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Information literacy for advanced users:

A German perspective

Oliver Kohl-Frey

This article presents the development and perspectives of improving the information literacy of graduate students at the University of Konstanz, considering the European background with the Bologna process and the general conditions of the German higher education system. It gives a short overview of the current reforms in European higher education and the consequences for information literacy instruction for undergraduates and graduates as well. The situation at the University of Konstanz, with its library being a leading institution in the German information literacy debate, is described explicitly. Some findings of a comprehensive graduate information literacy survey, which was recently realized there, are reported in detail. Further perspectives for graduate information literacy in the context of the library's user services are outlined.

Keywords: Information literacy, User services, Library instruction, Graduate students, Doctoral students, User survey

THE ROAD TO INFORMATION LITERACY IN GERMANY: THE BOLOGNA PROCESS AND ITS CONSEQUENCES

Introduction: information literacy as a topic in German librarianship

The discussion on information literacy in Germany during the last few years has concentrated almost exclusively on teaching undergraduates[1]. There are several reasons for this situation. First of all, information literacy is quite a new topic of discussion for German academic librarians. Although a few pioneers tried to raise the topic in the late 1990s (see Dannenberg, 2000; Hapke, 1999; Homann, 2000), the community remained reluctant[2]. Bibliographic instruction took place in a very tool-oriented way, as for example at the University of Konstanz[3]: Stand-alone sessions were offered, called "Using the local catalogue" or "Introduction to database XYZ". These sessions were not well attended. Either the students did not know of their existence, were not interested, or were not aware of having the need to learn more about useful resources. Some local innovative approaches may have taken place, but in general, the situation did not change at all. Students rarely participated and librarians were not content. This description seems to be representative for most of the German university libraries (see Lux & Suehl-Strohmenger, 2004, p.36-38). The situation changed dramatically at the moment when the Bologna process started in the late 90s.

The Bologna process and its consequences

The Bologna process seeks to harmonize the higher education systems of the participating European Union states with the vision of a European higher education system by the year 2010[4]. The former situation in the European Union was characterized by a wide variety of higher education systems in terms of structure, duration of study, and academic degree. Now the Bologna process aims

to define and implement a two-level study structure similar to the one already existing in the Anglo-American world: On the undergraduate level, the bachelor's degree includes three years of studying and should qualify a student to enter a job. It could be followed by a master's degree or a doctorate. The idea of harmonizing the European system is to allow students to switch between countries and universities and to improve mobility in European higher education [5]. This integration process has not currently been completed because the reform of the higher education system is still ongoing. Universities will have changed their curricula and degrees by 2010 and some already have succeeded, while others have not yet started. It is evident that the focus was laid on the bachelor's degree at the beginning of the process because the undergraduate level was the first step toward harmonization. A bachelor's degree in the new system corresponds to 180 credits over three years, including a thesis.[6] To obtain a master's degree, another 120 credits have to be awarded over two more years.

The idea of the new bachelor's degree is to allow students to leave university after just three years with an academic degree that qualifies them for the labour market. This was not the case in the former European higher education systems. In Germany, students normally had to work five or six years for their first academic degree, a Diploma (Diplom) or Master's (Magister artium). A shorter degree course such as a bachelor's was not previously known. As a result of this idea of job orientation, many German university departments included so-called key qualification credit-bearing courses in the curricula. These courses often include information technology or language skills, research skills or soft skills, such as rhetoric or presentation. Some libraries recognized the possibility of including information literacy as a key competence in this part of the curriculum at a very early stage of the process[7]. Various examples from the University of Konstanz will show the wide range of possible solutions.

Integrating information literacy in the curriculum: the undergraduate experience

The debate on information literacy at the University of Konstanz started in 2002, when the first bachelor's curricula were designed and some departments asked the subject librarians for teaching assistance in the field of key qualifications. A committee of subject and reference librarians started to discuss the issue. It concluded that this was to be a unique chance to develop the librarian's position towards a more research and teaching-oriented focus and to improve the library's standing in the university. Although there had been some bibliographic instruction before[8], a new era started at this point.

During the last few years, the integration of information literacy in certain undergraduate curricula has been forced. This has led to three basic models of teaching information literacy at this level[9].

1. Ninety-minute stand-alone sessions in subject-specific resources are still offered in most subjects, but attendance remains low.
2. Course-integrated arrangements allow subject librarians to teach 90- or even 180-minute sessions in a seminar run by the faculty. This is the case, for example, in sports science, ancient history or political science. The subject specialist can only show some of the most important resources, so teaching remains predominantly tool-orientated.
3. A completely new approach is a subject-oriented full semester information literacy credit course that may be integrated in the curriculum. This model is already followed by five of the ten subject specialists, who cover a range of approximately twelve fields of study (see table 1).

