In this booklet the insights and final results of the 2017/I project groups are presented. Starting from the broad call of “Idea – Communication – Reception,” bright students, each of them equipped with individual talents and a specific specialist background, first collaboratively sifted through their personal inspirations and then incorporated these into the ideas they wanted to work on. The consecutively formed teams then launched their projects and set themselves clear goals that could be defined by tangible results. This process was fuelled by scientific analysis, creativity, craziness, open criticism, commitment, and good communication, where nothing was taken for granted and established paradigms and common statements like “as we all know” were all subject to question.

The apparent variety of approaches you find in the booklet reflects the enriching diversity of our students at TUM, resulting from their different origins, contexts, priorities and individual creativity. The projects presented here address questions of how to assemble a team; how to proactively use various perspectives linked with diversity in order to improve the awareness of politics in everyday life, and – last but not least – how to promote greater citizen participation in decision-making processes.

Of course, given the complexity of the issues, the related work could not be predetermined by a fixed work-flow, starting with a given task and ending in a final review of how effectively everyone has fulfilled his or her clearly described duties. At the TUM: Junge Akademie the challenge is rather to steer the underlying processes of scientific enquiry, starting from a projection of individual ideas onto a hypothesis and a collaborative plan and then progressing through hard and binding teamwork. It is not just a “talk the talk” of a nice idea on which everybody casually agrees, but a “walk the walk” of tough struggle towards successful project completion.

The teams’ experiences were finally wrapped up in a remarkable symposium on the occasion of TUM’s Open House Day on October 13th. The students chose a new public format reflecting on their experiences and discussing the question of how to bring individual creativity into joint value creation. These were in my opinion very noble discourses, perfectly suited to the high ideals of a university. Congratulations!

Why do we invest such a lot of time and energy into our TUM: Junge Akademie? We do this as professors and external professionals, mentoring the teams with our expertise; as scientists and alumni, offering our experience to the projects as tutors; as TUM Board of Management in our continuous search for new formats of education and support that will help us all to cope with the future challenges of our society. We do this as we know that our excellent graduates will have the responsibility and power to shape the future in ways we are currently not aware of. They will have to identify and proactively steer disruptive and evolutionary processes, to understand, analyze and balance conflicts of interests, and to act as moderators and communicators.

My sincere thanks to all the mentors, tutors and former members involved in the projects. Their generosity of time, expertise and friendly advice has been of enormous value to the project groups. Many thanks also to the TUM Board of Management for the continuous support of the format, to the managing director Peter Finger, to Maria Hanneccker and their team for their invaluable and highly professional guidance, and to the members of the Taskforces and the Board of Members for their creativity, devotion and enthusiasm.

Enjoy reading this book and exploring the projects!

Yours,

Gerhard Müller
Senior Vice President Academic and Student Affairs
Today – just like 150 years ago, when our university was founded in 1868 – we are convinced that promoting talents is one of our noblest tasks.

The TUM: Junge Akademie plays an important part in the TUM’s initiatives to promote talent. The program creates an environment in which scholarship holders are able to unfold creativity beyond their own field of expertise and to put special dedication into interdisciplinary approaches to technical, social, economic, and political questions – and there are experienced mentors to provide assistance.

The main goal of the TUM: Junge Akademie is to bring students together to work on socially relevant topics.

In order to achieve this goal, we need strong partners. This year, our interdisciplinary network of partner universities was joined – in addition to the HFF Munich (Hochschule für Fernsehen und Film) and the University of Music and Performing Arts Munich (Hochschule für Musik und Theater) – by the Munich Academy of Fine Arts (Akademie der Bildenden Künste).

In our anniversary year, students of the TUM: Junge Akademie and TUM professors managed to make various scientific topics more accessible to society – and university research, as well as its application in everyday life, is to be seen as a cornerstone of society. This year, the Munich Streetlife Festival gave us two opportunities to enthuse the public about new research findings and science in general.

The “Buddies for Refugees” program of the TUM: Junge Akademie was an integral part of the auditor program for refugees at TUM. Over the course of six semesters, 640 TUM students and staff volunteered for the refugees, helping them to become integrated. I would like to thank everyone who served as a role model in this project. If you help quickly, you can help twice; and this is why I would like to express gratitude to our Honorary Senator Ingeborg Pohl, whose generous financial support made this program possible in the first place.

In the future, we will address many further ideas and projects together. I would like to wish all scholarship holders, alumni, friends, and sponsors of our funding program – which is unique in Germany – the necessary commitment, curiosity, and much success!

Wolfgang A. Herrmann
President
The important thing is to not stop questioning. Curiosity has its own reason for existing.

Albert Einstein
Prof. Dr. Lisa Herzog  
Summer of Diversity  
TUM School of Governance

Mentoring is a form of intergenerational solidarity – I’ve benefitted from various forms of mentoring and would like to pay forward.

Prof. Dr. Sabine Maasen  
PiA/muc.me  
Munich Center for Technology in Society

As a mentor at TUM:JA I cherish the opportunity to interact with students of the technical sciences and help them to engage in responsible engineering.

Prof. Dr. Alwine Mohnen  
MatchBox  
TUM School of Management

I love my role as a mentor for the TUM:JA teams. Meeting with these great young people is enriching, makes me believe of a better future than the press talks about.

Prof. Dr. (em.) Ernst Mayr  
StreetScience

TUM:JA is excellent, I enjoy very much to be a mentor for it. Helping students to create, shape, implement, and finally evaluate their ideas is a great experience.

Prof. Dr. (em.) Franz Hofmann  
Summer of Diversity  
TUM School for Medicine

TUM:JA is basically a very good idea, but needs some improvement in the recruitment procedure. Select only members that are willing and able to spend extra time on sociological/political ideas.

Prof. Dr. Michael Krautblatter  
MatchBox  
Civil, Geo and Environmental Engineering

TUM:JA is filling a key gap in the transdisciplinary education of next generation students; in cooperation with stakeholders in society, ideas are developed, conceptualised and realised.

Prof. Dr. (em.) Peter Russer  
StreetScience  
Electrical and Computer Engineering

It is a pleasure to mentor in TUM:JA students performing interdisciplinary scientific project work, putting a focus on the project’s benefits for the society.

Prof. Dr. Stefan Wurster  
PiA/muc.me  
TUM School of Governance

Promoting modern forms of political participation and education is one of the most important tasks of a political scientist in our day.

Prof. Dr. (em.) Peter Russer  
StreetScience  
Electrical and Computer Engineering

It is a pleasure to mentor in TUM:JA students performing interdisciplinary scientific project work, putting a focus on the project’s benefits for the society.
The TUM:JA is the perfect mixture of innovation and interdisciplinary team work, giving young scientists the space to realize their own ideas.

**List of Tutors**

**Dominik Irber**  
PIA / muc.me  
Physics

**Vivien Lechner**  
MatchBox  
Chemistry

**Dr. Matthias Lehner**  
PIA / muc.me  
TUM School of Education

**Wolfgang Enzl**  
Summer of Diversity  
Physics

**Martina Gschwendtner**  
StreetScience  
Mathematics

**Ruppert Heindl**  
PIA / muc.me  
TUM School of Education

**Tobias Stahl**  
StreetScience  
TUM School of Management

**Johannes Herms**  
Summer of Diversity  
Physics

**Tobias Stahl**  
StreetScience  
TUM School of Management

**Dominik Irber**  
PIA / muc.me  
Physics

**Vivien Lechner**  
MatchBox  
Chemistry

**Dr. Matthias Lehner**  
PIA / muc.me  
TUM School of Education

**Wolfgang Enzl**  
Summer of Diversity  
Physics

**Martina Gschwendtner**  
StreetScience  
Mathematics

**Ruppert Heindl**  
PIA / muc.me  
TUM School of Education

**Tobias Stahl**  
StreetScience  
TUM School of Management

**Johannes Herms**  
Summer of Diversity  
Physics

The TUM:JA offers a unique conjunction of soft skills training and practiced project management, allowing scholars to hone highly coveted skills.

As a tutor, I support the scholars of TUM:JA to develop their project ideas. Therefore I share my experience with our motivated students.

Using the experience I gained from my previous project at TUM:JA, I enjoy inspiring the students to grow with their challenging projects.

As a tutor, I support the scholars of TUM:JA to develop their project ideas. Therefore I share my experience with our motivated students.

The TUM:JA is a teamwork playground that helps students sort out their priorities.

The creativity and lateral thinking we can be a part of at TUM:JA is the perfect showcase for what truly cross-functional student teams are capable of.

Being a tutor allows to share your experiences at the Academy with a group of dedicated and talented students while developing new skills along the way.
In the 1.5 years that I’ve been on the project, I have learned a lot of valuable lessons for the future. First and foremost: how to delegate effectively.

My time at the TUM:JA has helped me reflect on Technology’s role and contribution to Society, something I would like to keep working on in the future.

I really enjoyed my time with TUM:JA. Being part of an interdisciplinary team was a truly memorable and enriching experience.

In the TUM:JA I was able to gain a lot of valuable experience regarding teamwork and project work. My highlight was a team meeting in Berlin.

TUM:JA offered the opportunity to learn valuable lessons about cross-discipline cooperation and project management in a welcoming environment.

I had an elaborate, but instructive time at the TUM:JA and, together with inspiring fellows, was often able to look beyond the horizons of my field.

TUM:JA was for me a deep learning travel into my own skills. Whoever you are, whatever you are studying, you can create something meaningful.

In the TUM:JA I had the unique opportunity to take part in a great project.
As a musician it was very interesting to meet people who study or work in totally different fields.

Working with the open-minded students of TUM:JA is an enrichment and the shift of perspective will widen your horizon thus improving skills and qualifications.

At university, a project usually ends after one semester. But here, my team was able to create and publicly release a product that might last for a long time.

At TUM:JA I’ve learned many important aspects about team work and project management. It gave me the chance to cooperate with different students.

TUM:JA is, in particular, a place for personal advancement. In this regard, it strives not only to do well, but to do Good.

TUM:JA made it possible for me and my team of “muc.me” to realise ideas we could not have carried out in a commercial or private environment.

The academy is an excellent opportunity to gather work experience in a team and to build a network to dedicated students of other disciplines.

The TUM:JA enables me to interdisciplinary engage in frontiers in science or society, form our visions into a fantastic project and then realize it.

TUM:JA taught me some key lessons about teamwork: what are the main obstacles and what ultimately motivates people to work together?

All average students are alike; each TUM:JA scholar is talented in her own way. This concentration of exceptional personalities enriched my studies.

The TUM:JA is an excellent opportunity to gather work experience in a team and to build a network dedicated students of other disciplines.

Working together in an interdisciplinary team with ambitious, intelligent and open-minded students, tutors and mentors enriched me so much – thank you all.
List of Scholarship holders 2017/I

Johannes von Stetten
Summer of Diversity
Electrical and Computer Engineering

It was fun to meet so many interesting and nice people and to work with them! Thanks to everyone for the great time!

Valentina Ustinova
Summer of Diversity
TUM School of Management

TUMJA is the space for creativity, own initiative, projects, fun with amazing diverse students of different background.

Johannes von Stetten
Summer of Diversity
Electrical and Computer Engineering

It was fun to meet so many interesting and nice people and to work with them! Thanks to everyone for the great time!

Valentina Ustinova
Summer of Diversity
TUM School of Management

TUMJA is the space for creativity, own initiative, projects, fun with amazing diverse students of different background.

Johannes von Stetten
Summer of Diversity
Electrical and Computer Engineering

It was fun to meet so many interesting and nice people and to work with them! Thanks to everyone for the great time!

Valentina Ustinova
Summer of Diversity
TUM School of Management

TUMJA is the space for creativity, own initiative, projects, fun with amazing diverse students of different background.

Johannes von Stetten
Summer of Diversity
Electrical and Computer Engineering

It was fun to meet so many interesting and nice people and to work with them! Thanks to everyone for the great time!

Valentina Ustinova
Summer of Diversity
TUM School of Management

TUMJA is the space for creativity, own initiative, projects, fun with amazing diverse students of different background.

Johannes von Stetten
Summer of Diversity
Electrical and Computer Engineering

It was fun to meet so many interesting and nice people and to work with them! Thanks to everyone for the great time!

Valentina Ustinova
Summer of Diversity
TUM School of Management

TUMJA is the space for creativity, own initiative, projects, fun with amazing diverse students of different background.

Johannes von Stetten
Summer of Diversity
Electrical and Computer Engineering

It was fun to meet so many interesting and nice people and to work with them! Thanks to everyone for the great time!

Valentina Ustinova
Summer of Diversity
TUM School of Management

TUMJA is the space for creativity, own initiative, projects, fun with amazing diverse students of different background.

Johannes von Stetten
Summer of Diversity
Electrical and Computer Engineering

It was fun to meet so many interesting and nice people and to work with them! Thanks to everyone for the great time!

Valentina Ustinova
Summer of Diversity
TUM School of Management

TUMJA is the space for creativity, own initiative, projects, fun with amazing diverse students of different background.

Johannes von Stetten
Summer of Diversity
Electrical and Computer Engineering

It was fun to meet so many interesting and nice people and to work with them! Thanks to everyone for the great time!

Valentina Ustinova
Summer of Diversity
TUM School of Management

TUMJA is the space for creativity, own initiative, projects, fun with amazing diverse students of different background.
Projects 2017/I

Diversity .................................................. 24
Match BOX ................................................ 44
muc.me .................................................... 66
PiA ............................................................ 90
StreetScience ........................................... 110
Projects of the TUM: Junge Akademie – Experimental approaches to research

The scholarship holders of the TUM: Junge Akademie have realized many unusual and innovative projects since the program started in 2010. Even after the official project phase, many of the project ideas have continued to attract attention and practical interest.

You want to use a bike in Munich? We proudly remember that our team TUMbikesharing of Year 2012 were the pioneers in analyzing the viability and potential of a mobility system based on the principle of a sharing economy, and this came before the Munich Stadtwerke started their planning of a related scheme.

Or do you know the reason why the successful TUM Campus Run, now organized once every year by the TUM: Junge Akademie, involves more than 1,500 members of the TUM family? It was the project team runTUMfit which aimed to motivate students and employees of TUM to become aware of their health situation. In the same context, for more than four years, members of the network of TUM have met together weekly in the English Garden to have fun, meet interesting people and improve their fitness. In 2014, a group of scholars started the project VisiTUM, which developed a scheme for students to present information to high school students about their future academic fields. Since then, the Student Service Center (SSZ) of TUM has adapted this concept to develop a volunteering program for students in which they visit partner high schools to advise the younger students on their subject choices as well as on the most appropriate places of study. A project in 2016 focused on nutrition and on analyzing the various factors influencing the decision making process when buying food. The result can be seen, bought and tasted at the TUM Shop: the 300 gram pack of TUMuesli.

