Project Report openTUM

Team
Lorenz Baumgartner
Anja Gain
Sarah Kittke
Tim Kostky
Yuki Nojiri
Max Schultz
Daniel Schweiger
Simone Stegbauer

Tutor
Philipp Geyer
Josef Kimberger
Robin Weiss

Mentor
Prof. Dr. rer. nat. (em.) Bertold Hock
Prof. Dr. Sabine Maasen
There was a young man called small Heinz. His alma mater was TUM, not in the vicinity of Mainz. He came south from there five years ago and was welcomed with a big “Hello.”

One day he was struck by an issue, which was so hard that he cried into a tissue. Someone told him to his face, “You should visit openTUM’s new project database.” He said, “They are quite nice. I want to meet them twice.”

As often in the examination period, the days became long and the nights short. One night, it was already past 2 a.m. when Heinz dragged himself to his bed, unsure if he would pass the exam or even his studies. “What will be in twenty years? What will I become?” With these thoughts he fell asleep… Twenty years later, Heinz made a career and became a professor. He recognized with surprise that a main focus of his work was influenced by interdisciplinary discussions and teamwork with people from another field. Some older colleagues were really amazed by Heinz’s rhetorical and social skills. Heinz found that these skills are not naturally given at all, but can be practiced and learned like scientific methods. He was really happy about having taken part in some interdisciplinary projects during his studies. He remembered the openTUM team and their interdisciplinary workshop as well as their database, which collected offers of different faculties for students. He was also able to share these experiences with his students, who thus got motivated to contact students from other fields. They agreed that a focus on only one subject might provide a solid foundation, but people who want to be successful and fulfilled in life do need a broader horizon. Therefore, Heinz concluded that interdisciplinarity would never be a completed topic, as long as science exists.

A streetcar drove by Heinz’s house waking him. He turned over to the other side of his bed and slowly drifted back to sleep… Twenty years later, Heinz obtained a responsible position as a manager in a company because of his rhetorical skills, his smart character and his social commitment. He earned a lot of money and remembered that he would never have been able to get into this position without his interdisciplinary soft skills. “I was so lucky, I practiced these skills during my studies,” he said to himself. He found himself in many situations where he had to convince people of the many benefits and advantages of his company. He was able to manage this since he knew the way of thinking of “foreign” people and how to work in an interdisciplinary team.

The crying baby of the neighbor woke Heinz, who cursed the thin walls of his apartment. He turned over to the other side of his bed and slowly drifted back to sleep…

Twenty years later, Heinz was going on vacation with his family by car. “Dad, when will we arrive?” “I don’t wanna sit in this car any longer!” “Darling, please do not drive that fast!” A “normal” father would suffer a crisis and shout or just stop listening. But Heinz knew about communication strategies and was therefore able to solve the situation in a smart way: He found a reasonable compromise. The holidays were rescued! Heinz remembered that he had learned about the way of dealing with different opinions and characters during his studies by taking advantage of the help offered by openTUM. “Different people, different cultures…,” he thought with a smile.

Loud buzzing of Heinz’s alarm clock marked the end of the restless night. Stumbling towards the shower, he recapitulated the parts of his dreams he could remember and summarized them for himself: Regardless of whether one wants to make a career in academia or industry or if one becomes a parent, it is important to keep an open mind and to get connected with others.
Interdisciplinarity is realized in some courses of studies, for example in chemical engineering or energy efficient and sustainable society. In many cases, important social challenges and problems cannot be addressed in an inter-disciplinary way, which leads to the demand of an interdisciplinary approach in science. Topics like "climate change" or "can-cancer" require input from several dominant disciplines (e.g., medicine, geography, chemistry). A satisfying and general discussion about these issues can only be accomplished by teamwork between the different fields (Bergmann, Brohmann et al. 2005).

The term "interdisciplinarity" has to be distinguished from "multidisciplinarity" and "transdisciplinarity" (Bergmann, Brohmann et al. 2005).

• Transdisciplinarity: Participation of people outside of the scientific context and consideration of their interests.
• Multidisciplinarity: Division of labor between different disciplines working independently from each other.
• Interdisciplinarity: Combining methods of different disciplines to solve a problem which cannot be assigned to a specific field of study.

