TAB

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Media use and eLearning in schools

Summary

SUMMARY

eLearning – electronic learning with the aid of computers and the Internet – has in the meantime become a part of everyday life in Germany. However, although the importance of eLearning for the changes in the education and research landscape and in the knowledge-based society in global competition, as well as also for the development of companies and their respective communication and organisational culture is generally accepted, eLearning is by no means a compulsory part of everyday life in German educational establishments and for educational providers – this is particularly true of the schools sector. However at the same time many hope that the comprehensive and lasting implementation of eLearning instruments will result above all in a needs-based and innovative development of educational opportunities at all levels and in all of the institutions in the educational landscape.

In recent years eLearning has constantly developed itself further in terms of content and technology, and its use has been intensified in all educational sectors. Not only have new training and learning opportunities arisen as a result, new educational and learning concepts as well as organisational forms have also been tested and corresponding hardware and practical learning materials created. The development of complex multimedia, computer and above all web-based teaching and learning modules has been pushed forward in the same way as the further development and mobile use of new information and communications technologies (ICT). At the same time these open up new prospects for education. The »web services« connected with the Internet in particular represent novel opportunities for learners and teachers.

The significance of virtual learning for teachers and learners in the different types of school, for teaching and learning concepts and formats, for remedial teaching and the development of learning cultures in the sense of lifelong learning, for knowledge and communications management as well as school development and school administration is immeasurable. At the same time the importance for education reforms, international performance comparisons and studies on the importance in the future of the introduction of children to the learning objective-oriented use of computers and the Internet in the classroom and in an extracurricular context, as well as the international reputation of the German education system and its individual institutions has been intensively discussed. The starting points and effects, the scale, the dependability and strategic relevance of eLearning initiatives are however very different, and extensive and

methodically co-ordinated analyses of the relevance and the impacts of the use of eLearning instruments have as yet only been conducted on a limited scale.

Previous TAB working reports have shown that eLearning is for the most part a meaningful supplement to traditional types of learning. The questions and aspects relevant to education policy associated with this prompted the Committee on Education, Research and Technology Assessment to commission TAB with the drawing up of a progress report on the subject of »eLearning and School«. The present report outlines the possibilities of eLearning in schools and refers at the same time to the challenges and necessities for action.

ELEARNING – HOW AND WHY?

The understanding of eLearning has changed continually over the years. The original highly technologically characterized definition is currently being discussed again and modified in connection with the integration of more comprehensive didactic concepts. This continual process of change requires various forms of eLearning to be taken into account; there is no one *single* concept of eLearning.

In this report eLearning applies to all forms of teaching and learning which are supported or made possible by modern ICT and which serve the recording, storage, handling and processing, application and presentation of information or learning content. The layout of the digital content can be interactive and multimedia, i.e. texts, graphics, audio and video, animations and interactive functionalities can be used. The learning processes can be complemented by net-based communication between the learner and the teacher – e.g. through email, chat rooms and collaborative working environments.

Developments in computer technology and the spread of Internet use make the computer a technical-organisational media centre and thereby a decisive aid for teachers and learners. Multimedia and hypermedia form the technical basis for eLearning. Moreover all net-based types of communication are used to support the learning process: Newsgroups and email, and more recently also weblogs and podcasts, assist the exchange of knowledge and information.

The benefits or added value for learners can be seen in the flexible use; in the greater motivation to learn through new learning scenarios and communicative, interactive support; in the opportunities for simulating real situations; in diverse, even collaborative ways as well as in the opportunity to be able to additionally

benefit from or make available information or knowledge building blocks. Additional test components allow for a continual and immediate learning review. Especially with completely digital forms of learning, these potential advantages are confronted by disadvantages which can arise from the absence of teachers and fellow learners.

