Abstract
The European universities and universities of applied sciences were undergoing vital changes and these are related to the Bologna Declaration, which aims at an unified and interchangeable course system all over Europe (46 countries). The former study programmes were step-by-step substituted by a normally 3-year Bachelor programme and a 2-year Master programme 2010 complemented by a post-graduate Ph.D. or doctorate degree. The main consequences and some projects in this context are summarized below:

Qualifications in a Changing Job Outline of Librarians
In future the different fields of librarianship (i.e. public, academic, and special libraries) will have a minor importance in education in Europe. Traditional skills like bibliography, literacy and the consideration of books as objects (ancient manuscripts, incunables, bookbinding, and design) lose in importance. The result is a growing convergence of information economy, documentation, and librarianship. And, librarians will no longer be employed only in libraries, they are very desirable in the fields of knowledge management, information research, information design, web technology, online editing etc.

What factors determine a career of an information specialist or librarian in future?
- The employers: e.g. libraries, enterprises, other institutions.
- The fields of work: e.g. management, indexing, information research.
- The skills: e.g. pedagogical education, cultural and social skills, language proficiency.

Some new fields must be integrated in the curricula, e.g. knowledge management and competitive intelligence as well as change and innovation management. Social skills like rhetoric, presentation, project and time management are integrated part of all subjects and not imparted separately.

The curricula can no longer be attached to the potential employers (i.e. libraries). They have to orientate on the different fields of work and the required working qualifications. The main advantages of this reorganisation are the smaller dependence on the job market in the different fields of work and a higher flexibility of the applicants for job. These are fundamental changes for universities and particularly for potential employers.

European Joint Core Curriculum in Library and Information Science - LIS
One of the central objectives of this project was to "examine the idea and relevance of a core curriculum in the context of European LIS education" and to manifest the curricula developments within the changes determined by the Bologna process throughout Europe. The project should be the initial point stimulating and qualifying the debate between the different educational environments and strengthening the cooperation between the LIS educational institutions.

12 working groups – Three to five core members including a group moderator – covered a broad field of relevant LIS subjects defined by the organizers:
1. (Meta-level) LIS curriculum in general
2. Cultural heritage and digitization of the cultural heritage
3. Information literacy and learning
4. Information seeking and information retrieval
5. The information society: Barriers to the free access to information
6. Knowledge management
Main aim and challenge of these virtual working groups was to elaborate the possibilities developing a European common core curriculum within a few months. The workshop leaders initiated the work with some questions and theses covering the different aspects and perspectives on the theme, i.e.: 1

- The European dimension
- The theme in the context of the international universe of the LIS discipline
- European theme or not? Is the theme essential for all LIS educational programmes in Europe?
- Should the theme be a part of a European LIS core curriculum?
- Different theoretical and curricular approaches to the theme in various parts of the European LIS education world?
- Different views on the theme and its components in different parts of Europe?

About 150 colleagues in the field of LIS education participated in these virtual discussions with hundreds of contributions and comments. Then in summer 2005 about 50 LIS experts – core members of the virtual working groups – met in Copenhagen for a working intensive two-day workshop discussing the possibilities of the European curriculum development in LIS.

Each of the 12 workshop groups had to explore a sequence of general questions:

- How does the range of typical LIS domains generally get reflected in a LIS school curriculum and how should it be reflected?
- Are there special national reasons why some curriculum elements have a particularly prominent place in LIS courses?
- What is the place of the individual LIS curriculum subject in a core curriculum developed from a European perspective?
- What part of the LIS subject could be determined to fall within a core curriculum for LIS?
- In what way could the individual LIS subject be related to the general objectives of LIS courses? In what way could the LIS domain contribute to promoting equivalency, comparability and transparency of LIS courses?
- Which kind of European networks should be built among LIS teachers and researchers in a specific LIS subfield?
- What is the place of a specific LIS domain in joint periods of study abroad?
- Which kind of research areas and research approaches could be defined for each of the LIS domains listed below? And how could research be advanced in these areas?

During the teamwork it became clear that thinking, structures and contents of LIS courses vary much between the different types of LIS education institutions in Europe. Here are two examples: Initially the topic of group 12 read as follows “Library management and promotion”, but after intensive discussions of the group members during the workshop in Copenhagen, it was decided to have the more generic title “Library management and promotion”, that would cover a wide range of knowledge and practical skills areas which are necessary for an information professional to function in ever changing library service organizations. Another example: “Mediation of Culture in a European Context”. In the discussions it became clear that the Scandinavian group members – majority of this group – had only little difficulty in understanding the meaning of the word “mediation” but nearly everyone outside of Scandinavia had these difficulties. Therefore intensive meta-level discussions about the term “mediation” in-and outside of this workshop-group were necessary.