One of the learning goals of the Academy’s project work is to take group members out of their individual comfort zones, and this is facilitated through an interdisciplinary approach. The scholarship holders identify a topic of interest and observe the role it plays in society. In a second step, a research question based on the observations is developed and a hypothesis is formulated. To verify the hypothesis, the students work together in a creative and explorative way to develop a methodology which, after testing, can help the team to plan an innovative project. Supervisors (formerly called mentors) and tutors do their very best to guide, prompt and challenge the teams to help them on their way to a successful outcome. After an intensive self-reflection process and several peer feedback sessions, after twenty months the outcome of the project is discussed and evaluated at the final symposium of each academic year. It is no surprise that the final results of the projects often differ greatly from what was anticipated in the initial project ideas — intellectual agility and flexibility are key qualities to be acquired during the learning process that TUM: Junge Akademie offers its members.

You can gain greater insights into this process by reading the complete reports from the project groups of year 2017/I and 2017/II in this publication — and, rest assured, you will find them full of fascinating surprises.
Greetings from the Mentors

Journalistic part

Scientific part

Self-reflection

Posters

Team
Anna Pontz
Albulena Semani
Ferbos Sikko Simon
Mehmet Ali Taş
Valentina Ustinova
Johanna von Stetten

Tutor
Wolfgang Erz
Johannes Herms

Mentor
Prof. Dr. Lisa Herzog
Prof. Dr. (em.) Franz Hofmann

Project Report Diversity
Margaret Mead is said to have coined the phrase, “Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it’s the only thing that ever has.” For the TUM: Junge Akademie, the modified version should read: “Never doubt that a small group of thoughtful, committed students can change the world…”

The participants we mentored were indeed thoughtful and committed – they were bursting with ideas for how to translate the topic of diversity, whose relevance for our societies cannot be doubted, into a project.

Finally, what actually materialized was a summer program aimed at raising children’s awareness for the topic of diversity, along with a social-scientific evaluation of the effect of the program. However, not even the soundest plan is immune to unpleasant surprises, such as a seminar facilitator cancelling his participation at short notice. It was only possible to carry out the summer program because all the team members pulled together and supported one another.

“Diversity” was not only the topic for this task force, though: It is another.

One question still remains, however, and it is one that remains unanswered for the TUM: Junge Akademie as a project as well. This question lies at the core of growing concerns for democracy: How can citizens, who deal with social diversity in their academic studies, and are thereby ly different interests in their academic studies, and are thereby find themselves in a dilemma. On the one hand, many of them share the concern about the cohesion of society and the future of democracy. On the other hand, they are “human capitalists” themselves, and generally equipped with a high amount of “social” and “cultural” capital. For these reasons, those who feel left behind and unheard view them with suspicion.

Certainly, this problem cannot be solved by giving up the values of knowledge and education in order to appeal to people who possess less of them and therefore feel disadvantaged. But maybe we need a new perspective on knowledge and education, one which is based on similar concerns as the ones about the value of diversity that motivated the team of the TUM: Junge Akademie. Unfortunately, knowledge and education are often interpreted in terms of individual progress, as means for climbing up the career ladder for the sake of a higher salary. Several decades of a neo-liberal conception of human beings as homines oeconomici have had their effects on education as well. But there are also alternative approaches. We can also understand knowledge and education as means that enable individuals to make a valuable contribution to social welfare. After all, even an ARD-sympathizer who feels left behind and lashes out at “the elites” benefits from medical progress or innovations in energy production.

Conversely, it is also true that those who work in the “higher” professions must appreciate that this is only possible for them because other forms of labor are taken on by other people. If individuals use their knowledge in order to actively support society, the diversity of professions, accompanied by a diversity of social spheres, does not have to result in conflict, but can instead be seen as mutually complementary cooperation. With their project dealing with social diversity, the members of our team have shown that they are willing to accept the social responsibility that comes along with the privilege of an academic education and a program like that of the TUM: Junge Akademie.

Diversity

Lisa Herzog and Franz Hofmann


The Junge Akademie – Project Reports 2017/I

26

TUM: Junge Akademie – Project Reports 2017/I

27
Summer of Diversity – Chopsticks on Steinway & Sons

“Could I make a phone call?” Max asks straight away on the first day. “I would like to call home and tell them how cool it is here.”

Max was one of the seventeen participants of “Summer of Diversity,” a three-day holiday program for children and teenagers between the ages of 8 and 14. The first day of the program, August 8th, the first participants arrived just after 8 a.m. at the Musikschule München, the event’s venue. The official beginning of the event was set to take place at 9 a.m. in the morning, especially when you’re on holiday. However, not so early for many of the participants. In fact, the children arrived long before the event was supposed to start. They enjoyed playing cards together or even having a play at one of the two grand pianos from Steinway & Sons, which were positioned in the room. At one point, even both pianos were played simultaneously by the kids who were keen on trying the Chopsticks. One could clearly feel that the kids were at home and there was only one thing that they wanted – fun! That’s enough reason to arrive early.

As the kids reported, it was mainly their parents who had sung the program’s praises over the phone. They had spotted either their colorful posters or an announcement about “Summer of Diversity” in the newspaper. That showed us: Our advertising in the run-up had worked!

The central question that we, the event organizers, had asked ourselves before coming up with the event was: How would it be possible to familiarize kids with diversity, a sensitive topic that overstrains even adults? Would it be relevant and interesting for the children to familiarize themselves with a topic that the participants were only able to learn something and have fun if they felt comfortable and part of the group. Due to the number of participants, the group had to be separated into two smaller groups. On the first day, the workshop Improvisation Theater and the first block of the Diversity Training took place.

In the Improvisation Theater module, the kids learned to put themselves in different situations and roles. Our participants were very impressed when they found out that actors, in their training, would have to do improvisation theater every day for two hours. One of the groups had a lot of fun when they were instructed to break a group into smaller parts. One could clearly feel that the kids were at home and only had one thing that they wanted – fun! That’s enough reason to arrive early.

As the kids reported, it was mainly their parents who had sung the program’s praises over the phone. They had spotted either their colorful posters or an announcement about “Summer of Diversity” in the newspaper. That showed us: Our advertising in the run-up had worked!

The central question that we, the event organizers, had asked ourselves before coming up with the event was: How would it be possible to familiarize kids with diversity, a sensitive topic that overstrains even adults? Would it be relevant and interesting for the children to familiarize themselves with a topic that the participants were only able to learn something and have fun if they felt comfortable and part of the group. Due to the number of participants, the group had to be separated into two smaller groups. On the first day, the workshop Improvisation Theater and the first block of the Diversity Training took place.

In the Improvisation Theater module, the kids learned to put themselves in different situations and roles. Our participants were very impressed when they found out that actors, in their training, would have to do improvisation theater every day for two hours. One of the groups had a lot of fun when they were instructed to break a group into smaller parts. One could clearly feel that the kids were at home and only had one thing that they wanted – fun! That’s enough reason to arrive early.

The Diversity Training was intended to make the participants familiar with the concept of diversity in general. It was important for us that the kids acquired their knowledge autonomously and were able to express their own thoughts. We did not intend to supply a list of characteristics to think about. During the first Diversity Training, the participants had to think about how they would describe themselves, which attributes distinguished them from others, what hobbies they had and what they were particularly good at. The comparison of these characteristics among the individuals led them to the insight that everyone is different, and that this is normal and good. In the following days, further diversity blocks took place, which enabled the kids to find out more about the concept in a playful way. Furthermore, percussion workshops, Capeoira and communal cooking were part of the program.

At the percussion workshop, the participants got acquainted with drums and different drumming techniques. The workshop instructor told the kids a Cajon and asked which German word had a similar sound to its name and what its appearance resembled them. One of the kids suggested a carton and was right on target. It was explained to the kids that Cajones were originally made from transport boxes and used by African slaves after their traditional drums had been taken away. The children also played on African Djembes and Latin-American Congos and Bongos.

The cooking workshop took place in the cooking school “Koch dich glücklich.” But in what way is cooking related to diversity? In no way! However, it is related to interculturality. The participants were asked to try out something new and to work together as a team while preparing a meal. The result for the starter was Vietnamese Spring Rolls, which they had made from rice leaves and rice noodles. Before consumption, the rolls were dipped in a hot sauce. The main course was self-made Ravioli with a self-made stuffing. As a dessert, they served American Chocolate Raspberry Crumble with vanilla ice cream.

In addition, the kids tried out the Brazilian Capeoira. The two Brazilian course instructors showed them how dance and martial arts can be combined. Promptly, one of the participants observed: “Do you really not hit each other?” Indeed, with Capeoira the intention is not to hurt your teammate. Neither should there be any body contact at all. The opponent’s attacks are not blocked, they are rather reacted to with a counter-attack. The result is a sort of conversation that requires a huge amount of agility, alertness and interaction. It was obvious that the kids were having fun trying out the several basic steps and finally playing themselves. Each round, at two at a time played in the Roda, the circle formed by all players, while the others were singing and clapping, accompanied by the take shape among the seven kids. One could clearly feel that the kids were at home and only had one thing that they wanted – fun! That’s enough reason to arrive early.

While examining the participant list, we caught ourselves thinking: This group is not diverse enough for investigating a question that deals with diversity. But that is exactly the wrong way of thinking about it. As we had reduced the term “diversity” to the participants’ backgrounds, it may be true that all our participants had at least one parent that was of another national origin. However, this characteristic on its own does not indicate a homogeneous group. We were able to observe a variety of different characters and attributes in this group consisting of seventeen children and teenagers. During the workshops, we also realized that the kids all had different taboo and use swearwords. Max was in the other group, which was a lot of laughter, as the kids used all kinds of means possible to bring the others out of their shells. It was incredibly entertaining to see with what self-confidence and creativity the kids performed the tasks.

At the end of the three days, Max said: “I am very sad that not more kids have participated, because they would have loved it too.” We also enjoyed the three days ourselves – and above all, the kids showed us just how diverse a group can be, even though it might not be obvious at first sight.
Leaving the Pigeonhole
How to communicate diversity skills

Abstract

The term “diversity” has been generally used within biological research and means in this field a great variety of species. The term is also used to refer to variousness in society. Our project aims to gather detailed information on the topic of promoting diversity competency in teenagers. Qualitative research during a three-day summer program was designed to provide such information.

1. Background

The development of societies shows a general tendency towards more complex and heterogeneous social milieus. These heterogeneous units have a multitude of particular characteristics across a large number of individual members. The term “diversity” denotes the overall social variety and heterogeneity within and between them. Very often the term “diversity” refers to so-called social diversity in education and also socio-economic environment, leisure behavior and habits.

Disparities between different groups in society aren’t always looked on favorably—the challenge of recent assimilation concepts in politics to those of social inclusion are a clear indication. But according to a research report of the Max-Planck-Gesellschaft, the term diversity is increasingly used in a positive way. The reasons cited were as follows: “allgemeine Individualisierungstendenzen, die Zunahme migrationsbedingter Vielfalt und die gestiegene Bedeutung von Antidiskriminierungsdiskursen.”

Considered as “general tendencies towards individualization, the increase of migration-related diversity and the increased importance of anti-discrimination discourses.”

Society has a duty to prepare its members for diversity

3

and to begin an early “training” for dealing appropriately with people from different communities. The aim is to prevent intolerance and discrimination and therefore to counteract social inequalities. For a long time the ability to encounter other people prejudice-free and in a spirit of mutual respect was called intercultural competence. Wolfgang Welsch, philosopher and researcher in the field of aesthetics and the discussion of postmodernism, criticizes the term “interculturality” because it implies a negative connotation of other cultures. In his view, the term “transcultural” symbolizes in a better way positive and respectful interactions between the members of society. Furthermore, according to Welsch, modern society is characterized as a place where identity formation proceeds in a heterogeneous environment of many cultures. Welsch describes this special patchwork which results in people becoming culturally hybrid.

Our summer program aimed to investigate if it is possible for pupils to acquire “diversity skills” in workshops dealing with the topic of diversity. These diversity skills do not have measurable characteristics, but rather can be seen as general social skills such as understanding and respecting others. This ability should be accompanied by a sensitization to stereotypes and a certain framework with which to interpret differences in others. The aim of our program is to foster an appreciative approach towards diversity where differences are evaluated in a non-normative way.

In summary, it can be said that the term “Kompetenz” see Franz Weinert’s definition of the term: “die bei Individuen verfügbaren oder durch sie erlernbaren kognitiven Fähigkeiten und Fertigkeiten, um bestimmte Probleme zu lösen, sowie die damit verbundenen motivationalen, willentlichen und sozialen Bereitschaften und Fähigkeiten, um die Problemlösungen in variablen Situationen erfolgreich und verantwortungsvoll nutzen zu können.”

Hence experiences are vital for learning.

2. Goals and Methods

The study aims to explore whether an experimental pedagogical summer program for children aged 11-13 can develop and strengthen their awareness and acceptance of diversity.
For the recruitment of participants, posters were hung in several public schools and various locations across the TUM campus. Flyers were handed out at public libraries in Munich, especially in the sections with children’s books. In addition, there was an article in the Süddeutsche Zeitung about the summer camp. Social media channels were used to announce the event on the Facebook pages of the TUM: Junge Akademie and TUM München. The program was also announced to professors of TUM via e-mail. A website was established to simplify the process of application. In the end 17 participants registered. Most of them were recruited via the newspaper article in the Süddeutsche Zeitung. We had decided to accept a maximum of 35 participants. In retrospect, we think that would have been too many participants for this program. The group size of 17 participants, divided into two groups of 8 and 9 children, was appropriate. The only inclusion criteria for participants was an age between 11 and 13 years. One exception was made for a 14 year old participant.

The conducted intervention was a three-day program named “Summer of Diversity” that took place at the University of Music and Performing Arts Munich. The participants took part in several workshops that were led by professional course leaders. The organization team participated as supervisors. The activities included workshops in improvisation theatre, Capoeira, percussion and cooking. These represent the experimental pedagogical component of the summer program. Furthermore, there was a workshop about diversity and also different group games. A detailed timeline of the program is shown in figure 1.

A one-group pre-test/post-test design was used. The 17 participants completed a three-page questionnaire at the beginning of the first day of the program. At the end of the last day of the program, a second eight-page questionnaire was completed by all 16 participants that were present on that day. In order to have a better overview and an appropriate statistical analysis of the results, the questionnaire was created on EvaSys. Furthermore, the 13 participants who gave their consent were interviewed on the last day. Moreover, the organization team made observations during all the activities of the three-day program.