Table 1: Undergraduate information literacy courses at the University of Konstanz*

Subject	Course offered	Time per week	Credits (ECTS)
Germanic studies	Every summer semester	2 hours	3
Romanic studies	Every other winter semester	2 hours	3
Slavonic studies	Every other summer semester	2 hours	3
Linguistics	Every other winter semester	2 hours	3
Media science	Every other summer semester	2 hours	3
History**	Every semester	2 hours	3
Philosophy**	Every semester	2 hours	3
Politics and management	Every summer semester	1 hour	2
Economics	Every summer semester	2 hours	3
Biological sciences	Every summer semester	2 hours	2
Life science	Every winter semester	1 hour	1
Chemistry	Every winter semester	1 hour	1

* The different number of credits is based mainly on decisions of the respective departments. As the information literacy courses have approximately the same workload per weekly hour, the idea of measuring workload with credits is somehow contradicted.
** = mandatory courses

Most of the courses in the humanities and social sciences are offered during the first year, whereas in the sciences, the courses are scheduled in the second or even the third year because of the different ways students learn to work during their time at university. It is obvious that the content of the courses depends strongly on the subject and the specific focus of the department, but the underlying structure of the course agenda is similar in most courses and covers the whole range of information literacy, from research strategy via catalogue, database, Internet and fact retrieval to evaluation, citation, bibliographic management software and so on[10].

Feedback from the faculty, students, and subject specialists is very positive and encouraging. The

faculty appreciates the teaching support in the important field of research skills, students can improve their information literacy, and subject librarians become engaged in teaching, valuing this new challenge. Support for the subject librarians has been provided through student assistants, who take the load off them in different ways. With this step, the library management had also made clear the importance of teaching information literacy as a new task for subject librarians and for the library as a whole. Without doubt, there is a certain changeover from collection development to a more research and teaching-oriented position of the subject librarian.

This situation at the University of Konstanz cannot be generalized for the German university landscape. There is still a wide variety of approaches between universities and libraries in teaching information literacy, from stand-alone presentations to course-embedded sessions and complete credit-courses. For further information, please refer to the overviews in Krauss-Leichert (2007) and Lux and Suehl-Strohmenger (2004) and the information on the nationwide information literacy website[11].

FROM UNDERGRADUATES TO GRADUATES: INFORMATION LITERACY PROJECTS AT THE UNIVERSITY OF KONSTANZ

Information literacy for undergraduates

At the University of Konstanz it became clear from the very beginning of the described process in 2002 that a lot of conceptual work was needed to develop a framework for consistent information literacy teaching. Given the already heavy workload of the subject specialists and reference librarians, it seemed to be necessary to obtain external funding, especially to create a temporary position to do some of this conceptual work. The library therefore applied for additional funding from the university and the Ministry of Science, Research and the Arts of the State of Baden-

Wuerttemberg[12], which was granted in early 2003 for a two-year project period. During this period, the project entitled *Informationskompetenz I*, a prototype course for teaching information literacy at the undergraduate level was developed, as well as a set of online tutorials using ILIAS, an open source platform. All the developed materials are freely available on the web under Creative Commons licensing[13] and have already been reused by a number of German university libraries. For detailed descriptions of the project, please refer to Dammeier (2006) and Kohl-Frey (2005). This project focused mainly on undergraduates because at this juncture, the new bachelor's study courses were developed within the universities, and with the integration of information literacy in the new credit bearing key qualification courses, the pressure for new solutions in teaching information literacy was extremely high. Simultaneously the window of opportunity for the library was open.

But even during the planning, conceptualizing, and evaluating of the undergraduate prototype course, it became evident that there was a need to set up special graduate arrangements in order to meet their particular needs. The library therefore applied for a second project dealing especially with advanced learners.

Information literacy for advanced users

This second project, called *Informationskompetenz II*, is funded by the German Research Foundation (*Deutsche Forschungsgemeinschaft*, *DFG*[14]) for two years and started in January 2006. From the very beginning, it was intended as a strongly cooperative project with the Library of the Chinese Academy of Sciences[15], which already has a wealth of experience with teaching information literacy to advanced students and researchers. Besides the exchange of materials and information, two librarians from the University of Konstanz visited the Chinese partners in April 2006, and two Chinese colleagues visited Konstanz in October 2006. Further Chinese-German consultations, including mutual teaching, are scheduled for July and October 2007. Because of the strong comparative perspective, one research trip to the United States in July 2006 and a second trip to the

UK in April 2007 with visits to several leading institutions[16] took place, where two librarians of the University of Konstanz collected many useful ideas for getting ahead with our own work[17].

The overall aims of the whole project are (a) to analyze graduate information competencies[18], (b) to reflect on their special needs in information literacy and (c) to find appropriate ways to inform and teach them. Besides the international focus, national developments should be taken into consideration, too. For this purpose, a range of quantitative and qualitative data was collected on a national level.

First of all, a graduate information literacy survey was carried out in April and May 2006 at the University of Konstanz. This survey is one important basis for our further considerations. Some of the results are reported in the next section. Secondly, several focused interviews with German experts in the field, especially the librarians of large research institutions, were conducted.

