# 7 Annex: Learning with new media in distance education

## Stages on the way to the "learning space virtual university" of the Fernuniversität in Hagen

| *Year* | *Type of digitalising* | *Changes to learning behaviour* | *Changes to teaching behaviour* |
|---|---|---|---|
| **1975** | Use of a central computer to control distance education operations. | Inspection of own files, including earlier written examinations and the grades for them. Greater transparency. | Wide-ranging documentation of performance data. Comparative overview of the performances of various population segments are possible. Where necessary, course syllabuses are optimised accordingly. |
| **1976** | Empirical evaluation of course materials with standard questionnaires as marking voucher. | Teaching text criticism by students. They enter their opinions and assessment in a coded questionnaire. | Formative and summative evaluation. Teachers check the teaching text criticisms from students and external experts and amend the teaching texts where necessary. |
| **1977** | Computer-aided correction systems LOTSE and bRw (operational accounting). | Students code their learning results on the basis of selective or numerical answers and enter them in a machine-readable marking code. | Teachers work in accordance with didactic aspects not only with *tutor-marked assignments* but also with *computer-marked assignments*. |
| **1979** | Digital study start advice STEB. | Detailed advice for potential students on the basis of their individual interests, inclinations and learning situations in the form of individually compiled computer letters. | Teachers, study counsellors and instruction technicians collaborate to provide relief for personal study counselling through this computer-aided advisory system. Where necessary, this computer-aided advisory system should also dissuade potential students if misguided conceptions of distance studying become apparent. |
| **1980** | Introduction of interactive access facilities of study centres on central computers. | Interactive process of programming training. | |
| **1980** | Teletext as information medium. | Low-cost request of study information. | Flexible provision of information relevant for studying. |
| **1982** | Teletext-computer network form computer communication from home. | Low-cost dialogue access for students to information, advice. In some cases to assignments and practical training. | Compilation and provision of digitalised information and assignments |
| **1984** | 1 PC in a study centre. | Decentral use close to home of IT resources. | Training in word processing and presentation and teletext communication. |
| **1984** | Computer access for distance students via EARN/BITNET (Internet predecessors) | | Scientists begin exchange of information. |
| **1985** | First digital teaching modules and disks. | Students learn on the screen: they are activated through the interactivity, profit from the elucidation through multimedia, in particular animation and simulation. They alter, store and manage the acquired knowledge. | Collaboration with instruction technicians is necessary. Study letters can be sent easily in the form of teaching disks. he development of digital courses begins. |
| **1986** | Institutional access to the Internet. | Students can request data and information and training tasks and send in assignment solutions. | The Internet takes up a place alongside the network of postal links. Information and teaching texts distributed via the Internet. |

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| **1986** | Institutional access to the Internet. | Students can request data and information and training tasks and send in assignment solutions. | The Internet takes up a place alongside the network of postal links. Information and teaching texts distributed via the Internet. |
| **1987** | Step-by-step introduction of electronic word processing. | Reading is made easier through better printing quality and greater variety of the graphics. | New forms of presenting texts on-screen are developed. Teaching texts can now be stored and easily updated and corrected. Teachers develop semi-professional skills for designing teaching texts. |
| **1986** | Institutional access to the Internet. | Students can request data and information and training tasks and send in assignment solutions. | The Internet takes up a place alongside the network of postal links. Information and teaching texts distributed via the Internet. |
| **1987** | DFN Deutsches Forschungsnetz | | Use of the Web in the framework of research projects. |
| | Trainings disks are offered to supplement and deepen the work with the printed study material. | Students use the training disks above all to prepare for examinations. | Development of teaching and trainings disks. |
| **1992** | Introduction for teachers and their assistants to professional use of the relevant software. | | Teachers increasingly use the help of experts in instruction technology to become more competent in designing online teaching texts. |
| **1993** | Using links with Gopher and WWW services. | Important precondition. | Important precondition for the distribution of teaching texts. |
| **1993** | Network infrastructure throughout the university. All workplaces connected to the Internet. | Introduction of WWW and News services for students. | When developing teaching texts, teachers and their assistants can make use of the varied information available on the Internet and communicate and collaborate with one another virtually. |
| **1994** | First course materials on CD-ROM. | Students learn with more extensive on-screen learning texts: they are activated through the interactivity, profit from the elucidation through multimedia, in particular animation and simulation. They alter, store and manage the acquired knowledge. | Collaboration with instruction technicians is necessary. Study letters can be sent easily in the form of teaching CDs. The development of digital courses begins. |
| **1995** | Start of the development work for the degree course ETOnline (electric engineering). | The first students test the digitalised teaching materials by working through them parallel to working with the printed material. They have constant access to the teaching materials placed on the Web, to their personal files and to the stored grades given for written examinations. | Developing and testing online courses and permanent optimisation of the technical infrastructure for online learning. |
| **1995** | Step-by-step introduction of ISDN video conferences for teaching and oral examinations. | Students take part in synchronous virtual seminars. Students abroad are examined in virtual oral examinations. | Teachers plan, organise and lead video seminars and gather experience with online oral examinations. |