With the technological dimension of eLearning long having been the centre of attention, the importance of didactics is meanwhile beginning to grow with the design of learning content and the development of competencies. Successful eLearning assumes a capability and readiness for self-learning. It is not only the teachers who have to attune and prepare themselves for new virtual forms of learning. Demands are also made on school administrations, decision-makers and persons responsible for further education. Online-based forms of learning in particular present the culture and the organisation of schools with a fundamentally new situation, requiring changes in internal procedures and processes. In order to introduce and implement such forms of learning, an education management system is required which is able to permanently analyse the scale of the changes and professionally intervene where necessary.

POTENTIAL AND DEVELOPMENTS

Through their special features – such as interactivity, networking and multi-mediality – the New Media can potentially contribute to an improvement in the didactic and methodical quality of teaching in schools. Pedagogic and didactic arguments which are put forward for the use of computer or web-based media in the classroom read more or less as follows:

With their diverse potential applications and their specific characteristics, New Media can positively and profitably change teaching and learning in school. New Media allow for new forms of teaching and learning (independent, active, co-operative and constructive learning) as well as the individual support of every single student. Multimedia learning programmes enable learners to shape their learning and learning processes individually. This opportunity is at the same time a basis for self-directed learning, something which is continually gaining in importance not least because the knowledge-based and information society requires lifelong learning. Media skills is a key qualification for the information and communications society and can be at best imparted through the (early) use of New Media in schools.

It has however also been established that those aspects which are important for learning such as motivation, emotion, cognition, metacognition and learning strategies strongly influence the learning processes and are mutually correlated yet have thus far been hardly considered in relation to media learning.

MEDIA USE IN HOUSEHOLDS AND SCHOOLS IN GERMANY

Families in Germany in which children and adolescents grow up are very well equipped with New Media today, with the majority also using New Media naturally in their everyday life. Children and adolescents use New Media predominantly for playing games, learning and for Internet access. While children use the Internet most often to search for information, research topics and to play online games, the role of the Internet for adolescents is mainly as a means of communication, first and foremost through so-called Instant Messaging and the sending of emails.

In contrast to the very good media equipment found in households in which children and adolescents live, the technical equipment available in schools and other places of learning has proven to be less so. Germany also comes off badly in an international comparison here. Almost all the schools in Germany providing general education have educational software, yet only a few have multimedia reference books and tool-like software applications. There is a lack of programmes which allow teaching staff to prepare software or teaching materials themselves.

The fact in the 2003 PISA study, that among all industrial nations Germany is the country in which the computer is most rarely used as a regular instrument for learning purposes, is not least due to the lack of or unspecific guidelines on the use of ICT in the education syllabuses of many federal states. There is in particular potential for the development of the use of computers for students with special needs and disabilities in Germany which remains below the EU average. The consequence is that children and adolescents acquire their ICT-related abilities for the most part independently in an extracurricular environment. The same holds true for the teaching personnel.

What is noticeable is the somewhat high level of scepticism with which German teaching staff regard the use of ICT. The proportion of sceptics is three times higher than the European average. German teaching staff rate their ICT knowledge rather critically on the whole. As a result a clear negative connection can also be established here between the confident use of ICT and length of service.

The majority of male teaching personnel taught themselves to use a computer, whereas female teachers acquired their knowledge primarily from family members or colleagues.

ELEARNING IN GERMAN SCHOOLS

It is true that eLearning strategies and action plans are also drawn up on a federal level in Germany, however in the end it is each State Ministry of Education and Cultural Affairs that decides to what extent eLearning and the acquisition of media skills by teaching staff and students should be integrated in their own education acts, education syllabuses, curricula etc. and are thereby to become indicative of desired practice in the respective school administrations or administrative districts. This means that a variety of strategies and development approaches are being pursued in parallel, without them being sufficiently co-ordinated with each other or possible opportunities for synergy being used.

A comparison of the approaches in the federal states shows that they do not differ so greatly in content. Consequently there is a further reason for a closer co-ordination of the measures: The opportunity to learn from each other when implementing individual eLearning measures could be improved by the building up of information platforms for the exchange of experience by teaching staff and closer networking when developing didactic solutions.