Interdisciplinarity requires disciplinary competence. An overlap of empty sets is empty as well. However, also the fascination by the common cause and the capacity for effective interdisciplinary work: 

"They [the disciplines] practice specific modes of working on tasks and different approaches to solve problems; in general they have therefore developed typical ways of thinking and acting." (Phain 2011)

The home field of study acts therefore as a stable reference and sets an identity in the social context of interdisciplinary working (H. Frehe 2015). The success of an interdisciplinary workshop is determined by how the members work together. Effective interdisciplinarity demands a clear definition of the topic as a so-called boundary object. Also, a structured organization by a reliable team leader is vital for success (Bergmann, Brohmann et al. 2005, H. Frehe 2015). The relationship between disciplines and boundary objects is illustrated in Figure 1.

At the beginning of the project year, we started a comprehensive analysis of the current situation at TUM. We mainly concentrated on existing and well-known interdisciplinary and multidisciplinary projects, trying to get a general overview and to find possible weak spots. We did not only focus on our university but extended our research to other universities like EuroTech universities and our own research, we were able to define two final project goals: A central database and an interdisciplinary project module. The database should improve the overview of multidisciplinary programs and resources at TUM. Students can either search for a specific program or obtain information about existing events. The content of the database is in a process of definition and will be transformed to a website. The ongoing maintenance should be performed by another TUM institution (e.g., ABA).

Five members of openTUM attended the 9th IGSSE forum (International Graduate School of Science and Engineering) in order to observe PhD students from different fields in a series of workshops. We paid special attention to the aspects of scientific work, interdisciplinarity, project management, teamwork and communication. The interdisciplinary project module, which was devised in cooperation with Prof. Sabine Maasen (MCTS) and Dr. Alfred Sianiçi (Carl von Linde Academy), aims to advance the learning of interdisciplinarity skills. The aim is to start a first run in summer semester 2016, after the administrative part is organized by the Carl von Linde Academy, and the final collaborative partners are determined.

3. Outcome and Discussion

The survey showed that contact with students from other disciplines is important for over 60% of the participants. Personal interest was the main reason for participation in events offered at TUM. All forms of options (sports, culture etc.) enjoy positive reception. Interestingly, many of the interviewees were interested in interdisciplinary activities outside of their studies.

After the status quo was evaluated by the interviews, the survey and our own research, we were able to define two final project goals: A central database and an interdisciplinary project module. The database should improve the overview of multidisciplinary programs and resources at TUM. Students can either search for a specific program or obtain information about existing events. The content of the database is in a process of definition and will be transformed to a website. The ongoing maintenance should be performed by another TUM institution (e.g., ABA).

"Interdisciplinarities, in my way of interpretation, are also always highly specialized affairs, specific for a question, as empirical as it, very exactly orchestrated and configured. Not the research of everyone with everyone on everything, but rather with specific people on specific problems."

Prof. Sabine Maasen, Director of MCTS
For a better overview of interdisciplinary opportunities at TUM, a database was built. Over 30 entries have been collected via collaboration with other institutions. The project module is planned for the summer semester of 2016. A project management workshop with professional trainers is necessary. To create a more focused working atmosphere, the groups should be intentionally matched to assure a boundary object and thus interdisciplinarity. Also a group size of 8 to 10 students is advisable. The working efficiency could be enhanced by providing project management workshops with professional trainers.

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We hope that our project will help all members of TUM to keep an open mind and will improve their cooperation with people from other disciplines.

As a result of increasing awareness, the database will be extended with additional or still missing entries. Our goal is the completion of the database to give students and employees an adequate overview over multidisciplinary groups and project. Maintenance and updating will be guaranteed by other TUM facilities.

Fig. 2: Structure of the interdisciplinary project module: Students of different disciplines form interdisciplinary teams working on individual topics assigned by cooperating professors from different disciplines.

4. Summary and Future Goals

An interdisciplinary project module for students was designed in cooperation with the MCTS. The basic design is illustrated in Figure 2.

As long as there is science, interdisciplinarity will not be exhausted.

"As a human being, you should look after your interests, also the ones outside of one’s subject area. Everyone is self-responsible to shape one’s life in an interesting way; professional and personal life should not be separated because there is only one life."

Prof. Bertold Hock, TUM Emeritus of Excellence

"Interdisciplinarity is endeavor to bring together different disciplines, to exchange ideas and to aim at new goals. As long as there is science, interdisciplinarity will not be exhausted.

"Nothing is as efficient and rewarding as the communication with another human being."

Prof. Michael Atteh, Managing Director of TUM Graduate School

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At the top: Teammeeting
Below: Information exchange with MCTS/TUM

TUM Campus Run 2015

Annual Conference of the Academy