The times they are a changin'
-
implementing a modern library and information science curriculum

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Overview

- Context
- Curriculum 2011-2016
- Curriculum 2016-2018
- Curriculum 2018-
- Conclusion and discussion
Context
Stuttgart Media University

- University of Applied Science
  - Formed from the University of Library and Information Science and the University of Print and Media in 2001
  - ~5000 students, ~130 professors
- School of Library and Information Management
  - ~300 students, 9 professors
  - 75 years tradition of library science education in Stuttgart
  - Eight other universities in Germany have a LIS school
Change triggers

- **2011: Switching from a 6-semester to a 7-semester B.A. curriculum**
  - Ongoing implementation of the Bologna process shifted the preferred model from 6 + 4 (semesters for Bachelor and Master degree) to 7 + 3 (or 4)
  - Challenge: Increased teaching workload
    - 16% increase
    - Same number of new students per semester
    - No new staff, no new resources
Change triggers

- 2016: Implementing a department-wide curriculum reform
  - Prepare the students better for a dynamic and changing work environment
  - Focus on interdisciplinary project-based learning in the last two semesters
  - Common „key skill“ classes for students of all schools of the department
  - Challenge: critical evaluation and redistribution of topics among compulsory and elective modules
Change triggers

- 2018: Rebranding the LIS school
  - Reasons: lackluster enrolment numbers, loss of professor positions
  - „Information Sciences“ with a choice of two focus areas
    - „Library, Cultural and Education Management“
    - „Data and Information Management“

- Challenges
  - two curricula instead of one, with less staff
  - critical evaluation and redistribution of topics among compulsory and elective modules
Curriculum 2011-2016
Goals

- Give a comprehensive overview of IT in libraries
- Introduce basic concepts and important software products
- Learn about data organisation according to the relational model
- Introduce IT service management
Modules

- 1st semester: IT 1 (5 ECTS)
  - 2 contact hours lecture
  - 2 contact hours lab

- 2nd semester: IT 2 (5 ECTS)
  - 2 contact hours lecture
  - 2 contact hours lab

- 3rd semester: IT Management (7 ECTS)
  - 2 contact hour lecture „IT Management“
  - 2 contact hour lecture „Library Information Systems“
  - 2 contact hour lecture „Digital Library“
IT 1

Learning outcomes:

- use common hard- and software competently
- use technical terms properly
- use the university network and services competently
- know about technological developments and their uses in libraries, media companies and other information service providers
IT 1

- Lecture contents
  - IT terminology
  - PC systems and peripherals
  - Operating systems and GUI
  - Digitization and online publishing
  - Campus network, internet services
  - Data and internet security
IT 1

- Lab contents
  - Boolean logic
  - PC-Hardware
  - GUI and command line interfaces
  - Office software
  - Online publishing and HTML
  - Internet search
  - Network configuration
  - Internet security, internet privacy and data encryption
Learning outcomes

- Can use the entity-relationship model in order to design database structures
- Can use a relational database management system to deploy a database
- Can formulate SQL queries
IT 2

- Lecture contents
  - Introduction and terminology
  - Database design and analysis
  - Entity-Relationship-Model and normalised forms
  - Table definitions
  - Data manipulation, reports, forms and data export/import
  - SQL
  - Multi-user databases, client-server connections
  - APIs (ODBC)
Lab contents

- Data structuring using entities and relationships
- Databases using MS-Access
- Data import and export
- Data access using MS Access
- Using ODC to connect Office programs with databases
- Database creation and access using a web interface
- MySQL DBMS
- Using MS Access as a front end with a ODBC database
IT Management

- Learning outcomes
  - Know about fundamental IT service management processes
  - Analyse and improve existing ITSM processes
  - Adapt ITSM processes to specific circumstances
  - Do a cost-benefit analysis for ITSM process changes
  - Know the software components to implement ITSM
IT Management

- Learning outcomes
  - Know about the players and products of the library information system market
  - Chose and evaluate a library information system using a criteria list
  - Know the requirements for repository software solutions and evaluate specific products
  - Know and evaluate technical access schemes to licensed digital content
  - Know the concept of linked data and design applications using it
IT Management lecture contents

- Central support by a service helpdesk
- Incident management and issue tracking systems
- Configuration management and the configuration management database
- Problem management
- Change management
- Release management
- Availability/capacity management
- Case studies
IT Management

- Library information systems lecture contents
  - Typology and historical developments
  - Market overview of products and companies
  - Criteria for evaluation of library information systems
  - Core components: acquisition, cataloging, opac, ledning
  - Data import und -export, data exchange formats
  - Z39.50, SRU, edifact
  - Software demonstration
IT Management