The first questionnaire contained questions about basic information such as age, sex, school form, native language and the place of birth of the participants and their parents. In addition, other questions aimed to capture the children’s knowledge and perception of diversity, discrimination and minorities. Besides that, there were questions about the participants’ expectations of the program and the reason for their participation.

The second questionnaire included the questions about basic information that had already been used the first time. A further 22 questions focused on knowledge about diversity and its various aspects and associations. In addition, there were questions to evaluate their competencies and their willingness to work in teams. Another important aspect of the questionnaire was the appraisal of the program. This contained questions about the workshops, the course leaders and the organization team in their role of supervisors. The participants were invited to give recommendations for possible improvements. One page of the second questionnaire can be seen in figure 2.

In the interviews there were questions about how the children liked the program and the other participants. They were also asked if they had had any funny or special experiences during the program. Finally, they were asked if they had known the meaning of diversity before participating in the program and then what they now knew about diversity after taking part in the program.

3. Outcome and Discussion

In the following, the results of the questionnaire evaluation and the observations made by the organization team are provided.

On the first and second day all 17 participants who had signed up took part in the program. On the last day there was one case of illness. This level of attendance indicates that the children favored the program. Furthermore the children gave positive feedback about the workshops. They said they had had fun participating and trying new things. This corresponds with our own observations.

Evaluation of the first questionnaire, which was conducted before the program, allows us to derive some facts about the participants and make various assumptions.
There were 65% female and 35% male participants. All participants were between 11-13 years old, with the exception of 2 children (10 and 14 years old). Gymnasium students formed the majority in our program. According to the questionnaire, only 15% of the participants face questions on their ethnic background in their daily lives, almost the same percentage of children ask this question to others. This signals that they do not feel discriminated against or excluded by their peers when asked about their ethnic background. Most of them have already faced some sort of discrimination, which can also be based on other reasons than nationality.

After the evaluation of the second questionnaire, which was carried out at the end of the program, we found that the awareness of participants with regard to diversity and how diversity manifests itself in daily life had surged. The detailed results can be seen in figure 3. In summary, children link diversity with teamwork, variety, creativity, and inequality. In order to get more unbiased and sensitive information related to the children’s understanding of diversity in the questionnaire, we presented children with different scenarios that touch the subject of diversity and discrimination based on race, color and disability. The results are provided in figure 4. It was found that although diversity is perceived as advantageous and society can gain a lot from it, the participants also acknowledged the fact that it also causes some misunderstanding and conflicts in group communication. Openness to other nationalities is less evident in relation to non-European countries, when compared to European ones. One outstanding discovery is that none of the participants see skin color as an interference parameter.

Moreover, we noted that the children quickly started interacting with the others and took part in the group games. In the interviews, most children reported that they thought the other participants were nice and that they had made new friends. All of them were able to explain the meaning of diversity in the workshops and did not like working alone. After being asked in the individual interviews conducted during the workshop breaks if they knew the word “Diversität,” almost all children said they did not know the word or its meaning before taking part in the program. All of them were able to explain the meaning of diversity in the interviews.

4. Summary and Future Goals

The summer program “Summer of Diversity” increased the awareness of diversity of the participating teenagers. We are aware that 17 participants are not sufficient to draw robust quantitative conclusions from questionnaires and that for meaningful results the programs needs to be scaled up. Meanwhile we learned that for a small team of scientists it is not easy to handle 17 teenagers. Therefore, in order to scale up our summer program, solutions must be found as to how to conduct it with larger numbers of participants.

Also, more extensive collaboration with a social scientist could have improved the scientific examination of our program. With additional guidance we might have been able to create questionnaires and interview guidelines which enabled us to draw more precise conclusions regarding our hypothesis.

Figure 3: "Which words do you associate with diversity?"
Looking at these shortcomings, but also the success of the program, we believe that it would certainly be worthwhile to conduct similar summer programs in the future, where some of the problems encountered in the first run could be remedied. As the organization of a summer program takes some effort, it might also be worth considering the option of teaming up with existing summer programs. On the one hand, examining the impact of other summer programs on the awareness of diversity could provide further insight into how the concept of diversity can be communicated more effectively. On the other hand, additional diversity workshops could be offered at existing summer programs. We would be happy to share our results as well as our personal impressions with others. We are convinced that it would be valuable for other summer programs to integrate concepts similar to “Summer of Diversity.”

References

– 1. Knowledge
Theorie der Freundschaft und Erziehung (Waller-Frank W. 2016).
– 2. Method
– 3. Best Practice

DiversityMatch BOX muc.me PiA StreetScience
As a basis for creating innovative ideas and planning our communications, there were regular meetings within the team. Our first meetings were taken up with approaches to understanding the basic ideas and different concepts of the terms “integration” and “diversity.” At first we called ourselves “team integration” but soon switched to the name “team diversity.” This title not only described our project but also the composition of the team, since the student members are drawn from three different universities – the TUM: Junge Akademie has small-scale cooperative arrangements with other universities – and from various areas and courses of studies such as film production, health science, electrical engineering and information technology, business studies and musical education. Additionally, the members have different cultural backgrounds. All these factors could be cause enough to complicate teamwork but we realized at an early stage that our common goal was to organize a participative project instead of a pure research project. Nonetheless, by distributing roles and tasks at various decision-making levels, and by establishing rules of communication, we avoided conflicts in the team. Members’ overloaded schedules sometimes resulted in exhausting team meetings, and so-called power projects that seemed often less than profitable contributed to this workload. Time management and estimating availability now and then caused minor problems.

As stated previously, we needed some time to familiarize ourselves step by step with the topic and to acquire the relevant specialist knowledge and methodology as well as an understanding of interdisciplinary interrelations.

As it later transpired, one of the main problems was getting started on the actual project work. Right from the first meeting, we generated ideas, but it needed quite some time till these ideas were firmed up sufficiently to allow us to envisage constructive solutions and to make actual plans for our project. One of the reasons why decision-making was quite difficult was our determination to include every team member in the process – which, as already mentioned, was complicated by problems of availability.

We were helped greatly, however, by managing our project through the setting of concrete milestones and interim steps.
POSTER 1: In the first months we focused on the determination of the main aspects of diversity and tried to establish a common understanding of the term. However, because of the wide-ranging nature of diversity and its role in our society, we decided to narrow down the social groups affected by it and selected “teenagers” as the group to focus on.

POSTER 2: Our initial research made it clear that there were no projects at high schools in Munich concerning diversity in general. So we decided to develop and carry out an experiential pedagogical summer program on diversity. We aimed to verify the hypothesis that teenagers’ competence for diversity can be improved through such a program.
POSTER 3: At the time of the preparation of the third poster, we had successfully elaborated the abstract idea of a summer camp for diversity and were able to increase awareness of our program thanks to newspaper articles promoting our camp and the numerous posters and leaflets we distributed throughout Munich. Although we were unable to meet every milestone on time, we successfully organized and executed the three-day holiday program and it received an enthusiastic response from the participants.

POSTER 4: In our final poster, we gave an in-depth description of our methodology. In addition, we presented and discussed the results of our summer program. From these results we drew conclusions on the sustainability of our project.
The MatchBox project team engaged with a particularly self-reflexive topic in the context of the TUM: Junge Akademie. As the scholarship to the Academy is all about preparing young people for project work with a variety of different players, the MatchBox team set itself the goal of discovering ways in which project teamwork itself can be made more effective.

At our first mentoring meeting in the summer of 2017, MatchBox had a rather ambitious vision in mind, which would have required a full-time commitment of eight persons over the next eight years. Hence, we had to refine and scale back the project’s main idea. This was to do with a web-based platform which would enable users, both project owners and project seekers, to link up with one another. To ensure a sustainable and successful long-term working relationship, the matching method envisaged was based not only on users’ skills but above all on their personality profiles. The platform, that is, would enable the matching of team members who not only complemented each other in terms of their skills, but also in terms of their interpersonal compatibility.

Therefore, the mentors’ task now was to help the team to refine their aims and methods along more realistic lines. In the course of our discussions, the emphasis of the project began to move away from a matching approach based on the model of dating services to one based on expertise drawn from the field of coaching for start-ups. This line of development proved to be successful and was adopted. The next step was to limit the target group. Initially, the players to be matched could have been spread throughout Europe; at a later stage, the potential reach was reduced to TUM and perhaps one or two other universities. In the end, however, the team decided to focus on evaluating the effectiveness of teams only within the TUM: Junge Akademie.

The idea of a visual final presentation, such as a Youtube video series, was also discussed, as it would have perfectly matched this year’s overall Academy theme, “Idee-Kommunikation-Rezeption” (Idea-Communication-Reception). Unfortunately, the workload related to the rest of the project seemed too great to allow for this, so the team decided to restrict themselves to the essentials of their research.

The project was, then, an investigation into the collaborative effectiveness of the other Academy project teams with the aim of identifying positive factors for success. At the same time, negative experiences of former Academy teams were also gathered and presented on a platform for all Academy members, together with the corresponding solutions that had been found to their problems.

This idea of sustaining a web-based archive of team experiences immediately appealed to the office of the TUM: Junge Akademie, so it has now been made part of the program of team development for new intakes.

Although the project’s methods for measuring the success of the intervention did not completely meet scientific requirements, the team nevertheless recognized the importance of basing their approach on the relevant recommendations found in the scientific literature.

In the end, the team was able to look back on a wealth of experience regarding project planning and teamwork, and this project will have a lasting influence on the collaborative efforts of other Academy teams.

We, as mentors, greatly enjoyed working together with this highly motivated team of students, with their various personalities and the numerous challenges they faced—all of which were overcome in the end! It was fascinating to see how, in the beginning, interdisciplinarity and the different personalities in the team were considered a challenge, whereas, in the end, these factors evolved and united into a fantastic driving force. Despite the chronic lack of time of a professor, it was both personally and professionally a rewarding task to accompany this team at least part of their way.

Alkeine Mohnan and Michael Krautblatter
Team MatchBox met with Dr. Elisabeth Raes – and asked her, among other things, how teams can be guided towards their goal the fastest. These are her answers.

Dr. Raes, you have made a lot of experiences – what has been your worst experience as a member of a team? I had been researching teams and thought I knew how things are supposed to be, and then came the disappointment that theory can’t always be translated into practice easily. I thought: “Let’s talk openly with each other and see how our strategies complement each other and how we go forward together!” That was a challenge for me in my first job after finishing my doctoral studies.

Could you elaborate? Does that mean that, after your doctorate, you became more aware of how teams really work? No, because to me, teamwork is only a means to an end. There is no team without a mutual goal. The question is thus: “Into what do I invest my energy first?” I think one will reach one’s goals faster or even reach better goals if one first organizes the team and repeatedly reflects and re-evaluates. Even so, we are curious: We as Team Matchbox have investigated measurable success factors – which criteria are there apart from profitability? I believe every team can think about their own criteria: if one works in a customer-oriented project, customer satisfaction will surely be important. So, the question I believe every team can think about is: “Let’s just finish our task!” That can be effective for a while, but the question remains if it is efficient and whether the potential of the team members can be reached. Many think (…) either “achievement” or being a “cuddle team” are important. Everyone thinks everybody is likable. But in reality, there are two dimensions resulting in a two-party conflict. Consequently, the best option is “high safety – high achievement.” That way you know what the goal is and want to progress but giving feedback and building trust is important as well. Of course, there are always exceptional teams who achieve very good results without that part. There is theory but there are always teams that do not fit the theory.

We have teams of 15 and of 7 members in the Academy. Does the measuring of performance differ between these? Not per se. If the teams have defined a goal, performance is measured by whether they reach it or not. With larger teams, one must invest more effort into working together before moving on to performing tasks. In theory, the best size for a team is four to seven members.

There are short-term and long-term teams. Does one choose different criteria for evaluating team success for them? I think the danger with temporary teams is that they think: “Let’s just finish our task!” That can be effective for a while, but the question remains whether it is efficient and whether the potential of the team members can be reached. Many think (…) either “achievement” or being a “cuddle team” are important. Everyone thinks everybody is likable. But in reality, there are two dimensions resulting in a two-party conflict. Consequently, the best option is “high safety – high achievement.” That way you know what the goal is and want to progress but giving feedback and building trust is important as well. Of course, there are always exceptional teams who achieve very good results without that part. There is theory but there are always teams that do not fit the theory.

In your experience: What are the three most important factors for successful teamwork? Trust, trust, and trust! (…) Naïve, but trust is certainly one of the most important ones. (…) Everybody wants to co-operate trustfully, of course, but, in reality, one can’t only like trustworthy people. In my opinion, the better question is how to increase the trust employees have in my company. Thinking one step further, one can ask: “What is the best form of diversity? That way one can analyze what is really important for each individual. One can always do something to bring new energy into a team. To be frank, I have thought that quite often with teams, when it was obvious that cooperation will only waste energy. (…) As far as the right option is concerned, I prefer “rather earlier than later” because my gut feeling is bad, I try to stop as fast as possible. But it is rather difficult.

Can you give us an example? What is a common mistake here? If you spend twenty hours a week on preparing a meeting, the question whether that is effective. The third common used criticism is “I can’t see across the table” (editors’ note: functioning of the team over longer timespans).

There is no team without a mutual goal.

What are the most common and gravest mistakes made in teamwork? Diversity is the reason we bring teams together and diversity is the reason why we have conflicts in teams. That is, one actually wants conflict when bringing a team together. But then that team has to learn to deal with conflicts. In that sense, diversity in teams is diffi-
cult, if not the most difficult element. How do the teams of the TUM Junge Akademie compare to traditional teams? I think the probability is higher that the teams are more diverse. Is there no diverse team and is there no team without diversity? If you manage (to work) with people who think differently, no matter whether they are men or women, Indians or Americans, that is the factor most closely connected to team performance. Can diversity be an obstacle to successful teamwork? Diversity is the reason we bring teams together and diversity is the reason why we have conflicts in teams. That is, one actually wants conflict when bringing a team together. But then that team has to learn to deal with conflicts. In that sense, diversity in teams is diffi-
cult, if not the most difficult element. Is there a point at which teamwork should be terminated be-
cause it will simply not work out? To be frank, I have thought that quite often with teams, when it was obvious that cooperation will only waste energy. (…) As far as the right option is concerned, I prefer “rather earlier than later” because my gut feeling is bad, I try to stop as fast as possible. But it is rather difficult. But the problem is that many teams continue on this energy for two months only to crash much worse after that, because nobody dares to ask “does what we are doing make sense?” In your experience, what are the best measures to improve teamwork? Making things explicit. (…) It is a lot easier to talk about interper-
sonal things and soft skills if one knows what one is supposed to talk about. Making things measurable somehow is often helpful as then the question is, do we continue with these things professionally, those are the real professionals to me. What are the most common and gravest mistakes made in teamwork? Naturally, one shouldn’t make problems where none exist, but it is a big mistake not to dare to bring certain issues to the table.

