LESSON D4_EN. HOW TO USE ELEARNING TOOLS AND TECHNOLOGIES. Basic Technologies.

Project: eEmployment

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After having learned this lesson you will be familiar with the following topics:

- Technologies for facilitating eLearning
- Components required for different learning scenarios
- Specific hardware for eLearning
- File formats to be used in eLearning
- Possibilities of categorizing eLearning tools

CONTENTS OF LESSON

1. Technologies needed for facilitating eLearning
2. Hardware
3. Software
4. File Formats for files used in eLearning
5. The use of Media Players and Viewers.
6. Categories of eLearning tools: CREATE, OFFER, ACCESS.

LEARNING OBJECTIVES:

After having learned this lesson you will have accomplished knowledge about:

- Basics about the technologies needed for eLearning
- Hardware components for eLearning
- Typical Software for eLearning
- File formats used in the context of eLearning
- Media players and viewers which can be used for learning content
- A system for the categorization of eLearning tools

1. Technologies needed for facilitating eLearning

When we talk about eLearning we mean the usage of Web or Internet technologies to support the process of learning. It is not possible to find an exact definition for the term “eLearning” but we can build some categories, which represent different types of eLearning scenarios:

- Learner-led eLearning
- Facilitated eLearning
- Instructor-led eLearning
- Embedded eLearning
- Telementoring and e-coaching

Each type of eLearning scenarios demands its specific technology requirements.

Learner-led eLearning

In learner-led eLearning scenarios the learner is independent for the most part. Because of this we also use the term “self-directed learning”. The learning content in many cases is interactive and presented on a Web server in the Web.

Here you see an example of an eLearning module for learner-led eLearning made with Macromedia Flash.

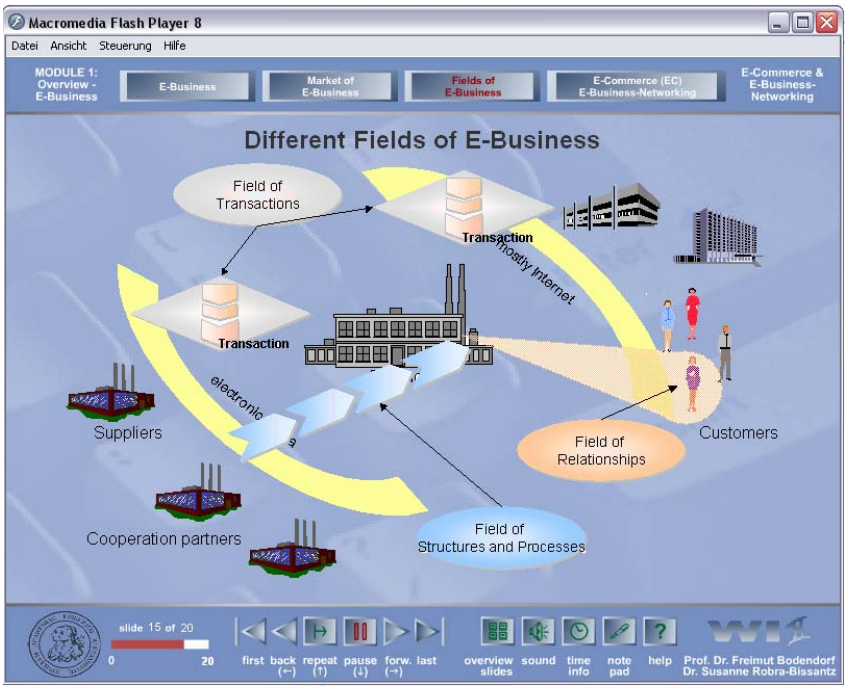


Figure 1: eLearning module for learner-led eLearning

Learner-led eLearning is very similar to learning with CD-ROMs. In this case – when the learning content is on the computer of the learner at home and not on a Web server – we speak of computer based training (CBT).

A scenario representing the components of learner-led eLearning consists of:

- The learning content
- A Web server
- A Tracking database
- Different Internet resources
- A browser
- An independent learner

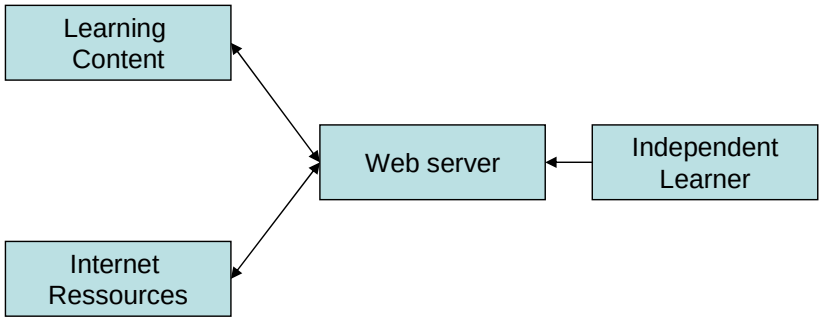


Figure 2: components of a learner-led eLearning scenario (after **Horton, W.; Horton, K.** [1])

What kind of technology do we need for learner-led eLearning?

Technology used for learner-led eLearning :

