LEARN@WU
10 Years of E-Learning in the Large

Univ.-Prof. Dr. Gustaf Neumann
(neumann@wu.ac.at)
Institute of Information Systems and New Media
Vienna University of Economics and Business
University = “Business University”

One of the largest Business Universities worldwide

- about 25,000 students in total
- more than 4,500 freshmen each year
- more than 5,000 different courses per year

E-Learning @ WU:

- Full content coverage on the first year of study (120,000 learning materials)
- E-Learning in the Large
E-Learning as a Necessity

- **Background**
  - Free access to public Universities in Austria
  - Fixed Budget, Fixed Resources
  - Number of freshmen increased from 2001 to 2002 from 3.000 to 4.000
  - University
    - completely overcrowded,
    - Renting cinema centers,
    - hiring security personnel to limit access to Audi.Max.
    - ...
    - Applied for a extra public grant from Ministry

- **Vision:**
  - New curriculum for all study programs
  - Streamlined courses and organization
    (0\textsuperscript{th} semester, half-semester, winter/summer University ...)
  - Based on E-Learning, but no pure distant learning
From Project to Infrastructure:

- **2002:** Initial Launch, Content Project, based on OpenACS (Learning Content Management System)
- **2003:** E-Learning became strategic goal of the University, member of DotLRN Consortium
- **2005:** E-Learning part of general Trainee Programmes
- **2006:** Development of an E-Learning Academy
- **2008:** Full coverage of all courses (~5000/year) Improving integration with the Campus Management System
- **2010:** Wiki, Mobile Learning, Streaming Content Delivery
- **2012:** Plagiarism Checking, Mobile Clicker, Learning Workflows

Total Staff:

- Currently 41 people employed, more than 250 content developers
Current Key Figures of Learn@WU

- **High Acceptance**
  - Developed more than 120,000 learning resources
  - More than 25,000 registered members
  - Students solve up to 600,000 interactive exercises per day online
  - 60% sessions > 10 minutes, 22% > 1h
  - More than 500,000 class-room exams prepared/corrected via Learn@WU (via mark-reader)
  - “Without Learn@WU, the operations of our university would not have been possible” (Christoph Badelt, President of WU)

- **Technical Figures**
  - Up to 15 Mio hits and 3.3 Mio page impressions per day from registered users
  - Average response time on views less than 0.05 sec
  - Up to 2,500 concurrent users, over 250 views/sec
  - Up to 235 GB/day delivered content

Current annual growth rate: ~20%
One of the worlds mostly intensively used E-learning platforms
Two Years Analysis

Continuous development:
- Page Views more than doubled
- Response Time three times better

Although:
- Same Machine
- More Data
- More complex Queries
- Workflows

Reasons:
- Monitoring, Selective Tuning, Software Engineering, Open Source
Sample day: Active Learners

Sample day:
- Yesterday: Oct 3rd
- Courses start Oct 8th

Midnight:
- 600 active users
- ~ size Audi.Max

“Active”
- Click within 5 minutes
- Just authenticated users

Max Values:
- Up to 2,500 concurrently
- Up to 15,000 users login per day
Success Factors (1)

- **E-Learning integrated with curriculum**
  - Study programs in first year built around E-Learning
  - E-Learning more than an optional add-on

- **Institutional support from University**
  - Project Pool (from 10h/semester to 40h/year)
  - Various kinds of E-tutors
  - E-Learning Academy (courses, trainee-programs, support)
  - Infrastructure Team (5 people)
  - Integrated with Campus Management System

- **Human-Centred Platform-Design**
  - University as a "community of communities"
  - Communities composed of
    - Groups of students, classes, courses, programs, alumni, ...
    - Members and administrators (decentralized management)
  - Shared Design and Responsibility
  - High adaptability by community owners
Success Factors (2)

- **Support of the full E-learning development cycle**
  - **Content Creation**
    - Mostly interactive content, different granularity
    - Most content developed by domain experts via Microsoft Office Tools
  - **Content Delivery**
    - Interactive exercises for training and self-assessment
    - Organization via Concept Space for easy navigation and recommender system
    - Concept Space is a knowledge map for students to track their learning-progress
    - Lecturecasts
  - **Content Assessment**
    - Integration with a mark-reader for class-room exams
    - Exams 3 times per semester 20 subjects × 1000 students
  - **Result Communications**
    - Personalized Web Interface, PDF-Generation, SMS Integration
Example: Lecture Casts as a Means for Low-cost Lecture Sharing

(1) Presentation in AudiMax

(2) Live-Streaming to Different Lecture Rooms

(3) Usage over Internet
   - Video-Podcast
   - Web-Platform
   - Mobile Devices (iPhone, Android, iPad, Slates, ...)

HS 0.1
HS 0.2
...
Lecturecast

- Recording of Presentations in large Lecture Rooms
- Highly automated (Touchscreen to record)
- Automated splitting at Slide changes, search integration
- Teachers decide delivery methods
  - streaming
  - video-podcast (subscription)
Success Factors (3)

- **Highly scalable Platform**
  - Fully based on *Open Source* software components
  - OpenACS (Community Framework),
  - DotLRN (Course Management + Collaboration tools)
  - PostgreSQL, AolServer, XOTcl

- **Integration with e-learning Research**
  - Technical Lead at the *Institute of Information Systems and New Media*
  - Actively participating in many *EU Research Projects*
  - Founded *University Spin-off Knowledge Markets*
Sample Projects

- **Prolix (EU)**
  - Workplace Learning, learning alignment with business processes

- **LtFLL (EU)**
  - Advanced Text Mining for E-Learning applications (Grading support, Recommender Systems, ...)

- **Role (EU)**
  - Social Networking in E-Learning Systems

- **iCoper (EU)**
  - Open Contents, Learning Outcomes, Competencies

- **Bildungsserver Burgenland, LMS.at (Gov.)**
  - E-Learning support for Schools (more than 30,000 users)

- **Daimler (Company)**
  - Knowledge Management along a supply chain Management System (several thousand supplier)
Some Benefits

- **Organization**
  - **Cost reduction:**
    - Instead of up to 50 parallel courses/semester typically up to three
    - What does it cost to evaluate 500,000 exams?
  - Content improvement through transparency and learning analytics
  - Platform as a means for improving teaching core processes (e.g. plagiarism checking)
  - Image driver (positively noted in equis accreditation)

- **Teacher**
  - Reduce workload (e.g. exams, result communication, use students as resources)
  - Improve student satisfaction

- **Students**
  - More free leaning materials
  - Higher transparency, uniform appearance
  - Continuous learning and self-development