engaged experts only and on what topics curricula should be developed. In the course of the PARCEL project the consortium searched for experts on issues of technology enhanced learning NGOs named as of being especially interesting for them. Although a lot of very different organisations were contacted by applying a snow ball system, in the end we received the names of a handful of experts only.

ANNEX 1: SOFTWARE PROVIDED FOR TESTING

ActiveMath

ActiveMath is a web-based, multi-lingual, user-adaptive, interactive learning system for mathematics.

The system provides an open architecture for the presentation of interactive mathematics



Welche beiden Zahlen werden hier gemittelt?

Die eine Zahl ist ...

Nein. Vergleichen Sie die Formeln im Bild mit den Formeln für arithmetische und geometrische Mittelwerte . Versuchen Sie es dann noch einmal.

Die eine Zahl ist ...

... die andere ist .

Genau, x und y werden hier einmal arithmetisch und einmal geometrisch gemittelt .
Wie lautet die Ungleichung zwischen arithmetischem und geometrischem Mittel in diesem Fall?

\leq

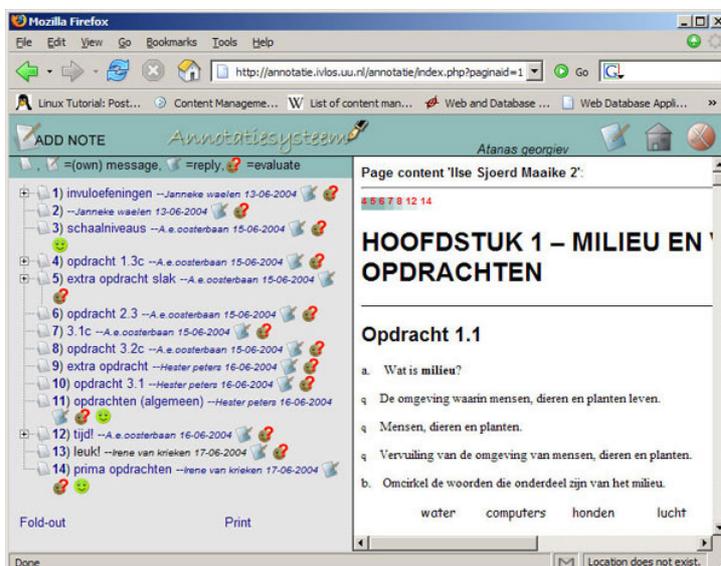
Auswerten Lösungshinweis Eingangssyntax: Maple™ Anzeigeformat: HTML

documents and combines components such as a learner model, a course generator, a knowledge base and several integrated service systems. The course generator allows for the assembly of individual "books" according to learner's goals, preferences and knowledge.

Provided by Erica Melis and Paul Libbrecht, German Research Centre for Artificial Intelligence (DFKI), Saarbruecken, Germany (PROLEARN)

Annotation System

Annotation system is a server-based application for anchored asynchronous discussion, developed for online collaborative learning.



ADD NOTE

Atanas georgiev

1) invuloefeningen --Janneke waalen 13-06-2004

2) --Janneke waalen 13-06-2004

3) schaalniveaus --A.e.oosterbaan 15-06-2004

4) opdracht 1.3c --A.e.oosterbaan 15-06-2004

5) extra opdracht slak --A.e.oosterbaan 15-06-2004

6) opdracht 2.3 --A.e.oosterbaan 15-06-2004

7) 3.1c --A.e.oosterbaan 15-06-2004

8) opdracht 3.2c --A.e.oosterbaan 15-06-2004

9) extra opdracht --Hester peters 16-06-2004

10) opdracht 3.1 --Hester peters 16-06-2004

11) opdrachten (algemeen) --Hester peters 16-06-2004

12) tijd! --A.e.oosterbaan 16-06-2004

13) leuk! --hene van kriecken 17-06-2004

14) prima opdrachten --hene van kriecken 17-06-2004

Page content 'Ise Sjoerd Maaik 2':

HOOFDSTUK 1 – MILIEU EN OPDRACHTEN

Opdracht 1.1

a. Wat is milieu?

q De omgeving waarin mensen, dieren en planten leven.

q Mensen, dieren en planten.

q Vervuiling van de omgeving van mensen, dieren en planten.

b. Omcirkel de woorden die onderdeel zijn van het milieu.