FINDINGS OF THE GRADUATE SURVEY

Description of the sample

The survey was conducted as an online survey and was developed mainly within the project team, which consists of three people. A pre-test with 23 graduate students was carried out during March 2006, and the suggestions of the pre-test group were investigated intensively and the survey was modified following these suggestions. An English translation of the questions is documented in the appendix. With the help of the university administration, it was possible to identify the number and email addresses of all master's students, doctoral candidates, post-docs and researchers and on April 4th, a group of 867 graduate students of the university received an e-mail with the link to the survey and an invitation to participate[19]. Three weeks later, a reminder was sent out and on May 5th the survey was closed. Two hundred and eighty-five graduate students answered the questions, a

response rate of nearly one third (32.9%).

Within the sample, most of the interviewees started their university career before the year 2001 (91.3%), the median being 1997. Most of them (89.4%) studied mainly in Germany, whereas only a smaller percentage studied predominantly in foreign countries. Nearly three quarters (73.3%) of the sample already had a master's degree (or an equivalent, like the former German *Diplom* or *Magister*), allowing the assumption that they are working on a doctoral thesis. A mere tenth of the sample (10.5%) had only a bachelor's degree, which is not surprising in view of the quite young Bologna reform.

Table 2: Highest academic degree

Academic degree	**n**	**%**
Bachelor's	30	10.5
Master's, Magister, Diplom etc.	209	73.3
Dr., PhD, *Habilitation*	34	11.9
Other (e.g. Swiss *Lizenziat)*	12	4.2
Total	**285**	**100**

Most of the interviewees (75.8%) were frequent library users, using the library's services at least once a week. Nearly two thirds 61.3% used the library's physical collections, electronic resources or services several times a week. More than one half of the sample were graduate students from the sciences (53.0%), while nearly one quarter were from the humanities (24.2%) or the social sciences including law (22.8%)[20]. This corresponds approximately to the graduate distribution at the university as a whole.

Information literacy measurement: What do they know?

A battery of 20 items[21] was used to obtain a graduate's self-assessment of their information literacy. These 20 items were compiled mainly by the project team, with topics such as developing a search strategy, different ways of searching the resources, evaluating results, citing, and publishing. This was measured on a scale of 1 (very high competence) to 5 (very low competence)[22]. We found a high variance in interpersonal as well as in inter-topical competence grading. The highest self-assessments were given in the following topics:

1. Basic search on the internet via search engines ($\bar{x}$ =1.50)
2. Basic search in the local OPAC ($\bar{x}$ =1.75)
3. Citing correctly ($\bar{x}$ =1.82)
4. (…)

The grading of the first item is not astonishing. Everyone knows: It is so easy to write your keywords into the Google search field and click on "I'm feeling lucky." In conjunction with another result of the survey, the picture becomes even more interesting. When we asked which sources the interviewees usually used for the investigation of specific research results (see Figure 1), the overwhelming answer was search engines, and most likely that means Google. That means that most of the graduate students search for current research results with the tool they think they can handle best: Google. These facts lead to the already ongoing discussion that libraries and database providers should make more effort to make their search interfaces even more frugal and to integrate more bibliographic data into the search engines.

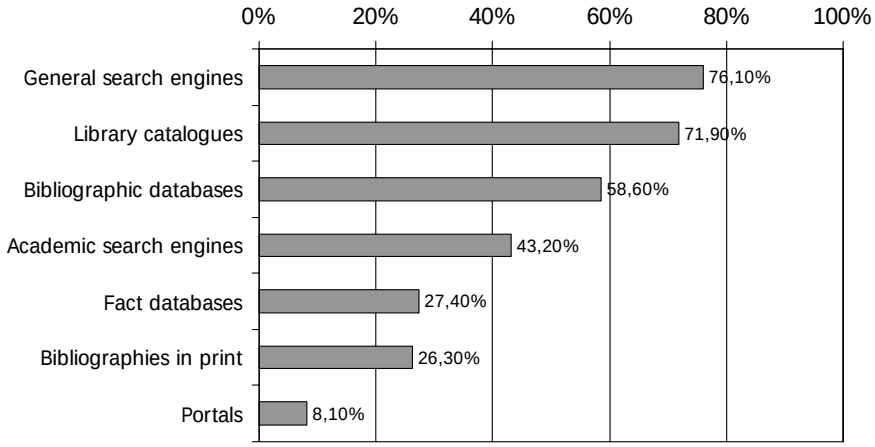

Figure 1: Which sources do you use for the investigation of specific research results?

The average personal information literacy assessment, calculated as an index for each graduate student, including the 20 items, is $\bar{x}$ =2.62. The variance of this self-assessment as a whole, graded between "high" and "neutral," is extremely high (see Figure 2). Further conclusions are discussed in the next section.