New Media are primarily perceived as an aid by the Ministries of Education and Cultural Affairs; the development of media skills, also for the use of eLearning, has until now only seemed to be a goal for higher classes. Secondary schools have been expected to take the use of New Media more into consideration in their curriculathan primary schools. Consideration must be given here to the fact that the demands made on basic education in information technology change rapidly and that this should be adequately reflected in specific curricula and didactic concepts.

Reports published to date by scientists monitoring the development measures indicate that appropriate education policy, pedagogic and didactic concepts are necessary for a targeted use of the potential of New Media. In the meantime there have been reactions to these insights in many places, and corresponding measures have been taken for the instruction of children and adolescents in schools based on future needs. However it follows from the analysis of the education acts and curricula, as well as the targets set by the majority of the development initiatives, that it is ultimately left up to teachers to investigate and implement

appropriate information with regard to solutions, tools or measures. Through this individualisation of the implementation of curricula, the exchange of experience about good practices or supporting information is made yet more difficult.

ELEARNING IN ENGLISH SCHOOLS

Great Britain plays a leading international role in eLearning activities in the education sector. In the schools sector, ICT-related content is anchored throughout the whole curriculum and is an integral part of lessons in most subjects. The attitude of teachers towards the use of ICT is positive in an international comparison and they are well-informed about and skilled in the use of computers.

Schoolchildren and teachers profit from diverse teaching and learning materials, teaching staff and school administrations see themselves confronted with a growing range of training and further education courses in the ICT sector. In major projects the creation of a standard digital infrastructure is being pushed forward with, and in particular the use of broadband technology is also being promoted as are compatible software solutions. Many different players from the fields of education, research and industry are working closely together on the realization of individual strategy modules, in order to ensure a multidisciplinary and all-embracing approach.

A comprehensive evaluation of national eLearning strategy in 2006 however also identified weaknesses and challenges: Criticism was made that binding regulations on regular upgrades and renewals of the ICT were lacking in the majority of schools or that these were not being complied with, resulting in only a few schools actually being technologically up-to-date. The lack of compatibility between different hardware and software packages in the education sector also remains problematic. The quality of the digital teaching materials was on the whole rated as high. The materials are still used offline most of the time, whereby a trend towards increased online use is becoming apparent.

It remains in doubt however, whether the materials available are always used effectively in the classroom, in part because teachers are often unable to judge the quality of the materials. Accordingly, teachers still see the greatest need for their own further training in the ICT sector, even though the majority of school administrations consider their abilities and skills in using computers as being adequate to or better than the requirements. At any rate though, the use of computers on schoolchildren's performance was able to demonstrate a slightly positive effect in national performance tests.

Seen as a whole and in spite of the weak points indicated, England is to all appearances on the road to the further improvement of its already good position in a European comparison. Forthcoming evaluations will show to what extent the various ambitious goals of the »e-strategy« will have been fully achieved.

ELEARNING IN SWISS SCHOOLS

eLearning has begun to arrive on a broad scale in everyday teaching life in Switzerland. This is the result of diverse activities and initiatives. Courses are directed at different target groups, such as e.g. teaching personnel, disseminators, school administrations and schoolchildren. There are a large number of organisations in the meantime which occupy themselves specifically with the introduction and pedagogically meaningful application of ICT in the education system. Many of these players support innovative projects in individual cantons. The private sector has also committed itself in the field of eLearning and supports schools in many ways, through the provision of technology and support or by assisting with training.

Particular value is placed on ICT-related education and further training of teaching staff and their instructors. In every canton there are large numbers of courses, some of which are free or partly financed. At universities, ICT and their possible fields of application in the classroom are a compulsory part of teacher training for all academic levels. On the whole, through the increase in training and further education courses, the ICT skills of teaching staff as well as their attitude to the use of ICT in the classroom has improved considerably. Even schoolchildren are being supported in eLearning with platforms planned for specific target groups. The range of courses for homework support or educational software is large. Finally, the ICT equipment available in schools has significantly improved in recent years from both a quantitative as well as a qualitative viewpoint.