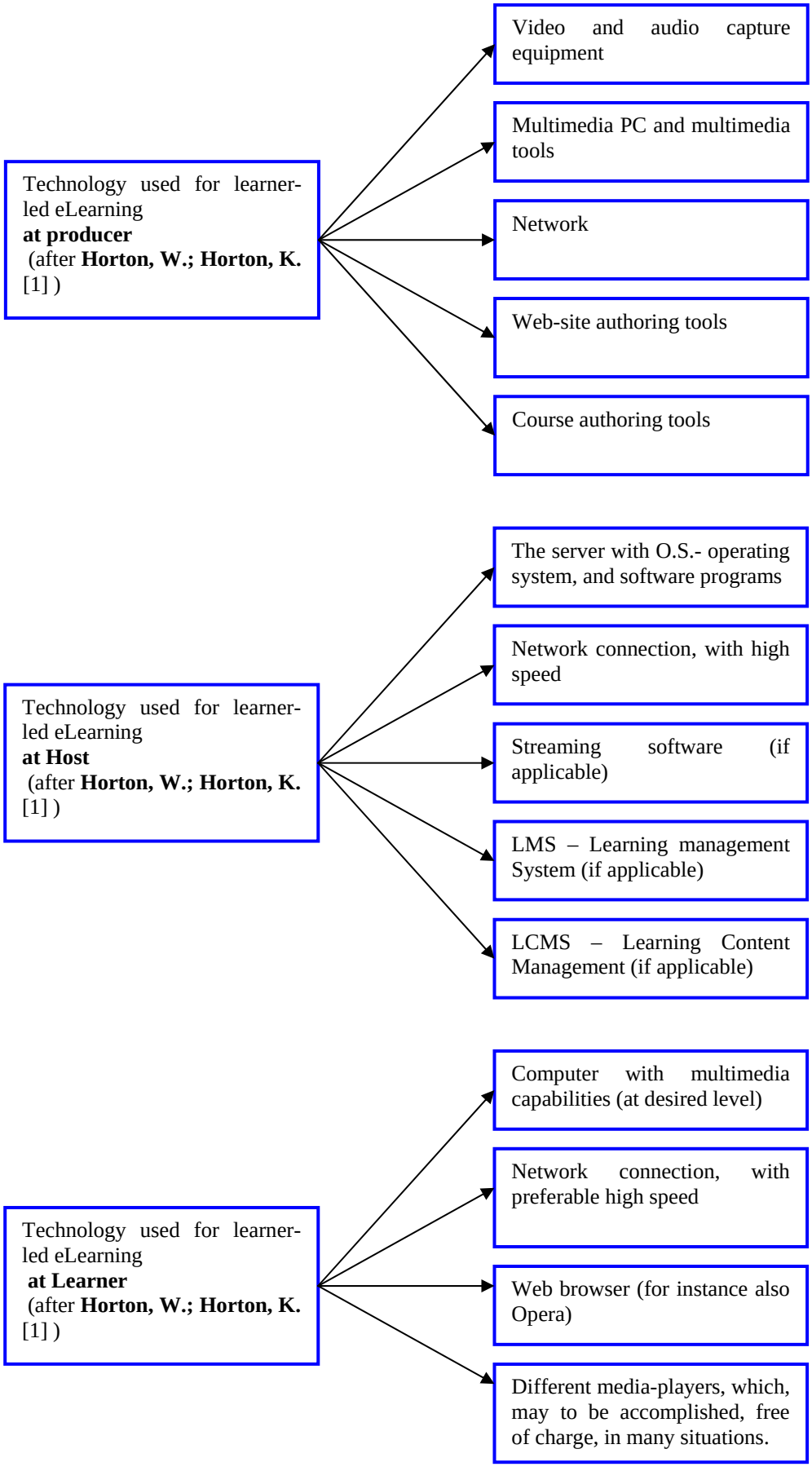


Figure 3: technology needed for learner-led eLearning

Facilitated eLearning

For facilitated eLearning the concepts of learner-led eLearning are combined in parts with the concepts of instructor-led eLearning. The learning scenario of facilitated learning contains the help of qualified trainers but not in a kind of virtual classroom training. The facilitators are persons you can send your questions to or they help you to solve your specific (learning) problems.

Learners who don't like concrete schedules for classroom training but are interested in augmented learning in the contact with others are the most suitable target group for this form of computer aided learning.

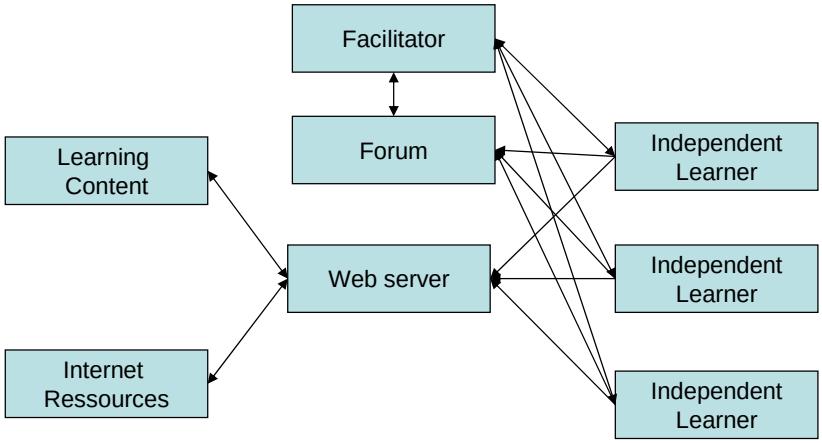
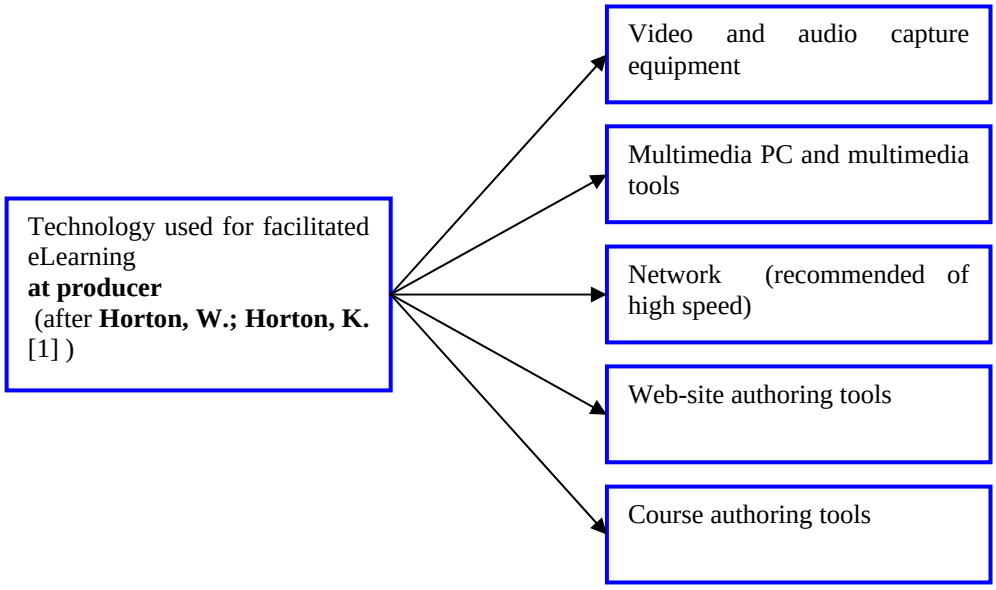


Figure 4: components of facilitated eLearning (after **Horton, W.; Horton, K.** [1])

Technology used for facilitated eLearning:



