

Mobile Computing in Higher Education

移动电脑在高等教育中的应用

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Scope 范围

- Usecases for mobile computing in higher education 高等教育领域具体应用
 - eLearning (incl. blended learning) eLearning (包括混合式学习)
 - MOOC 大规模开放在线课程
 - multi media tutorials 多媒体教程
 - virtual classrooms 虚拟课堂
- New options in lectures enabled by „tablet computing“
平板电脑在授课中的新型使用方法

Tablet Computing on Mobile Devices 移动设备上的平板电脑

New educational Options in Lectures 新型授课使用方法

- Development of Educational Media
教育媒体的发展
- Tablet Computing
平板电脑
- Tablet Computing in Lectures
平板电脑在授课时的应用
- Demonstrations
展示

Blackboard 黑板

- Used since hundreds of years 已使用了数百年了
- Assets 优点
 - Interactive development 互动发展
 - Content is not predefined 内容没有预设
- Drawbacks 缺点
 - No rewind 不能回放
 - Drawing sketches is difficult and time consuming 图像绘制困难且耗时
 - Talking to the blackboard 讲课时需要面对黑板

Overhead Projector 投影仪

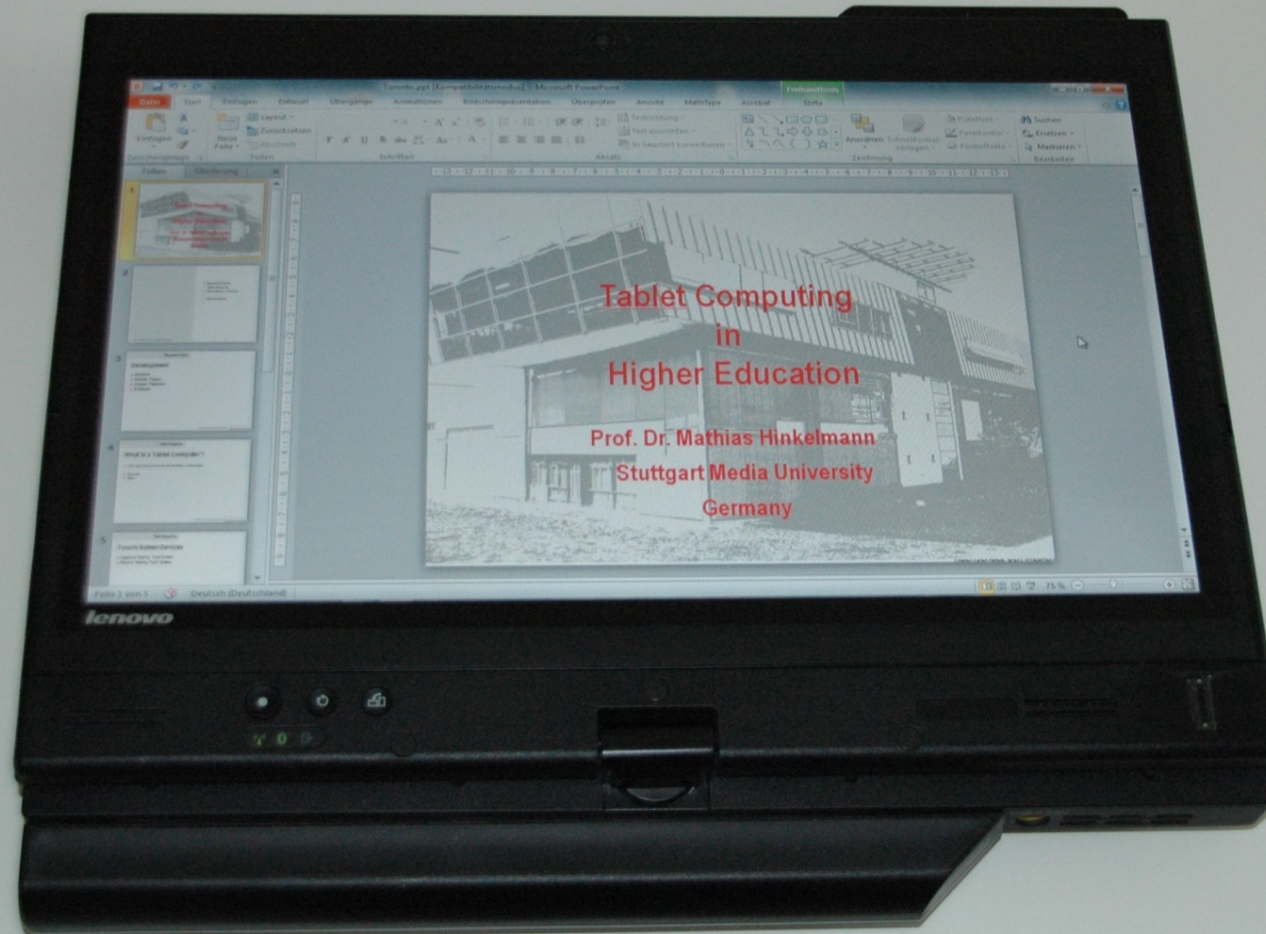
- Used since 60's 从60年代开始使用
- Assets 优点
 - Interactive development 互动发展
 - Content can be predefined 内容可以预设定
 - Rewind 可回放
 - Talking to the audience 讲课时面对观众
- Drawbacks 缺点
 - Handling of the slides 幻灯片制作复杂
 - Almost gone 投影仪几乎已经消失