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| **1996** | Broadband connection to the Internet / DFN | Students can work online and offline. Accustomising to the use of links in the framework of presentations similar to hypertext. Various forms of literature research and information acquisition. | First attempts at improving the didactical design of the presentation of learning contents on the screen through multimedia and interactivity. Opening up the services of the university library in Hagen and other libraries via the Internet. |
| **1996** | First courses and teaching material in the Internet. | Learning on-screen. Downloading required learning units. Virtual computer conferences. | Teachers conceive and develop specific online modules, course units or course packages. |
| **1996** | First pilot system for the development of an all-round software infrastructure for web-based practical training on the basis of WebAssign. | Learners can enter their solutions up to ten times and these are returned before the final evaluation with the points already received so that they can be worked on again. | Teachers have to formulate the written assignments with regard to a highly differentiated evaluation system. |
| **1997** | Conversion of the IT systems for distance education organisation and administration to client-server processes. | | Intensified integration of teaching staff into the control systems of distance education organisation. |
| **1997** | Digitalising distance education courses. | Several accesses and learning paths available. Links enable various extensions and deepening of the learning texts. | Structurally changed presentation. Along with linear forms, teachers use complex forms of presentation of knowledge. Solutions similar to hypertext are created |
| **1997** | Production of learning software on disks. | Learning facilitated through new modes of presentation. Improved graphics standard, learning with window-driven menus, more learner autonomy. Interactivity, *drill and practice.* | Teaching through particularly carefully and expensively developed presentation of complicated facts or those which are difficult for other reasons. |
| **1998** | CD-ROM. | As with disks. Additional learning with multi-sensory and simulated presentations. | Teaching with video sequences, animation, simulations and virtual practical training. |
| **1999** | Start of virtual bachelor's degree in informatics. | Students in this degree course can carry out their studies completely web-based and have to train web-based learning as the standard form of acquiring knowledge and develop it further. They have to internalise this new and completely different form of learning and teaching. | The main task consists of planning a didactically practical and productive combination of multimedia and interactive teaching texts, virtual seminars, virtual discussions and cooperation and in this way to create a digital learning environment which provides sufficient space for autonomous learning as well. |
| **2000** | Central technical platform for web-based studying. | Broad use of learning space virtual university. | Aligning course syllabuses and practical training to web functions. |
| | Start of bachelor's degree ET online in German and English. | Students in this degree course can carry out their studies completely web-based and have to train web-based learning as the standard form of acquiring knowledge and develop it further. They have to internalise this new and completely different form of learning and teaching. | The main task consists of planning a didactically practical and productive combination of multimedia and interactive teaching texts, virtual seminars, virtual discussions and cooperation and in this way to create a digital learning environment which provides sufficient space for autonomous learning as well. |