water computers honden lucht

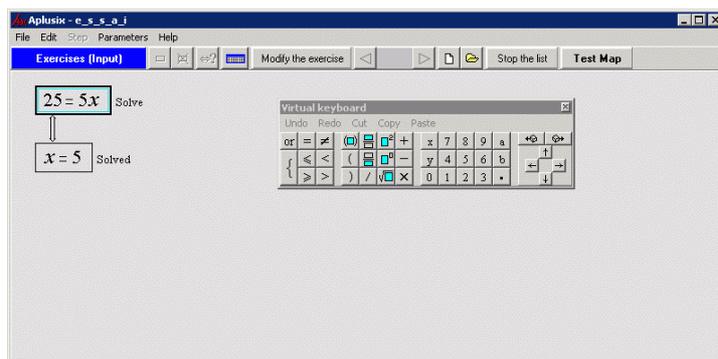
A regular threaded discussion forum adapted for discussing or processing texts. The particular text is found on screen, besides the discussion area and messages can be linked or 'anchored' to specific passages.

Provided by Jakko van der Pol, IVLOS ICT-Expertisecentrum, Utrecht University, The Netherlands (KALEIDOSCOPE)

Aplusix

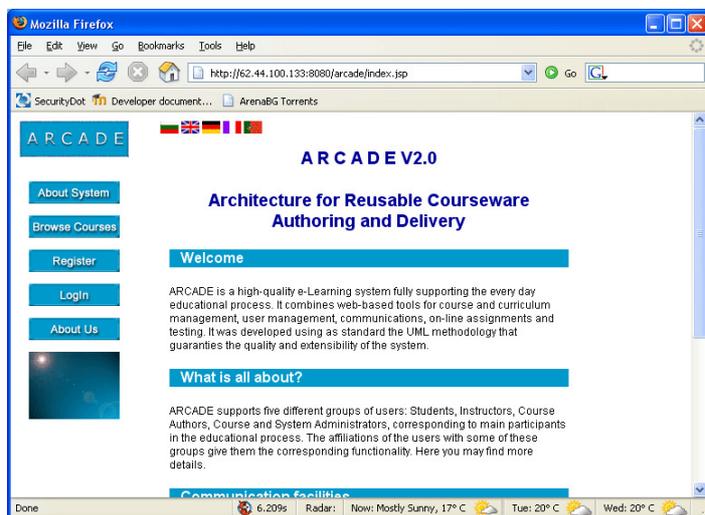
Aplusix is an exerciser for algebra, mainly for grades 8 to 11.

An exercise editor allows teachers to build their own lists of exercises; Aplusix also permits working with textbook exercises. The software contains a "Test" mode in which students solve exercises without any feedback. In the "Self-correction" mode students can modify their work to produce a correct answer.



Provided by Jean-François Nicaud, Institute for Computer Sciences and Applied Mathematics (IMAG), Grenoble, France (KALEIDOSCOPE)

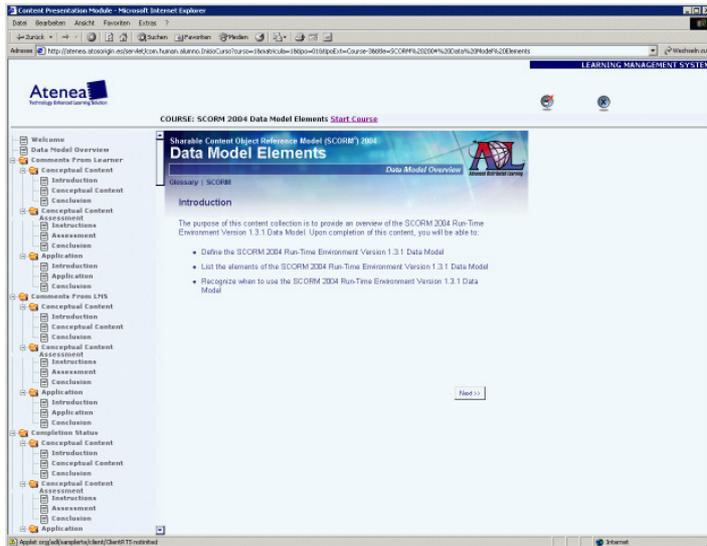
ARCADE



Arcade combines web-based tools for course and curriculum management, user management, communications, on-line assignments and testing to an integrated software platform for authoring and delivery of Internet-based distance courses.

