

# **The effect of new technologies on library design: building the 21st century library**

Emory University, Atlanta, Georgia, USA, 10 - 11 August 2011

## **Reinhard Altenhöner: Learning and working environments – what students expect. Results of a Student Design Contest**

1. Architectural design and technical equipment for libraries is often planned and realized in the context of higher education: Increasing student numbers, increased demands on the qualification and training of students require optimized study conditions - particularly in the area of infrastructure facilities on campus. Even in Germany there is a trend to restoration measures in libraries, including both the construction and the furniture and technical equipment of the building. And in the face of buildings, which use was often planned in the sixties and seventies, the question arises, what needs the users have today: How can requirements for the use of digital media and changing forms of cooperation between students with classical forms of work be brought together in libraries? What could be more effective than to ask the users themselves? This was the starting point for a students contest under the umbrella of DINI, the German Initiative for Network Information (DINI).<sup>1</sup>

What is DINI? DINI was founded to coordinate and support the management of modern information and communication technologies in Germany in the context of colleges and universities. The change in the information infrastructures of higher education and other research institutions urges to improve the information and communication services of those institutions and learned societies, and the necessary information infrastructures regionally and nationally. Today DINI is a member organization with more than 100 media centers, academic universal libraries, computing centers and research institutions and research organization. Various topics are covered within the initiative: technology guidelines for repositories, networking, e-publication are addressed as well as standardization or specific issues of higher education institutions like video conferencing, workflow processing and even real and virtual learning spaces.

Key question of the competition was: What can libraries, computing and media centers do in order to provide students with optimal working conditions on campus? What are the needed new approaches for a new learning culture? What are today's expectations for a modern workplace. Times sought the quiet space for individual learning and individual times of the well-equipped space for group working together. Can combine the two claims? How do the students define the ideal "living learning center"

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<sup>1</sup> The competition is fully documented in the Web: Please refer to <http://www.dini.de/lebendige-lernorte/preisverleihung/> (access 2011-08-01), unfortunately only in German. The complete set of applications is available under <http://www.dini.de/lebendige-lernorte/beitraege/> (access 2011-08-01). Results and evaluations were summarized in the publication "LEBENDIGE LERNORTE" 2009. Studentischer Ideenwettbewerb. Betrachtungen der DINI-Arbeitsgruppe „Lernräume“. Hrsg: DINI – Deutsche Initiative für Netzwerkinformation e. V. Göttingen: 2010 (Lebendige Lernorte 2009). Available also online <http://www.dini.de/lebendige-lernorte/auswertung/> (access 2011-08-01).

in front, which makes appetite to work and motivate for second coming.

The considerations in the design competition were based on those challenges that must be met:

- Access to both digital and traditional media,
- Learning support technical and physical infrastructure,
- Web-based work environments,
- Learning support services and
- Promoting the learning processes of information and media literacy.

In this sense, the competition can be understood as a contribution to the international discussion on "Learning Resources Center" or "Information Commons".

Under the patronage of the Federal Minister for Education and Research DINI had called for a prize of € 5000 students in a design competition, conducted in 2009. 51 entries were submitted in total with many creative ideas and approaches: furniture designs, architectural designs and drawings for libraries as well as reflections on virtual learning systems, but also a controllable electronic room booking system and a manifesto for green and alternative libraries.

From the contributions, the jury selected five finalists:

1. Learn connected! - Eight visions in different dimensions (TU Dresden, Centre for Industrial Design)<sup>2</sup>
2. Library of St. Anna - the study rooms in the Church (University of East Westphalia-Lippe)<sup>3</sup>
3. TU Delft - a learning-oriented architecture not only for architects (RWTH Aachen)<sup>4</sup>
4. MyPaed-my personal study environment (TU Darmstadt)
5. Gemma - the renovation of the virtual and real spaces (TU Dortmund)

The winner was ultimately the contribution "MyPaed - My personal study environment"

In the grounds was pointed out that "MyPaed" is not only a pure learning environment, but also a potential space that combines a real computer study workshop with possibilities of a virtual learning environment and Web 2.0 services and is used even at the university Darmstadt.

