From Traditional to Flexible Learning: Implementing Flexible Study Programs at the University of Innsbruck, Austria

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1. Introduction

The University of Innsbruck is a "conventional" – or shall we say traditional – university dating back to the 17th century and the approach to teaching was and still is quite "classroom centred". The university has seven faculties with quite differing academic cultures, several service centres and 29,000 students.

As can be seen from the figure, there has been no ICT revolution but a step by step process with several phases.

The whole process can be devided in three major phases. The first phase could be called *discussion phase*. In this phase the main concepts were developed and all major decisions were made by the Senate. This phase started in 1978 and was done in the framework of the university reform process.

The second phase could be called *implementation phase*. Implementation started in 2000 and is still under way. We will report on some of the important steps later on.

A third phase – we could call it the near future – is linked to the outcomes of the implementation phase.

2. The University Reform Process

Like all other Austrian universities, the University of Innsbruck had to undergo a reform process during the last years. In Innsbruck this process involved several specialized
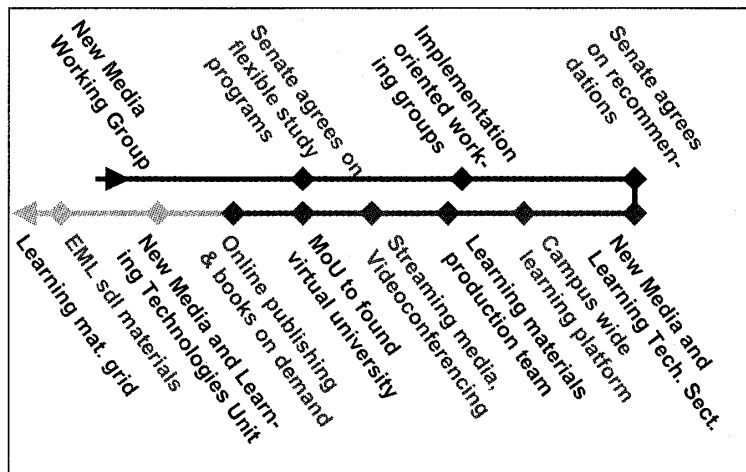
working groups which reported directly to the Senate. They also had to discuss their proposals with all interested university members[1] from time to time. One of those working groups concentrated on new media and learning technologies – at least in the Austrian context this was still at an early stage and before broad nation wide discussion began.

2.1. The New Media Working Group

Members of this working group were faculty members, students and service centre staff. Most group members were new to the subject, some were educationalists. It was a representative, but not specialized group of interested people.

One might think that such a group was not very helpful to formulate a new media and learning technology strategy for the university. But soon it turned out that it was not that important to be an expert in the field. It was more important to ask the right question: *How can the university improve teaching and what is the role of technology in that process?* Once the right questions were asked, it was relatively easy to identify people who could help to give answers.[2] New media and technology usage was identified to be one among several means to improve teaching. It had to be embedded in a learning model.

2.2. Flexible Study Programs

The New Media Working Group's approach to new media and ICT usage was the *Innsbruck Model of Flexible Study Programs*. Flexible study programs combine traditional teaching, distance learning, new and experimental forms of teaching and student exchange programs. Students also can attend courses at partner institutions in Austria or abroad. Credits are exchanged using ECTS.[3]

In the context of classroom centred teaching *flexible* means that teaching will be done more or less the same as it has been done before, but that technology will be used to ease access to learning materials, that communication tools will be used for discussion among students, and so on. Technically speaking this meant the implementation of a learning platform to be used by all courses.

But *flexible* also means that part of the teaching or learning can be done at a distance or that students go abroad for some time. Flexible study programs also open the door to experimental forms of teaching or learning and self directed learning. Working or disabled students should benefit from flexible programs too. Finally, *flexible* means that study programs are designed in a modular way.

3. Implementation Phase

After the New Media Working Group had finished its work it was decided to set up several small implementation oriented working groups. These working groups concentrated on the following topics:

- E-learning platform (virtual campus software).
- Integrated online and book on demand publishing.
- New Media and Learning Technologies Competence Centre.
- Learning centres.
- Teleconferencing and streaming media.
- "Integrating" traditional media.

We cannot give the results of all working groups here, so we will concentrate on the first three and the things achieved so far in these areas.