Computer Presentation

电脑演示

- Used since late 90's 从90年代开始使用
- Assets 优点
 - Layout inkl. animation and multi media content 布局设计可包括动画与多媒体的内容
 - Rewind 可回放
 - Talking to the audience 讲课时面对观众
 - Handling of the slides 制作PPT课件
- Drawbacks 缺点
 - Everything is predefined (→Power Point Karaoke) 一切需要预设定
 - No Interactive development of content 无互动发展内容

Tablet Computing 平板电脑



What

- Light weight
带触摸屏的
- Tablet-PC
 - Laptop
 - Windows
 - Office
- Tablet 平板
 - Light
 - Open
 - Apps
能完全的软件



平板电脑?

提电脑

作系统

型应用取代功

Touch Screen Devices

■ Capacitive (Reacting) Touch Screens

电容型触摸屏

- Handling with fingers or specific pen

使用手指或专用笔

■ Inductive (Reacting) Touch Screens

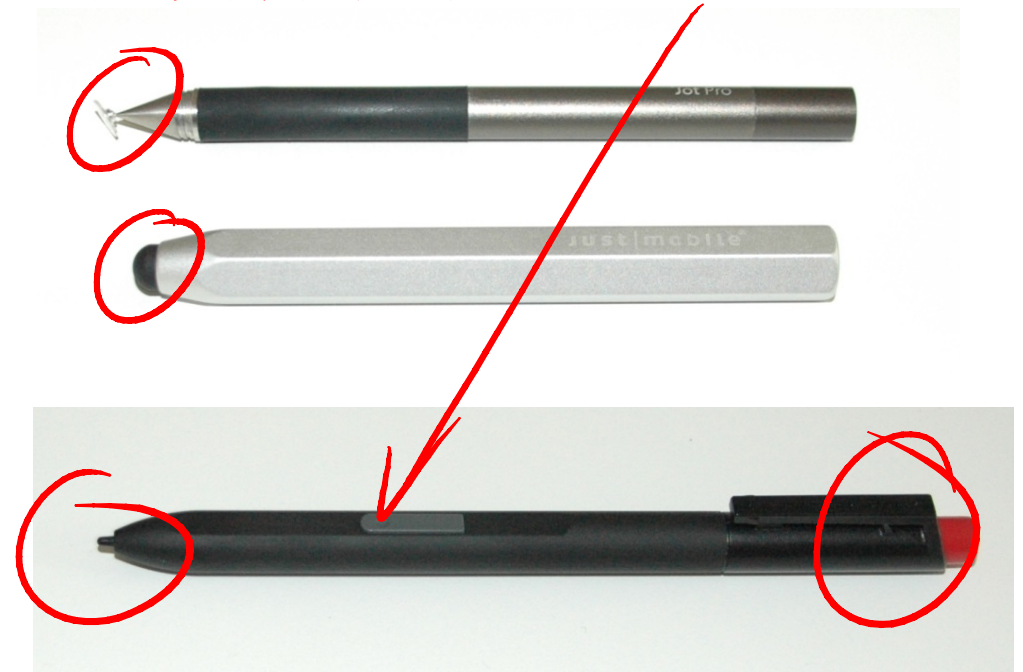
感应型触摸屏

- Handling needs a specific pen 使用需要一支特定的笔

- Two modes and „mouse button“ possible 二种模式及“鼠标键”皆可

- Touching the screen does not launch any function 单碰触摸屏不会启动任何功能

触摸屏设备



Tablet Computing in Lectures

平板电脑在授课中的应用



- Regaining interaction that is lost in standard computer presentations

重获在标准电脑演示中失去的互动性

- Annotated presentations e.g. in PowerPoint 可对 PowerPoint 的演示做注释

- Electronic Blackboard (eBlackboard) 电子黑板

- Cloze derived from 完形填空来源于

- Presentation 展示

- Textbook or lecture note 教材或讲义

eBlackboard 电子黑板

- Typical tool: Application to annotate PDF-Documents
典型的工具：用于对PDF文档的注释
- Toolbars and menus only visible for the lecturer