Provided by Boyan Bontchev, Sofia University, Bulgaria (KALEIDOSCOPE)

Atenea



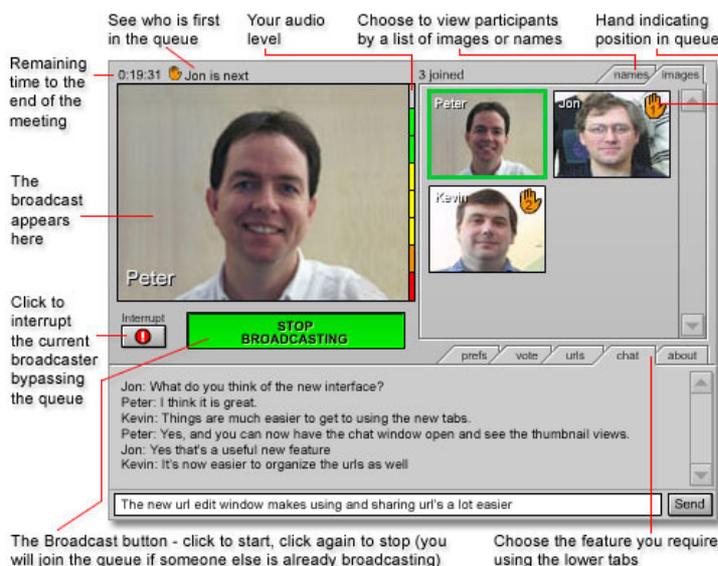
Atenea is a web-based Learning Management System designed to support and monitor the learning process.

It is flexible, scalable and easy to use for tutors and learners with a very little knowledge of information technologies.

Provided by Lydia Montandon & Ana Frutos, Atos Origin, Madrid, Spain (KALEIDOSCOPE)

FlashMeeting

FlashMeeting is a video conferencing application with all features packed into a small applet implemented in Flash direct in a web page.



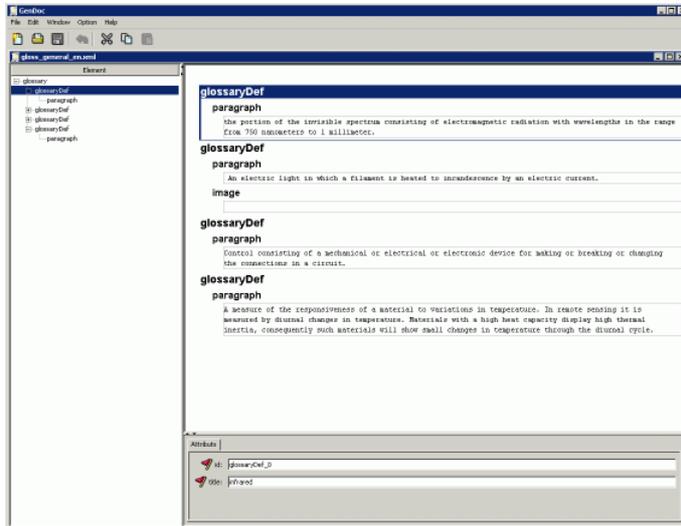
It allows secure and private meetings by using text and video chat with a queuing system. For web replay, meetings are recorded.

Provided by Kevin Quick, Knowledge Media Institute, Open University, Milton Keynes, United Kingdom (PROLEARN)

(Screenshot by Knowledge Media Institute, Open University)

GenDoc

GenDoc is an open source XML editor written in Java 2 and can handle sets of Document Type Definition templates.



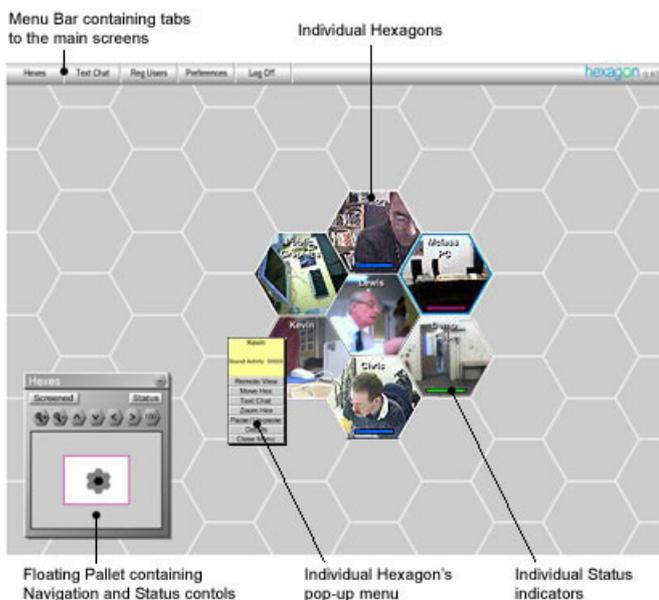
It has a plugin API that allows the editing of some elements to be customised for specific DTDs, and also allows publishing actions to be executed from the editor.