3.1. E-Learning Platform

It was decided at a relatively early stage that an e-learning platform should be installed for campus wide use. At this moment we have about two years of experience with such a platform[4] and 23,000 registered users of which about 4,000 are enrolled in more than 375 courses. The figure shows the login page of this e-learning platform.

Learning platforms make publishing of documents on the web very easy. A web browser can be used by teaching staff to perform all administrative tasks like uploading documents, building online tests and quizzes, etc. Other features are communication tools like email lists for all students of a certain course, discussion boards and chat rooms.

Calendar functions, a grade book or the possibility to post news normally are also available. When students log on to the system they get all the information for the courses they are enrolled in presented in their web browser.

Another important feature are statistics. These allow instructors to see who has accessed course documents or in the case of quizzes and tests gives feedback about learning

progress.

3.1.1. Selection Process

A group of educationalists, students and computer centre staff did a survey of about 40 products available at that time and developed a catalogue of criteria that were important for the use at the University of Innsbruck.

Three products were selected for test installation, but as one product was not available[5], only two products were installed for testing. These products were WebCT[6] and Blackboard[7] Courseinfo. As Blackboard fit better the technical needs, this product was finally licensed.

Testing of Blackboard Courseinfo was done in two phases, a non public and a public phase. In the public phase of testing faculty could use Blackboard Courseinfo for their teaching needs. As public testing was far more successful than expected, it would have been difficult to stop licensing Courseinfo already at that early stage[8].

3.1.2. Benefits of Using a Learning Platform

First of all a learning platform is a productivity tool for producing better and richer course materials. It takes away much of the overhead instructors are normally confronted with when using the web for teaching. It saves hundreds of programming hours.

Another benefit is that it enables instructors who would not use web technology for teaching to use this technology the easy way. Finally, many staff who use the learning platform become interested in learning new tools or technology to improve their course materials. They also become interested in new methods of teaching. So there is a positive side effect on faculty development too.

Installing *one* product for campus wide use reduces the overhead for learning the technology itself. One must always keep in mind that this kind of technology should ease access to course materials and information, not complicate things. If every course uses different technology or interfaces, users will stop finding such technology useful.

Besides benefits for instructors and students there are also benefits for the university or organization as a whole.

First of all, a university starts producing ready made course materials that can be reused, sold, exchanged or shared. This may not be obvious at the very beginning, but using a learning platform is an important step in that direction.

Another benefit is that instructors get feedback they would not get without using a learning platform simply by using quizzes or looking at course statistics. Such feedback helps to track student interest or learning problems at an early stage and helps to improve teaching in a very efficient way. Also teaching of large classes can be done more efficiently as the learning platform can be used for tutoring and for cooperative teaching.

Finally, students become less dependant of office hours if administrative information is fed into the system and the workload of administrative staff is reduced if students do not ask the same questions again and again.

3.1.3. User Acceptance

A survey on user acceptance was done after the first year of using blackboard in production. Here are some important results:

- 70 % of instructors think Blackboard was easy or very easy to learn.
- About 92 % of first time users (instructors) said they intended to continue using Blackboard.
- 88 % of students found Blackboard was easy or very easy to use.

Another finding is that instructors need time to start using all features. Normally they start using the ones they find easiest to use like uploading course materials, posting news or creating link collections. The figure shows which features were most used. Once there are more experienced users these figures will probably change.
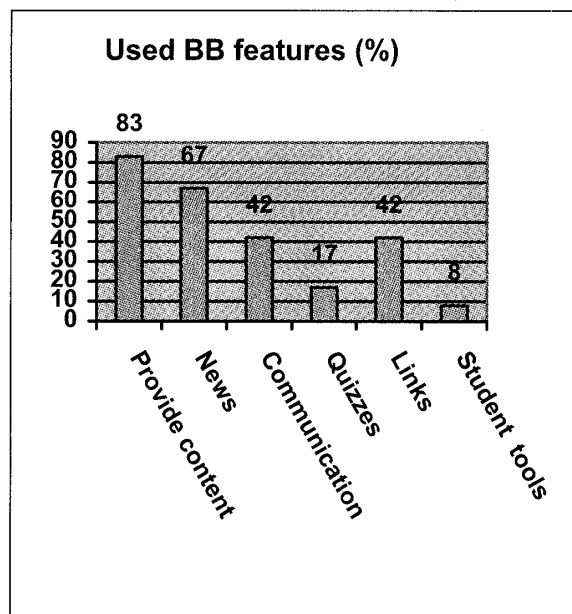
3.1.4. Lessons learned