In addition, one endowed with 2.000 € Creative Award went to nine students at the TU Dresden for the poster "Learn Connected". Graphically and textually, the poster presents in eight different

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<sup>2</sup> [http://www.dini.de/fileadmin/wettbewerb/lebendige-lernorte/beitraege/20\\_ziegner\\_learn\\_connected.pdf](http://www.dini.de/fileadmin/wettbewerb/lebendige-lernorte/beitraege/20_ziegner_learn_connected.pdf)  
(access 2011-08-01)

<sup>3</sup> [http://www.dini.de/fileadmin/wettbewerb/lebendige-lernorte/beitraege/09\\_helmig\\_bibliothek\\_st\\_anna.pdf](http://www.dini.de/fileadmin/wettbewerb/lebendige-lernorte/beitraege/09_helmig_bibliothek_st_anna.pdf)  
(access 2011-08-01)

<sup>4</sup> [http://www.dini.de/fileadmin/wettbewerb/lebendige-lernorte/beitraege/14\\_toepper\\_neubau\\_delft.pdf](http://www.dini.de/fileadmin/wettbewerb/lebendige-lernorte/beitraege/14_toepper_neubau_delft.pdf)  
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[http://www.dini.de/fileadmin/wettbewerb/lebendige-lernorte/beitraege/43a\\_palermo\\_gemma.pdf](http://www.dini.de/fileadmin/wettbewerb/lebendige-lernorte/beitraege/43a_palermo_gemma.pdf) and more  
(access 2011-08-01)

concepts different scales of interactive learning like learning glasses and ideas terminals, or large buildings as learning and knowledge centers.

Beside the award winners or finalists the other contributions are of great interest, they represent a good overview of requirements to appropriate learning environments. In the perspective of a general evaluation of the more than 50 contributions this paper tries to identify some characteristics of a good place of learning – in the perspective of student's usage.<sup>5</sup>

2. A commonality that runs through many posts is the general dissatisfaction of students with the existing situation. In this sense many of the proposals are more suggestions for the optimization of the present situation.

Two general remarks:

- The concepts are looking for places of learning for the whole day, based on a full-time study. They expect temporally and spatially flexible and technically up to date facilities. Group and project work are required and this means that the students ask for offers for cooperative and independent learning, for which often the prerequisites are lacking.
- Many of the ideas, especially the winner contributions are comprehensive. The concepts tackle all areas of student's life in the university, and realization can only be done, when all the involved agencies concerned to implement common seek solutions. Comprehensive and consistent solutions are proposed and expected, whether it is access to seminar rooms of the departments, the computer labs of the data centers, the cafes of the student union or the media stocks go from the library: As long as delineated responsibilities, different opening times, access and online presences prevail, the situation is unsatisfactory.

3. Real and virtual Space. In the contributions a lively place of learning is a real and a virtual space. The learning center is characterized by supporting teaching and learning as well as by the use of digital technologies and media. This includes the provision of learning environments, providing advice and support as well as access to print and digital media, but also offers to teach media literacy. This results in equipment requirements for the university. The professional support of student learning has become a core mission of universities.

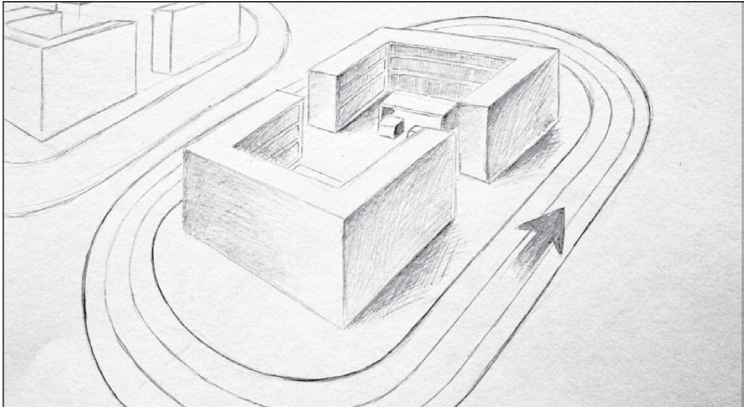
Pulling through all the posts an interesting aspect is the fact that the pure technology is paramount. It is assumed they will both quantitatively and qualitatively be at a high level, but it is rarely considered in isolation but integrated into the real world of learning. In this respect it is hardly even futuristic, innovative new developments, but the linkage and integration of existing technologies in the learning and working environment. In essence, therefore, all contributions revolve around the question of how real and virtual world can be linked together properly.