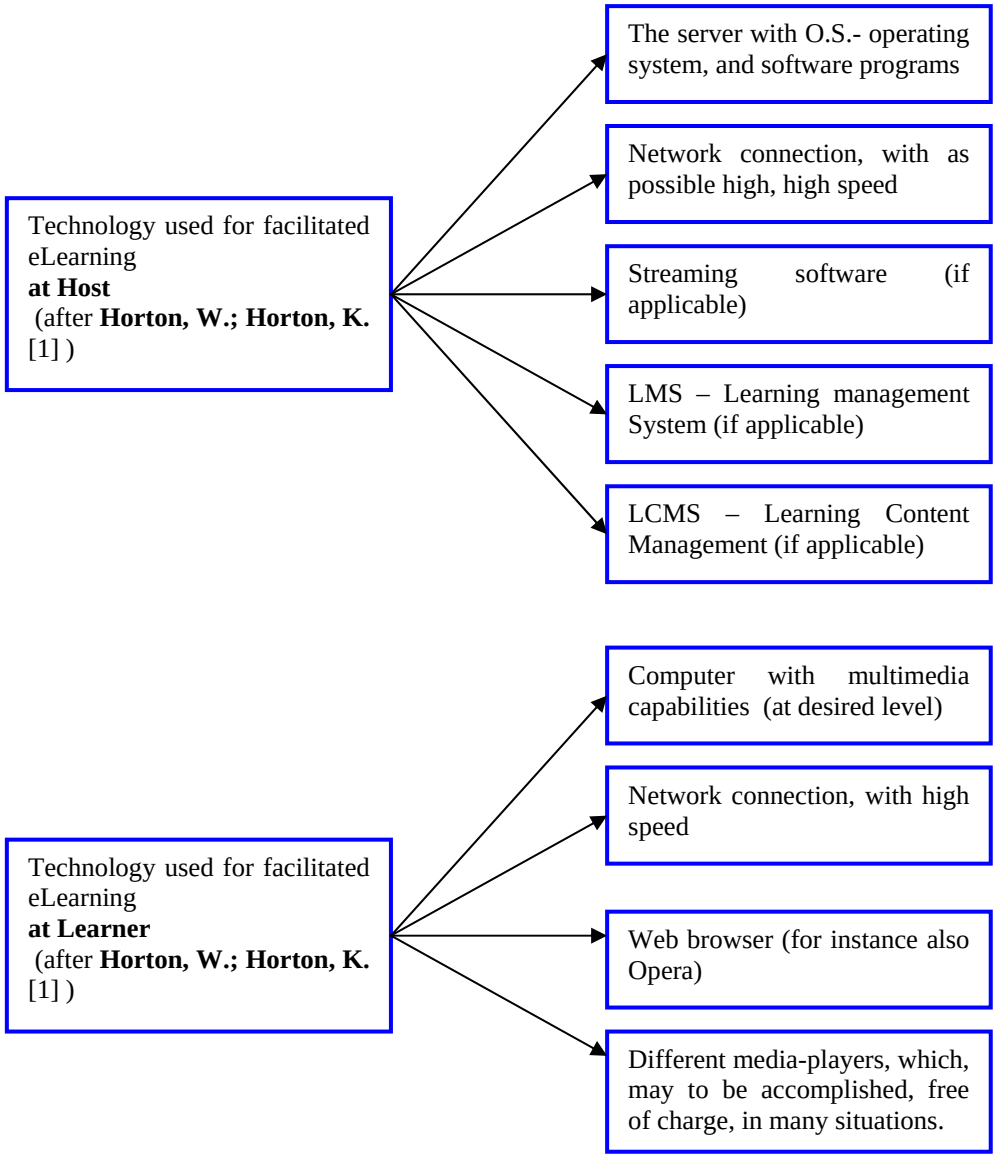


Figure 5: technology required for facilitated eLearning

Instructor-led eLearning

In instructor-led eLearning scenarios an instructor plays a very important role in the learning process. With the help of real-time technologies like audio chat or video and audio conferencing he teaches in virtual classes similar to a normal school or university.

Figure 6 shows the components of instructor-led eLearning.

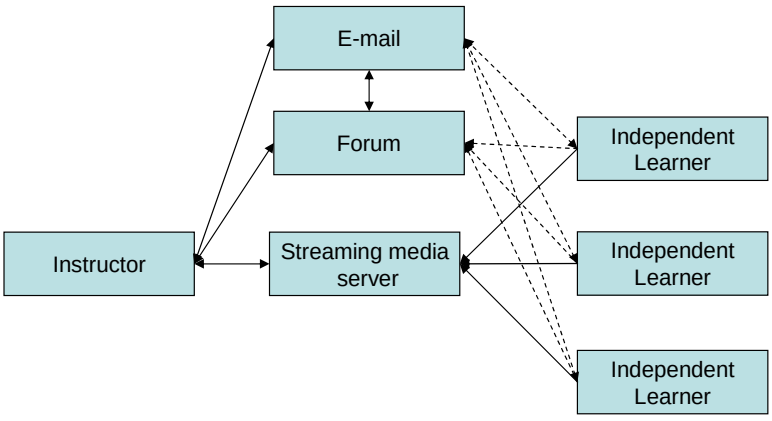


Figure 6: components of an instructor-led eLearning scenario (after **Horton, W.; Horton, K.** [1])

Technology used for instructor-led eLearning:

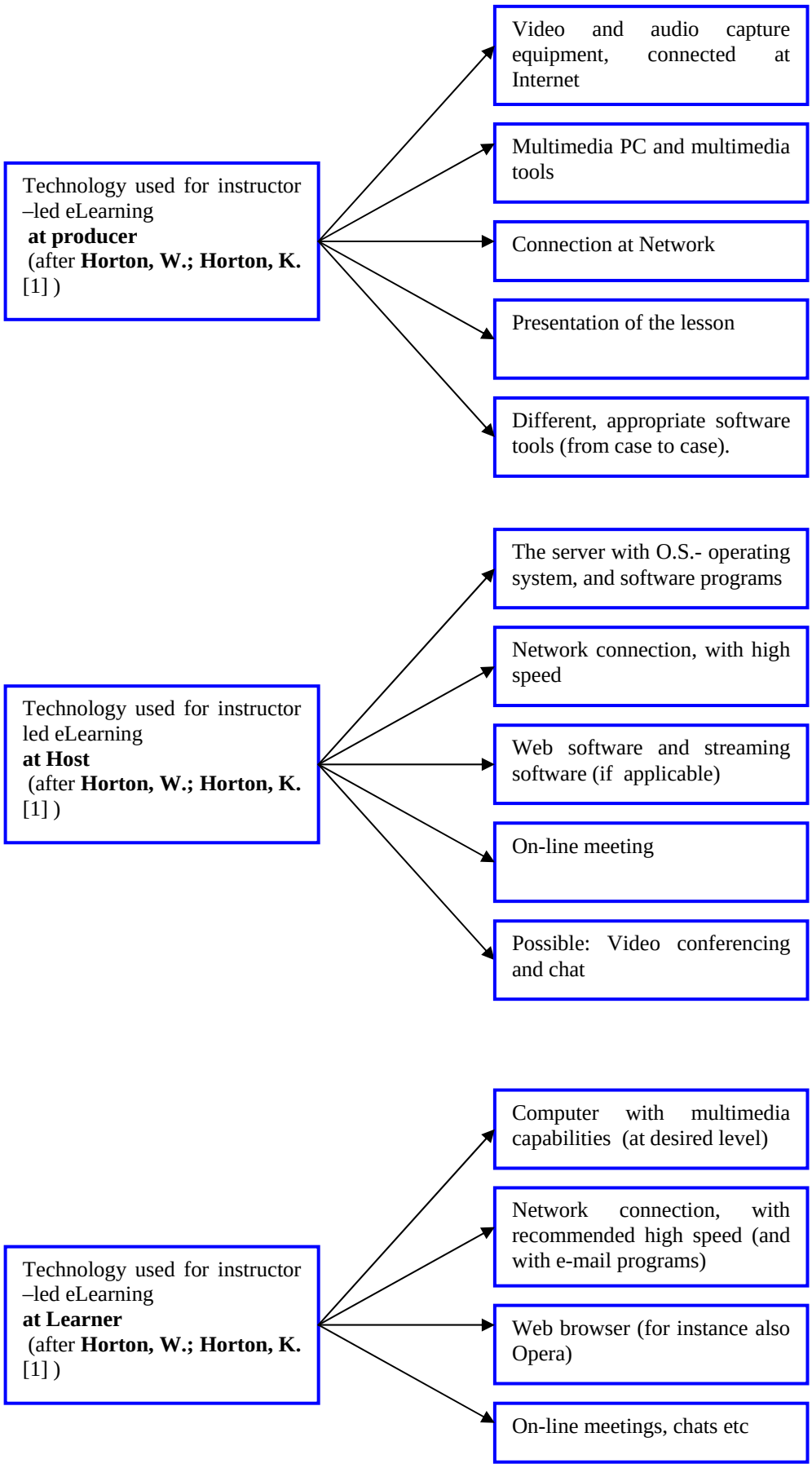


Figure 7: technology needed for instructor-led eLearning

Embedded eLearning

Embedded eLearning normally is integrated into a special context. For example the learner works with a specific application and does not know how to go on; he or she can use the integrated help files of the application (Figure 8).

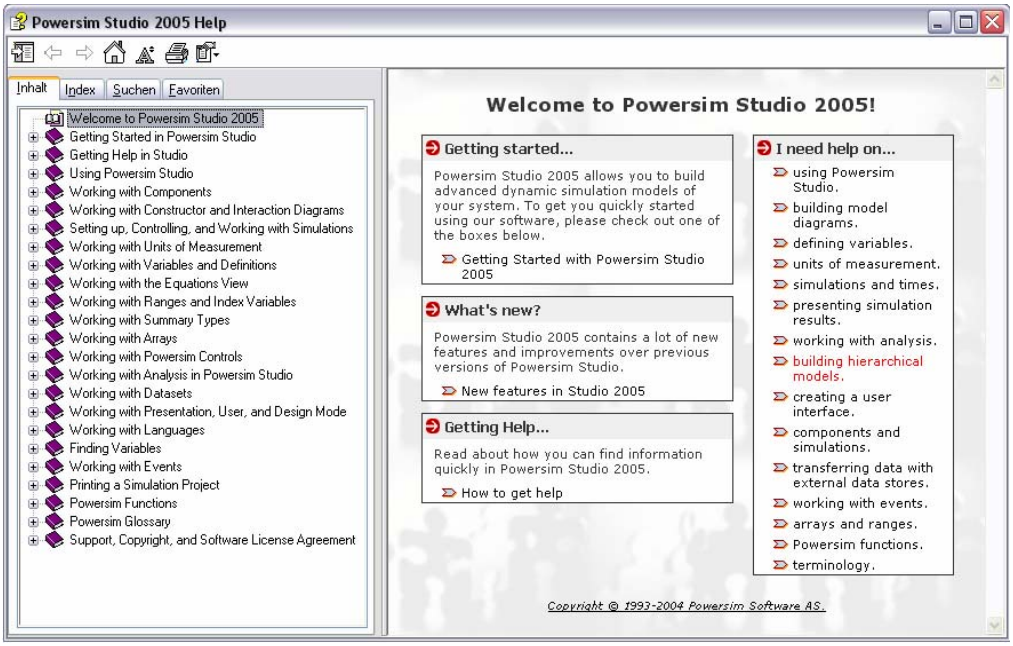
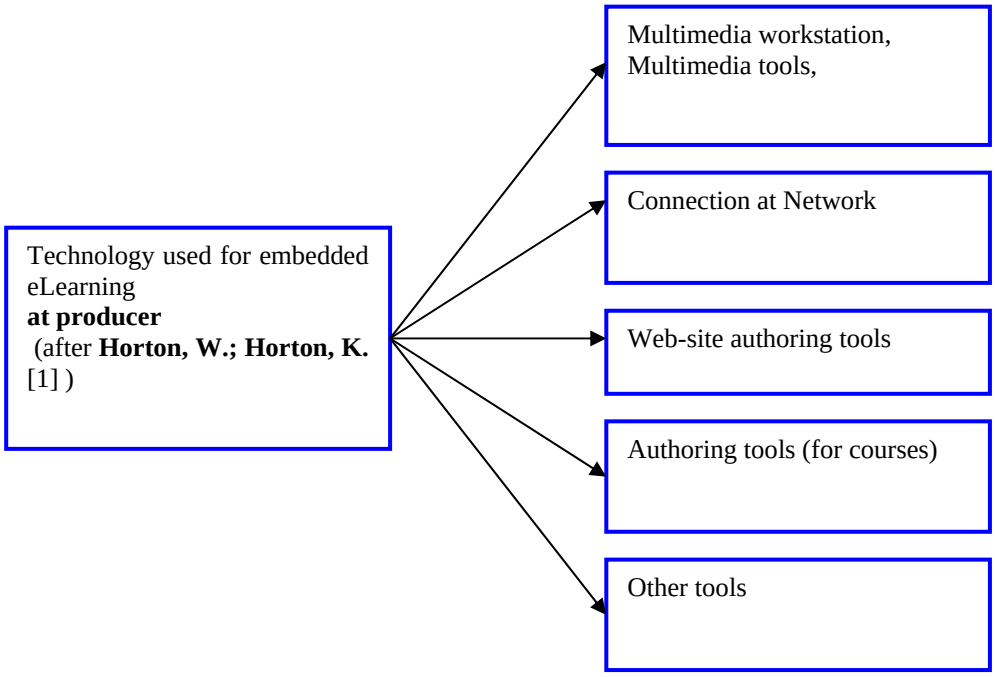