只有讲师才能看见工具栏和菜单
- Insertion of new pages 插入新页面
- Tools available to 可用工具
 - Tablet-PC 超薄平板电脑
 - Tablet 平板电脑
- Scaling has to be adressed 缩放比例须设定

iPad - Lectureres View

讲师可阅览

Proof: $2n^3 + 3n^2 + n = 6 \cdot k_n \quad n, k_n \in \mathcal{N}$

$A(1): 2 \cdot 1^3 + 3 \cdot 1^2 + 1 = 6 \cdot k_1$
 $6 = 6 \cdot k_1$
 $\Rightarrow k_1 = 1 \checkmark$

$A(n): 2n^3 + 3n^2 + n = 6 \cdot k_n \checkmark$

$A(n+1): \cancel{2(n+1)^3} + 3 \cdot \cancel{(n+1)^2} + \cancel{(n+1)} = 6 \cdot k_{n+1}$

$2 \cdot (n+1)^3 + 3 \cdot (n+1)^2 + (n+1) = 6 \cdot k_{n+1}$

App: GoodNotes

iPad – Audience View

听众可阅览

Proof: $2n^3 + 3n^2 + n = 6 \cdot k_n \quad n, k_n \in \mathcal{N}$


$A(1): 2 \cdot 1^3 + 3 \cdot 1^2 + 1 = 6 \cdot k_1$
 $6 = 6 \cdot k_1$
 $\Rightarrow k_1 = 1 \quad \checkmark$

$A(n): 2n^3 + 3n^2 + n = 6 \cdot k_n \quad \checkmark$

$A(n+1): 2 \cdot (n+1)^3 + 3 \cdot (n+1)^2 + (n+1) = 6 \cdot k_{n+1}$
 $2 \cdot (n^3 + 3n^2 + 3n + 1)$

Info:

Datum:


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Cloze 填空

- Based on eBlackboard environment 在使用电子黑板的情况下
- Partial omitted text on slides or in textbooks 在课件或教学中有部分隐藏的内容
- Options 选项
 - Interactive development of the content 内容的互动性发展
 - Real discussions e.g. on pros and cons 例如对优缺点的真实讨论
- Full / added text can be provided to the students 完整的 / 附加的文本可供学生参考