Many diverse individual projects have been supported across cantonal borders within the framework of »Public Private Partnerships – Schools in the Net«. The development requirements should confront two central problems which tend to reduce the effectiveness of ICT-related measures: Due to the control by the cantons over the domain of education, individual measures are often not integrative and good examples are too rarely carried over to other cantons. A second central problem is the short term nature of many projects. Thus promising measures are frequently drawn up, then however only carried out for a short period of time and afterwards discontinued.

Summarising, it can be noted that Switzerland has positioned itself well with the measures so far undertaken in the sector of academic eLearning. Those responsible for education have realised that in future it has to be a case of safeguarding the sustainability of previous efforts, of pushing further ahead with inter-cantonal co-operation and of continuing to intensively support teaching staff implementing the knowledge acquired within the scope of training and further training in the classroom. This is accordingly also the focus of the future work of the »Swiss Co-ordination Office for ICT and Education«.

ELEARNING IN FINNISH SCHOOLS

Finland is regarded worldwide as a pioneer in the education sector. According to the PISA studies, the knowledge of 15-year-old schoolchildren in mathematics, sciences and reading literacy puts them at the top of the table of the OECD countries. The share of weak schoolchildren is low in comparison with other OECD countries and differences in performance between different regions and schools are not very pronounced. In Finland all people – irrespective of their place of residence or their family background – receive equal access to education and vocational training. Finland's success has aroused a continually growing interest internationally in the Finnish school system in recent years.

The country agreed on a comprehensive strategy for the development of eLearning and pressed ahead with the building up of the infrastructure in individual educational institutions and the development of digital teaching materials. Programmes were launched and institutions built up for all areas of education, beginning with a network for the pre-school sector right up to a Virtual University and an Open University.

The central public players in eLearning in Finland are the Ministry of Education and the national education authority; even the radio and television broadcasting network YLE is among the most important players, in particular as the provider of television-based courses. The Ministry of Education introduced an initial programme for the promotion of ICT in schools as early as 1995, resulting in all schools being equipped with computers and the corresponding infrastructure by the year 2000. According to a European Commission study from 2006, the pupil-computer ratio in Finnish schools at 16.8 % (6:1) is significantly above the European average.

A successful implementation of eLearning concepts calls for a positive and open-minded attitude to ICT and its use on the part of teachers. According

to the European Commission study mentioned, Finnish teaching personnel are comparatively more positive about the deployment of ICT in the classroom than the European average; and the proportion of sceptics is distinctly lower than in Great Britain.

In contrast however to the relatively positive sounding programmatic statements, the practice appears to look somewhat different. Thus teaching personnel in national surveys refer to the lack of suitable digital teaching materials as the reason for ICT use remaining below what is in principle possible. This should be counteracted by modified legislation – among other things for the responsible YLE.

PREREQUISITES FOR SUCCESSFUL ACADEMIC ELEARNING

The use of ICT and eLearning activities in German schools are comparatively less than widespread from an international point of view, and requirements for improvement have been established in many places. A number of developments in recent years have demonstrated that central aspects in the conception and implementation of eLearning activities have to a certain extent not always been thought through and that this has had a negative influence on success. It has been demonstrated that co-ordinated measures and strategies are essential for quality assurance in the various projects and initiatives. The motivation and qualification of the teaching staff also have a particular importance or effect on the use of eLearning. Finally it has become clear that the establishment of specific basic conditions is a precondition for the practical or best application of the different set-ups and functions of eLearning.

HARDWARE

A quantitative and qualitative equipping of schools with high-grade hardware is a fundamental prerequisite for eLearning activities in schools. The reduction of the so-called pupil/computer ratio is also often mentioned as an essential aspect in this context. The question needs to be asked however, as to whether the improvement of the pupil-computer ratio represents a necessary precondition for successful eLearning activities. Rather the equipping of each school with a specific or desirable level of computers can only be judged against the background of the teaching concept applied. In practice different allocations of computers have come about which, according to the situation and objective, can each in itself be absolutely legitimate and appropriate.