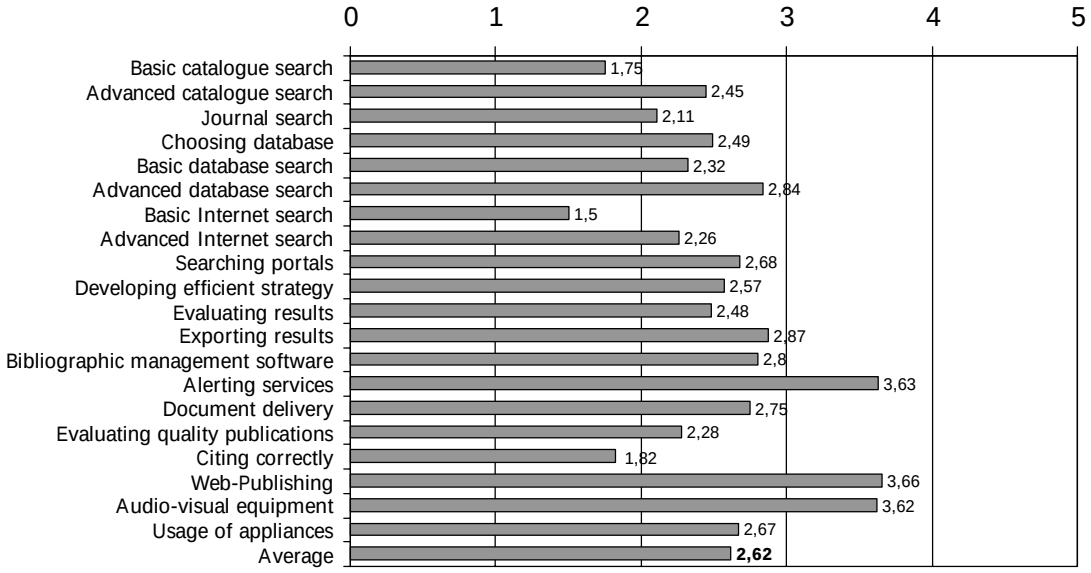

Figure 2: Self-assessment of information literacy

Information literacy ignorance: What to teach them?

One obvious starting point for the needs of the graduate students is their self-assessment. The six lowest rated items according to this are:

15. Use of bibliographic management software ($\bar{x}$ =2.80)
16. Usage of optional search parameters ($\bar{x}$ =2.84)
17. Exporting of search results ($\bar{x}$ =2.87)
18. Audio-visual equipment ($\bar{x}$ =3.62)
19. Alerting services ($\bar{x}$ =3.63)
20. Web publishing, e.g. institutional repository ($\bar{x}$ =3.66)

So it is particularly the more sophisticated functions of search instruments (optional search parameters like truncation, index search, etc., the export of data and the initializing of alerting services) that are named as necessary competence extensions. The use of bibliographic management software seems to fit very properly into this whole field of advanced searching, exporting and managing references, and staying up to date, which could be the focus of a workshop, a series of workshops or an important part of a semester-long course in information literacy for advanced users.

The use of audio-visual equipment (video digitalization, film cutting, preparation of audio-visual teaching material etc.), however, is expected to be the need of a very specific target group, such as media scientists or historians, working with that sort of material. For them, custom-made solutions could be provided.

The self-publishing of research papers, especially on an institutional repository (like *KOPS*, the Konstanz Online Publication System), is a requirement, too. At the moment, the library is particularly active in promoting this form of academic publishing as the “green way” of the Open

Access movement. One-on-one support is already provided, but with the results of the self-assessment, workshops should also be considered. Besides the information literacy self-assessment, the survey points to at least one more lack of competence: the above-mentioned result that most of the interviewees use general search engines for the search of current research results (see Figure 1).

One can draw the conclusion that the adequacy of using general and academic search engines should be at the core of information literacy instruction for graduate students. There is no doubt that Google and Google Scholar, in particular, are becoming more and more attractive for the academic community as they include more and more content in their engines, despite all the disadvantages they imply (for an overview see Miller & Pellen, 2005). It may be that the librarians' mission is to show how they are best used and to show the alternatives to the patrons as well.

Another interesting question in this context was which services the graduate students would like to use in the future. Most of them answered that they would favour consulting in specific areas. These results basically confirm the observations described above:

1. Consulting in the use of specific databases (46.3%)
2. Introduction to bibliographic management software (45.6%)
3. Consulting in searching for academic literature (41.4%)
4. Information about electronic publishing (38.9%)

Offering information literacy: How to reach them?

If a library seeks to reach a certain target group, that means two things. First of all a simple channel of information is needed, along which the library is able to convey purposeful information to the user. Secondly, to go one step further, the library needs ways of imparting knowledge (e.g. about topics in information literacy) to the user. Both topics were addressed in the graduate survey at the

University of Konstanz.

The first question, concerning the channel of information, asked how the users want to be informed about library news. The results are not surprising, with an electronic newsletter being the most requested method of information (see Figure 3).