Diversity is the reason why we have conflicts in teams.
“There is theory but there are always teams that do not fit the theory.”

Bad planning is one too. Recently, we ended a Skype meeting with “somebody should do that then”. That is a common mistake, not communicating responsibilities with people, resulting in a lack of accountability. (...) Better be concrete: (...) “Who is responsible for what and how do we proceed from there?” Another big mistake is blaming people for things that went wrong. Sometimes one has to, to help process it, but most of the time it is a waste of energy. Forming a shared vision is important too, because one can fall back on it in times of conflict.

Is there empirical evidence whether teams in open or closed structures work better, for instance a team in a company versus a team of students in the Young Academy?

I find it a difficult comparison (...). Teams with autonomy tend to work well. Those with a certain freedom to organise themselves (...) I think it is affected by commitment. In a team of students with a common goal, the question “Are we enthusiastic about the topic?” is as important as the skills of the individual. That aligns with my experience with student teams and start-ups. That is also what Human Resources is about: if there is no power behind the people, nothing will happen. And power comes from motivation. I think it is smarter to aim to unlock motivation in people. As a final factor, it is also about the proper fit (editors’ note: best person to fill a position).

Thank you, Dr. Raes, for this enlightening conversation!

Elisabeth Raes received her PhD in Psychology and Educational Sciences from KULeuven. In her work as a team coach, she focuses on transferring research and theory into hands-on practical experiences for corporate teams, start-ups and other cooperative projects.

MatchBox – teams support teams

In a Nutshell:
This report deals with
- the definition of team success in a scientific environment
- consequently the potential improvement of team success with different approaches.

The opportunity of this research lies in the utilization of the acquired knowledge for a long term enhancement of the team structures in TUM: Junge Akademie. A practice-oriented approach to seek tools in order to fulfill this challenge represents one of the strengths of Team MatchBox.

The most prominent lesson that was learnt is the scientific evaluation of assumptions in order to measure the impact of this research.
Abstract

In today’s corporate culture, teamwork is identified as an integral part of a promising work philosophy. Research in this area mainly focuses on a business environment. Project MatchBox pursues the endeavor of examining the current project teams of the TUM: Junge Akademie regarding their team composition and success, thus aiming to improve team performance based on experiences of previous teams. For that we decided to combine two different approaches.

**Tool A:** Project MatchBox used the tool Team Canvas to stage an intervention with current teams of TUM: Junge Akademie to help them improve their reflexive ability about their ability to reflect their project work to help them gain insight into the status quo of their teamwork, including personal and interpersonal aspects. Framing this exercise, teams of TUM: Junge Akademie analyzed variables identified to be responsible for team success. To this end, a questionnaire was set up and evaluated. The results showed that the team evaluation of the team by these variables differed a lot. This leads to the assumption that there is a need for reflection in the majority of the analyzed teams. Team Canvas might be a specially helpful tool for this.

**Tool B:** Project MatchBox implemented a platform which offers future scholars the opportunity to benefit from the experiences of past teams. For that, the critical challenges in the project work were identified. Subsequently, current and past scholars were asked to share their experience pertaining to each of these aspects by online survey. In future, this could enhance the efficiency with which obstacles are addressed within teams as well as result in improved personal development for team members of TUM: Junge Akademie.

structure

1. Background: current state of research
2. Goals and Methods
   2.1 approach of Tool A: implementation of the tool Team Canvas
   2.2 approach of Tool B: making use of the experiences of the former teams
3. Outcome and Discussion
   3.1 experience in teamwork within TUM: Junge Akademie
   3.2 Tool A: development of teamwork within TUM: Junge Akademie
   3.3 Tool B: implementation of platform “MatchBox”
4. Conclusion and Future Goals

1. Background: current state of research

Teamwork plays a central role in successful working environments. Furthermore, it is crucial for the potential for success within a working group. There has been great interest in factors positively impacting teamwork in this context, scientific literature provides a multitude of studies analyzing characteristics of team members and their effects on the success of a team. After focusing mainly on established major enterprises and the analysis of their respective process of performance, studies have recently shifted to assessing start-up companies and their team structure. The correlation of individual traits with successful teamwork is often defined based on psychological studies.

Project MatchBox implemented a platform which offers future scholars the opportunity to benefit from the experiences of past teams. For that, the critical challenges in the project work were identified. Subsequently, current and past scholars were asked to share their experience pertaining to each of these aspects by online survey. In future, this could enhance the efficiency with which obstacles are addressed within teams as well as result in improved personal development for team members of TUM: Junge Akademie.

While the knowledge thus collated sheds light on teams and their success in an economic and entrepreneurial context, project MatchBox examines these dynamics in a scientific working environment. The TUM: Junge Akademie provides an especially suitable setting for exactly this. This is mainly because TUM: Junge Akademie is a self-contained institute, where comparable teams are not defined by economic concerns presenting an opportunity of independent research on team dynamics.

For the analysis of the teams of TUM: Junge Akademie, project MatchBox concentrated on the factors revealed by the Aristotle project to be the crucial ones for team effectiveness (see above). However, whether or not the definition of project success in an economic environment is also suitable for the scientific environment had to be examined. Based on expert opinion from the field of research as laid out in the interview with Dr. Raes, three separate factors might instead be appropriate for evaluating successful scientific teamwork: a) Performance: An achievement of mandated and self-imposed goals; b) Efficiency: Utilization of personal and mutual resources as well as team management (scheduling, workflow) and c) Viability: Long-term capability of working, functioning, and developing adequately.

![Figure 1: factors for successful teamwork](image)
Taking into account the factors identified by the Aristotle Project, we developed a model for the evaluation of team success. Any in- sights gained from evaluating TUM: Junge Akademie teams by such an assessment may well be valuable to future teams. According to Tuckman, teams generally experience defined phases and common challenges. It has been demonstrated that being aware of these phases enables teams to traverse these phases more quickly. To- gether, it stands to reason that they can be empowered to be more successful via the direct communication of such knowledge. This is particularly relevant considering that there is no organized exchange of experience between the teams yet.

2. Goals and Methods

Through refinement of the specifications and the analysis of crucial factors, two methods were defined. To satisfy the focus on scientific relevance, we gained insight into effective discussion within a team with the purpose of gaining insight relevant to teamwork.

After the workshop with Dr. Elisabeth Raes, a questionnaire was sent to the active teams of the TUM: Junge Akademie to assess the current state of teamwork within those teams. The questions were related to the five factors defined in the Aristotle project.

Subsequently, the Team Canvas was applied to seven teams of the TUM: Junge Akademie at a two-day seminar. In order to evaluate whether or not and to what extent the intervention affected teamwork, a second questionnaire was sent to the participating teams after the intervention.

2.2 approach of Tool B: making use of the experiences of the former teams

In order to make the experiences of former teams accessible to current and future scholars, project MatchBox has designed a web-based platform for information exchange. The platform’s goal is to provide solutions to recurring problems, thus helping scholars to solve these more efficiently.

Based on the assumption that many teams face similar challenges during their project phases, assistance in overcoming these could lead to more successful teamwork due to problems being resolved faster. Therefore, providing suggested solution strategies to common challenges could prove valuable for future generations of scholars.

The experiences of individual scholars were collected via online questionnaires. These referred to subjects prior defined as central to and after the Team Canvas intervention.

3. Outcome and Discussion

3.1 experience in teamwork within TUM: Junge Akademie

After our team initially formed at the kickoff seminar, we quickly discovered a shared vision: namely, to analyze the impact of personality traits on team success in teams each having a different context. Subsequently, we began detailing how to best implement this vision but, upon feedback by tutors and mentors, were forced to revisit the feasibility of our goals as well as to posit a precise hypothesis. FutureLabs and input from our mentors forced us to redefine the framework of WIKI. This was far less than team MatchBox expected. The assessment of the utility of Team Canvas at TUM: Junge Akademie is therefore limited in terms of statistical significance.

Each item on the questionnaire was assigned to one of the five categories. Every respondent was thus evaluated within these categories, and the results were compared within the team to elucidate similarities and discrepancies in individual perception. The results of the questionnaire which was set before the Team Canvas are delineated below.

Within each team, we found that individual team members differed greatly in how they perceived important aspects of team and project work. This is evident from highly discrepant individual ratings on numerous questionnaire items, which is mirrored by the large standard deviation.

3.2 Tool A: development of teamwork within TUM: Junge Akademie

As described in the goals and methods section, the questionnaire was on the topic of teamwork in TUM: Junge Akademie and had to allow for further specification, these categories were divided into sub-categories as well. Scholars provided approaches to solutions in those sub-categories they felt had been challenging during their project phase. They also had the opportunity to record items which were not directly related to one of these seven categories. Prior to implementation, a dummy run of the questionnaire was performed with a TUM: Junge Akademie sub-committee. This led to further optimization of the questionnaire. The results will be made available on an internet-based platform to provide easy access for scholars.

In line with current data protection legislation, the data-base will be in connection with the Team Canvas intervention.

Enable team to look up solutions to challenges they have identified in connection with the Team Canvas intervention.

3.3 hints & tricks

In order to make the experiences of former teams accessible to current and future scholars, project MatchBox has designed a web-based platform for information exchange. The platform’s goal is to provide solutions to recurring problems, thus helping scholars to solve these more efficiently.

Based on the assumption that many teams face similar challenges during their project phases, assistance in overcoming these could lead to more successful teamwork due to problems being resolved faster. Therefore, providing suggested solution strategies to common challenges could prove valuable for future generations of scholars.

The experiences of individual scholars were collected via online questionnaires. These referred to subjects prior defined as central to and after the Team Canvas intervention. Unfortunately, response was limited, with 41 respondents before and even fewer (17) after the intervention. The challenge and a subsequent approach to solve it. The platform will be organized in line with the categories and sub-categories of the questionnaire. Entries will consist of a short description of the challenge and a suggested solution to solve it. The platform will enable teams to look up solutions to challenges they have identified in connection with the Team Canvas intervention.

4. Conclusion

In line with current data protection legislation, the data-base will be in connection with the Team Canvas intervention. Unfortunately, response was limited, with 41 respondents before and even fewer (17) after the intervention. The platform will be organized in line with the categories and sub-categories of the questionnaire. Entries will consist of a short description of the challenge and a suggested solution to solve it. The platform will enable teams to look up solutions to challenges they have identified in connection with the Team Canvas intervention.

Each item on the questionnaire was assigned to one of the five categories. Every respondent was thus evaluated within these categories, and the results were compared within the team to elucidate similarities and discrepancies in individual perception. The results of the questionnaire which was set before the Team Canvas are delineated below.

Within each team, we found that individual team members differed greatly in how they perceived important aspects of team and project work. This is evident from highly discrepant individual ratings on numerous questionnaire items, which is mirrored by the large standard deviation.

Psychological Safety

In the area of psychological safety, the following categories were set within the teams varied consistently in questions 1, 2, 4, 5, 6, 7, 8. This implies that the team may be lacking project success due to low psychological safety perception. This finding emphasizes that teams need to promote more exchange about psychological safety.
Moreover, insometime, self-assessment and assessment by the group differed drastically. Surprisingly, the perception emerged of the supervising coaches who are members of team MatchBox serve as an element for the evaluation of the effectiveness of TeamCanvas. The general perception was that conflicts were already present but not yet confronted, thereby impeding successful cooperation. Moreover, teams seemed to be quite different when compared to each other. Whereas some seemed to have problems with regard to open discussions, for others it was difficult to define goals. Especially in smaller teams tasks and task areas were not defined clearly and the envisioned objectives remained in some teams.

The personal feedback of the participants at the end of the workshop was generally positive confirming the impression of the coaches that the workshop was useful for the teams. The large majority would recommend the workshop to the other teams.

- Dependability: Individual team members were in disagreement about perceived dependability. Thus, sustainable structural improvements in team-work seem to be necessary in TUM: Junge Akademie (questions 12, 16). The Team Canvas is designed to lead to reflexion when having highly varying perceptions within a team. This is why it has the potential to evoke improvements in this area.

- Structure and Clarity: It seems that the project goals haven’t been clearly formulated in the teams (question 17) and the communication between the different team members lacked (question 20). That might be the reason why the perception of the goals differed between the team members. Furthermore, the impression of team members differed about what the other expect from one another.

- Meaning: When goals haven’t been defined clearly it was harder for the team members to see a purpose in their work (question 30, 31, 32). As Team Canvas confronts a team with the necessity to clearly define goals it can be highly effective in this area as well. Because of the fact that goals can change within the project phase, it might be especially important to discuss them more often.

- Personal experiences of the coaches: The personal experiences of the supervising coaches who are members of team MatchBox serve as an element for the evaluation of the effectiveness of Team Canvas. The general perception was that conflicts were already present but not yet confronted, thereby impeding successful cooperation. Moreover, teams seemed to be quite different when compared to each other. Whereas some seemed to have problems with regard to open discussions, for others it was difficult to define goals. Especially in smaller teams tasks and task areas were not defined clearly and the envisioned objectives often differed between the team members.

Moreover, in some teams self-assessment and assessment by the group differed drastically. Surprisingly, the perception emerged that individuals in these teams gravitated towards latent univalence of themselves. The expressed trust of teammates in their skills, however, then resulted in increased motivation after this prompted self-reflexion.

An other interesting insight was that members of the smaller-than-average team seemed to have a more cautious manner of interaction with each other. Besides that, the coaches got the impression that discussions could be provoked and conflicts could be resolved through the posing of precise questions by the seminar leaders. Nevertheless, difficulties in reaching a consensus remained in some teams.

The implementation of the platform for Tool B is on the way and is to be finished in October 2018. Then, it can be used by the present and future team members of TUM: Junge Akademie.

The remaining ten of Tool B is that teams of TUM: Junge Akademie often face similar challenges during the project phase. This assumption is based on the impressions of recent and former members. This provides the rationale for why we consider it vital that an organized exchange of experience between the former and the active members of the TUM: Junge Akademie is implemented. We consider it especially important when teams are confronted with the challenges which are enumerated below, including their sub-categories:

- Organisation: time management, meetings, presence, assignment of tasks
- Project phase: finding a topic, milestones, turning points, practicability, side projects, scientific practice
- Interaction: communication, rules of working together, role allocation, liability, interpersonal conflicts, team reflection
- Final product: usability, sustainability, presentation, marketing and public relations
- Personal aspects: motivation and personal attitude, time, personal advancement
- Involved parties that were most helpful: partners and external parties with either an economic, scientific or social background or parties inside the TUM: Junge Akademie including the main office, mentors, tutors and members
- Hints & tricks: regarding team building, platform for working together, tools, legal, data privacy protection

In the future, the platform is intended to accumulate the experience of every new scholar at the end of their project phase. Thus, the platform is maintained up to date and is continuously provided with new information. This also allows the analysis of what topics are most difficult to handle for the scholars.