What we have learned so far is that at the beginning we were too pessimistic concerning acceptance of such a system. Also, that a wide range of special features or goodies are not the really important thing one has to concentrate on when choosing a learning platform. Finally, that educational concepts immanent to a learning platform in many cases are mostly the concern of educationalists or specialists, not instructors. For a campus wide installation for large user groups reliable software must be one of the main concerns. Fancy

features in a non working and not scalable environment are of nobody's help. Another concern is the life cycle of such an installation. Instructors invest much time in building courses and do not want to loose this investment in time (and often extra money).

Large scale installation is not out of the box. If such a system has to be integrated with existing solutions (like course catalogues, user databases, etc.) the necessary manpower must be calculated.

The most critical factor is training and support, for both, students and instructors. Especially at the beginning of the academic year we invest much of our time for that. One also must be aware that such systems are used by both, computer literate and mostly computer illiterate people and help desks have to deal with these users in an adequate and efficient way.

Finally, when instructors start using technology in the classroom or for teaching, they expect that this technology works whenever and wherever they need it. Or at least ten minutes after calling technical support. This means that besides technology also the necessary support and maintenance infrastructure has to be made available.

4.   Integrated Publishing

As is widely known, universities and scientists pay high amounts of money to get books published. Libraries on the other hand spend vast budgets to buy the same books while copyrights go to the publisher and are lost for universities.

One approach to this problem is online publishing: an electronic version of the document is produced and made available on web or ftp servers.
Unfortunately, the academic community is not that flexible to accept such publications as "real" publications. Integrated publishing tries to get the best of both worlds, online publishing and publishing on paper and to combine it.[9]

Integrated publishing is quite simple. A PDF version of the document is produced and put on an e-book server. So far this is online publishing as known.
To produce a print version, or better said a "real" book for the
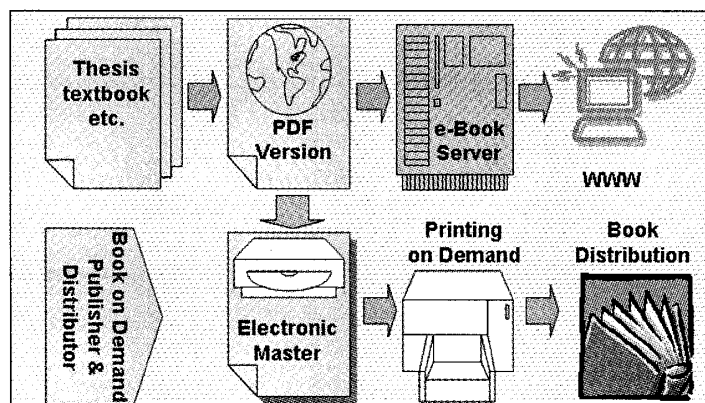
market, the PDF version is handed over to a book on demand service.[10] The book on demand service produces an electronic master and provides bookstores with the same information a publisher provides for "real" books. Handling of *on demand books* is like handling other books, as such books can be ordered in the usual way and are delivered within three days.

But instead of keeping copies of books in stock, every time when such a book is ordered, one copy of the book is produced.

4.1. Benefits of Integrated Publishing

Integrated publishing allows the university to feed real publications in the book market without having to produce a single copy. These books have an ISBN number, appear in the "books in print" listings and can be delivered within a few days.

Another benefit are costs. Mastering costs are about 10 – 15 % of usual printing subsidies and there is almost no financial risk in publishing. As the book on demand service is also the biggest distributor of books in the German speaking market, one gets better support in distributing scientific publications. Also, administration overhead is reduced. Orders are placed directly with the book on demand service, accounting is also done by this service.
Such books usually are also cheaper. As only sold copies are produced, this is also an environment friendly solution. Last but not least the university holds all copyrights.

Publishing books that way in many cases is self funding, as only 100 – 200 copies have to be sold to cover mastering costs. For course materials this means that one can afford shorter update cycles of paper copies.