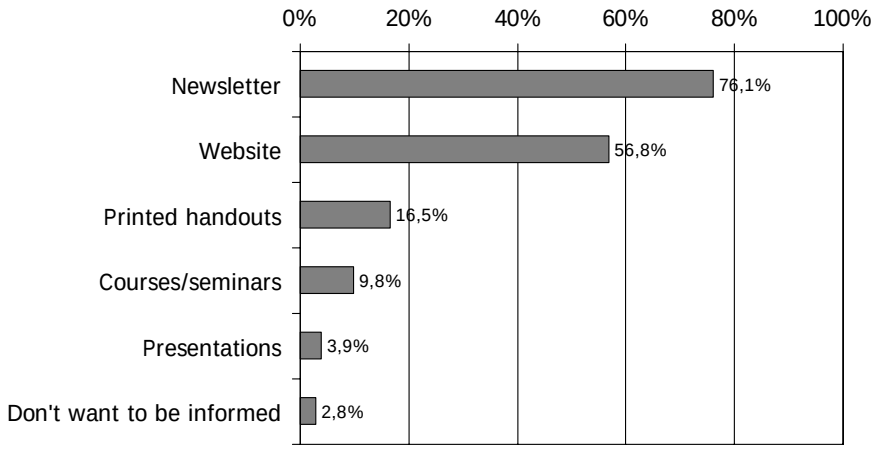

Figure 3: How do you want to be informed about library news?

During the last years, particular subject oriented mailing lists have already existed at the library at the University of Konstanz with sporadic mailings to several interested users. One consequence of the survey result will be the creation of a more institutionalized library-wide newsletter, which will be sent biweekly from the summer semester 2007 with a broader range of content.

In addition to the simple dissemination of information, the second question asked how the graduate students want to be advised by the library (see Figure 4). The purpose of this question was to gather more information about the ways advanced users could be instructed in the different fields of information literacy. We presumed that the graduate students could not be reached as easily as the undergraduates in workshops or courses, a fact which was basically validated by the survey's results: Most of the graduate students prefer to receive advice in an e-mail (60.0%), in personal talks with the

librarians at the reference desk without appointment (53.0%), and with the help of online-tutorials (31.9%) or printed brochures (24.2%). Fewer of them called for one-on-one appointments with an individually fixed date (23.5%) or expressed their willingness to participate in courses or workshops (22.8%).

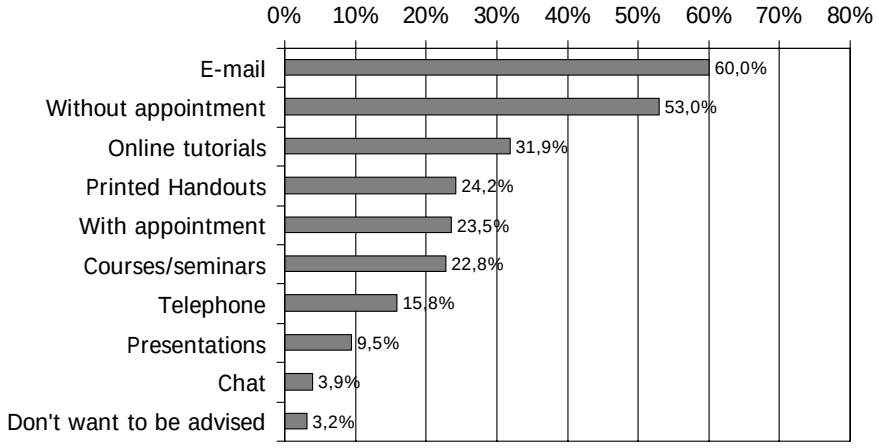

Figure 4: How do you wish to be advised by the library in the future?

On the one hand, these findings seem to be a contrast to the statements of the experts we had already interviewed in Germany, China, the UK and the US, where we learned a lot about the importance of one-on-one consultations. On the other hand, one can argue that nevertheless, nearly one quarter are interested in such a formal consultation with a temporal arrangement. At the University of Konstanz, we will debate the possibilities of extending our service in this area, at least for a small target group. Older scholars with a higher degree are more interested in one-on-one consultations, while master's students and doctoral candidates are more interested in courses and workshops, and both facts will be taken into account in our future plans.

The fact that one quarter are interested in participating in courses or workshops seems not very much at first glance. But it is still one quarter that could be reached in this way. So the impression

that graduate students are not willing to take part in a workshop or session is not completely validated with these results. Again, the approach will probably have to be changed, from tool-oriented sessions ("Introduction to the database XYZ") to problem-oriented workshops ("Manage your references", "Staying alert!" etc.).