In these two days many joint discussions as well as informal communications took place between the colleagues in the LIS field about many terms like “culture” and country-specific characteristics in LIS education based on the elementary political structure of the countries. The outcome of this conference should be an expansion, intensification, continuation of communication and better understanding within colleagues, practical experts and politicians in future. Now European education and research institutions on the one side and practitioners on the other hand have to discuss the future of European LIS education together. 2

The Bachelor – an Academic Degree

The following four education levels in LIS are established now in Germany:

- 1st level: Apprenticeship of three years to the employee of media and information services, in German: Fachangestellter für Medien – und Informationsdienste (FAMI).
- 2nd level: Undergraduate: Higher education of three or maximum four years at Universities of Applied Sciences or Universities awarding the academic degree „Bachelor“ in librarianship or information economy.
- 3rd level: Graduate. Higher education awarding
the academic Master-degree in Information Science at Universities of Applied Sciences or Universities or an official government supported education at special school of academic librarianship for 2 years as a postgraduate programme.

- **4th level: Postgraduate:** Doctorate only at Universities

In other countries similar structures are established. Most of the universities and employers have only little experience with the new study structure following the Bologna process and in reality little is done regarding the USP promotion of the Bologna process. One of the key issues is to take care of the value of the Bachelors’ degree as an academic degree. Normally the work of the FAMIs encompasses technical services like database management etc., ordering, claiming, cataloguing and classification, serials control, binding and public service. This shows that library-specific skills are indispensable and that this job can not be done by honorary capacities. On the other hand currently many of the FAMIs assume more and more responsible areas in librarianship depending on the size of the library and the budgetary restraints. Therefore the consequences of indiscriminated personnel management must be discussed. Many of librarian directors only compare the duration of study (Bachelor) and apprenticeship which are with three years nearly identically. But the fundamental differences consist in the kind of teaching and learning.

Therefore the Conference of Education and Study Degree Courses in Information and Library Science – (in German: Konferenz der informations- und bibliothekswissenschaftlichen Ausbildungs – und Studiengänge – KIBA) decided in 2006 to start a campaign to promote and protect the Bachelor as an academic degree.\(^3\)

One result of this discussion and campaign was the compilation of arguments “pro Bachelor” by students. It was the goal to show the differences between an academic degree and apprenticeship – important for every library and librarian.

**The Theses**

1. Only a study degree offers the opportunities to carry out the future of library and information science active.
2. Higher education enables abundantly the innovation of products and services. Thereby the graduate has good chances for a good job with a promising future.
3. Only a study degree negotiates the techniques for scientific work.
4. The study degree negotiates the branch-overlapping qualifications.
5. A study degree makes internationalisation easier
6. Study degrees are qualifying for executive duties (management).
7. A study degree gives the power to act with third persons like administration or funding provider.
8. A study degree improves the academic reputation on the market.
9. A study degree increases the chance of a good salary.
10. Conclusion: A study degree is indispensable in future too.

The marketing for the Master’s degree and the new career opportunities will be the next step.

**Common R & D Activities**

Most of the LIS programmes combine theory and practical work in the sense of applied sciences. This also can be considered as a significant difference between the employees in media and information services (FAMI) and the academic level / degree. The first one works task oriented, whereas the second one works problem oriented in the sense of methodology. There are many projects to proof this hypothesis: LIS students are involved from the beginning in projects like mission statement development, corporate design, service development or surveys, i.e. conceptual design, performance, controlling, documentation, financing and so on.

Teaching, research and development (R & D) at European universities are normally based on a combination of universally applicable knowledge as well as specialist knowledge. The European universities are striving for a close cooperation between academia and practise (libraries) by mutual knowledge transfer. A huge number of businesses and libraries are cooperating partners of the European universities. This helps to gain a realistic view on the own (market) position and to provide benchmarking about the own curricula permanently because cooperation is the best way of learning. For students these projects are indispensable.

**Internationalization**

In the 1990\(^{th}\) new study abroad programs, including exchange programs, were established in Europe but the success of the universities international educational program had come to be measured only by two student mobility figures:

- How many students were studying abroad? (Outgoings)
- How many international students were studying at the own university? (Incomings)

The most popular program for studying in another European university is called Erasmus program. The goal of this program is that about 10 per cent of European students should study in another European University – mostly for a maximum of one semester.
The result: there is a benefit for a maximum of 10 per cent of the students!

Not only the multinationals but also middle-sized companies and libraries are looking for graduates capable of working in a multi-cultural environment. Therefore, more and more businesses recruit from universities that train graduates in communication across cultures. There are a lot of topics relevant in international context like: diversity management, ethics, cultural specific facts, poverty etc.