4. Environment, green library, ecology. In the contributions one can see that overall social aspects play a major role in the work of the students: aspects of ecology are named in a big number of

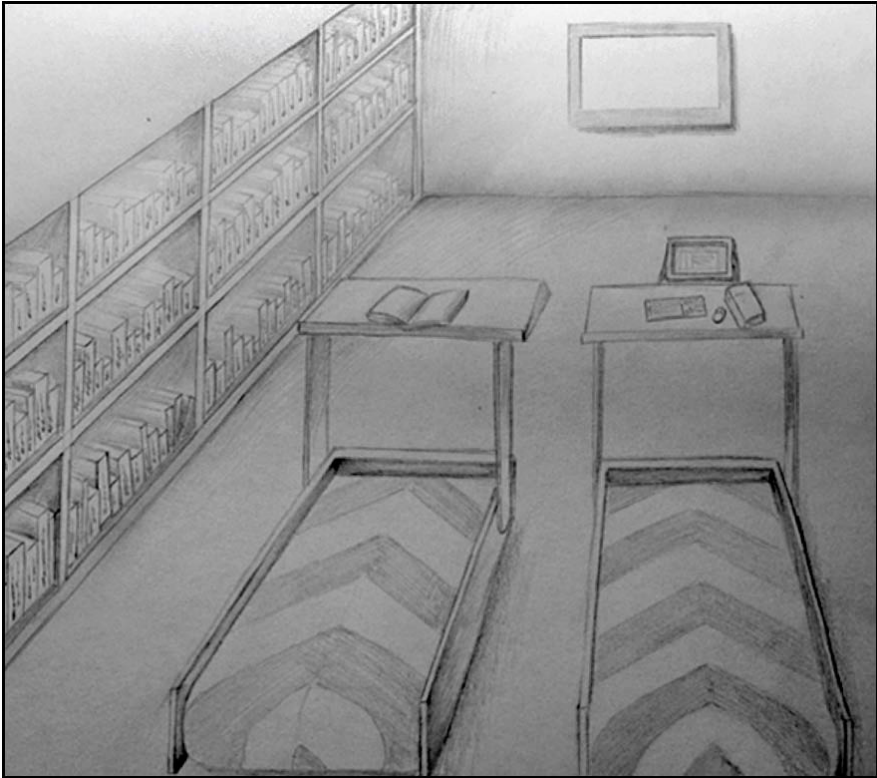
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<sup>5</sup> cf. Anne May: Einleitung: Eine gesamtuniversitäre Herausforderung – Perspektiven des studentischen Ideenwettbewerbs „Lebendige Lernorte“ In: Lebendige Lernorten 2009, S. 6 – 13.

contributions. The topic of personal health as basic requirement for learning and the lack of movement produces some curious results in proposals.<sup>6</sup>



Trajectory: This example shows how important the physical recovery for mental performance is. (contrib. 3)



(contrib. 3)

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<sup>6</sup> All graphs from the contributions see cited list. In order to present a general impression of offered ideas I omit a detailed citation of specific contributions/contributors. Nevertheless all the designs and graphs are protected by intellectual copyright law.



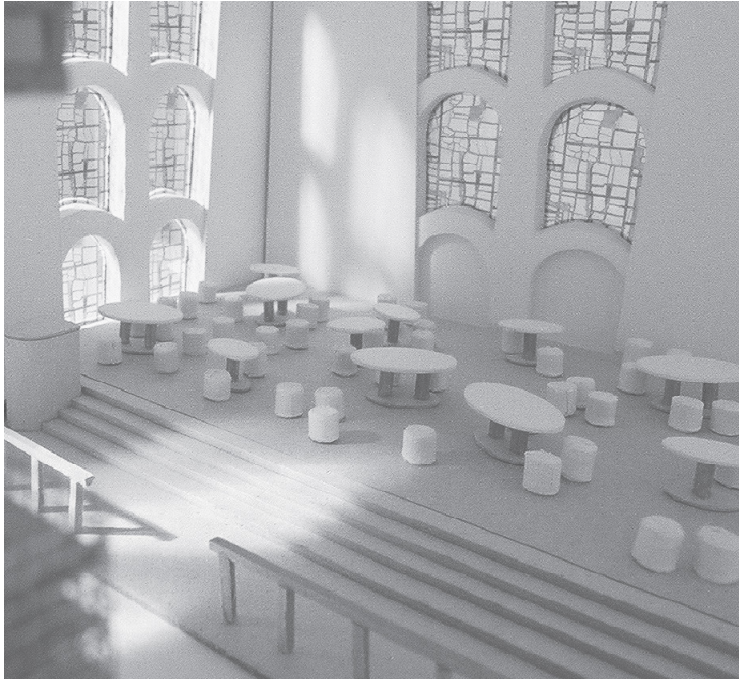
(contrib. 3)

5. Place to identify. An important feature in a few designs is the desire to have points for personal identification, which encourages the visitors to stay or to rest in the working environment



The students want comfortably designed areas with plants and drinking water dispenser (contrib. 15)

Adoption of given room situations is a popular topic, e.g. St. Anne Church in Duisburg, which should become converted into a library: the formerly sacred space remains almost unchanged and continue to experience (contrib. 9)



On the other hand learning centers / libraries are less stationary, but are distributed with the help of technology on campus. At small venues in the form of PC workstations with touch screens in the open, students can monitor the digital media and further information call around the clock on campus. Information service provider is the library that provides these media.