Figure 8: embedded eLearning with the help files of the simulation tool Powersim

Technology used for For embedded eLearning:



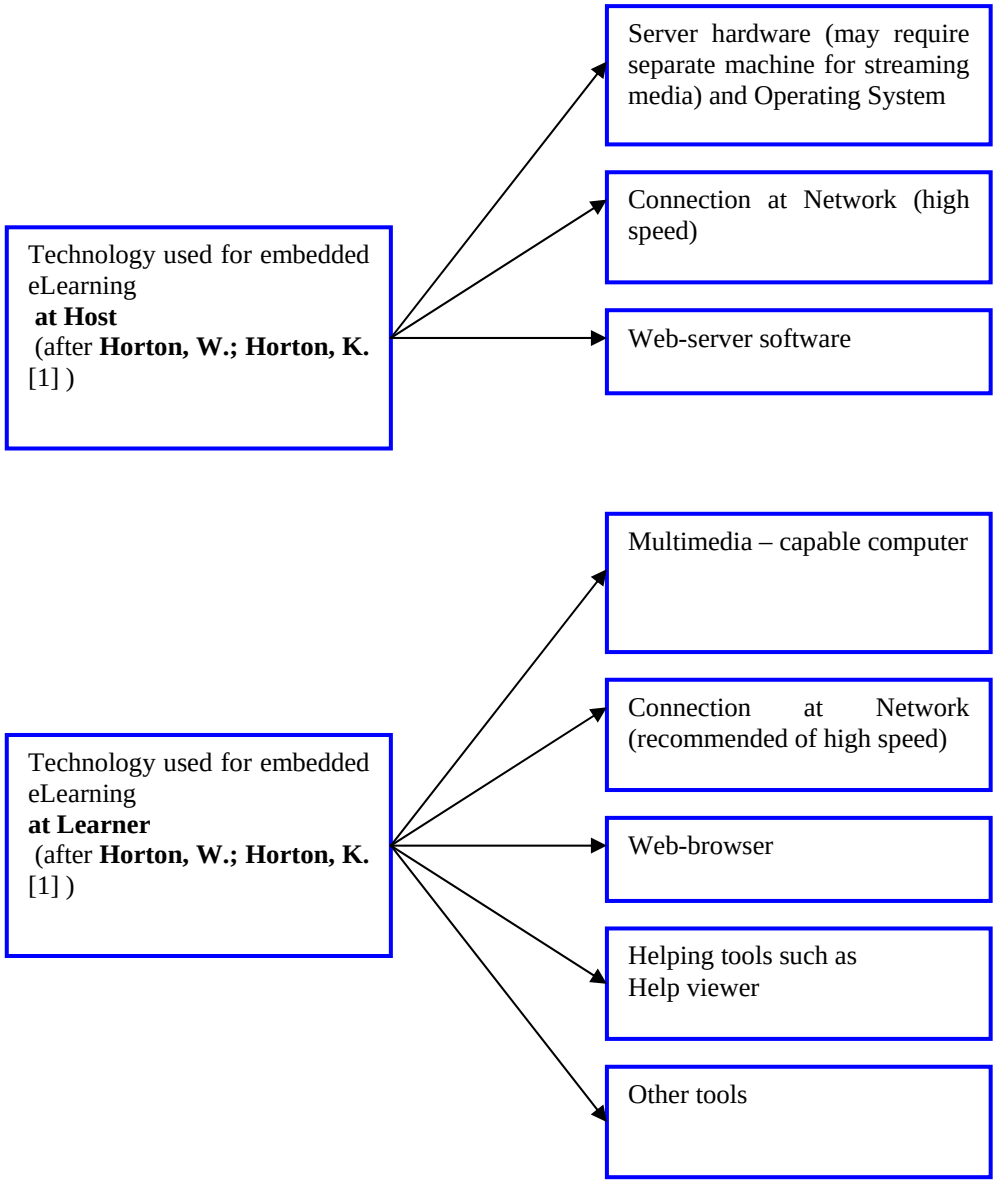


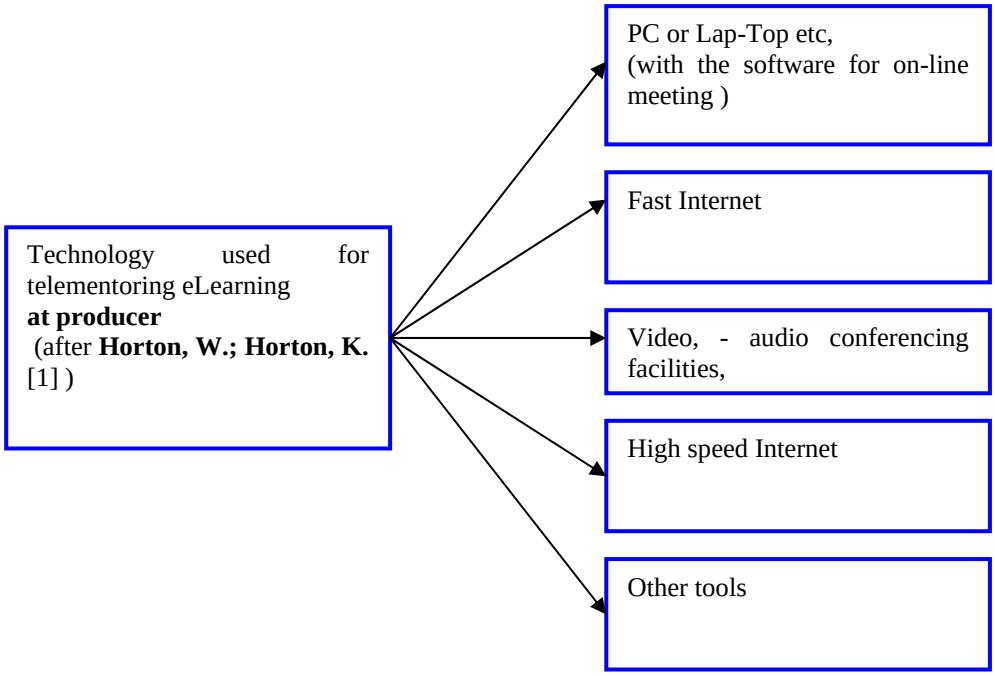
Figure 9: technology needed for embedded eLearning