PERSPECTIVES

During the remaining project period of *Informationskompetenz II*, additional tasks will be completed. More interviews with German and international experts in the field will be conducted. Together with different German information literacy initiatives, data will be collected concerning the graduate information literacy engagement of the large university libraries. Various ways of teaching information literacy to the target group will be tested and evaluated to come to a sustainable and successful set of methods for teaching graduate information literacy in the German university system. Some examples of plans for concrete measures follow:

Teaching master students in a credit bearing course

From the winter semester 2006, a semester-long credit-bearing course in politics and management is the first credit course for the master's level at the University of Konstanz. It is included in the study regulations, is mandatory for all master's students (approximately 40 per year) and awarded with four credits. It is situated in the methods module, which consists of two lectures in research design (seven credits each) and the information literacy course. The content of the course, which is taught by the subject specialist for political science, includes the full range of basic information literacy (research strategy, knowledge of and searching in the relevant resources, evaluation, citation, bibliographic management software etc.) as it is imparted in bachelor's courses. During the first course it became evident that information literacy basics have to be repeated once again because

transfer is not always achieved, even if the students already took part in an undergraduate information literacy course. Obviously the level of the master course has to be higher, e.g. in terms of the resources presented, but repetition still seems to be necessary. In addition, the focus will shift to some new topics, e.g. academic writing or ethical questions (such as plagiarism) or will be more intensive in some more common fields, e.g. the most relevant resources from adjacent subjects (such as law) or the use of bibliographic management software (which is more necessary for graduate students). To meet the needs of students, the course looked at their fields of interest and the content depended strongly on their previous knowledge. During the course, the information literacy of the 32 participants increased by 8%, measured with a simple test before and after the term. The self-assessment of the students even increased by 12.5%.[23]

Since the development of the master's curricula at the German universities is still "work in progress," with the first degree courses just now starting, this master's course was equally "work in progress." Further courses on the graduate level at the University of Konstanz, e.g. in sports sciences from the winter semester 2007, will highly profit from these experiences.

Collaborating with doctoral research training groups

The University of Konstanz has a strong tradition of supporting and promoting young scholars. At the University of Konstanz, several research training groups for doctoral students (*Graduiertenkollegs*) are working with postgraduates on campus. In addition to the existing four groups from the sciences, social sciences and humanities, a fifth group was established in spring 2006 in cooperation with the University of Zurich, the Swiss Federal Institute of Technology (ETH Zurich) and two pharmaceutical companies, doing research in the sciences. Close collaboration with the instruction librarian for the sciences was arranged to offer information literacy workshops for the doctoral candidates. Workshops on research strategy, relevant resources, or bibliographic management software will be provided by the library from 2007 onwards.

New services for a certain target group

Some years ago, the University of Konstanz founded a Centre for Junior Research Fellows (*Zentrum für den Wissenschaftlichen Nachwuchs*) to attract excellent young scholars to the university. The university intends to strengthen and broaden the importance of the junior scholars within the current German excellence initiative of the German Research Foundation (*Exzellenzinitiative* of the *DFG*). The aim of the initiative is to promote top-level research and to improve the quality of German universities. Therefore 1.9 billion € will be spent (2006-2011) in three lines of funding, and the DFG will come to a final decision in October 2007. The University of Konstanz has applied for funding in this initiative with a focus on junior scholars to enlarge the Centre for Junior Research fellows. Hence the library is debating tailor-made support for young scholars, and the members of the Centre have been selected as a first group to profit from these services. After an initial discussion with the members of the Centre a first concept has been developed to support these researchers: Several information literacy workshops, dealing with bibliographic management software or open access publishing, will be realized from the summer term 2007. In addition, the role of the subject librarian as a personal librarian for this target group is emphasized more: From the beginning of 2007 a welcoming one-on-one consultation is offered to every new member of the Centre.

Training the faculty as multipliers

A completely different approach is to train the faculty so that they are able to teach students in information literacy in their courses. This concept of bringing the faculty on board is not a new one in the information literacy debate, but we are trying to walk a new road: In the state of Baden-Wuerttemberg with its nine universities, a Centre for Higher Education Didactics (*Hochschuldidaktikzentrum, HDZ*) was founded a few years ago to support young scholars in

particular in improving their university teaching by means of special workshops in teaching methods, course planning, assignments and so on. In 2007, two new one-day workshops are offered within this Centre. One course on information literacy and e-learning has already taken place in January. Afterwards several participants have uttered their intention to integrate e-learning in their own teaching. Another course on ethics and plagiarism will be provided by librarians of the University of Konstanz for all interested faculty members in Baden-Wuerttemberg in July. Our aim is to impart basic knowledge in information literacy and customized methods for integrating information literacy into the curriculum of the faculty's courses.

International symposium on graduate information literacy

As the final stage of the *Informationskompetenz II* project, an international symposium on graduate information literacy is planned to be held at the University of Konstanz, probably in winter 2007/08. We intend to invite international experts in the field to give a state-of-the-art report and to initiate a constructive debate in this important area of librarianship.