Starting with December 2001 the University of Innsbruck will invite all students to publish their doctorate thesis that way. The university has a fund for subsidizing such publications. Until now about 30 – 40 publications were subsidized every year. By introducing integrated publishing the university now can afford to finance the publication of all doctorate thesis without spending more money.

5. Learning Materials Production

One of the most critical factors for universities in the future will be producing high quality learning materials. Until now, production of such materials is mostly done by innovators or isolated project teams. Conventional universities normally do not have the same experience in producing learning materials as distance teaching institutions have. Partnerships with

such institutions can help to narrow this gap.

Most universities also do not have a strategy how to handle learning materials production in a professional way. Consequences are large overhead due to lack of professionals, high costs and often poor results. Another disadvantage is that know how is lost when a project comes to an end. Or worse, all know how stays with the company that was paid for producing such materials.

Another common experience is that scientists loose interest in producing online learning materials once they have proved that they can do it, or when the pilot phase is over and funds are consumed. Finally, in such an environment students often play the role of test persons and not the role of learners.

A more promising approach allows faculty members to concentrate on their business, research and teaching. Learning materials production is done by specialized teams with clear roles:

- Faculty members provide content.
- Educational designers know how to design courses for various media types.
- Production teams do the necessary conversion work, graphics, web design,programming, etc.

5.1. New Media and Learning Technologies Unit

The consequence for the university is that a new type of service centre must be set up: a new media and learning technologies unit. Setting up such a unit was one of the recommendations of the New Media Working Group. It consists of several flexible teams for learning materials production and technical and administrative staff. Responsibilities of such a unit are:

- Course production (multimedia, web based materials, print).
- Marketing and exchange of course materials.
- Copyright clearing.
- Faculty development (educational design, new media skills, training on the job).
- Basic media centre services.
- Infrastructure like learning platform, media and image server, videoconferencing, etc.
- Support and helpdesk services for faculty and students.
- Cooperation programs, EU projects, national projects, etc.

The figure shows one core team for learning materials production. Faculty members provide content, the educational designer acts as an intermediary between faculty and the production team. He or she also brings in didactic know how. Another important aspect is that interested faculty members shall be given an opportunity to work for some time as a trainee in such a production team. This helps to build competence in the departments and to reduce the communication overhead.
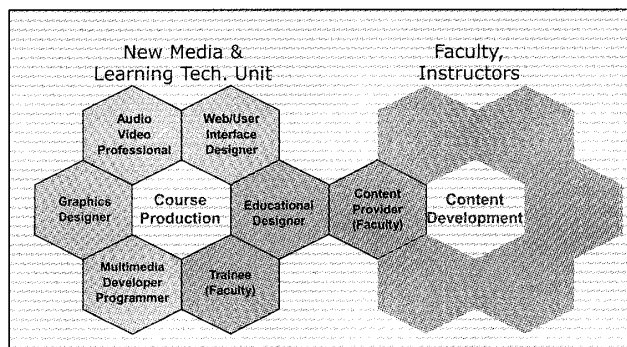
Another reason for this trainee program is that several faculty members expressed fear that all know how would shift to the new unit and would no longer be available in the departments.

Production in such a unit can follow standardized procedures allowing for less overhead and better quality of service. The figure shows a simplified production flow chart.

To try out this approach und to build core competences, one production team has been set up in spring 2000. Useful advice in planning team structure and working procedures came from one of our partner institutions, the Griffith Flexible Learning Unit.[11] Out of the various courses produced during summer 2001 one example screenshot is given below.[12]
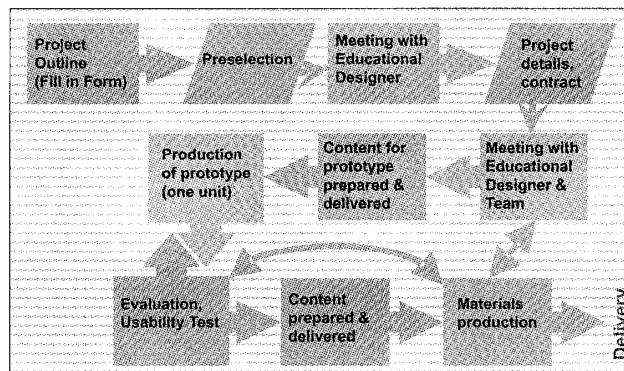
At the moment of preparing this paper, the New Media and Learning Technologies Unit consists of one production team and two additional staff and is part of the Centre for Informatics Services. Funding for up to three production teams and several additional staff for 2002 will be decided by the end of 2001. By 2004 five production teams and 40 staff are planned. Additional funding will be available by participating in EU projects and national projects.