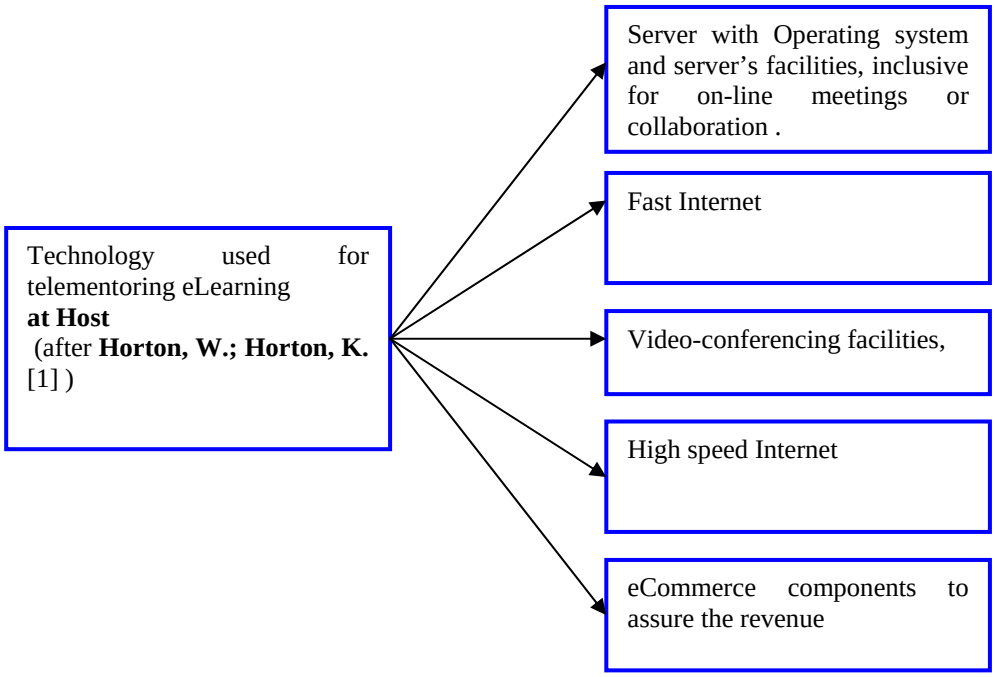
Telementoring and eCoaching

For telementoring an experienced person adopts the role of a telementor or a coach. Video and audio conferencing, instant messaging or Internet telephones support this form of teaching.

While the relationship between the mentor and mentee normally tends to be long-term, Online-coaching is a more short-term form of teaching.

Technology used for telementoring and Online-coaching:


Technology used for telementoring eLearning **at producer** (after **Horton, W.; Horton, K.** [1])
PC or Lap-Top etc, (with the software for on-line meeting)
Fast Internet
Video, - audio conferencing facilities,
High speed Internet
Other tools


Technology used for telementoring eLearning **at Host** (after **Horton, W.; Horton, K.** [1])
Server with Operating system and server's facilities, inclusive for on-line meetings or collaboration .
Fast Internet
Video-conferencing facilities,
High speed Internet
eCommerce components to assure the revenue

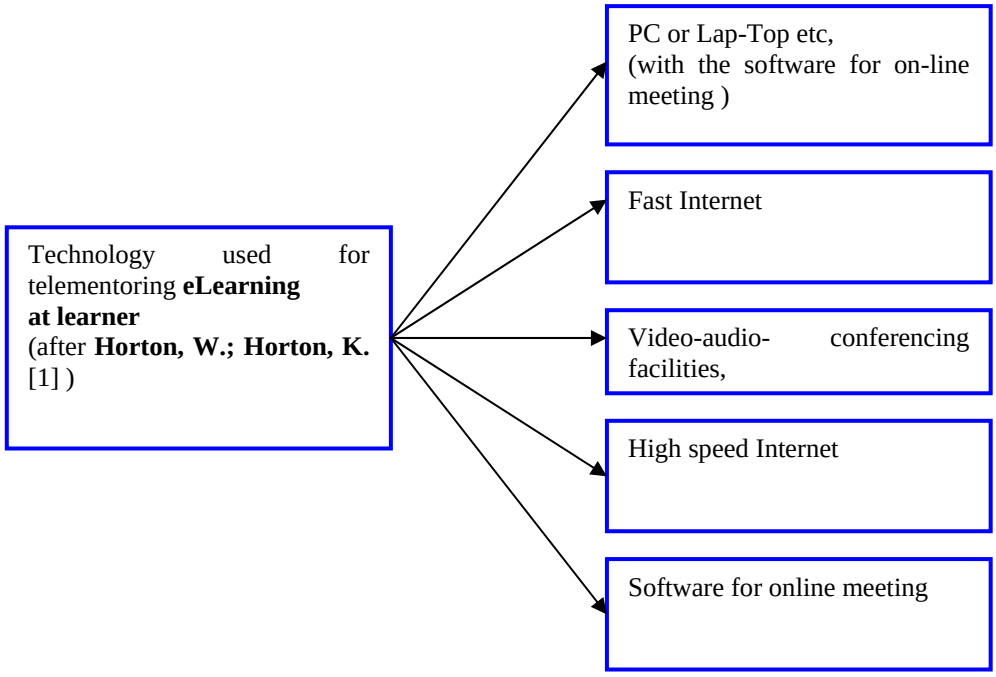


Figure 10: Technology needed for telementoring and online coaching

2. Hardware

Without compatible hardware it would not be possible to start working within an eLearning scenario.

The most typical hardware for eLearning is:

- The personal computer equipped with the following components:
  - Processor
  - Memory
  - Hard disk
  - Network card
  - CD-Rom or DVD

- Input and Output devices:
  - Keyboard
  - Mouse or track ball
  - Display

- Peripherals:
  - Headphone
  - Camera
  - Microphone

3. Software

As typical software components for eLearning can be named:

Tools for accessing eLearning

- Web browsers
- Media players and viewers

Tools for offering eLearning

- Web servers
- Learning management systems (LMS)
- Learning content management systems (LCMS)
- Collaboration tools
- Virtual school systems
- Media servers

Tools for creating eLearning content

- Course authoring tools
- Web site authoring tools
- Testing and assessment tools
- Media editors
- Content converters

4. File Formats for files used in eLearning

Here you see some examples of file formats for eLearning.