CONCLUSION

The Konstanz graduate survey provides useful results for the further development of information literacy services for graduate students. The most important findings are that the graduate's information literacy competencies could be improved in certain fields using different ways and methods of information and advice. The University of Konstanz library has already developed and implemented varying models of information literacy instruction and consulting for graduate students and will extend these services in the future. The library took the opportunities that arose out of the Bologna process, especially with the formal integration of information literacy courses in Bachelor's and Master's curricula. In contrast, not only the needs of doctoral students and post-docs are

different, but also their institutional integration is less formalized. That led to a different library strategy with customized services and close relationships with doctoral research training groups or the Centre for Junior Research Fellows. The cooperation with such institutions seems to facilitate the achievement of our goal to improve the library's information literacy services and the graduate students' information literacy competencies.

Notes

1. As a German term for information literacy, Informationsliteralitaet is not used, because the word Literalitaet is not widely used in the German language. Instead, the German discussion uses the term Informationskompetenz (information competence). For an overview see Krauss-Leichert (2007) and Lux & Sühl-Strohmenger (2004).

2. Hence, there have been no national information literacy standards as exist in the Anglo-American world up to now. There have, however, been some regional campaigns, often based on ACRL standards, to develop regional standards. There will probably be integration in a national standard, but this is an open-ended process. The discussion is still continuing. For the region of Baden-Wuerttemberg, see: www.informationskompetenz.de/fileadmin/DAM/documents/Standards%20der%20Inform_88.pdf (April 13, 2007).

3. The University of Konstanz is one of the smaller universities in the south-western German state of Baden-Wuerttemberg. The young university was founded in 1966 and has approximately 10,400 students and 1,140 staff in total, whereof 174 are full-time professors. The library has an open stack collection of 2 million volumes and is open nearly 24/7 (141 hours per week). A staff of 95 works for the library, including ten subject specialists. They have tenure positions, but are not faculty members.

4. It is named after the Northern Italian city of Bologna, where the treaty was signed in 1999 by the responsible ministers of education from 29 European states. For further information, see Reinalda & Kulesza (2005).

5. For further information, please visit the website of the current Bologna Secretariat: www.dfes.gov.uk/bologna/ (April 13, 2007)

6. The European Credit Transfer System (ECTS) sets an average workload of 30 hours for one credit, which means a workload of 180 * 30 hours (= 5,400 hours). Therefore not every course or lecture is valued with the same number of credits per hour of teaching, since it also depends on the time for preparation and post processing of the course or lecture. Hence this varies widely from one to approximately eight or even more credits.

7. A second very important reason for the rise of the information literacy debate was the publication of the so-called SteFi-Studie in the year 2001 (Klatt, Gavriilidis, Kleinsimlinghaus, & Feldmann, 2001). This study analyzed the information competencies of students and faculty members in a nation-wide survey. The findings were dramatic.

8. Besides the above-mentioned stand-alone sessions, there had already been a full semester research skills course in philosophy and various lectures, mainly for Germanic studies.

9. Again, besides the non subject specific one hour workshops, such as an introduction to the catalogue, to Internet searching or bibliographic management software.

10. For the detailed content of the courses see Dammeier (2006).

11. www.informationskompetenz.de

12. www.mwk-bw.de

13. See: http://www.ub.uni-konstanz.de/bibliothek/projekte/informationskompetenz.html

14. www.dfg.de

15. www.las.ac.cn/en

16. We are very grateful to Columbia, NYU, MIT, Yale, Stanford, UC Berkeley, UCLA, University of Sheffield, Manchester Metropolitan University, Imperial College London and London Metropolitan University for their hospitality and openness. A report including the findings is in preparation.

17. More information can be found on the web: http://www.ub.uni-konstanz.de/bibliothek/projekte/informationskompetenz.html

18. A comprehensive literature review regarding graduate student's information literacy is in preparation and will be published later this year.

19. This has led to two biases: The first bias is that only graduate students with a registered e-mail account had the chance to participate in the survey. The second bias is that only master and doctoral students and post-docs had the chance to participate, but not the 4th and 5th year students of the former Diplom studies. The reason is that it would have been very complicated to look them up in the university administration's database, so they were excluded from the target group, as well as the people without a registered e-mail account.

20. There is no medical or engineering department at the University of Konstanz.

21. Following the existing standards of information literacy.

22. The methodological problems of a subjective self-assessment in this way are known as social desirability effects (see Diekmann, 1995, p.382-385). But given these problems, it is an adequate measurement of self-assessment, which was used in much larger relevant surveys, e.g. Klatt, Gavriilidis, Kleinsimlinghaus, & Feldmann (2001). A more objective

measurement of the information literacy of a certain group could be done with questions as were developed by the SAILS project, for example, (www.projectsails.org). A step in this direction was made during the graduate course in political science, see the chapter “Perspectives”.

23. Source: Own data and calculations.

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APPENDIX: TRANSLATION OF THE GRADUATE SURVEY AT THE UNIVERSITY OF KONSTANZ

(During translation, some questions were slightly changed to avoid some typical German expressions which are not necessary in this context.)

