

A different approach to planning and design Combining a planning theory in architectural design with e-learning.

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Abstract: We have developed a rather uncommon way of understanding and teaching architectural design and the use of computers in this process:

Our idea consists in defining the design process not only as finding a nice shape for an object like a building or a new car. We see designing and planning as the "art" of solving complex problems. This implies, that the design process is not the mere use of methods or tools to solve a given problem, but the process of understanding the roots of the problem and finding a suitable and often alternative and unusual solution.

The way we teach this process is enhanced by the use of computers and webbased applications. In this paper we will describe the key elements of the planning and design theory used as well as the methods for teaching these ideas to graduate students. Lastly, we point out the experience that came from the practical implementation.

Keywords. Approach to Planning and Design, e-learning, course-design, educational-design, computer supported collaborative work

Complex Problems and architectural design

In our work we focus on the kind of challenging problems, that are quite often common to the work of architects and urban planners - complex problems. These problems do not yet have a given routine to solve them, have a diverse array of sometimes opposing demands and are not individual problems but rather of a somewhat general importance or meaning.

Some examples of such problems range from traffic problems in Stuttgart to the problem of poverty in Argentina or the problem of an insufficient education system in Germany.

One might question, how these topics are related to architecture. Even though complex problems are mostly unique, our concept implies, that certain steps are common to all problems.

So, coping with pieces of a problem enables us to find solutions to architectural problems, as well as to many other problems of various areas outside the close vicinity of architecture.

Our approach to design and planning

We have developed an approach to design and planning, which describes these common steps of planning and the implementation of the solution in general. We will briefly outline these steps of our planning-model:

One center of attention is to understand the problem before finding solutions. The first step is to define the complex problem ("big mess") and to comprehend the circumstances in which the planning task is embedded. This is usually achieved through an interplay of explorations and

the interpretation of the results. On a more abstract level semantics (the theories of meaning and truth), epistemology (the theories of knowledge) and ethics (the theories of value and right actions) are important.

The model also includes defining the key-constructs used to describe the problem, looking at the underlying paradigmatic approaches and the description of the individuals and groups involved, including their interests. It is important to mention in this context, that there is actually no planning "per se". Planning is always done by people who have certain biological and psychological properties, who live and work in social and cultural surroundings and who have certain abilities, skills and faults.

Further steps include the definition of goals, finding solutions to achieve these goals, looking at the positive and negative sides of the possible alternatives and also planning the path to implement the solutions. These steps largely focus on the interplay between thinking up various types of action (design) and reduction of these through assessments.

The model of planning also includes the working stage, where one communicates with those affected and involved. This mainly includes steps like communication and cooperation.

Questions of how to organize the measures that are the results of planning - for example through project management - and the evaluation of the "outcomes" are further points of our concept of planning. In this case, outcomes is a term which summarizes the consequences of the interventions - the result of the planning process. This can either be the preservation of satisfying states or the modification of unwanted states. These outcomes can trigger further planning.

The course – a “blended learning” concept

The challenge was to find a way to teach this idea. As a result of research projects, our answer was a course, that has now been successfully tested twice.

The course is based on the briefly mentioned approach to design and planning, tailored to suite the audience according to latest ideas in educational design, and the content delivery with well proven aspects of our past and current teaching combined with elements of e-learning.

The main elements where the use of web-based learning modules, and a “blended” combination of face-to-face meetings and a server for computer supported collaborative work.

Content Map and web-based learning modules

To use the planning-model for educational purposes and also in a real life environment, we have structured the various topics of our planning model into a content map with clusters of main topics. These were then translated into a set of questions – a set that could be seen as a checklist when dealing with complex problems.

At the same time we have started to create so called “web-based learning modules”, that make our information, ideas and knowledge to these main topics available. These modules are intended to be used when working with the set of questions to offer the needed background information with the focus on our perception and vision of a topic; for example there is a module on communication – but not on communication in general but rather in the context of our planning model.

The authors come from within our institute but also include national and international experts, for example from the University of Karlsruhe, Zürich and Vienna.