- Digital library lecture contents
  - Mobile library: devices and formats
  - Resource discovery systems, link resolvers
  - Persistent identifiers
  - Access schemes and DRM
  - Research data management
  - Digitization in libraries
  - Software for institutional repositories
  - Cloud computing concepts
  - Digital preservation of cultural heritage
Results

- Students could follow the classes well
  - But: more IT-minded students were sometimes bored and complained about a lack of advanced elective classes
  - The workplaces demand much higher IT competencies

- Competencies focussed on knowledge and use, not creation or configuration/adaptation of software

- Most importantly: IT is part of all processes and services in library and information science
  - Teaching „traditional“ topics should also include the corresponding IT systems and technologies
Curriculum 2016-2018
Goals

- Enable students to use a wide range of software competently
- Encourage the use of programming as a way to automate recurring processes and as a general tool
- Make students think about data and databases not as a consumer of data, but a curator and provider
- Enable students to create interactive and dynamic web services
- Prepare students for more advanced topics like text analysis, data preservation and IT-based projects
**Modules**

- **1st semester: Information Systems 1: Programming (5 ECTS)**
  - 4 contact hours lab
- **2nd semester: IS 2: Data (5 ECTS)**
  - 4 contact hours lab
- **3rd semester: IS 3: Web (5 ECTS)**
  - 4 contact hours lab
- More IT focused elective modules
  - e.g. Innovation Management of Services, IT Management, Library Information Systems, Research Data Management, Information Retrieval, Software Development, Digital Preservation
Learning outcomes

- Know the elements of programming languages: linear and conditional execution, variables, loops and functions
- Know the basic data formats and structures: numbers, characters, strings, lists and dictionaries
- Can use the Snap! Web-based programming environment to create and run programs
- Can use the PyCharmEdu IDE to create, run and debug python programs
- Can create python programs to solve simple problems
Information Systems 1: Programming

Contents

- Snap! Web-based programming environment
- Solving problems by creating programs in Snap!
- The python programming language
- Solving problems by creating programs in python

- Mostly “flipped classroom” with individual and group learning using homework / problem descriptions and discussions during class
Information Systems 2: Data

- Learning outcomes
  - Know about common ways to store and access data using python: text files, CSV, XML, JSON, document-based databases, relational databases
  - Can create a domain model using objects and use it in own programs
  - Understand the difference between an internal data domain model and a data format used for data exchange
  - Can filter large datasets according to chosen criteria using programs
Information Systems 2: Data

Contents

- File based access: theory and programming exercises
- Database access: theory and programming exercises
- Data filtering, data analysis
- Presentations on common data formats by the students
- Again, use of the “flipped classroom” principle
Learning outcomes

- Know the basic components of the web: HTML, CSS, HTTP and their practical usage
- Can develop a modular website with header, menus, different content sections and footer
- Can use a database to create dynamic web pages
- Know the role of JavaScript in web development
- Know about current topics in web development like web security, responsive design or content management systems
Information Systems 3: Web

Contents

- HTML and CSS
- Developing a http server in python
- Introduction to JavaScript, dynamic content and CMS
- Presentation on current trends and topics by the students

- Again, use of the “flipped classroom” principle
Results

- Students could follow the classes well
  - Results often exceeded our expectations
  - But: a minority of less IT-minded students complained vocally and continually
  - Flipped classroom requires constant participation in class and staying ahead of homework, which was considered stressful by many students
- Students considered the ECTS to little for the workload
- Enough students continued with IT topics to fill the more advanced elective modules
Curriculum 2018-
Goals

- Clear distinction of the two focus areas
- Only basic topics for the “library, cultural and education management” students
  - Basic IT concepts and introduction to programming
  - Web technologies
- “Full throttle” IT for the “data and information management” students
  - Same classes as above
  - Additional required modules
Shared lectures

- Introduction to IT and programming
  - 2 contact hours/week lecture
  - 4 contact hours/week lab
  - 10 ECTS

- Web services
  - 4 contact hours/week lab
  - 5 ECTS
Data and information management

- All shared lectures
- Data and data analysis
  - 4 contact hours/week lab
  - 5 ECTS
- Web programming
  - 4 contact hours/week lab
  - 5 ECTS
- Metadata management
  - 2 contact hours/week lecture
  - 2 contact hours/week lecture
  - 5 ECTS
Main changes

- More time in the introduction class
- “Data” topic only for “data” students
- “Web” topic split into two modules
  - HTML, CSS, etc. for all students
  - Advanced web programming only for the “data” students
- Metadata management will bridge cataloguing and data class
  - Bibliographic data integration
  - Automatic classification
  - Data enrichment using open data
Questions and Discussion