Das Panel



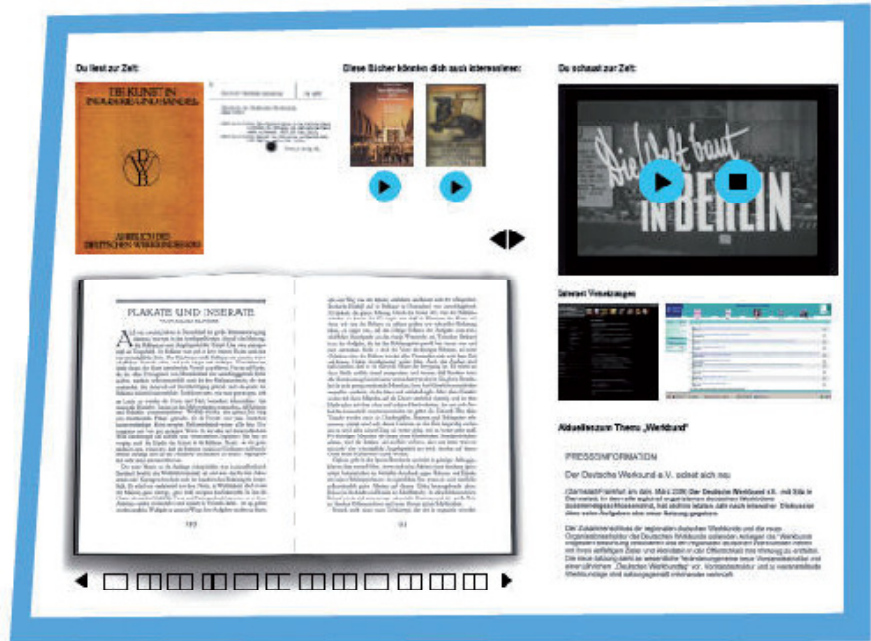
Draufsicht



Ansicht

In den DILE befindet sich das eigentliche Lernmedium: Der BiboTouch.

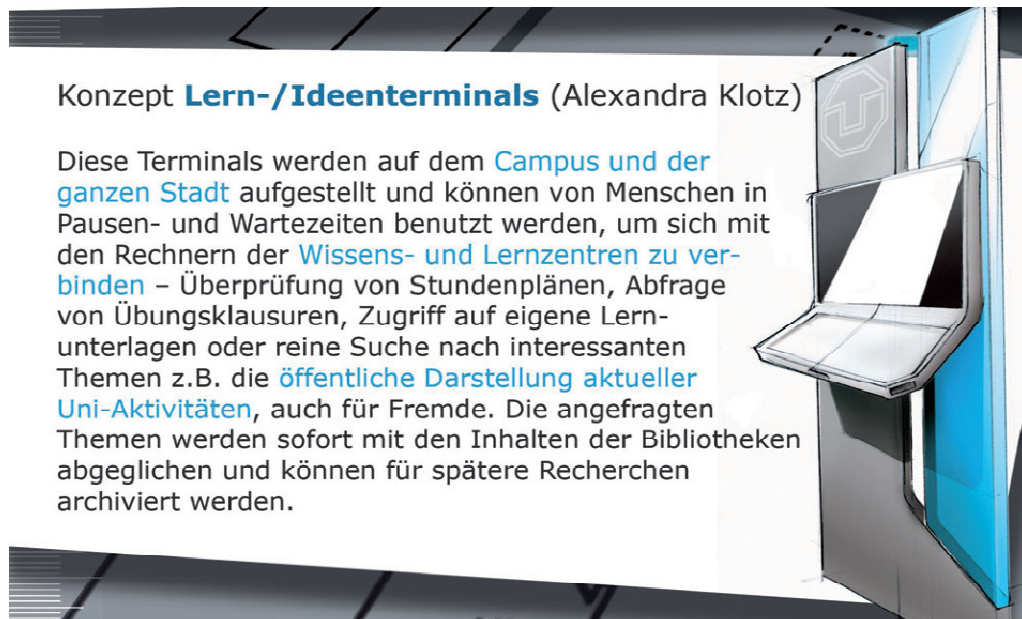
Auf einem Touchscreen kann der Lernende Bücher digital abrufen, lesen und für sich bearbeiten. Weiterhin besteht die Möglichkeit zusätzliche Informationen durch Internatvernetzung zum Thema wie Filmmedien oder aktuelle Meldungen abzurufen.