Whether or not the platform is used by future teams has to be investigated. Nevertheless, since it affords teams as well as the main office of TUM: Junge Akademie the ability to benefit from past experience, we are confident that it has the potential to positively impact workflow within the TUM: Junge Akademie.
In conclusion, we are confident in saying that Team Canvas confronts the teams with their – evident and subliminal – conflicts, this tool is thus a recommended part of guided self-reflexion. For the TUM: Junge Akademie the Team Canvas could be a means of visualizing the status quo and helping to develop the team. On top of that, existing conflicts can be unearthed and resolved via decisive intervention and prompted self-reflexion as represented by the workshop of Project MatchBox.

One could argue that this reflexion accelerates the storming phase according to Tuckman17,18, empowering teams to reach the phases of norming and performing more efficiently. For one, such reflexion may trigger resolution of highly discrepant perceptions within a team as discovered through our questionnaire. This assumption was confirmed by the impression that we gained while staging the intervention, namely that the conflicts confronted then had been present long beforehand. Not least, feedback on the workshop was stellar, with most participants likely to recommend this together heralds the conclusion that Team Canvas is an apt tool to other teams.

References
Self-reflection

After the initial formation of the team at the kick-off seminar, we quickly discovered a shared vision for the project and agreed upon possible paths to take. In the following weeks, the team members discussed how to reach this vision in increasing detail. After presenting our decisions to the tutors and mentors, we realized we should critically examine the feasibility of our goals and therefore articulate a precise hypothesis. Consequently, we then narrowed down our specific goals and approaches, utilizing feedback in the context of the future labs and talks with our mentors. With the absence of two of our teammates—Philipp being in Singapore temporarily and Judith having to move permanently to another city for professional reasons—the group struggled to continue with the same enthusiasm and energy as before. Adding to that, the required emphasis on a scientific approach made it more difficult for us to precisely survey our subject matter due to the sociological nature of the project. Noting a lack of true progress at the following future lab in early spring of 2018, we decided to take a thorough look at the status quo and feasible objectives for the continuation of the project. To this end, all available team members decided to meet in Berlin for a “power weekend” of intensive discussion and re-evaluation of Project MatchBox. This resulted in a new conception of the project and a detailed timeline of the envisioned milestones to be reached on the way to completion. To satisfy the focus on science, we decided to use the TUM: Junge Akademie as our survey group, providing us with a somewhat homogeneous collective. Informed by the re-imagining of MatchBox, we divided the project into two parts, resulting in the more practical Tool A and the data-based Tool B. The former was soon implemented as a hands-on workshop for scholars and gave us the chance to apply our knowhow and research in a real-life setting. Following a power project we temporarily toyed with the idea of designing a science-themed board game in parallel to our project. In the course of the following days, however, we decided not to follow up on this notion in order to focus completely on our original idea.

After the Berlin episode, the work stream picked up considerable speed, leading to the application of Tool A and subsequently Tool B. Both started yielding results. The scholars’ responses to our questionnaires however resulted in data amounts that fell short of our expectations and thus to results that were less usable than we had hoped for. Nevertheless, we were happy to receive positive feedback from the scholars and this has prompted the TUM: Junge Akademie to continue using our workshop in the course of the program.

Despite the challenges we faced and the setbacks we suffered, working together always proved to be not only enjoyable but also the key to solving complex problems.
During the 20-month project work, we, the team MatchBox, went through a long process of development of an idea and creating a successful team. The following steps show the progress according to the posters, which were the official milestones of our teamwork.

POSTER 1: The first milestone was to create a hypothesis. After the initial formation of the team at the kick-off seminar, we quickly discovered a shared vision for the project and agreed upon possible paths to take. In the following weeks, the team members discussed how to reach this vision in increasing detail. After presenting our decisions to the tutors and mentors, we realised we should critically examine the feasibility of our goals and therefore articulate a precise hypothesis. We narrowed down our target group from young European citizens to teams of the scholarship program Junge Akademie. Consequently we then also narrowed down our specific goals and approaches, utilising feedback in the context of the future labs and talks with our mentors.

POSTER 2: The next step was to develop out of the hypothesis the following actions, by forming the methodology and make a plan for the research process. But the step of team structure had to be cleared before that. The size of the team MatchBox was loose due to several issues. One member wanting to come into our team, never arrived there and gave up half the way. Even though we tried to bring her on board. One team member had to move into another city and quit the scholarship of TUM: Junge Akademie. Another team member was permanently in Singapore, which made it impossible to get hold of him. So we struggled a lot with our motivation and focus of the project. Adding to that the emphasis on scientificity made it more difficult for us to precisely survey our subject matter due to the sociological nature of the project. Time passed without any progress.
POSTER 3: Process and a working team structure was possible after we decided to take a thorough look at the status quo and feasible objectives for the continuation of the project. To this end, all available team members decided to meet in Berlin for a “power weekend” of intensive discussion and re-evaluation of Project MatchBox. This resulted in a new concept of the project and a detailed timeline of the envisioned milestones to be reached until completion. Invigorated by the re-imagining of MatchBox we divided the project into two parts, resulting in the more practical Tool A and the data-based Tool B. The former was soon implemented as a hands on workshop for scholars and gave us the chance to apply our knowledge and research in real life setting. Following a power project we temporarily toyed with the idea of designing a science-themed board game in parallel to our project. In the course of the following days however, we decided not to follow up on this notion in order to focus completely on our original idea.

POSTER 4: Results: After the Berlin episode the work stream picked up considerable speed, leading to the application of Tool A and subsequently Tool B. Both started yielding results. The scholars response to our questionnaires however resulted in data amounts that fell short of our expectations leading to results that were less usable than we had hoped for. Nevertheless, we were happy to receive positive feedback by the scholars prompting TUM: Junge Akademie to continue using our workshop in the course of the programme. Despite the challenges we faced and the setbacks we suffered, working together always proved to not only be enjoyable but also to be the key to solving complex problems.
Greetings from the Mentors

Journalistic part

Scientific part

Self reflection

Posters
Political communication and learning in the digital age
How to bring citizens and politics closer together?

In times of digitalization, politics and the dissemination of political knowledge face many new challenges. One of them is that public opinion-forming processes are increasingly taking place in the digital space. This is becoming particularly important for democratic decision-makers. Conversations, newspaper articles and television appearances are no longer sufficient for an informed exchange with citizens. Today, chats or tweets find themselves among the new digital forums. However, there are still few formats that bring politicians and their constituents into a productive and sustained conversation. It is therefore an important task, especially for students of a technical university, to develop such formats at the interface of politics, society, education and new technologies.

Two projects of the academic year 2017/I have done this, each with a different focus.

The group “Politics and Fun” has set itself a goal of making political education work with young people interactive, while remaining sharply focused on politics. For this purpose, it has developed a program that allows students in political education to witness the parliamentary week of a deputy, thereby helping them to understand the influence of politics on very specific everyday problems and, at the same time, providing them with an insight into the complexity of political decisions.

However, new information technologies are not just a way for citizens to learn about politics. Conversely, it is also important for politicians to record discussions on the Internet and to pick up articulated opinions and interests there. In this context, “muc.me” offers the possibility to make statements and preferences posted by citizens on the internet accessible and transparent to the political decision-makers. The voting tool developed in this project can provide valuable help in concrete decision-making at the municipal-political level.

As mentors of these two groups, we defined our task as sustaining the motivation of the groups over a period of eighteen months, during which our continual substantive input not only facilitated elaborate discussions, but also promoted more profiled projects, opened doors, supported the organization of the projects, and offered ongoing academic advice. At the beginning, both teams were struggling with the complexity of the task, the challenging scientific program of the Junge Akademie, and the considerable time constraints. However, the results achieved so far make us confident that, in addition to the benefits for the participating students themselves, not only innovative but also socially relevant products have emerged that are worth further development.

Sabine Maasen, Stefan Wurster and Alexander Lang

muc.me
Since August 2018, there has been a new way to submit ideas and motions to the borough councils of Munich

Do you know who to approach if you had a suggestion for your immediate surroundings? Do you know which politicians you would have to contact if you had concerns about the local infrastructure? Do you know how public financing works for newly planted trees or public art installations? If your answer is “no” to all of these, you are not alone. A great number of citizens neither want to be bothered with the legal and political details of a formal application to their councils, nor do they have much time to sacrifice to delve into such matters.

A group of six students from the Technical University of Munich (TUM) hopes to offer a solution with its digital participation platform for local politics. Supported by the scholarship program TUM: Junge Akademie, the students have established a website, https://muc.me/, where citizens can easily post their own ideas on topics of local significance to Munich’s borough councils.

This platform is intended to facilitate the introduction of ideas and motions to the relevant committees of local councils. Anybody can submit proposals in the platform’s various categories and view the suggestions of other users, voting on them with a five-level rating system. The resulting picture of public opinion may then be used for a formal motion to the respective council committee, to stress its importance.

The main goals of muc.me are to inform people about the possibilities of direct participation in local politics and to appeal especially to Munich’s younger citizens. It is focused deliberately on borough-related topics. “We see a lot of potential in borough politics to reach out to politically disengaged citizens, because local decisions influence our everyday lives and the council committees are easily accessible — provided one knows how,” says Prof. Stefan Wurster, Professor at the Bavarian School of Public Policy associated with TUM, and mentor of the team behind muc.me.

The council’s budget as a cornerstone of muc.me’s offering Particularly worth mentioning is that muc.me offers a place for discussion of the so-called council’s budget ("Stadtbezirksbudget"), which was just introduced in 2018. This budget shall be used specifically for ideas proposed by citizens. The amount is defined by the number of inhabitants in a district: Each council has 2€ per citizen at its disposal for this. Thus, muc.me allows its users to submit proposals for the described council’s budget which other users can then vote for or against.

The council’s budget category stands equally next to muc.me’s other categories which boil down to: Health & Environment, Construction, Infrastructure, Culture, Social Affairs, and Education & Sports. These are inspired by the organizational departments of the city council of Munich. This eases the processing of the resulting proposals in the councils because the responsibilities can be attributed directly.

When registering, users specify which district of Munich they live in. This information is supposed to be displayed in the poll results so that the borough councils know what their residents think about a specific topic or if a certain topic is seen differently across the boroughs. “It’s indispensable information for a borough’s politicians whether it’s the local residents who favor a road rerouting or the commuters passing through the borough, for example,” explains Jonas Ruchti, Electrical Engineering student and core member of the team.

Current outreach and plans for muc.me’s future On questioning, the students commented that their greatest specific challenge was to do with data privacy and all the bureaucracy associated with it. “TUM puts great stress on data privacy and protection. But as we all know, this is very important and just has to be done,” comments Simon Rehwald, co-founder of muc.me and Master’s student in Information Systems. Additionally, the scientific evaluation of the work is important for the students. To be more precise, they want to find out how well users accept the platform and what demographic characteristics, such as age and level of education, registered citizens have. These results can be used to assess their efforts and improve the platform or other digital participation offerings further.

So far, the team has successfully convinced the politicians of the borough councils of Maxvorstadt, Aubing-Lochhausen-Langwied, Ludwigsvorstadt-Isarvorstadt and Feldmoching-Hasenbergl to support and use muc.me. More boroughs will be approached in the future. The project will definitely run until the end of November 2018, i.e. until the end of the active membership of the respective students in the TUM: Junge Akademie. What will happen afterwards is not clear. One possibility under consideration by the students might be to seek a further collaboration with the city of Munich. However, concrete steps in this direction have not yet been taken.
muc.me – SWOT & In a nutshell

Strengths:
- Easy and minimalistic
- Low initial hurdle for participation
- Available everywhere at any time

Weaknesses:
- Continuous inflow of new content needed to keep platform interesting
- Large number of users required to generate reliable results

Opportunities:
- Unique in Munich
- Supported by local politicians

Threats:
- Incentives required to make users come back
- Problematic content (e.g. racism)

In a nutshell:
- Design and Development of the digital platform muc.me for civic participation in Munich
- Evaluation of marketing effectiveness and demographic characteristics of the platform's users
- Groundwork for the research question: Which features does such a platform require to be successful?

Abstract
This paper outlines the relevant political processes for general elections in Munich's citizen councils and the council's budget, introduced in 2018. Based on these, an overview of the design process and operation of a digital citizen participation platform is presented. Our research aims to define features such a platform requires to be relevant and useful for Munich citizens. In the course of this, we conducted an intermediate evaluation based on usage statistics and a survey among newly registered users. The results suggest potential behind the idea, especially since the majority of our users were previously not involved in local politics. Nevertheless, a definitive conclusion cannot be drawn due to the short time span of platform operation and the small data set.

1. Background
Democracy is based on political participation. Human beings living in a democratic state have the powerful right to influence politics by voting for a specific party, taking part in meetings of local borough councils or generally expressing their opinion on certain topics. However, political participation is unequally distributed from a demographic perspective. Kroh and Könnemann [4] state that unemployed and low-earning people are less politically active than people who work and earn enough salary so that they live above the poverty line. According to them, inequality in Germany regarding political participation is higher than in other European countries. In Brooks and Hodkinson [1], the authors describe that interest in politics among young people has declined over the past years in many countries. They also note that digital media and the internet seemed very promising in the 1990s to reverse this trend, yet the expectations were too optimistic. Still, using new technologies in politics is of high interest. These results are similar to those of Zapio et al. [9]. They explain that a participation among municipalities of low-income households was implemented in many German cities, but the citizens' interest in it and their actual participation is rather low. As a result, the authors analyze and categorize potential barriers for the non-participation. Besides that, it is also worth mentioning that the degree to which citizens should be able to influence politics is controversial according to Vetter [7].

At the same time, Vetter [7] states that democracy needs participation and citizens can bring in valuable experiences. Especially in relation to topics which directly affect them, citizens might be excellent consultants. This is particularly true for local politics represented by borough councils, as for instance in Munich. Unfortunately, experience from our own meetings with politicians has shown that citizens are either not aware of the different opportunities for taking part in political discussions or are not interested. Consequently, our project is about the development and evaluation of a digital solution, namely a platform for enhancing civic participation in Munich's local politics. Even though there has been limited success in using digital media over the past years as we have explained, we think that our new attempt is worthwhile: On one hand, we can use our own experience and design the platform to fit the needs of actual users. On the other hand, recent developments, as for instance the greatly increased usage of smartphones, might have changed the situation as compared to the 1990s. In the course of our project, we developed and evaluated the online platform muc.me, which allows people to create posts other users can vote on and that can subsequently be transformed into a formal request submitted to a responsible council.