Extension	Name	URL
.a5w, .a4w, .a3w	Authorware Windows file Authorware is very well known authoring software to create multimedia and eLearning content.	
.avi	Audio Video Interleave If you watch a movie on your computer, in most cases you use avi files.	http://www.microsoft.com/
.bmp	Bitmap The standard Windows file format for bitmaps without compression.	http://www.microsoft.com/
.doc	Microsoft Word Document The standard Windows file format for text documents.	http://www.microsoft.com/
.fla	Flash Flash is software to create interactive multimedia and eLearning content. Most of the animations used in the web are created with Flash.	http://www.macromedia.com/
.htm, .html	Hypertext Markup Language The standard format for static web sides.	http://www.w3c.org/
.jpg, .jpeg	Joint Photographic Experts Group If you need images with many colors and with a big size for the web, you normally use jpeg.	http://www.jpeg.org/
.mov, .qt	QuickTime The standard file format for movies on apple macintosh.	http://www.apple.com/
.mp3	MP3 A very well known and often used file format for music.	www.telecomitalialab.com
.ppt, .pps	PowerPoint Presentation	http://www.microsoft.com/

	The standard Windows file format for multimedia presentations.	
.smi, .smil	Synchronized Multimedia Integration Language A markup language to integrate different kinds of media.	http://www.w3c.org/
.wav	WAV The standard Windows file format for music without compression.	http://www.microsoft.com/
.xls	Excel Spreadsheet The standard Windows file format for spreadsheets and spreadsheet analysis.	http://www.microsoft.com/

Figure 11: file formats used for eLearning

5. The use of Media Players and of Viewers.

Media players are the most important applications for getting access to the many different and specific media file formats existing.
Media players can be used in different variations:

- within a browser interface
- embedded in a web page
- as a stand alone application without a browser

Inside an eLearning scenario, media players normally are associated with the Web browser, because most of the learning content is presented in the Web.

According to the type of media file, the media player can represent one or more of the following media types (examples):

- Audio
- Video
- Flash files
- PDF files
- Authorware files
- Director files

Here are a few examples for well known media players:

Windows Media Player
The Windows Media Player plays many different types of media files.
The Media Player is part of every normal Microsoft Windows installation.
Moreover the Media Player can be used for Macintosh, Solaris and Windows CE or Pocket PC.

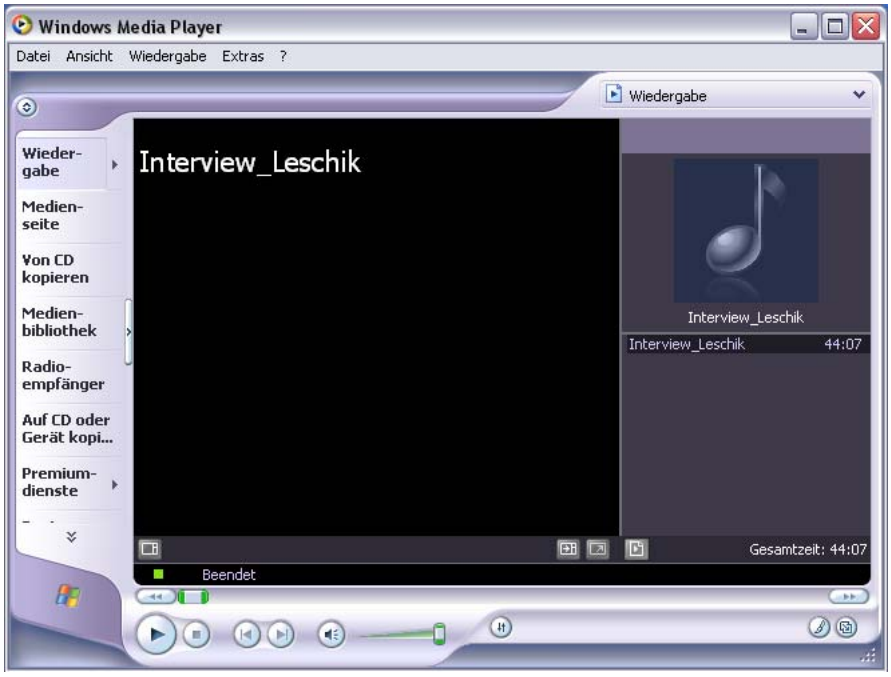


Figure 12: the Windows Media Player

Flash Player

The Flash Player from Macromedia is a very well known and well used player for eLearning.
More than 90 % of all Web users have an installation of this player on their computer.
It displays content which is produced in the SWF format.

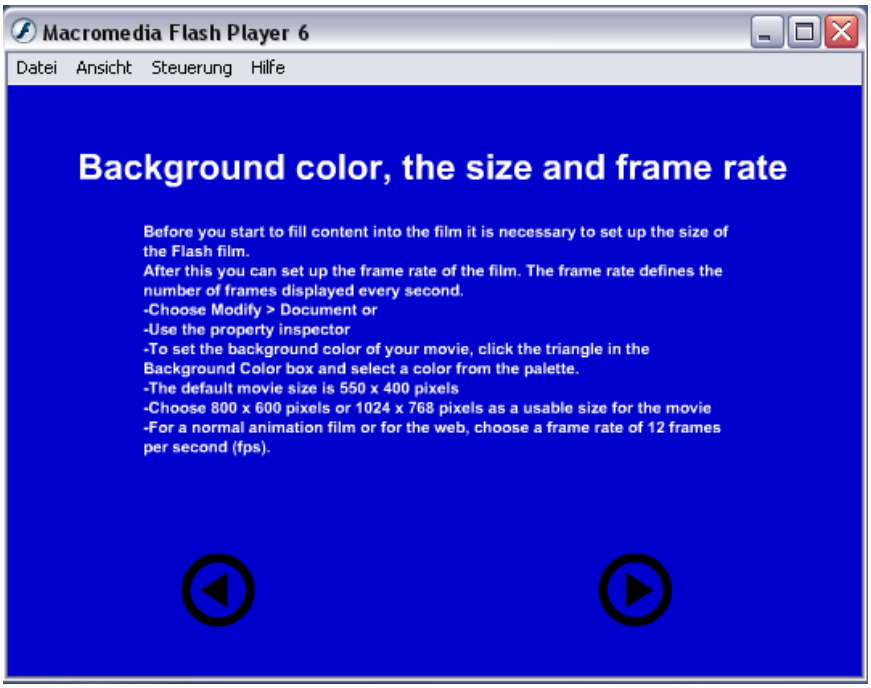


Figure 13: the Macromedia Flash Player

Acrobat Reader
Much of all textual information presented on the Web today is presented in PDF files.
To display these text files the Acrobat Reader is required.