BiboTouch

Here the panel is visualized. (contrib. 16)

Or similar:



Konzept **Lern-/Ideenterminals** (Alexandra Klotz)

Diese Terminals werden auf dem **Campus und der ganzen Stadt** aufgestellt und können von Menschen in Pausen- und Wartezeiten benutzt werden, um sich mit den Rechnern der **Wissens- und Lernzentren zu verbinden** – Überprüfung von Stundenplänen, Abfrage von Übungsklausuren, Zugriff auf eigene Lernunterlagen oder reine Suche nach interessanten Themen z.B. die **öffentliche Darstellung aktueller Uni-Aktivitäten**, auch für Fremde. Die angefragten Themen werden sofort mit den Inhalten der Bibliotheken abgeglichen und können für spätere Recherchen archiviert werden.

(contrib. 20)

As stated before requirements for technical equipment were less relevant in the competition. There were few innovative technology-driven ideas, but more focused to the quality and completeness of the equipment (for example, peripheral devices). Many essays deal with the connection of different media and types of learning: the aim is as seamless combination of virtual and real supply forms, such as links from scripts with digital documents, merge scan support in the workplace or integration platforms that use different tools in one interface.

The requirements for services are addressed to all higher education institutions in order to achieve simplifications of services.



Self-service components in this proposal allow the reservation of rooms and technical equipment (contrib. 41)

6. Learning concepts<sup>7</sup>. The competition entries which have dealt with learning concepts are comprehensive and geared to the entire learning process. Often there are ideas for e-learning and campus management systems that enable an independent and self-directed learning and support the learner in the acquisition of general learning and working techniques.

The most important requirements here were:

- learner is supported as an active subject in the learning process
- unified e-learning landscape

7. Furniture. Coming back into the buildings the topic of furnishing / workplace design was among the students with the greatest interest to the many visible examples. The most important requirement here was ergonomic, functional and attractive furniture. Some examples:

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<sup>7</sup> A lot of contributors covered this topic, which isn't addressed in this paper in detail, because the focus is more on real life measures.





This design shows ergonomic workstations that are height adjustable (contrib. 3):



The individual design of the workplace is the focus here, which - allows a flexible combination of lamp, magazine holder, magnetic board, pens and cell phone holder - as in this example.(contrib. 8)

## ENTWURF FÜR EINEN STUDENTISCHEN ARBEITSPLATZ

Grundidee war es, ein einfaches, mobiles, wandelbares Möbelstück für Produkt-design-Studenten der Bauhaus-Universität zu schaffen, das zum einen als Arbeitsplatz und zum anderen als Präsentationsmöbel genutzt werden kann.

1. Das Möbel sollte nicht nur kostengünstig sein, jeder Erstsemesterstudent sollte es auch während des Werkstattkurses für seine Studienzzeit selbst herstellen. Ein Heft mit allen Bauplänen würde von der Universität bereitgestellt.

2. Zur Platzersparnis sollte der Deckel des Containers gleichzeitig Teil der Schreibtischfläche sein. Durch die spezielle Verbundplatte 3F-board kann man die Tischbeine und den Steh-arbeitsplatz aufklappen. Dieser Plattenwerkstoff besteht aus zwei Lagen Multiplex, zwischen die eine spezielle Gummischicht eingeleimt ist. Durch V-Nut-Fräisungen kann die Platte gefaltet werden. Dadurch gelang es, alle klappbaren Bauteile (bis auf die Tür) ohne Scharniere zu produzieren.