The ultimate question we would like to answer is which features such a platform requires to be relevant and useful for Munich citizens. Due to time restrictions, our evaluation is so far mostly based on demographic data obtained from the platform's users. A follow-up survey on the features of muc.me and how it is perceived in general is planned for the future.

The remainder of this report is structured as follows. In the next two sections, we continue with important background to our research. More specifically, we describe relevant political processes in Munich (Section 1.1) and the council's budget (Section 1.2). Following that, we present our goals and methods (Section 2). The outcome of our research and its discussion is part of Section 3. Finally, this report is concluded in Section 4 with a short summary and outlook.
1.1 Relevant Political Processes

The city of Munich is divided into 25 districts, e.g. Maxvorstadt, Ludwigsvorstadt, Feldmoching-Haidhausen, or Aubing-Lohhausen-Langwied, each of which has its own council committee. The latter consists of politicians democratically elected on a six-year basis by eligible citizens. The councils are usually concerned with topics that are local and very specific to them. For instance, they have to do with on whosenicestreetsshallbedeclaredor how much parking spaces shall be located in a specific area or whether they financially support cultural events or projects, that take place within the borders of their respective district. Additionally, councils can be further divided into subcommittees that concentrate on a particular subject, e.g. infrastructure or culture. Items on the agenda of a meeting may not only come from the politicians themselves, but also from citizens who have a request or proposal. For this, they need to contact the council committees in written form, i.e. by letter or email, and state their matter. The committees then decide on when and possibly if this can be discussed during an official meeting. The proposal is expected to attend and has again the ability to describe what they want to discuss during the meeting. The latter consists of politicians democratically elected on a six-year basis by eligible citizens. For this, they need to contact the council committees in written form, i.e. by letter or email, and state their matter. The committees then decide on when and possibly if this can be discussed during an official meeting. The proposal is expected to attend and has again the ability to describe what they want to discuss during the meeting.

2. Goals and Methods

In the following, we point out the goals and methods within our project and research.

2.1 Goals and Scope

As mentioned in the sections before, there is a need to enhance civic participation in Munich. With our project, we try to solve this issue by developing a digital solution that is concerned with Munich’s local politics. Along with that, we evaluate our platform. In particular, we want to find out which features such a platform requires to be relevant and useful for Munich citizens. Our ideal goal is to especially reach young people who have not been politically active so far.

Our research comes with a few limitations. Due to a long period of time that we were not able to collect data in a first survey for a short period of time. Additionally, a second survey which we would like to run when users have had enough time of working with the platform, has thus not yet been sent out. Consequently, our current research results are still in a preliminary state.

2.2 Method: A Novel Digital Platform for Political Participation

In this section we present our research method, a digital platform. We start with reviewing similar platforms and then describe the way we designed our own platform. Lastly, we give insights into conducted and planned surveys.

2.2.1 Review of Existing Platforms

As mentioned in the sections before, there is a need to enhance civic participation in Munich. With our project, we try to solve this issue by developing a digital solution that is concerned with Munich’s local politics. Along with that, we evaluate our platform. In particular, we want to find out which features such a platform requires to be relevant and useful for Munich citizens. Our ideal goal is to especially reach young people who have not been politically active so far.

Our research comes with a few limitations. Due to a long period of time that we were not able to collect data in a first survey for a short period of time. Additionally, a second survey which we would like to run when users have had enough time of working with the platform, has thus not yet been sent out. Consequently, our current research results are still in a preliminary state.

2.2 Method: A Novel Digital Platform for Political Participation

In this section we present our research method, a digital platform. We start with reviewing similar platforms and then describe the way we designed our own platform. Lastly, we give insights into conducted and planned surveys.

2.2.1 Review of Existing Platforms

As mentioned in the sections before, there is a need to enhance civic participation in Munich. With our project, we try to solve this issue by developing a digital solution that is concerned with Munich’s local politics. Along with that, we evaluate our platform. In particular, we want to find out which features such a platform requires to be relevant and useful for Munich citizens. Our ideal goal is to especially reach young people who have not been politically active so far.

Our research comes with a few limitations. Due to a long period of time that we were not able to collect data in a first survey for a short period of time. Additionally, a second survey which we would like to run when users have had enough time of working with the platform, has thus not yet been sent out. Consequently, our current research results are still in a preliminary state.

2.2 Method: A Novel Digital Platform for Political Participation

In this section we present our research method, a digital platform. We start with reviewing similar platforms and then describe the way we designed our own platform. Lastly, we give insights into conducted and planned surveys.

2.2.1 Review of Existing Platforms

As mentioned in the sections before, there is a need to enhance civic participation in Munich. With our project, we try to solve this issue by developing a digital solution that is concerned with Munich’s local politics. Along with that, we evaluate our platform. In particular, we want to find out which features such a platform requires to be relevant and useful for Munich citizens. Our ideal goal is to especially reach young people who have not been politically active so far.

Our research comes with a few limitations. Due to a long period of time that we were not able to collect data in a first survey for a short period of time. Additionally, a second survey which we would like to run when users have had enough time of working with the platform, has thus not yet been sent out. Consequently, our current research results are still in a preliminary state.

2.2 Method: A Novel Digital Platform for Political Participation

In this section we present our research method, a digital platform. We start with reviewing similar platforms and then describe the way we designed our own platform. Lastly, we give insights into conducted and planned surveys.

2.2.1 Review of Existing Platforms

As mentioned in the sections before, there is a need to enhance civic participation in Munich. With our project, we try to solve this issue by developing a digital solution that is concerned with Munich’s local politics. Along with that, we evaluate our platform. In particular, we want to find out which features such a platform requires to be relevant and useful for Munich citizens. Our ideal goal is to especially reach young people who have not been politically active so far.

Our research comes with a few limitations. Due to a long period of time that we were not able to collect data in a first survey for a short period of time. Additionally, a second survey which we would like to run when users have had enough time of working with the platform, has thus not yet been sent out. Consequently, our current research results are still in a preliminary state.
to familiarize themselves with. On the right-hand side, there are only trivial decisions to be taken. In our case, this axis correlates with the level of politics, with federal politics more to the left and local politics more to the right. As the ideal case of combining all four axis end points would be trivial decisions to be taken. In our case, this axis correlates with the level of politics, with federal politics more to the left and local politics more to the right.

2.2.3 Conduct of Surveys
For measuring our impact on the public’s interest and eagerness in political participation, solely using our website traffic, or other usage statistics would be insufficient. Using our platform’s built-in surveys provided an easy, but restricted in terms of question format, means for our evaluation. Thus, online surveys were used as another source of data, conducted using the survey system Evisuality.

Directly after registration, every new user was asked to fill out a short survey, because we wanted to determine the experienced development of our users’ participation. This survey is presented to them before they were lead to the platform, but it was not required for using muc.me. Because the survey was opt-in, we tried to fit our questionnaire as short as possible. We focused on a few aspects:

- Because our target demographics are an important aspect of our research question, we wanted to know our participants’ age and profession.5
- We queried our users’ borough of residence and workplace.
- These questions were asked mainly because they facilitated interesting correlations to the posts we later saw on muc.me.
- We wanted to know about the participants’ commitment to their immediate surroundings in the city. Thus, we included questions on how many years someone has been living in Munich and how much they (subjectively) identified with their borough.
- It seemed to us like the simplest measure for a person’s general political interest to ask how often they discuss political topics with their family and friends.
- We had some questions about our users’ prior knowledge of their opportunities to participate in politics on a local level, namely if they knew how they could approach the politicians of their borough, if they knew about muenchen-transparent.de and if they had heard of the citizen’s budget. We also included a question on whether they had personally contacted their local city council.
- Based on the citizens’ knowledge of their opportunities, we inquired about their general satisfaction with the tool, if they found their concerns were valued, and taken seriously by the politicians and if there were sufficient digital means of citizen participation in Munich in their eyes.

The survey concluded with a question how the participants became aware of muc.me (for evaluating our marketing efforts) and a free-text field on what should be addressed in a digital political participation platform.

For the home and workplace location questions, we offered our participants the options to state their borough or their zip code. Since we are mainly interested in boroughs and not in the resolution provided by zip codes, the zip codes were mapped to boroughs in case no borough was given.4

After three months of platform operation, we plan another survey in order to monitor the development of muc.me’s participants’ political engagement. At the time of writing, the questionnaire design for this survey, whose results we could compare with our first survey’s, was almost completely finished. This survey will include many of the questions from the first one to aid a direct comparison. Additional questions will be included about their experiences on our platform which we hope to improve further based on the feedback.

3. Outcome and Discussion
3.1 Core Features
muc.me’s main purpose is to ease the creation and submission of proposals to a borough council. As such, a user can create a proposal or post, as we like to call it at that stage, that describes their matter. Other users can vote on the created post and express their opinion and specify whether they agree or disagree. Each post can belong to one or more boroughs, which we describe in the next paragraph, and one or more boroughs. After a period of four weeks, a post expires and voting is no longer possible. The user who created it will then receive an email that contains a template for turning the post into a formal proposal to the borough(s) it is relevant to. This template will also contain a reference to the post on the platform. Hence, the idea is that muc.me on the one hand makes it easier to submit a proposal and on the other hand allows us to create an overall picture, which could be helpful for the politicians deciding on a proposal. However, not each post needs to necessarily be turned into a proposal. Users and especially politicians might also just ask for opinions on a specific topic.

Having explained the functionality of muc.me from a high-level perspective, we now provide a walk through its most important features

4 Because some zip codes are shared by multiple boroughs [6], the data analysis is complicated slightly. For ambiguous cases, all possible boroughs were counted, aligned with their respective population [based on current data from 7].
5 https://angular.io; accessed September 23, 2018
6 https://nodejs.org; accessed September 23, 2018
7 https://semaphore-ce.de; accessed September 23, 2018
8 https://www.firebase.com; accessed September 23, 2018

3 The former was queried by month and year of birth, while we used a selection list based on [2] for the latter.
3.2 Results from the first survey

In our first survey, we analyzed questionnaires from 128 participants. Some questions were omitted from this section as their results will only become relevant when compared to the results of the second survey we are planning. This section briefly presents the relevant results, which will be discussed in section 3.3.

3.2.1 Demographics

66 participants indicated they were male and 55 female. Figure 7 shows some additional demographics based on the collected data.

3.2.2 Political Involvement

Most of our survey’s questions regarding political involvement were planned for an evaluation in contrast to the second survey, hopefully indicating some development. Nevertheless, figure 9 shows the answers of muc.me’s current user base to questions about their past political experiences. It is thus valuable for evaluating if our concept is able to attract people who would otherwise not be involved in politics.

3.2.3 Marketing and Outreach

The most mentioned reason for registration in the survey was, by a large margin, information from friends and family (43 participants), followed by Facebook (16 participants), direct contact from us (14 participants) and newspaper articles (12 participants). Our information stands at the TUM main campus and the StreetLife festival were indicated a total of two times.

Because of the small numbers, no meaningful correlation between the mentioned reasons and our marketing campaigns could be established.

3.3 Results from the first survey

In our first survey, we analyzed questionnaires from 128 participants. Some questions were omitted from this section as their results will only become relevant when compared to the results of the second survey we are planning. This section briefly presents the relevant results, which will be discussed in section 3.3.
made. Thus, just the number of registered users on the platform over time, as displayed in figure 10, was used for the analysis.

3.3 Discussion of the Results

The collected data allows for some preliminary assessment of the demand for a solution similar to our platform, but also lets us evaluate our marketing strategy so far. It is thus a first step towards answering our research question.

3.3.1 Survey Sample Size and Bias

On its own right, the results from our first survey have little significance for general cases. This is mainly due to two reasons:

- The samplesize is comparatively small with 128 participants.
- The sample suffers from a strong bias: The initial user base for the platform was formed mainly from our and the participating politicians’ acquaintances. The marketing channels provided by TUM also had their effect, reaching mainly people with a scientific background.

Later, we reached a broader audience with our marketing campaigns (cf. section 3.2.3), but a small number of groups, e.g. citizens active in Interessengemeinschaft Fasanerie aktiv e. V., an association cooperating with the local politicians supporting our project.

The sample bias can be seen best in figure 7b, where the prevalence of scientific occupations and students is apparent. Similarly, figure 8a shows a dominance of Maxvorstadt, the location of TUM and LMU main campuses, as a work/study borough. The noticeable number of participants from Feldmoching-Hasenbergl in figure 8b can be traced back mainly to Interessengemeinschaft Fasanerie Aktive e. V.

Our primary concern was acquiring a large enough user base for our platform. We thus accepted the resulting bias for our survey as a deliberate selection of participants would have either decreased the number of users or necessitated additional means of acquiring participants for our survey.

As a consequence, our research question cannot be reliably answered at this point in time. Nevertheless, the gathered data provides means of intermediate evaluation of our efforts.

3.3.2 Demographics and Political Involvement

Because of this strong bias, the results are to be taken with a grain of salt. The age distribution visible in figure 7a indicates that our platform gained popularity outside our targeted younger audience. Instead, 40 to 49 year old citizens are disproportionately over-represented in our user base.

Similarly, the answers to the yes/no questions graphed in figure 9 show that the user base acquired satisfies key aspects of our aim:

- The majority of users were not in contact with their council (figure 9b), meaning we did not only motivate citizens who already took advantage of their possibilities in Munich. Additionally, a large portion would not even have known whom to approach with their suggestions (figure 9a).
- An even larger number of users did not know muenchen-transparent.de, which is the most direct source of information from the city councils (figure 9c).

As we suspected when conceptualizing the platform, the knowledge of Munich’s council budget is still not very widespread (figure 9d).

As the platform operation and our marketing efforts continue, we hope to acquire more citizens previously not involved in politics as users for muc.me.

3.3.3 Marketing Effectiveness

As mentioned in section 3.2.3, the number of users over time provided a sensible way of determining the effectiveness of our campaigns. In the plot in figure 10, some jumps are visible. These correlate with some specific events:

(1) The most notable increase coincides with our article in the Süddeutsche Zeitung\(^\text{10}\) from August 12, 2018.

\(^{10}\)https://www.sueddeutsche.de/muenchen/muenchen-online-mitreden-1.4090637 (last accessed September 23, 2018)
(2) Our Facebook campaigns took place between August 30 and September 6, and from September 12 onwards. Naturally, they did not effect a sudden increment, but rather a increase in the slope of the graph.

(3) Our presence at StreetLife on September 8 and September 9 did not have any visible effect. Indeed, there was only one mention of the festival in the survey.