A further important aspect concerns the technical quality of the computers and the peripheral equipment used, as obsolete ICT restricts the opportunities of eLearning considerably. Regular and reliable maintenance of the hardware is of outstanding importance. There are to date no standard approaches with respect to this in Germany. Service contracts with appropriate providers are comparatively rare; frequently the responsibility for maintenance seems to lie with the teaching staff or school administrations themselves. The provision of external services therefore appears advisable, on the one hand, in order to ensure the professional solution of more complex problems, on the other hand in order to relieve the teachers and school administrations for the benefit of their actual core tasks.

SOFTWARE

With regard to content, therefore what is actually being taught and learned, neither »the« strategy nor »the« concept exist for eLearning activities, and the materials and the software for eLearning are also accordingly diverse. Outstanding importance is added to the availability and selection of suitable teaching and learning materials and software. The question raised here is as to what are appropriate channels of distribution and thereby access capabilities for the users. It is also important that the available software is compatible with the hardware installed, which is above all conditional upon the capability of the computers. Ultimately, the fixing of (minimum) standards is importantin order to guarantee the quality of the software used as well as its pedagogic benefits.

QUALIFICATIONS

The extensive equipping of schools with hardware and software as well as its adequate implementation does not in itself ensure success. Rather the way that eLearning is practically and purposefully structured is heavily dependent on theindividual competences and interests of the teachers. In this respect, transferable didactic concepts are useful, which provide for uniformity and measurable standards and at the same time offer teachers a constructive framework for action. Moreover, adequate levels of qualification and motivation on the part of the teaching personnel are important, if not even the decisive factors for the long-term success of eLearning. The training and further education of teaching staff plays a central role in this context. What is additionally important is a qualification in methodology and didactics as well as the knowledge and acceptance of the potential applications of New Media in the classroom. The role and

importance of the school administration and other decision-makers need to be specified and more strongly highlighted in this context.

The experience of teaching staff from the same or neighbouring disciplines as well as the same or neighbouring school years and types of school is of great importance for the integration of the eLearning instruments into the classroom. The exchange of experience is of considerable importance for »eLearning novices«, in particular in situations where computers are not intended to be only a peripheral phenomenon in unchanged didactic models. In this way, handouts for the school administration and questions on organisation and administration, costs and finances as well as media profile and school development, yet also valuable tips for teaching staff on how to deal with hardware and software, can from time to time be more quickly settled »informally«. Didactic concepts can be jointly developed, discussed or tried out. Experience in dealing with pupils' problems, references to interdisciplinary computer work or also for projects beyond what is required in the classroom should be supported as well through a stronger exchange of information and experience.

EQUALITY OF OPPORTUNITY

Academic eLearning initiatives and specific eLearning applications have to take social differences or socially conditioned access requirements and experience in dealing with ICT into consideration, as not all schoolchildren have the same opportunities at their disposal regarding the use of computers in general and access to the Internet. Even if all schools were equally well-equipped with computers, the aspect of home computers use plays a not inconsiderable role. Target group oriented programmes would have to take care of the equality of opportunity here independent of social background.

SUSTAINABILITY

Academic eLearning should be sustainably implemented. Many eLearning projects have to be discontinued after a few years – often despite proven successes – because the financial and personnel resources necessary for independent continuation are not available at the end of the sponsorship period. For this reason not only do subsequent generations of schoolchildren or teachers miss out on the opportunity to also profit from specific media-related promotion, but rather on occasion also the results of conceptional and administrative work often involving a lot of time and resources are lost. There is an urgent need here for the

development of relevant concepts which could guarantee the sustainable application and implementation of practical eLearning projects.