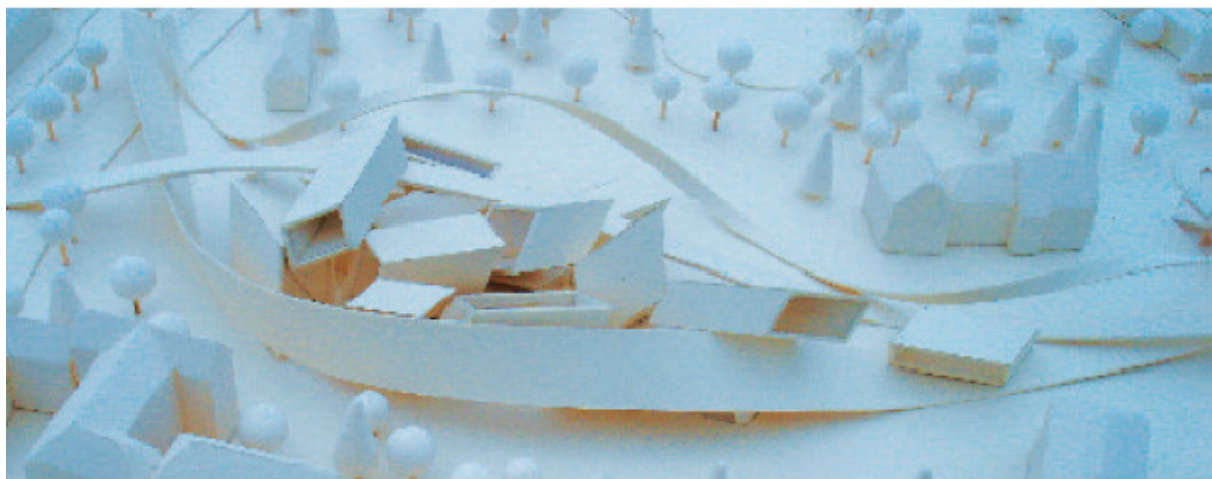


Guidelines for the design of working places are the flexibility and multifunctionality (contrib. 5)

8. Library design. Central learning and communication within the university is located often in the library. Important aspects in the contributions are – not really surprising -

- Zoning, (peace, communication, recreation)
- Functional and multi-functional rooms
- A pleasant atmosphere (light, air, colors ...)
- Restrained technology
- combination of real and virtual space

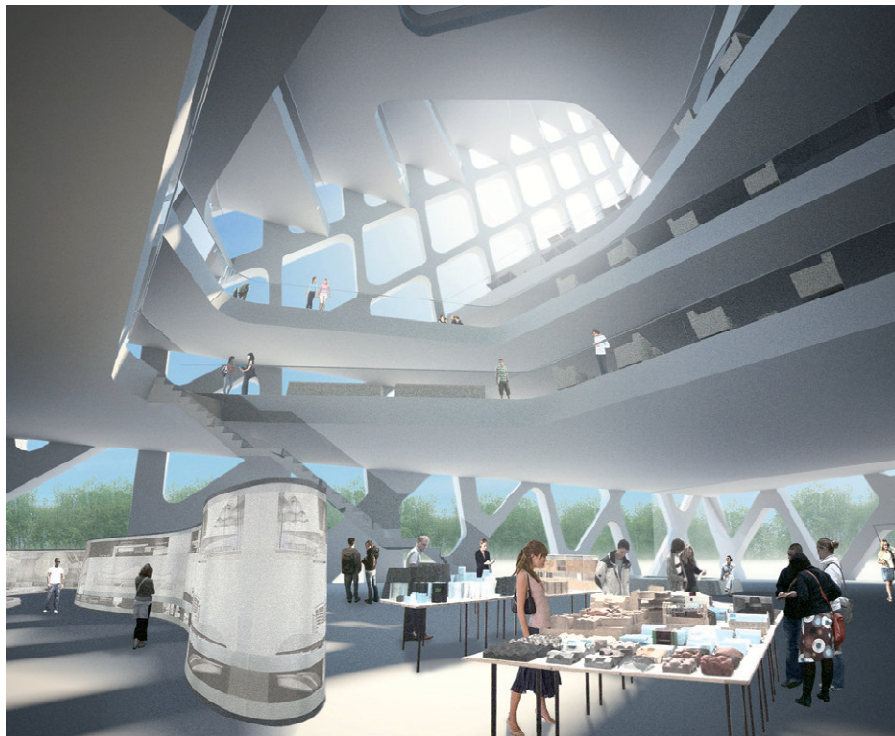
In the library a feel-good atmosphere is expected, which also extends to the furniture and the environment. Library buildings will be highly flexible and simultaneously offer a pleasant working atmosphere, in which a lot of different requirements have to be mixed in a short distance way. An interesting example is the design for a new university library:







The section of the building shows that the different area requirements for individual workstations, group work, reference and media sectors are closely intertwined: it created many more small-scale areas. In addition, here is found a very individual form of language. (contrib. 47)