(4) Another “step” in the graph could be explained with the Future-Lab II of the TUM. Junge Akademie on September 14, where we were able to reach additional people within our scholarship program.

(5) On September 16, a post went online. Usage statistics suggest a large number of our users registered solely for this post, as the author further publicized it himself. Thus, we trace back the large number of users joining around October 5 to this post.

3.3.4 Conclusion

Our preliminary results show that people are, in general, interested in the idea of a digital platform for civic participation. The fact that a large portion of our users registered after reading about muc.me in the newspaper or hearing about it via Facebook indicates that our platform seems to be reasonable and valuable at least in theory. However, we so far can answer neither whether muc.me is really needed in Munich nor whether its design is sufficient for the use of citizens. A consequence, we can only estimate that there is some general interest in our concept at this point in time. In general, we see a lot of potential in our idea for a very simple and easy-to-use way of participating in local politics and the number of users we managed to acquire in the short time frame is a sign case, mainly because of two reasons. First, we do not track how often users visit our platform because of privacy concerns and thus cannot measure their interest in new topics and ideas. Second, we have to discuss the quality of the created posts with politicians, as the launch of our platform coincided with the summer break of the councils. As a consequence, we can only estimate that there is some general interest in our concept at this point in time.

4. Summary and Future Goals

Within our project we were able to develop and finally launch a digital platform called muc.me for enhancing civic participation in Munich. Our main research question was which features such a platform would require for being successful. For this purpose we planned two surveys, one asking for general information at registration time and another one specifically focusing on our research question. While the former is already in progress and currently has a sample size of 128, the latter is still part of our future work. That is, our research results are still preliminary and cannot decisively answer our original question. However, our data show that the idea is promising: The majority of the citizens we reached has not been actively involved in political participation.

In general, we see a lot of potential in our idea for a very simple and easy-to-use way of participating in local politics and the number of users we managed to acquire in the short time frame is a sign of the demand for a solution. In the short term, we thus want to continue our platform development ourselves and develop a number of additional features like more data analysis capabilities, better filtering and other usability improvements. Our aforementioned second survey will provide additional insights into the demand for a digital platform for local politics in Munich. It will help us to improve muc.me’s offering further by validating our key assumptions in the design process.

For the long run, however, we are looking for a partner to take over the platform operation. We hope to permanently establish muc.me as a successful platform in Munich’s local politics, not only simplifying the ways citizens can submit their suggestions and work closer together with the politicians, but also motivating citizens about their rights and opportunities for influencing Munich’s local politics.
Self-reflection muc.me

Citizen Engagement in post-Brexit times

“It is a truth universally acknowledged” that the year 2016 marked a before and after moment in politics. The result of the EU referendum on June 23, 2016, with 51.9% of votes in favor of leaving the EU, changed the course of politics. This result was seen by many as a turning point, as the United Kingdom, a long-time member of the EU, announced its departure from the union.

The months that followed were important to define our problem statement and project goals. At the same time, however, the engagement of our five members back then in the discussions and meetings provided each of us with understanding of our own team-building process and each of team members’ characteristics. In getting to know each other’s strengths and weaknesses, interests and motivations, participating in the development of this project became a much more engaging and exciting task. Our output became no longer a combination of several individual efforts but the result of a unified team moving forward as a “High Performance Team.” This feeling became even stronger when we successfully managed to incorporate our sixth member into the team, allowing us to grow in diversity and to learn about inclusiveness in team structures.

The first memorable experience regarding our group formation was during the project definition phase. In our endless “Group of 13” discussions, more than half of the group had a different idea in mind regarding the methodology to agree on. Agreeing to disagree, two teams separated out, one of them focussing on Digital Political Communication and the other on Political Participation. At our first get-together at Lake Starnberg in May 2017, a “High Performance Team.” This feeling became even stronger when we successfully managed to incorporate our sixth member into the team, allowing us to grow in diversity and to learn about inclusiveness in team structures.

In the following months after these traumatic events, TUM’s Junge Akademie raised a call for the Class of 2017/I titled “Idee-Kommunikation-Rezeption” (“Idea-Communication-Reception/Process”). At our first get-together at Lake Starnberg in May 2017, a large group of scholars assembled and the project title: “Politik and Participation.” In other words, many of us were interested in researching the communication process of decision making by politicians and in analyzing the involvement of citizens in those decision-making processes – all of which links back to the Year’s call: “Idee-Kommunikation-Rezeption.”

What we did not know back then was that in order to move forward from a project title to a 20-month project, a lot of participation from our side would be needed. With more or less uncertainty, we set out on a journey to become active participants in this joint endeavor.

From a Group of 13 to a High Performance Team in a Network of Excellence

The first memorable experience regarding our group formation was the project definition phase. In our endless “Group of 13” discussions, more than half of the group had a different idea in mind regarding the methodology to agree on. Agreeing to disagree, two teams separated out, one of them focussing on Digital Political Communication and the other on Political Participation. At our first get-together at Lake Starnberg in May 2017, a “High Performance Team.” This feeling became even stronger when we successfully managed to incorporate our sixth member into the team, allowing us to grow in diversity and to learn about inclusiveness in team structures.

But our feeling of togetherness was not only experienced within our team. Without a doubt, our collaboration with several partners within the TUM’s Junge Akademie’s “Network of Excellence” provided us with the necessary experience, insight and perspective (and sometimes a well-deserved call for driving forward our project according to our project plan) to guide our research toward a successful outcome and to a tangible and productive result. For that reason, we would like to express our most sincere gratitude to our Tutors, Matthias Lehner and Dominik Irber, and to our Mentors, Prof. Dr. Matthias Lehner and Prof. Dr. Markus Wurscher, who supported us tirelessly and contributed with their enthusiasm and creativity in making our project happen. Our “Network of Excellence” certainly reached out much further than that. Special thanks to the excellent Management Team of the Junge Akademie, Matthias Hannecke, Peter Finger and many others, to the Board of Members, Advisory Board, Emeriti of Excellence, Task Forces and Alumni, and last but not least Prof. Müller for his extraordinary engagement and support.

This list of gratitude could not be completed without sending special thanks to our colleagues of the Class of 2017/I and II, with whom we had the opportunity to learn and grow together and whose valuable input in and outside the project realm was essential for our success and will continue in the form of friendship.

muc.me – a project on digital citizen participation in Munich’s districts

It was only then, on a dark Tuesday night in one of TUM’s rooms in the Main Campus, after a long transforming session by our team members, that the name of our project emerged: muc.me – digital citizen participation. After almost ten months of work, our concept began to take shape. And the pace and intensity at which it developed from that time on to our present day’s project is indeed something to be proud of.

Deciding to do a project on citizen participation at district level is surely an exciting task. Along the way, we believe that the experience we have had with countless district representatives, often ordinary citizens who feel passionate about improving their living environment and that of their neighbors, has been one of the best experiences of this journey. In the process of researching citizen engagement at district level and trying to propose a tool to foster it, we have become ourselves active participants in our own local districts’ politics. This is, we believe, a “Win-Win” or “unexpected externality” of our project. Our personal interest in local politics has grown and our ambition to share our tool with the rest of society has grown as well.

As it is often the case in participatory planning, the process is often more important than the outcome. We believe that muc.me has initiated a process for Munich’s citizens that can lead to a more sustainable way of decision-making at local level in the future, thus contributing to the fostering of trust among citizens in open and inclusive ways of doing politics.

Participation, quo vadis?

With these reflections, we come to the end of our journey. Sadly, nowadays many people would agree in saying that Democracy, understood by Western society, is under threat. Populism, media manipulation and fake-news have a strong influence on people’s opinions, often affecting political decisions with strong implications for the world’s society...

Our project has shown us an answer to the question raised by ourselves at the beginning of this text and of our journey: Participation, quo vadis? Our answer is not that participation is itself automatically beneficial for society, though neither do we believe that society is sustainable without participation. We believe that informed citizen engagement by the key to a democratic system. Inclusive, transparent and informed participation can indeed help to fight back against populism and fake-news. For that reason, new digital and physical tools that foster informed citizen engagement and spark inclusive decision-making processes are essential for the sustainable development of our societies.

... and muc.me PiA StreetScience
POSTER 1: As the name indicates, our team wanted to work on the topic of citizen participation. For determining the scope of the project, we first had to analyze the predominant state of affairs. We did so by identifying the current problems of citizen participation and then researched their possible origins in order to understand their roots at first hand.

The main problem we identified was a general lack of interest – in participation (even where opportunities are available), information and communication. The decisive reasons for this problem are, in our eyes, as shown in the first poster: an often non-existent sense of political responsibility, the relatively large effort needed to get information, the lack of visible political influence and the lack of opportunities to participate.

To get a deeper understanding of civic participation and create an effective tool for the improvement of this initial situation, the hierarchy of participation possibilities was analyzed. As can be seen on the first poster, the lowest level of possible participation of citizens is in receiving information. Higher levels are: the feedback of citizens; consultation; joint planning; and, finally, citizen control. Citizen control gives people the opportunity to decide on topics themselves.

With all this in mind, we decided that we wanted mainly to address the two, in our eyes, most important deficits concerning participation: the citizens’ perceived lack of influence on decision-making processes and the low levels of information exchange.

From our findings, we have derived the first hypothesis: “A direct and objective exchange of views and information strengthens citizens’ perceived influence and political participation.”

POSTER 2: By the time the second poster was designed we had changed our project slightly. During research it turned out that, beginning in 2018, Munich’s boroughs would have responsibility for a yearly citizens’ budget. We agreed that this should be a core of our project. We decided to develop a digital platform to enable citizens to propose concrete projects on which that money could be spent, but also to come up with any city-improving ideas. All users should be able to rate these proposed projects and ideas. Furthermore, the proposals with good feedback should be forwarded to the responsible politicians to influence their decisions concerning these subjects.

A non-negligible benefit of such a platform is the possibility of using it also for the evaluation of the created participatory processes.

Focusing on this idea we tried out existing participation platforms and had meetings with experts and politicians. The outcome of our research and the feedback of the consultants reaffirmed our plans. We are convinced that an innovative, simple and interesting platform that is specialized in just a few topics and allows citizens to communicate their demands and desires can be an enrichment for today’s political world.

This idea led to the altered hypothesis: “A digital platform for the collection of ideas and opinions can help to lower young people’s inhibition threshold regarding politics, build trust in civic participation, improve transparency and generate important information for Munich’s local politicians (for example, concerning the citizens’ budget).”

This platform should create a simple communication channel between citizens and politicians and at the same time reduce feelings of project and impotence concerning political matters. All, but especially young people, should be motivated to contribute.
POSTER 3: During the time before the third poster was introduced, the platform “muc.me” was actively developed. The research questions we want to answer with the platform changed slightly from the last hypothesis. We now want to derive the features that a digital platform for civic participation in Munich requires to be successful. In addition we are interested in the demographics of the people who are attracted by the platform design.

Launch day was August 9, 2018. During the creation of “muc.me” the collaboration with the borough councils of Ludwigsvorstadt-Isarvorstadt, Maxvorstadt, Feldmoching-Hasenbergl and Aubing-Lochhausen-Englach led to further cooperation. Furthermore the third poster states clearly the goal we are trying to achieve with our project: We want to use “muc.me” to research the effectiveness of such a tool and the features it needs for success in Munich. The platform allows all registered users to propose and rate ideas and projects for Munich’s benefit and to inform responsible local politicians about the outcomes of frequently rated ideas. We want to find out whether this time-efficient way of interaction and participation, which brings some degree of transparency into political decision-making processes, lowers the threshold of contacting local politicians.

We are collecting information by analyzing questionnaires that are filled out by the platform users. To get reliable results we are trying to attract as many participants as possible. The project has already been mentioned in newspaper articles in “Hallo München” and “Süddeutsche Zeitung”. The age and activity spread of the first “muc.me” users can be seen on the poster. Still unanswered is the question about the future of the platform: Possibilities might be to hand the platform over to a chair at TUM or to establish a cooperation with the Landeshauptstadt München or its borough councils.

POSTER 4: As mentioned before, we want to extract the features of a successful platform for civic participation and to identify the relevant demographics of engagement with the platform. To answer these questions we are on the one hand using data that is generated by the users of the platform and on the other hand two online surveys among the platform users. The users are presented with one survey when they first log in and with the second one after three months of using the “muc.me.”

Since the second survey’s data is not yet collected, we are not able to answer our research questions fully at this stage.

The relatively high number of registrations over a short time on “muc.me” has already enabled us to conclude that there is a demand for such a means of participation. Furthermore the first survey indicated that it is mainly people who are not involved in politics who are drawn to the platform.
Political communication and learning in the digital age
How to bring citizens and politics closer together?

In times of digitalization, politics and the dissemination of political knowledge face many new challenges. One of them is that public opinion-forming processes are increasingly taking place in the digital space. This is becoming particularly important for democratic decision-makers. Conversations, newspaper articles and television appearances are no longer sufficient for an informed exchange with citizens. Today, chats or tweets find themselves among the new digital forums. However, there are still few formats that bring politicians and their constituents into a productive and sustained conversation. It is therefore an important task, especially for students of a technical university, to develop such formats at the interface of politics, society, education and new technologies. Two projects of the academy year 2017/2018 have done this, each with a different focus.

The group “Politics and Fun” has set itself a goal of making political education work with young people interactive, while remaining sharply focused on politics. For this purpose, it has developed a program that allows students in political education to witness the parliamentary week of a deputy, thereby helping them to understand the influence of politics on very specific everyday problems and, at the same time, providing them with an insight into the complexity of political decisions.

However, new information technologies are not just a way for citizens to learn about politics. Conversely, it is also important for politicians to record discussions on the Internet and to pick up articulated opinions and interests there. In this context, “Mucma” offers the possibility to make statements and preferences posted by citizens on the Internet accessible and transparent to the political decision-makers. The voting tool developed in this project can provide valuable help in concrete decision-making at the municipal-political level.

As mentors of these two groups, we defined our task as sustaining the motivation of the groups over a period of eighteen months, during which our continual substantive input not only facilitated elaborate discussions, but also promoted more profiled projects, opened doors, supported the organization of the projects, and offered ongoing academic advice. At the beginning, both teams were struggling with the complexity of the task, the challenging scientific program of the Junge Akademie, and the considerable time constraints. However, the results achieved so far make us confident that, in addition to the benefits for the participating students themselves, not only innovative but also socially relevant products have emerged that are worth further development.