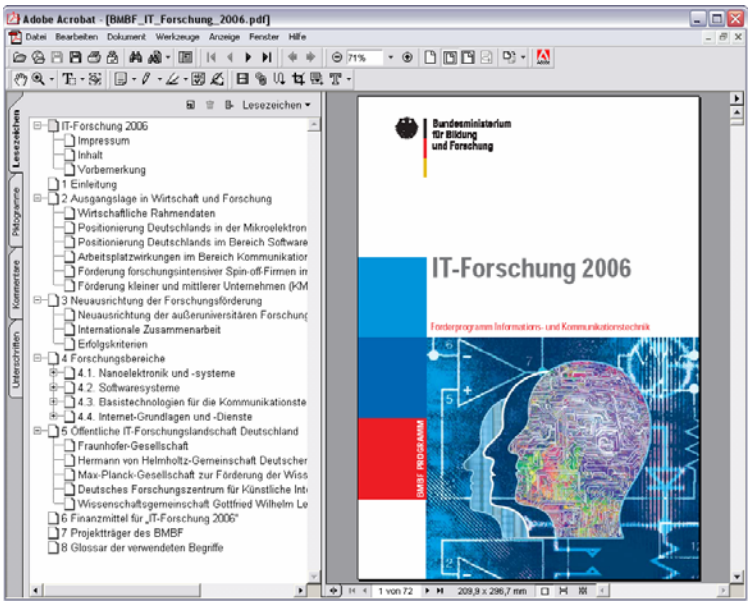


Figure 14: a PDF document presented in the Adobe Acrobat Reader

6. Categories of eLearning tools: CREATE, OFFER, ACCESS.

When we think about tools for eLearning we must realize that normally there is not only one special tool to satisfy all of our needs. In a real and complex learning scenario we have to choose a couple of software tools out of hundreds of possible candidates.

Because of the huge number of different tools it is helpful to build categories of tools.

- Tools for creating
- Tools for offering
- Tools for accessing

learning content.

Here are some examples:

Core tools
Core tools are the basic part of every computer supported learning scenario.
Core tools are:

- Tools for web site authoring (CREATE)
- Web servers (OFFER)
- Web browsers (ACCESS)

Tools for creating and testing eLearning
Examples for these tools are:

- Course authoring tools (CREATE)
- Testing tools (CREATE, OFFER)

Collaboration tools
In this category we find the following tools:

- Collaboration servers (OFFER)
- Collaboration clients (ACCESS)

Authoring and editing tools
Tools for authoring and editing could be f.e.:

- Media editors (CREATE)
- Media servers (OFFER)
- Media players (ACCESS)

LMS and LCMS

Learning **M**anagement **S**ystems (LMS) and **L**earning **C**ontent **M**anagement **S**ystems (LCMS) are very helpful for the creation and offering of the learning content and the administration of the learners.
LMS focus more on the learning content and the learning scenario whereas LCMS enable the detailed administration and organization of the learners and the learning content.

- LMS (CREATE, OFFER)
- LCMS (CREATE, OFFER)

Key Point Summary Conclusions and Recommendations

1. Different learning scenarios are:
- Learner-led eLearning
- Facilitated eLearning
- Instructor-led eLearning
- Embedded eLearning
- Telementoring and e-coaching

2. The most typical hardware components are:
- The personal computer
- Input and Output devices
- Peripherals

3. There are many different file formats for multimedia usage e.g. BMP, FLA, AVI, MOV

4. Important media players and viewers are:
- Windows Media player
- Flash player
- Acrobat reader

5. You can categorize eLearning tools in:
- Core tools
- Tools for creating and testing eLearning
- Collaboration tools
- Authoring and editing tools
- LMS and LCMS

Study Guide

ESSENTIAL QUESTIONS FOR THE VERIFICATION OF THE ACCOMPLISHED KNOWLEDGE

1. Which different types of eLearning scenarios do you know?
2. What are the technologies required for the different eLearning scenarios?
3. What kind of hardware do you typically need for eLearning?
4. What are typical software components for eLearning?
5. Please name a couple of file formats used in eLearning scenarios.
6. Which media players or viewers can be used for eLearning?
7. Please name 3 different categories of eLearning tools.

BIBLIOGRAPHY. REFERENCES.

[1] **Horton, W.; Horton, K. (2003):** eLearning tools and technologies : a consumer's guide for trainers, teachers, educators, and instructional designers, John Wiley & Sons, Hoboken, New Jersey 2003
[2] **Horton, W.K. (2000):** Designing Web-based training: how to teach anyone anything anywhere anytime, Wiley, New York [u.a.] 2000

SUPPLEMENTARY IMPORTANT BIBLIOGRAPHY. REFERENCES.

[3] **Powersim Software AS (2003)**: Powersim Studio 2003, User Manual, Bergen 2003
[4] **Macromedia, Inc.**: www.macromedia.com
[5] **Microsoft Corporation:** www.microsoft.com
[6] **The World Wide Web Consortium:** www.w3c.org
[7] **Joint Photographic Experts Group:** www.jpeg.org
[8] **Apple Computer:** www.apple.com
[9] **Telecom Italia Lab:** www.telecomitalialab.com

RESPONSES TO THE QUESTIONS

1.
- Different learning scenarios are:
  - Learner-led eLearning
  - Facilitated eLearning
  - Instructor-led eLearning
  - Embedded eLearning
  - Telementoring and e-coaching

2. See to the figures: 3, 5, 7, 9, 10.

3.
- The most typical hardware components are:
  - The personal computer
  - Input and Output devices
  - Peripherals

4.
- As typical software components for eLearning can be named e.g.:
  - Web servers
  - Media servers
  - Learning management systems (LMS)
  - Learning content management systems (LCMS)
  - Collaboration tools
  - Virtual school systems
  - Web browsers
  - Course authoring tools
  - Web site authoring tools
  - Testing and assessment tools
  - Media editors
  - Content converters
  - Media players and viewers

5.
- Typical file formats for eLearning are e.g.:
  - Authorware Windows file
  - Audio Video Interleave
  - Bitmap
  - Microsoft Word Document
  - Flash

6.
- Typical media players or viewers are e.g.:
  - Windows media player
  - Flash player
  - Acrobat reader

7.
  - Tools for CREATE eLearning content
  - Tools for OFFER eLearning content
  - Tools for ACCESS eLearning content