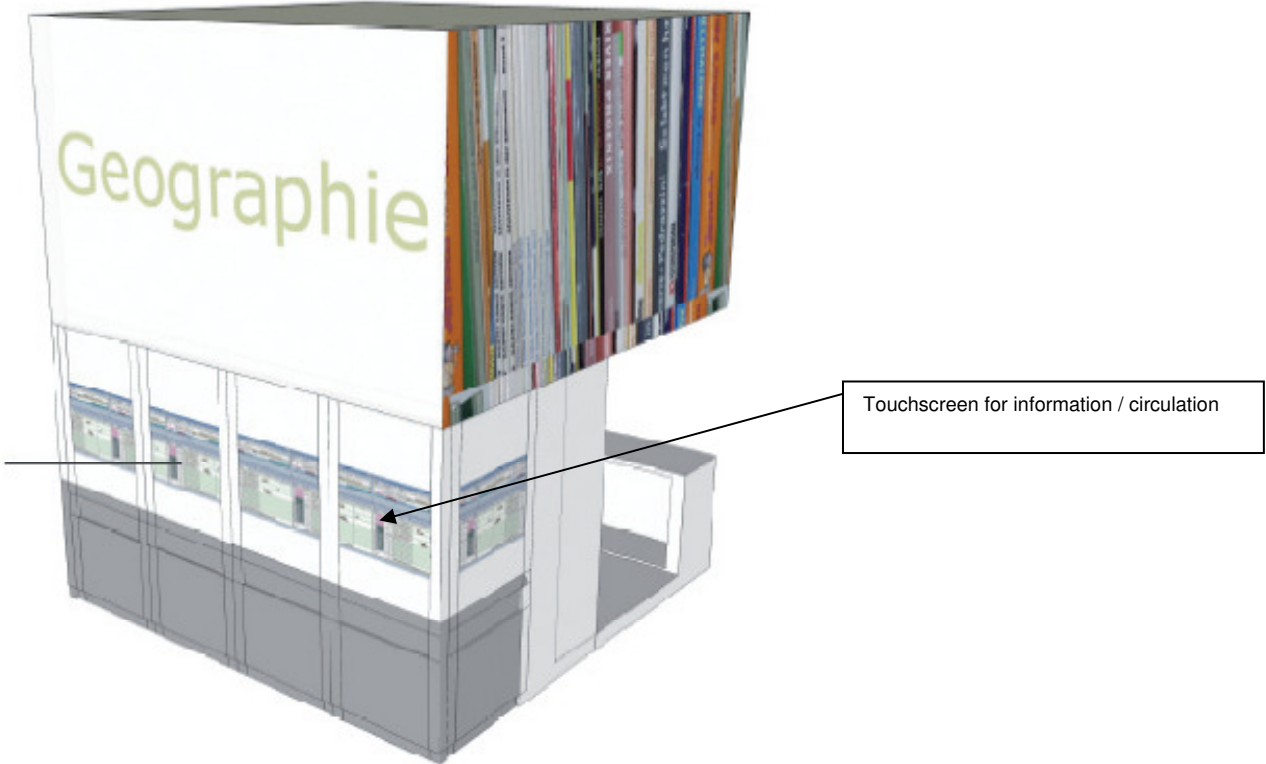
Cross-floor air spaces, smooth transitions and the possible visual communication through the building structure to almost all levels are essential characteristics of this design in contrib. 14.

Perhaps most interesting are the attempts to realize through the interior design small-scale and flexible units.



The winner of the competition, Mypaed: The interior design emphasizes the informal nature and is flexible used as a relaxation zone or work (contrib. 29)

In another contribution the demands on the library collection and the stocking are worked out explicitly:



Here the basic problem, space-hungry books and the need for workspaces all together is addressed. The books are stored in a module. On the flipside, there is a touch screen on which the module is mounted in the books can be borrowed (contrib. 32)



The books make room for learning in the library:



But it is already clear in these few details to the stock that students don't accept the lack of book collections, but assume all information, regardless of medium, for their current learning situation to have quickly available. The stock should be there, but do not occupy unnecessary space.