1. In which year did you start your first course of studies at a university?
2. Where have you attended university for most of the time?
- Germany
- United Kingdom or Ireland
- Middle, Western or Southern Europe
- Northern Europe
- Eastern Europe
- USA, Canada, Australia or New Zealand
- Middle or South America
- Africa
- Asia

3. Which is the highest academic grade you have obtained?
- B.A., BSc, etc.
- M.A., Magister, Diplom, etc.
- Dr., PhD
- Habilitation
- Professor
- None
- Other

4. In which function do you mainly use the Library of the University of Konstanz ?
- Student
- Employee (non researcher w/o tenure)
- Employee (researcher w/o tenure)
- Scholarship holder, member of a graduate school, etc.
- External user
- Visiting lecturer
- Other

5. How often do you use the services of the library (e.g. lending, catalogue search and using databases, document delivery)?
- Several times a week
- About once a week
- Several times a month
- About once a month
- Fewer
- Never

6. To which department do you attribute yourself?
- Mathematics and Statistics
- Informatics und Information Sciences
- Physics
- Chemistry
- Biology
- Psychology

- Philosophy
- History
- Sociology, Sports, Pedagogies
- Literature, Art and Media Sciences
- Linguistics
- Law
- Economics
- Politics and Administrative Sciences
- University Administration and Services
- None

7. How do you inform yourself about new developments in your profession or field of research? (Five answers at most)
- Journals (print)
- Journals (electronic)
- Bibliographic databases
- Internet portals
- Automatic alerts
- Online contents, current contents
- Exchange with colleagues
- Newsletter, weblogs, mailing lists
- Assignment of research service providers (with costs)
- Publisher programs
- Publications of professional associations
- Other

8. Which sources do you use for the investigation of specific research results?
- General search engines (google, yahoo, etc.)
- Academic search engines (google scholar, scirus, etc.)
- Library catalogues
- Bibliographic databases (Scopus, MLA, Pubmed, etc.)
- Fact databases
- Bibliographies in print
- Portals (Elektra, Vascoda, etc...)
- Other

9. How do you obtain full texts, which you need for your academic work?
- Printed stock of the library (Journals, books, etc.)
- Electronic texts (E-Journals, full-text servers)
- Free publications from the internet
- Document delivery
- Swapping texts with colleagues (PDF, reprints, preprints, etc.)
- The student assistants, secretaries care for this
- Other

10. Self-assessment of my skills and knowledge (1 = very high, 5 = very low)
- Basic search in local OPAC
- Advanced search in local OPAC
- Search for journals in local OPAC
- Choosing the right database
- Basic search in chosen database
- Usage of optional search parameters (truncation, indexes, thesaurus, etc.)
- Basic search in the Internet via search engines (google, etc.)
- Advanced search via search engines
- Search in portal-sites
- Developing an efficient strategy for enquiries

- Evaluation of results; broadening or narrowing of enquiry parameters
- Exporting results from catalogues and databases
- Electronic bibliography software (Endnote, BibTex, Bibliographix, etc.)
- Alerting services of databases, publishers, etc.
- Document delivery (print, electronic)
- Evaluation of the quality of publications
- Citing correctly
- Web-publishing (publishing on the internet, institutional repository, etc.)
- Audio-visual equipment (video, cutting, preparation of teaching-material)
- Usage of appliances (video-beamer, vcr, reader-printer, microfilm-reader, etc.)

11. How did you acquire these skills?
- Learning by doing, trial and error
- Autodidactic with teaching material (e.g. online tutorials, books)
- With the help of colleagues and friends
- Direct support of library employees
- Courses of the library
- Courses of your department
- Courses outside the university (schools, community colleges)
- Courses at the Hochschuldidaktikzentrum
- Other

12. How useful has this method been for you? (1 = very useful, 5 = not useful)
- Learning by doing, trial and error
- Autodidactic with teaching material (e.g. online tutorials, books)
- With the help of colleagues and friends
- Direct support of library employees
- Courses of the library
- Courses of your department
- Courses outside the university (schools, community colleges)
- Courses at the Hochschuldidaktikzentrum
- Other

13. Finally we would like to know what your experiences have been with the library.
Which of these library services would you like to use in the future?
- Help with enquiries for academic literature.
- Help with the use of certain databases.
- Help with the use of fact databases (protein databases, statistics, etc…)
- Introduction in the use of bibliographic management software
- Information on electronic publishing (e.g. institutional repository)
- Legal help (copyright for authors)
- Extension of the e-learning platform (online tutorials)
- Help on the problem of plagiarism in student papers
- Research assignments by the library
- None
- Other

14. How do you want to be informed about library news?
- Printed handouts
- On the website of the library
- Electronic newsletter
- Presentation
- Courses
- I don’t want to be informed
- Other

15. How do you wish to be advised by the library in the future?

- One on one appointments
- Help by the employees of the help desk (without appointment)
- Printed handouts
- Online tutorials and e-learning
- Phone
- Chat
- E-mail
- Presentation
- Courses
- I don’t want to be advised.
- Other

16. How content are you with the library all things considered? (1 = very content, 5 = not content)