CHALLENGES AND OPTIONS FOR ACTION

The fact that computers represent (almost) ubiquitous access tools to the global information memory, that the method of access to information in schools is changing and has to change and that the opportunities offered through eLearning must not be ignored by schools have been made clear by developments in recent years. It is rather the role of the school to pick up and purposefully integrate the new reality in the lives of children and adolescents into the classroom. Through the increasing interconnection of hardware and the Internet eLearning is also developing in a new direction itself: Weblogs, podcasts, wikis and social software are making out of the previous – rather static – »WWW« a web2.0 or eLearning2.0, where content is designed by the users themselves and which is meanwhile highly rated by adolescents and schoolchildren. In the course of eLearning such developments should be actively taken up and used in teaching.

The fact that quite a lot of things are happening in this direction in schools, and also that investments have been made in the public education sector since the results of the first PISA study became known, is certainly recognizable. Current OECD studies however imply that this has been so far insufficient and that investments in education have in part been misdirected: Substantial improvements are accordingly not going to be achieved through more test procedures and examinations, but rather through the introduction of new forms of teaching and learning suitable to the modern information and knowledge-based society. Naturally the use of computers alone will not result in better education. Rather it is necessary to embed the New Media in a pedagogic concept of eLearning. Moreover only a systematic all-embracing approach can prevent investments in equipment and software falling flat without any lasting educational effects.

On the basis of practical experience and previous scientific findings the further promotion of New Media or the use and the sustainable implementation of eLearning in schools then appear to be meaningful, if certain specific conditions and prerequisites, named in the current report, are taken into consideration. A large number of successful ideas have been brought into schools in Germany by individuals or institutions. This knowledge should be taken into consideration for further development just as should be international experience in this field. With an eye on England in particular and to an extent also on Switzerland, spheres of activity can be seen which could, where necessary, also be carried over

into German educational structures. In addition, previous progress reports on individual projects as well as research results should be brought together, adjusted where necessary with respect to methodology and also made publicly accessible. This would also contribute to a more efficient and effective discussion of the eLearning theme, to the needs-oriented development of projects and to the avoidance of redundancies in planning, conception and execution.

ICT-EDUCATION AND STANDARDS OF COMPETENCE

It would be useful if there were binding transnational minimum standards for academic eLearning provisions, which moreover found their way into the education syllabuses and curricula of the individual federal states. The determination of year-specific levels of competence also seems worthy of consideration, in a similar way to the education syllabuses in Great Britain. There the abilities and knowledge the schoolchildren should have acquired in the area of New Media by the end of an academic level, is laid out for each school year. Media skills should not only be required and promoted within the scope of individual school subjects, such as for instance computer science, but rather should be treated as an educational goal which runs throughout the whole academic curriculum.

It is true that media skills are playing an increasing role in teacher education and training, however the type, quality and scale of courses offered in the individual states and partly also regionally differs greatly; a need for action here has been established. It would be conceivable to have binding (nationwide) standards for the integration of media-related content into teacher training for all academic levels. At the same time attention would have to be paid to make sure that ICT-related content is not exclusively the topic of independent events or seminars, but rather that media-didactic competence is purposefully imparted in the respective subjects. The better structuring, co-ordination and preparation of the further education courses is also to be aimed for as well as their supplement and expansion. Not least against the background of the possible cost savings, the support of the training of teaching staff to be disseminators, who pass on their acquired knowledge in internal school training sessions, should also be intensified. What would be useful would be the certification of further training courses, in order to improve the motivation of teaching staff to take part and at the same time to make the respective teaching or teacher's qualification transparent. Switzerland has diverse exemplary experience here.

NETWORKING AND CO-OPERATION

A greater networking and co-operation of schools with each other is to be striven for. The individual acquisition of suitable hardware and software still predominant until now leads on the one hand to the loss of potential economies of scale, and on the other hand the system solutions worked out by individual schools are often not compatible with each other, making the exchange of ideas and also the spread of successful eLearning approaches more difficult. On the whole, a more intensive exchange of tried and tested good eLearning solutions – also across academic levels – is desirable, in order to be able to develop a practical, consecutive development concept. Finally, the regular and co-operative evaluation of eLearning activities as well as their continual improvement is of overall importance. This in turn would require a clear definition of objectives, which for instance would also have to be anchored in the curricula.