In the European Curriculum Reflections on Library and Information Science Education the title of one chapter is: “The Library in the Multi-cultural Information Society”. The following needed competencies and skills were formulated:

1. Understand and advocate the role of the library in the multicultural context
2. Develop awareness of methods and approaches for multicultural and intercultural work
3. Design and deliver services aiming at realising the library’s goal in the area.

At the education, the following demands were made on the education to a multicultural librarian in the frame of the Bologna process.

“First cycle/Bachelors level

Each information professional should be in possession of general competences related to multicultural communication as a general framework for librarians’ work. In fact, to communicate with the people of different cultures (i.e. different social groups, generations and finally ethnic groups) is part of the ordinary tasks of all librarians in every kind of library.

Second cycle/Masters level

A deeper awareness of multicultural heritages and sensitivity to the diverse information needs of multiethnic and multicultural populations should be the target of the second (Master level), aiming to produce more qualified information professionals able to face complexity and challenges with innovative solutions.

Lifelong learning

As emphasised by the Prague Communiqué (2001), lifelong learning is one means of improving competitiveness and employability but also facing rapid technological, economic and social changes such as the new multicultural society. Just in connection with the multicultural topic, LIS programmes could offer alternative learning paths to standard qualifications, such as non formal learning opportunities (on line education, distance education, adult education) and recognition of prior learning (also experiential learning) in multicultural services.

The results are strategic alliances, double or joint-degree programs, and “internationalisation at home”.

Alliances of Excellence

UAS7 is a strategic alliance of seven leading German universities of applied sciences committed to excellence in teaching and research, whose goal it is to further academic exchange between North American universities and the German UAS7 and one example for an alliance of excellence between several universities to intensify the collaboration between universities in different countries. With a liaison office in New York they organize the following programs for American and Canadian students and faculty:

- Scholarships: Study and Internship Program (SIP),
- Undergraduate programs,
- Graduate programs,
- Summer School programs,
- Faculty exchange.

For example, the Study and Internship Program is a program in cooperation with the German Academic Exchange Service (DAAD), and would like to invite students from USA and Canada to apply for this unique educational experience involving one semester of study at one of the seven universities, followed by a six-month internship in a company or research institute in Germany. They will study for a full semester together with German and international students at one of Germany’s leading universities of applied sciences and they have the opportunity to apply their academic and professional skills in a five to six month’s hands-on supervised internship in Germany. This is an excellent opportunity to put Germany on their resume.

Double and Joint-degree Programs

More and more universities around the world establish English spoken study programs. Normally these courses are Master programs, not Bachelor. But only students with a good knowledge in English participate in these programs. Often it is a huge loss of knowledge transfer and depth to notice: many of students and lecturers (outside English-speaking countries) do not speak English like their own native language. Moreover in the curricula is no or only small orientation in intercultural communication skills established.

But there are a few very successful and interesting programs. These are courses of European universities which are developed with partner universities within the same country or with partner-universities abroad. A most attractive example is the International Master’s Program “Digital Library Learning” between the three universities Oslo (Norway), Tallinn (Estonia) and Parma (Italy). The first semester is offered in Oslo, the second in Tallinn, the third in Parma and the fourth semester involves writing the Master Thesis. A maximum of 30 students will be selected: 10 from European and 20 from non-European countries. The
requirements for all students are:

- A degree in Library and Information Science (based on no less than three years of full-time study – 180 ECTS) or equivalent qualifications, such as a degree in another relevant subject.
- English skills. Students from non-English speaking countries must have passed either IELTS (International English Language Testing System) or TOEFL (Test of English as a Foreign Language).
- Knowledge and skills of computers for information use.

The final selection of students is made by a selection committee, which consists of representatives from all three partner institutions. The criteria for evaluation of the applications include:

- Relevance and excellence of academic background,
- Relevant experience and professional training,
- The submitted statement of purpose.

These double- and / or joint-degree programs are very attractive for student’s future careers and it should be interesting to intensify the international student mobility with countries outside of Europe until it has become normality.

"Internationalisation at Home"

Higher education must adopt new methods to educate students in new competencies and qualifications in response to the industries and libraries demands and needs. There is the necessity of curricula rich in international and global content. And there is a need of collaborative structures around the world (social university communities). The most important aspects are:

- integrating cultural knowledge in the curricula,
- bringing an international dimension to a class,
- international group work,
- co- and extra-curricular activities in which students can share knowledge and experience,
- integrating experiences of returning students from abroad.

But the success of this package of measures depends on the participation of all taking part.