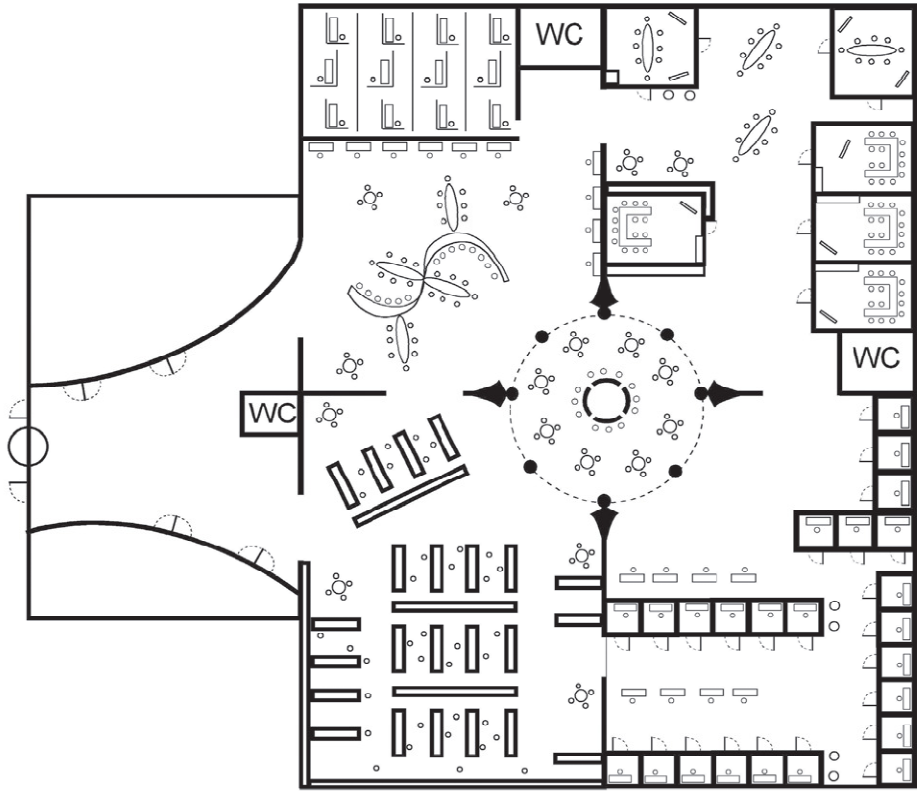
9. Learning sites as places for collaborative learning. Many contributors discuss the dilemma of collaborative learning and individual learning and individual working in a common spatial environment. They develop spatial concepts and technologies for its support. Particular emphasis is again and again the importance of social relationships, for example in the article "Coffee2go", a virtual community, where the students interact informally with similar interests (in this case coffee enjoyment) and start real encounters.





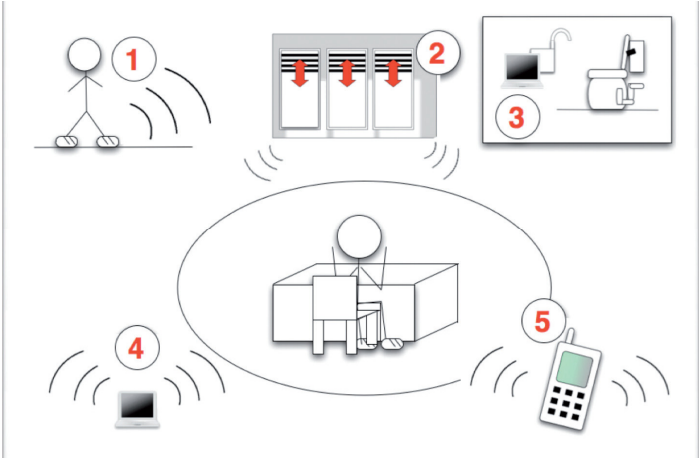
(contrib. 2)

In the real world the working space that supports the collaborative learning is a recurring component. On the one hand the "Social Web" is known and becomes integrated in some contributions, on the other hand the need for cooperation and collaboration should be visible and well served - this transition is reflected from many contributors. Study rooms in the library are still needed to work on learning objects in the group. This leads to more or less traditional ideas and it's interesting that zoning is so important.



Different zones address the different needs (contrib. 44)

One challenge in the contributions is the individual working environment and the avoidance of disturbances; some of them are highlighted in contrib. 26.



Another contribution proposes so called clear spaces, individual work spaces, which logistically are distributed at different places on campus (contrib. 46).



10. The library as a learning and communication center in higher education. Increase the supply of virtual learning opportunities associated - contrary to some expectations - with increased use of on-site libraries. This image is also reflected in the contribution. If a place of learning is localized in space, he is in almost all entries submitted by students - the library.

The traditional library tasks are not so challenged, but expanded to include the function as a central communication and learning center in college. The competition clearly shows that in the discussion of a possible ideal "living place of learning" academic libraries play an important role - especially from a student's perspective. It was formerly the place of learning, however, today the function is more like a symptom of the traditional library and now this relationship has reversed in the perspective of the student contributors.

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