The structure

Graduate level students individually choose complex planning problems to work on for one semester. Along these self chosen topics, the set of questions mentioned above guide the students step by step through discovering and articulating the planning problem and the aim of the planning process, through finding and choosing solutions and the process of putting these solutions into practice. When students have answered all questions, they have covered and thought about the main aspects of solving complex problems.

The On-site elements of the course consisted of weekly meetings, as a group or with individual students: These meetings gave us enough time to discuss the individual progress and problems of the students. By listening to other students' problems, the students realized, that the same aspects of planning seem to be applicable to even the most different and unique problems.

For the online part, we used a mix webpages and asynchronous communication methods – mainly a bscw (basic support for collaborative work) server, that allows webbased collaborative work. Students placed their papers on this server and others read these and critiqued and praised the work. This peer-to-peer learning allowed the students to position themselves within the group, forced them to precisely express their ideas, gave them new input und ideas and practiced accepting the feedback others give.

Students presented their final results in a "handout", a booklet that shows the ideas and concepts in a very condensed way while at the same time finding an appealing tactile design to further enhance the understanding of the content.

Experience

After having tested this course twice, we have gained a wide range of knowledge based on the feedback of the students, outside experts and our

own experiences. The following points outline some of these findings:

The planning model:

As students of architecture and urban planning are used to receiving seemingly well defined problems with the mission to find a suitable solution, the focus on the phase before finding the solution seemed somewhat unusual to many. But by letting the students find individual answers to a series of questions, which led through our theory, they quickly realized, that the definition and comprehension of the problem closely relates to - or even defines - the scope and the nature of the solutions. This ofcourse might be known to many who have actually dealt with design and planning tasks in a real life situation, but seems new and compelling to the students.

The course

Using "problem based learning" as method increased the students' motivation, because the students took ownership of their topic.

The mix of on-site and online was very successful and led to a noticeable higher level of quality in the student's work. This result was reflected in the student's evaluation of the course, as well as in the opinion of external experts, who where part of the final grading process.

Webbased tools:

The bscw-based peer-to-peer review lead to unexpected open and yet constructive results. The individual student was all of a sudden not alone, eventhough not sharing one physical location with other students. The arising problems, regarding content and organisational questions, where often solved amongst the students without our help.

The students also mentioned, that the work was more present in their heads in comparison to a normal course. This had the advantage, that –

just like in a real life planning process – ideas seemed to appear at odd times and places, as one did not stop to think about the project.

Our our role changed from the classical teacher of specific knowledge to also being a moderator of group-dynamic and learning processes.

The web-based learning modules can be downloaded by the students at any time and at any location – enabling them to refer to out knowledge when they need it, and not when we have a course.

As we saved time by not having to talk about basic content as much, we gained time to discuss more complex concepts and to take very close looks at the work of the students.

As the progress of the students' work was online and accessible at all times, the students were also a bit more demanding on us as teachers. The students sometimes expected us to be closely informed on the progress of their work.

The process of creating web-based learning modules consumed our time but was also a very worth while experience. It forces us to be extremely clear and brief in the way we describe our ideas. Including the students' feedback in developing the web-based learning modules was very helpful. Involving external experts increases the amount of coordination needed, but lead to many discussions, that allowed us to reflect on our way of thinking and teaching and also lead to gaining new knowledge.

What did the students learn?

The students gained the ability to work with complex problems, including an open mind that is also capable of looking at the other sides of the problem.

The course also provided the students with some transdisciplinary knowledge, like skills in communication, in giving and receiving critique etc. and lastly provided a further part in the seem-

ingly endless puzzle of how to effectively work with the internet and webbased tools

Conclusion and outlook

The results of the course and the students' feedback encourage us to pursue and develop this direction of teaching and to center further courses around the described concept. The combination of e-learning and face-to-face meetings proved to work very well.

We will continue our efforts of creating more web-based learning modules, including further national and international experts.

We are also considering offering the course in a combination with other universities, as the web-based approach and the use of the bscw server would facilitate such a task.

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