Provided by Jean-Pierre David, Equipe ARCADE, Laboratoire CLIPS – IMAG, Grenoble, France (KALEIDOSCOPE)

(Screenshot by Equipe ARCADE, Laboratoire CLIPS - IMAG)

Hexagon

Hexagon is a video conferencing application for larger groups, which includes text chat, private voice chat between two people.



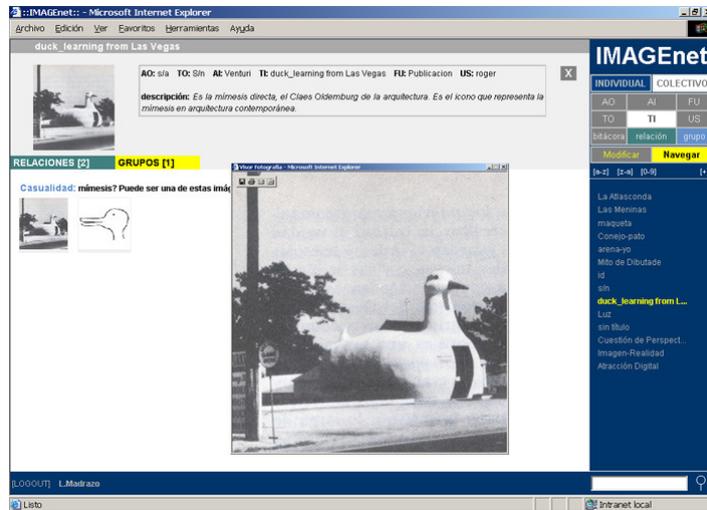
As FlashMeeting, the application is a small applet implemented in Flash direct in a web page.

Provided by Kevin Quick, Knowledge Media Institute, Open University, Milton Keynes, United Kingdom (PROLEARN)

(Screenshot by Knowledge Media Institute, Open University)

IMAGeNet

IMAGeNet is a web-based learning environment that allows a group of users to create collaboratively a digital library of images, in order to reason about their meanings.



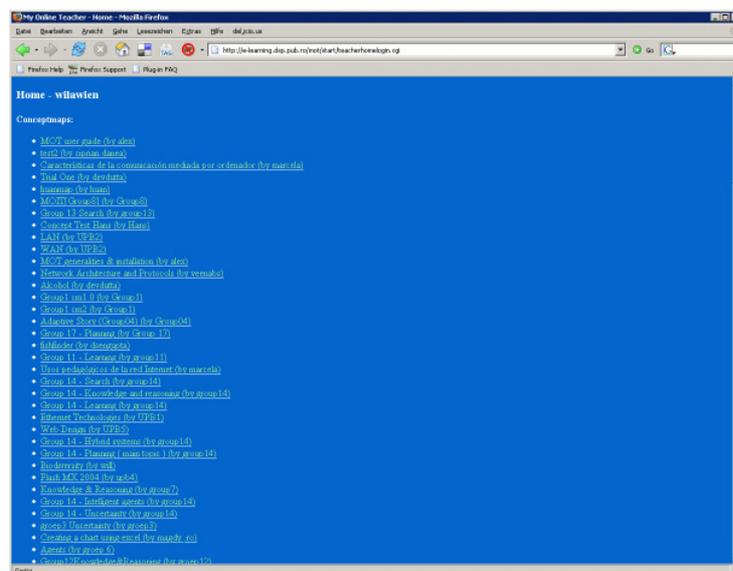
Images are described with a set of attributes, including the name and the author of the depicted object, the title and the author of the image, and the source. Also, users can build a vocabulary of concepts which then are associated to the images.

Provided by Leandro Madrazo, Research Group Architecture, Representation & Computation, Department Engineering in Architecture, La Salle-University Ramon Llull, Barcelona, Spain (PROLEARN)

(Screenshot by Research Group Architecture, Representation & Computation, Department Engineering in Architecture, La Salle-Universität Ramon Llull)

MOT

MOT is a single authoring environment to deliver content in independently designed Educational Hypermedia Systems.