Cloze derived from a presentation

从演示中引入的填空

- Creation of a standard computer presentation 创建一个标准的电脑演示
- Definition of slides with omitted elements 带有空缺元素图片的定义
 - ➔ headline and omitted text elements in a special color 标题和隐藏内容用特殊颜色标注
- Duplicate of slides with omitted elements 空缺元素图片的复制
- Delete selected text from learners slides 从课件中删除选定的文字
- Mark „full text slides“ with option „do not display“ of the presentation program 演示软件中带有可使“全部文本”“不显示”的选项
- Print all slides (incl. not displayed ones) = lectures view 打印所有图片(包括没有显示的) = 讲师可阅览的内容
- Generate PDF for the learners with option: „displayed slides only“ 为学生生成“只显示课件”的PDF

Cloze derived from a presentation (1)

从演示中引入的填空 (1)

- Creation of a standard computer presentation 创建一个标准的电脑演示
- Definition of slides with omitted elements 带有空缺元素图片的定义
 - ➔ headline and omitted text elements in a special color
标题和隐藏内容用特殊颜色标注
- Duplicate of slides with omitted elements 空缺元素图片的复制
- Delete selected text from learners slides 从课件中删除选定的文字

Cloze derived from a presentation (2)

从演示中引入的填空 (2)

- Mark „full text slides“ with option „do not display“ of the presentation program
演示软件中带有可使“全部文本”“不显示”的选项
- Print all slides (incl. not displayed ones) = lectures view
打印所有图片(包括没有显示的) = 讲师可浏览的内容
- Generate PDF for the learners with option: „displayed slides only“
为学生生成“只显示课件”的PDF

Tablet Computing in Lectures

- Regaining interaction that is lost in standard computer presentations
- Annotated presentations e.g. in PowerPoint
- Electronic Blackboard (eBlackboard)
- Cloze derived from
 - Presentation
 - Textbook or lecture note

Tablet Computing in Lectures

- Regaining interaction that is lost in standard computer presentations
- Annotations to sketches e.g. in PowerPoint
- Electronic Blackboard
 - Tablet PC
 - Tablet (iPad)
- Cloze derived from
 - Presentation
 - Textbook or Lecture Notes

Cloze derived from a presentation
Slide with marked elements
= lectures view
从带有标记元素的演示图片中导入
的填空 = 讲师可浏览

Cloze from Textbooks / Lecture Notes (1)

从教材/讲义中完成填空 (1)

- Full text lecture notes or textbooks written e.g. using MS Office
例如使用 MS Office 制作的全文本教材或讲义
- All text elements that have to be omitted have a special named format
所有隐藏内容都带有特殊的命名格式
- Setting font color to white before PDF generation will provide a cloze
在生成 PDF 前将字体设置成白色来提供填空
- Using a special font color makes it easy to control the content
采用特殊字体使内容控制更方便

Cloze from Textbooks / Lecture Notes (2)

从教材/讲义中完成填空 (2)

- All graphic elements are tagged (field „alternative text“)
所有图片元素被标准化
- Small VBA scripts provide 小型 VBA 文本提供:
 - buttons to display or hide marked graphic elements
展示或隐藏标记过的图片的按钮
 - button to set or unset the attribute for graphic elements
设置 / 解除图片元素属性的按钮

Textbook – Full Text 教材 - 全文字

Satz [S.2.1]: "De Morgan'schen Regeln"

$$\begin{aligned} \cancel{\neg(A \wedge B)} &\Leftrightarrow \cancel{\neg A} \vee \cancel{\neg B} \\ \cancel{\neg(A \vee B)} &\Leftrightarrow \cancel{\neg A} \wedge \cancel{\neg B} \end{aligned}$$

Wie in Abschnitt 2.1.2 bereits ausgeführt, wird die Beweisführung durch die Ermittlung der Wahrheitswert über eine geeignete Wahrheitstabellen vorgenommen.

Beweis zu [S.2.1(1)]

Ausgangswerte		linke Seite		rechte Seite		
A	B	$A \wedge B$	$\neg(A \wedge B)$	$\neg A$	$\neg B$	$\neg A \vee \neg B$
0	0	0	1	1	1	1
0	1	0	1	1	0	1
1	0	0	1	0	1	1
1	1	1	0	0	0	0

Text book – Cloze = Learners Version

教材 - 填空 = 学生版

Satz [S.2.1]: "De Morgan'schen Regeln"

Wie in Abschnitt 2.1.2 bereits ausgeführt, wird die Beweisführung durch die Ermittlung der Wahrheitswert über eine geeignete Wahrheitstabellen vorgenommen.