Sample of learning materials (screenshot).

6. Outlook

6.1. Cooperation

Cooperation with other partners in the region and worldwide is an important aspect for the University of Innsbruck. Locally, our learning platform infrastructure is also used by other institutions and there is more and more demand to make this service available to the whole region. Talks are under way to license our learning platform for most of the educational sector of the Tyrol with the university as a service provider.

Also cooperation with nearby universities is on the work plan. A first step in this direction is closer cooperation with the University of Salzburg, a virtual university for western Austria is on the to do list. The universities of Innsbruck and Salzburg in a memorandum of understanding have already agreed on the following points:

- Harmonization of infrastructure, e.g. to use the same learning platform, compatible teleconferencing equipment, etc.
- Cooperation in the field of faculty development.
- Joint course development, mutual use of courses, joint study programs.
- Harmonization of policies, e.g. in the field of copyright or bonuses for course development.

6.2. Standardization

Existing learning platforms still lack a lot of functionality for self directed learning and for

the exchange of courses and students. Standardized techniques and methods will help to fill this gap. EML, educational markup language, is one of the standardization approaches we are studying in this context.

EML is an XML-based language for coding learning materials, learning processes and teaching and learning roles. It is independent of pedagogical models and target media. EML is on the way to become an international standard, so it will play an important role for all educational institutions in the near future.

Together with the Open University of the Netherlands, the Open University of the UK, Fernuniversität Hagen, IBM and Cisco the University of Innsbruck participates in a proposal for an EU funded project that aims to improve EML, to develop tools, platforms and course materials. The production of sample materials will be done by the New Media and Learning Technologies Unit and the University of Innsbruck will also be a test bed for tools and platforms.

7. Concluding Remarks

The approach to implementing learning technology and ICT at the University of Innsbruck was "bottom up" and not "top down". In our case this strategy probably was more successful than top down implementation by technocrats or senior management. Relatively simple measures which were implemented in small steps proved to be quite successful.

On the other hand we have reached a point now, where the university as a whole must decide what direction to take. All measures taken until now relied on interested faculty and staff and were implemented on a voluntary basis. The hard task is not to get funding for technology, but to manage organizational change. It is not so clear yet if the university has already accepted its new role in a global student centred "lifelong learning economy" and is willing to take the necessary steps.

There are some simple principles university management and faculty need to learn to accept on a broad basis:
— First of all, that the simple formula *instructor + student = learning* may be outdated soon. Like industries that have disappeared within years, also traditional educational institutions that are not willing to change run the risk to disappear or to loose their former status.
— As long as career plans for faculty do not value teaching and learning materials production and as long as such materials are not understood as an asset, things will not really change.

- Instructors must understand that producing professional learning materials involves team work and that traditional hierarchies have no place in such teams.
- Finally and most important of all, as long as the necessary funds are not transferred to new areas, e.g. to learning materials production, change will not happen on a broad and sustainable basis.

Notes

1. Besides faculty members also students played an important role.
2. There were of course also misunderstandings during the discussion process: one such common misunderstanding was that new media usage meant distance teaching or TV lectures. Especially educationalists expressed fear that one would make poor teaching worse by using technology to keep it alive instead of improving teaching itself.
3. ECTS, the European Credit Transfer Scheme, is based on workload and not on teaching hours, which makes it easier to exchange credits among institutions with differing teaching practices. For more information on ECTS see:
   http://europa.eu.int/comm/education/socrates/ects.html.
4. 9months of testing and more than one year of marketing and using the platform for production
5. At that time several learning systems existed mainly on paper (or web pages) and companies were not able or willing to ship software for testing.
6. See http://www.webct.com.
7. See http://www.blackboard.com.
8. One must be aware of the fact that introducing a learning platform also creates a certain dependency of the product chosen once it is heavily used.
9. The Austrian Ministry of Education also was interested in such a project and financed a pilot.
10. See http://www.bod.de.
11. See http://www.gu.edu.au.
12. More examples can be found on http://e-campus.uibk.ac.at.
13. See http://www.ou.nl/eml/.

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