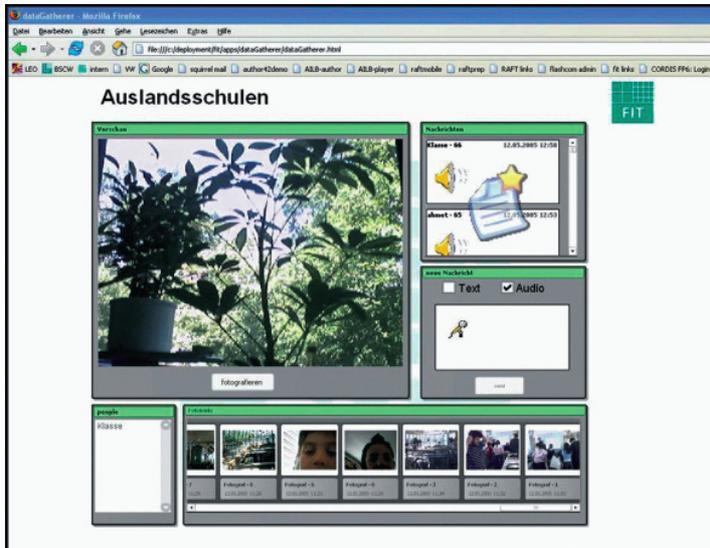
This allows for moving towards having an appropriate lesson for each student. With this tool, the subject-matter of the course to be designed can be modeled by means of concept maps on which lessons can be constructed.

Provided by Alexandra Cristea, Eindhoven University of Technology, The Netherlands (PROLEARN)

(Screenshot by Eindhoven University of Technology)

Open Classroom

Open Classroom is a platform that enables real time collaboration and authentic real world learning experiences such as virtual guided tours, virtual partnerships, and Remote Accessible Fieldtrips for students.

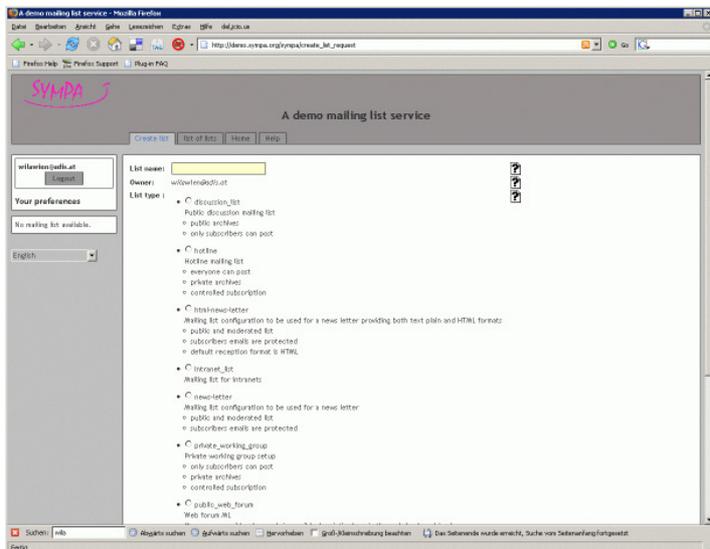


Provided by Andreas Kaibel, Fraunhofer Institut für Angewandte Informationstechnik FIT, St. Augustin, Germany (PROLEARN)

(Screenshot by Fraunhofer Institut für Angewandte Informationstechnik FIT)

Sympa

Sympa is a mailing lists software providing a rich web interface including member tools (subscription, message submission, web archives, shared document repository) as well as list administrator / moderator features (list configuration, subscription and message moderation) with enhanced features (virtual hosting, online mailing list creation, LDAP-based mailing lists, extensible authentication methods).



Provided by Olivier Salaün & Serge Aumont, Comité Réseau des Universités (CRU), Paris, France (PROLEARN)

More information on all the software is available at <http://parcel.uni-sofia.bg>

ANNEX 2: THE AUSTRIAN AND CZECH ROUNDTABLES

Roundtable on web conferencing, 15 November 2006, Ostrava

Roundtable on NGO opportunities, barriers and perspectives of NGOs for technology enhanced learning, 1 December 2006, Vienna

Roundtable on technology enhanced learning in labour-market projects, 5 September 2007, Vienna

Roundtable on barrier-free technology enhanced learning, 12 September 2007, Vienna

Roundtable on technology enhanced learning for senior citizens, increasing employment chances on the labour market, 13 September 2007, Ostrava

Roundtable on technology enhanced learning for increasing employment chances on the labour market, 24 October 2007, Ostrava – Přívoz

Published und edited by

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Participatory Communication Activities on E-Learning (PARCEL) is a project funded by the European Commission (DG Research) (Contract No SAS6-013635).
<http://parcel.uni-sofia.bg>