Beweis zu [S.2.1(1)]

Ausgangswerte		linke Seite		rechte Seite	
A	B				
0	0				
0	1				
1	0				
1	1				

Printed Text book = Lecturers Version

可打印的教材 - 讲师使用版

- Double-Printed version of the text book for the lecturer

Satz [S.2.1]: "De Morgan'schen Regeln"

Wie in Abschnitt 2.1.2 bereits ausgeführt, wird die Beweisführung durch die Ermittlung der Wahrheitswert über eine geeignete Wahrheitstabellen vorgenommen.

Beweis zu [S.2.1(1)]

Ausgangswerte		linke Seite		rechte Seite	
A	B				
0	0				
0	1				
1	0				
1	1				

Satz [S.2.1]: "De Morgan'schen Regeln"

$$\neg(A \wedge B) \Leftrightarrow \neg A \vee \neg B$$

$$\neg(A \vee B) \Leftrightarrow \neg A \wedge \neg B$$

Wie in Abschnitt 2.1.2 bereits ausgeführt, wird die Beweisführung durch die Ermittlung der Wahrheitswert über eine geeignete Wahrheitstabellen vorgenommen.

Beweis zu [S.2.1(1)]

Ausgangswerte		linke Seite		rechte Seite		
A	B	$A \wedge B$	$\neg(A \wedge B)$	$\neg A$	$\neg B$	$\neg A \vee \neg B$
0	0	0	1	1	1	1
0	1	0	1	1	0	1
1	0	0	1	0	1	1
1	1	1	0	0	0	0

Text book – Learners Version finally

教材 – 供学生使用的最终版

Satz [S.2.1]: "De Morgan'schen Regeln"

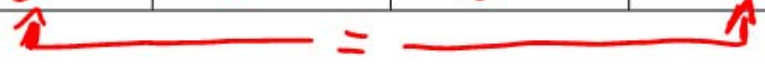
$$\neg(A \wedge B) \Leftrightarrow \neg A \vee \neg B$$

$$\neg(A \vee B) \Leftrightarrow \neg A \wedge \neg B$$

Wie in Abschnitt 2.1.2 bereits ausgeführt, wird die Beweisführung durch die Ermittlung der Wahrheitswert über eine geeignete Wahrheitstabellen vorgenommen.

Beweis zu [S.2.1(1)]

Ausgangswerte		linke Seite		rechte Seite		
A	B	$A \wedge B$	$\neg(A \wedge B)$	$\neg A$	$\neg B$	$\neg A \vee \neg B$
0	0	0	1	1	1	1
0	1	0	1	1	0	1
1	0	0	1	0	1	1
1	1	1	0	0	0	0



Cloud Integration 云集成

- Lecture Notes are available immediately
讲义随时可用
- Learners are able to focus on the development of content
学生能够专注于内容的发展
- Benefits for handicaped learners
有利于身体残疾的学生
- Not possible when IPad is used
不能与 Ipad 同时使用

Next Steps 下一步

- Wireless display environment 在无线网环境下
 - Apple TV
 - Intel WiDi
- Content generated by the students can be displayed and discussed 由学生生成的内容可显示和讨论
- Drawback: Specific hardware needed! 缺点：需要特定的硬件支持

Tool Set

- Microsoft Office
 - Generation of Documents (VBA-Script necessary -> Sample Document available)
 - Annotations in Power Point

- PDF-Generator
 - PDF24 – simple
 - Acrobat Pro – incl. Cut-and-Paste Protection

- PDF Annotator
 - Annotation of PDF on Tablet PC-Systems

- iPad App GoodNotes
 - Annotation of PDF on iPad



**Vielen Dank für die
Aufmerksamkeit!**

Ich freue mich auf die Diskussion!

Prof. Dr. Mathias Hinkelmann

Gastvortrag TU Xi'an