One alternative possibility should be the creation of a web portal that will house various resources, e.g. articles, blogs, contacts, podcasts, videos, webinars, web links, a collaboration platform, and contact information. It should be a LIS specific platform open for everybody so that communities, discussions, tutorials etc. can be created by all, teachers and students and also librarians. The result would be a combination of learning, collaboration, social networking and leisure, a trend worldwide.7

Lifelong Learning

Continuing education has to keep librarians abreast of knowledge and developments within their field of activity to enhance job competencies, or to lead to new areas of librarianship. Today continuing education activities gain in importance at universities in Europe. They will be organised in form of sideline career studies, part-time studies, lectures in the evening and on weekends, summer schools, e-learning and distance education etc.

Training Centres for Further Education

To meet the specific training needs of employees in scientific libraries, e.g. at the Cologne University of Applied Sciences an education centre for further education was founded a few years ago9. This centre is a service oriented and innovative institution for employees in scientific libraries in the federal state Northrhine-Westfalia that works in close co-operation with its customers on constant development of existing and new seminars / courses and is financed by the Ministry for Innovation, Higher Education, Research and Technology. The seminars are open to librarians and information specialists from other federal states too, but they have to pay. The centre offers numerous seminars on different library-specific topics, IT, online research, and management skills. Last year 56 seminars with 710 participants took place and the demand grows continuously.

Part Time Postgraduate Courses

One fine example is the part time postgraduate course in Library and Information Science (Master in Library and Information Science) at the Cologne University of Applied Sciences9 which qualifies graduates for specialised tasks and executive/management positions in libraries and other national and international institutions providing access to information and information services. The course is aimed at graduates from bachelor’s and master’s courses, as well as graduates with a German “Diploma” degree. On successful completion of the course, students receive the degree “Master in Library and Information Science”. The minimum admission requirements for the course are a university degree and twelve months of professional experience (gained either during an internship or previous occupation) in a library or other institution providing access to information and information services.

The duration of the course is four semesters. The period can be extended to up to ten semesters (five years of study) without any problems, thus giving students the opportunity to complete the course at their own pace. Based on the concept of blended learning, course organisation is particularly geared towards the needs of students working full or part time while pursuing the degree. Thus the curricular content is partly imparted in on-campus block courses and partly acquired in self study phases. A powerful learning management system facilitates exchange between
students during collaborative work and communication with teaching faculty and allows them to make available their work results.

Alternatively those interested in further education can book individual modules as single courses. Per course there are a few places (3-5) left. Integrated into the course are a number of practical projects, giving students an opportunity to put theoretical contents into practice in their employing or hosting institutions. At the same time, freely selectable areas of concentration allow students to shape the course content according to their own interests. The curricular content divides into seven closely linked subject areas, each offered as an individual module over the course of at least one semester. Exams take place either at the end or above all during the respective semester.

In addition to professional competencies, general key qualifications of particular importance in management and leadership will be imparted. These include:

- Communicative competence (conducting negotiations, communication in situations of conflict),
- Presentation (rhetorical skills and techniques),
- Cooperation and teamwork.

It is expected that adults studying part-time will make up an ever-increasing part of the student population in future especially in aging societies like in Europe.

**Conclusions**
The study structure of the European Higher Education Area changed essentially in the last few years and there are a lot of consequences for universities and employers in the present and future. But the universities must be the major protagonists in creating this European Higher Education Area and they have to take strategic action permanently. Some important aspects of these developments are presented in this paper.

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Engineering Education in Europe: Current challenges and developments. These standards represent a paradigm shift in quality assurance as they are no longer based on input parameters but on outcomes. The application of an outcomes-based approach to the development and implementation of bachelor and master programmes within a two-cycle (or a three-cycle including the doctorate level) system of higher education is a topical issue for both Russian and European Universities. Engineering Curriculum Design / 9.

1. Engineering Education in Europe: Current challenges and developments. What kind of paradigm shift in education are we talking about? The traditional linear education system just doesn’t cut it anymore. For the past few years, we’ve felt the changes coming, but they hadn’t taken shape. We aren’t talking about small adjustments or adding something on to what already exists. We are talking about profound changes at an institutional level. Changes in the way that teachers share information and changes in how students receive it. Not only that, but we need to change the values that we teach our students and the way that students acquire certain skills. Those things weren’t a priority in the traditional educational system. Nevertheless, our young people will need these skills in their adult life. Linear education vs. horizontal education. Recent genetic, isotopic and linguistic research has dramatically changed our understanding of how the Corded Ware Culture in Europe was formed. Here the authors explain it in terms of local adaptations and interactions between migrant Yamnaya people from the Pontic-Caspian steppe and indigenous North European Neolithic cultures. The evidence from the recent studies of ancient DNA documenting human migrations into temperate Europe during the early third millennium BC can be summarised as follows: There was a widespread process of genetic admixture, leading to a reduction of Neolithic DNA in temperate Europe and the dramatic increase of a new genomic component that was only marginally present in Central Europe prior to 3000 BC (Allentoft et al.).