FINANCING

The state has invested far in excess of 1 billion euros in a multitude of eLearning projects since 2000, however at the same time without any visible signs of any overall concept or national co-ordination to increase efficiency. Instead of this, multiple developments have been and are being undertaken, and economies of scale have hardly been able to be used. What is more, as a rule the development period is limited; many projects have to be brought to an end after the expiry of the support owing to a lack of adequate financial and personnel resources.

The current costs for ICT in schools probably only represent the tip of the iceberg. Not until the financing of model projects and pilot schemes has come to an end, guarantees for technical equipment have run out, replacements are under consideration or the support is awarded to external service providers, will it be possible to realistically estimate the actual and long-term costs facing the institutions supporting the schools. The federal government and the states should therefore try hard not only to inform teaching personnel and decision-makers in the education system about project ideas and suitable hardware and software equipment, but also in particular about ways to finance this. Before a project is publicly subsidized, it should be made clear how the activities can be continued once the designated subsidy period is over, which financial and personnel means are available or how these should be procured. A look at Switzerland could prove helpful in this case: One of the decisive subsidy criteria there is that possibilities for the long-term continuation of the respective project are evident from the application for subsidy.

RESEARCH REQUIREMENTS

Previous studies on the influence of computer and Internet use or on the specific use of eLearning instruments and content in schools on pupils' performance are neither able to substantiate the fact that the use of New Media or eLearning has generally positive effects on academic performance, nor that the use of computers at schools has no fundamentally positive potential for pupils. They do suggest however, that such potential has not been exhausted by far with the use in schools to date. The relevant discussions and disputes are far from settlement; further detailed investigations and long-term studies are necessary.

For this reason it would be sensible first of all to identify effective potential applications for computers in the classroom, and to verify their effectiveness in field and longitudinal studies before there is a comprehensive deployment of eLearning in schools. In general there has as yet still been a lack of determined research which actually measures the respective subject-specific learning success – or even failure – against the background of the use of eLearning instruments. It remains unclear, which concepts here actually bring about learning success and how many computers per pupil are necessary to achieve that. In the end however, it is these details which the local authorities urgently need to plan school resources, in particular where applicable to subsequently set up and guarantee (affordable) long-term operation after the expiry of the model and pilot phases.

It can be assumed that increasing mobility, more frequent learning at home, the growing importance of lifelong learning, an increase in the number of broadband ICT applications in many application areas as well as the use of internet-based learning platforms will have repercussions on the academic eLearning area as a whole and in particular lead to an extension of the range of web-based learning arrangements. That is why the development of strategies for the optimisation of eLearning services and the gathering of fundamental information and detailed knowledge about eLearning processes in their individual phases are of essential importance. The following topics in particular need to be taken into consideration in future studies:

> Media and learning behaviour of younger target groups: How and when does learning occur; over which periods of time, in what intensity, with what motivation? Whichparticular target groups need to be taken into consideration and how?
> School-specific questions with regard to the target groups of pupils, teachers, school administrations, institutions, publishers or providers of content

> Cost-benefit analyses of eLearning instruments and underlying technical resources
> The modes of action of special methodical didactic arrangements with the aim of refining eLearning-specific learning steps
> The design and user-friendliness of fundamental control elements for functional and educational software
> Quality standards

The gathering of essential information from such studies is ultimately indispensable, in order to be able to solve a number of as yet unanswered or insufficiently answered questions as well as to suggest approaches for optimising academic eLearning.

Even if the public dialogue on the educational relevance of computer use is currently once again being conducted more controversially or appears to be more critical of media, eLearning should by no means be hastily considered a temporary phenomenon. In many educational sectors, and certainly also in schools, eLearning will prove to be a significant extension of teaching and learning opportunities, and it will become apparent that eLearning can represent an interesting enrichment to the instruction or even a central element in the school. Teachers and learners, school administrations and educational experts must themselves however play a part in passing on and evaluating their experience with New Media in the schooland thus contribute to the assurance of the quality of the learning and teaching using eLearning instruments.

TAB

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