Sabine Maasen, Stefan Wurster and Alexander Lang
A group of three students from class 9b of a High School in Nürnberg has met up in front of the escalator in the school building. In their midst, they are holding a tablet. “Pick at Everyone should be able to move autonomously!” one of the students says. But not everyone agrees: “Why not c? Only, if a person is specifically affected?” It’s about accessibility!” another counters. The students had just scanned a QR-Code printed on a piece of paper, which was hanging on the escalator’s door. As soon as they had placed the tablet over the code, a video about inclusion in the school building and beyond was shown.

The students are out and about with PiA. That is not only the name of the project, which has emerged from the TUM: Junge Akademie. Since May 2017, the nine schoolchildren have thought that decisions like “Christian crosses in classrooms – yes or no?” require so much effort and regulations. In class, this particular question generates disagreement. “For me, it’s part of the Bavarian culture,” one student says, encountering high approval in class. However, a classmate then asks the question: “Why can’t we hang up the symbols of all religions in our classroom?”

PiA is the project of an interdisciplinary team which has emerged from the TUM: Junge Akademie. According to one of the mandates of the Ministry of Education, schools are responsible for the formation of mature citizens. Of all things, might a tablet app contribute to such a task? Beyond work and study, extracurricular activities to discuss with their friends and they don’t have a real say yet anyway.

Combining a traditional paper chase with modern digital technology, the topics can be found by the students at stations located at suitable places within the school building. The paperchasers use the tablets to scan the stations and receive information and questions about integration in everyday school life or about the pros and cons of an all-dayschool.

After the students’ paper chase and PiA's first parliamentary week, the results of the quizzes are evaluated in the classroom. An overview of the game, and afterwards about the questions of opinion raised at different stations. “I know that how long you have to go to school for and what you get taught there is decided by your politics,” a student explains to her classmates. However, I wouldn’t have thought that decisions like “Christian crosses in classrooms – yes or no?” require so much effort and regulations.” In class, this particular question generates disagreement. “For me, it’s part of the Bavarian culture,” one student says, encountering high approval in class. However, a classmate then asks the question: “Why can’t we hang up the symbols of all religions in our classroom?”

Citizens of the future

Besides the three ninth grades of Nürnberg, several other schools got in touch with PiA at the end of the school year 2017/18. As a result, the students of an eighth grade in Kirchheim, as well as two fifth grades of a secondary school in Traunstein, had the chance to compete in the quiz and to discuss their opinions. For the upcoming school year, several additional schools have expressed their interest.

Indeed, although for most of the students their right to vote will be long incoming, many of them care about politics already, particularly about the upcoming regional elections. They discuss matters with their parents and obtain information from the internet and radio and, sporadically, newspapers. On the other hand, some students don’t bother with politics at all. For them, there are more relevant topics to discuss with their friends and they don’t have a real say yet anyway.

Maturity via app?

According to one of the mandates of the Ministry of Education, schools are responsible for the formation of mature citizens. Of all things, might a tablet app contribute to such a task? Beyond work and study, extracurricular activities are a focus on their own lives, an image of politics that goes beyond the common media-defined horizons should be imparted. Instead of election campaign banter, long speeches or twitter debates – even in the digital age.

The Tablet App enables students in groups to embody the role of young politician PiA, who has to orient herself in her first parliamentary week. While the protagonist is making her way from briefings to commissions and interviews, the eighth to tenth graders have thought that decisions like ‘Christian crosses in classrooms – yes or no?’ require so much effort and regulations.” In class, this particular question generates disagreement. “For me, it’s part of the Bavarian culture,” one student says, encountering high approval in class. However, a classmate then asks the question: “Why can’t we hang up the symbols of all religions in our classroom?”

The Christian cross in the classroom, questions of inclusion, as well as the menu of the school canteen are some of the issues discussed in the videos. Afterwards the students must choose their own answers to the questions that the journalists in the video ask PiA. The quiz is rounded off by questions that seek for the students’ own opinions about each of the political topics. Instead of identifying the right answer, the young people voice their opinion in a ‘for’ – or ‘against’ – depending on their own view on the issue.

The Christian cross in the classroom, questions of inclusion, as well as the menu of the school canteen are some of the issues discussed in the videos. Afterwards the students must choose their own answers to the questions that the journalists in the video ask PiA. The quiz is rounded off by questions that seek for the students’ own opinions about each of the political topics. Instead of identifying the right answer, the young people voice their opinion in a ‘for’ – or ‘against’ – depending on their own view on the issue.

The increasing possibilities in terms of video games in the past years has enabled a new trend called “Serious Games” to develop. Coded in a playful story, these apps aim at teaching sciences, languages or mathematics. However, political didactics have rarely been integrated, and not only in the German-speaking regions. PiA is intended to connect gaming fun with the appeal of technical innovation. In the students’ hands, the tablet enables them to explore their schools as political sites. As long as tablet classes are a rarity, the devices need to be passed on to other schools for their next mission. However, a critical eye on politics in young people’s daily lives might also be a trigger for them to ask new questions. Some students had already started thinking beyond what they had learned from PiA before they had even left the building. “I don’t like being told what I should or should not eat. But how about school arranging food information days, so we could learn about healthy foods?” one highly-engaged young girl wondered. It appears that ideas continue to be born out of questions – even in the digital age.
Scientific part

What happened:

- Conceptionalization and design of an app-based interactive educational game. The goal was to teach about the role of politics in the everyday lives of students as a form of civic education. The game was tested and evaluated.

Strengths:

- Game mechanics connect analog and digital potentials within the didactics of politics in an outstanding way.
- Bottom-up instead of top-down education: the concept starts from the student's personal experience instead of abstract subject matter.

Weaknesses:

- The game's complexity is limited as we needed to balance the didacticsofpoliticsinanoutstandingway.
- More iteration is needed for the elaboration of design, game mechanics connect analog and digital potentials within the didactics of politics in an outstanding way.

Lessons learnt:

- Communicating with the help of a prototype is more effective than without such an aid and allows for more precise discussions.
- Students more eagerly discuss political topics when they are not abstract, but linked to their personal experiences.
- Although stakeholders agree with the concept, the need for one of our group members to be present. We also found that politics is not abstract, but linked to their personal experiences.

Opportunities:

- The concept is prototypical for future development in educational games for social science subjects.
- The game raised interest from relevant publishers for politics education materials.

Threats:

- Tablets are required and this may be a disadvantage for schools in poorer/rural regions.
- The game experience is more engaging than without such an aid and allows for more precise discussions.

1. Background

Dingpolitics & The Fun of Discovering Politics in Daily (Student) Life

- We decided to make a game that allows students to discover that politics is not something that exists in the far universe of national capitals or exclusively within the realms of the European parliaments. Quite the opposite is true: Politics touches upon all aspects of our lives. With this conception of politics at the back of our minds, we set out to conceptualize a fun, engaging game for students. After all, today’s students are the tomorrow’s voters!

- Research indicates that different methods and tools support different learning environments, opportunities and cultures. Thus, variety can positively impact the learning process, especially if the tool is fun, motivating students and feeding their interests (Lang, 2002). We found that history and social studies lessons are valuable for building a solid foundation about the macro- and micro aspects of political processes, historical developments and what democratic decision-making means for a society, yet it did not leave overmuch room for discovering how politics figure in aspects of everyday life. Instead of looking at seemingly “hard facts,” we wanted to see how artifacts that surround every student assemble and disassemble. The cross on the wall, the elevator button is fun; the cross one each wall of Bavarian classrooms for instance. This has the power to separate and divide as much as it can serve as a unifying symbol for groups. We decided to make a game that allows students to discover these patterns. It was very important to us that the game should be fun and engaging, nurturing a desire to learn more. We wanted to create a game that allows students to discover that they too, are part of the entanglements, that they should want to reflect upon political questions and to see how and why politics are relevant in their lives. Many people say that young people today, specifically the ominous “Y” have no interest in politics whatsoever. Studies show that this is far from the truth and our work with the students on the project reaffirmed these findings (Deutschland, 2015). Students today have a higher interest in politics than the generation before. And how could they be political in a world where in times of Brexit and Trump, it is times of Brexit and Trump, it is not abstract, but linked to their personal experiences.

The renowned French philosopher, anthropologist and sociologist Bruno Latour calls it “Back to Things? How does this a-political? They are growing up in times of Brexit and a Trump presidency, after all. Our presumption on embarking on the creation of the game was never that there is a “deficit” of student political knowledge or engagement. Instead, we wanted to create a game that reaffirms their curiosity and that can be a fun add-on to the syllabus. Our team took a lot of time and effort to research which didactical methods would best fit our purpose. In Germany, there is an excellent base of political games and simulations that have been developed by political organizations, both state-run and non-profit. The German Federal Agency for Civic Education (Bundeszentrale für Politische Bildung) offers various online and offline formats, for all age groups (Bundeszentrale für Politische Bildung, n.d.). Foundations that are associated with political parties offer other opportunities to learn about politics (e.g. Friedrich Ebert Stiftung, 2018). Most of these games are simulations or workshop-events. We quickly decided that we wanted to create something that could be used in the future as well, as opposed to a one-time event. A digital application seemed to fit the bill quite well. It can be uploaded to the app store and installed on devices, without the need to send out physical materials, and without the need for one of our group members to be present. We also found that an educational app has a novelty factor for most students, so to speak. It is quite a thrill to discover that seemingly mundane things are not simple truths but complex assemblages that convey meanings, opinions and theories. Consider the cross on each wall of Bavarian classrooms for instance. This has the power to separate and divide as much as it can serve as a unifying symbol for groups. We decided to make a game that allows students to discover these patterns. It was very important to us that the game should be fun and engaging, nurturing a desire to learn more. We wanted to create a game that allows students to discover that they too, are part of the entanglements, that they should want to reflect upon political questions and to see how and why politics are relevant in their lives. Many people say that young people today, specifically the ominous “Y” have no interest in politics whatsoever. Studies show that this is far from the truth and our work with the students on the project reaffirmed these findings (Deutschland, 2015). Students today have a higher interest in politics than the generation before. And how could they be political in a world where in times of Brexit and Trump, it is not abstract, but linked to their personal experiences. 
which makes them even more eager to try our game. Combining the digital with a walk around the school building was also a conscious decision. It gives students a break from sitting and listening and lets them see their everyday surroundings in a new light. Our game, PiA (PiA StreetScience), combines all the features that we felt were most conducive to facilitating political education: it is eye-opening, engaging, fresh and most of all – fun!

2. Goals and Methods

Although there is plenty of political games in didactics, our research and reflections suggested that a game set up on digital devices would be beneficial to interest students in politics and in search and reflections suggested that a game set up on digital devices would be beneficial to interest students in politics and increase their competences. Political education would become more attractive and students would be more interested in continuing to learn about politics. Students in political topics and increase their competences to reflect on and deal with political phenomena. PiA was designed to be a serious game. Serious games are ‘serious’ because they are designed to improve education and/or learning in an enjoyable and entertaining way. As previously mentioned, Hans Piaget has diagnosed issues in distinguishing politics-relevant competences from other competences. By creating a serious game, we hope to address these issues.

We want to design an interactive political diagram for students that can provide knowledge to engage with related deliberative processes/controversies, and foster critical thinking and a self-reflective approach to the world of politics.

b) Provides knowledge to engage with related deliberative processes/controversies, and:

According to our hypothesis, this game would be able to succeed in these goals, thereby becoming a prototype for future political serious games. PiA would become combination of a classical scavenger hunt through classroom and school building with a quiz about the politics behind common objects in these spaces. It would be staged on a portable digital device to meet demands for durability past our project phase, for effects of excitement by novelty and relatability for the students.

In the game, the students walk around the school building and search for clues of politically relevant topics in everyday life. They follow the story of PiA, a fictive member of parliament, who has to collect information on different topics before voting in favor or against a policy. The five topics that we included in our game are: (a) education, (b) employment, (c) environment, (d) health, and (e) housing.

In order to prevent the students from seeking the help of external sources to find the correct answer, there is a time limit on each question. Additionally, there is a ranking of the students in respect to their performance in the quizzes. The printed names are nicknames which the students have chosen when starting the game. For each topic, there is a pie chart depicting the overall opinion of the students on the given question. This data is used for an in-class discussion after the game.

The following example illustrates the process of playing one station:

The students find a QR code located at a clock. They scan it and receive three videos dealing with the topic of all-day schooling. The videos talk about the pros and cons of all-day schooling and sum up the current political situation in Bavaria. After watching the videos, they answer four questions on the information discussed in the videos. In which city is the Bavarian Ministry of Education and Culture located?

a. Munich
b. Forth
c. Augsburg
d. Nuremberg

Upon completing the quiz, the students are prompted to answer a question on their opinion:

Do you reckon that the state should invest more money in the expansion of all-day schooling?

At the end of the game, two kinds of charts are automatically generated by our web server and these can be reviewed by the teachers. So far, our game has been played in three Bavarian schools with six classes in total. The students were either in eighth or ninth grade.

3. Outcome and Discussion

From the results of the evaluation, it was possible to observe the different perspectives of teachers and students. With the help of the teacher, we evaluated the reactions of the students during the session. All of the teachers who have been interviewed through the

Figure 1: This bar chart shows the distribution of all-day schooling among the students in one of our classes in a visual form. The bar represents a list of students and shows the number of students who voted for all-day schooling out of a total of 30. The nickname list that has been chosen by the students themselves.
The students’ opinions have been evaluated by two separate surveys: one before the activity with PiA and another one afterward. The majority of the students participating in the study were male (68.5%) and studying in the 9th grade (70%).

The study before the activity recorded a rather low interest in politics, as shown in figure 1. A reason for this apparent lack of interest might be that the students did not recognize the involvement of politics in daily life, as we observed in the study results represented in figure 2 and figure 3. This result does not match with broader studies about political interest in the current generation that we have investigated during our project (i.e., Shell Study). The reason for this discrepancy might be the different scales of the studies. While large-scale studies offer a considerably higher amount of better-refined elements, the PiA project was structured in a simpler manner and was also constrained by time and by the size of the sample reached (106 students).

From the evaluation form that the students received after playing PiA, the students’ impressions regarding the PiA project have been evaluated. In general, the majority (81%) considered the activity entertaining. The figure of the Assemblywoman, Pia, was interesting for 44%, while almost 41% gave an average evaluation of it. Nevertheless, almost 91% of the students expressed a willingness to play something like PiA again, since the majority found it easier to concentrate on the topics than during a conventional lesson, confirming the teachers’ impression. What also becomes clear from the evaluation process is that the students particularly enjoyed the interaction with each other and the fact that the activity had to be conducted in teams. After the project, there was only a slight increase of students more interested in political topics than they were before, as shown in figure 4. However, from the results depicted in figure 5 and figure 6, students seem to have changed their opinions regarding the impact that political decisions can have on their daily life at school. Additionally, students felt that the commitment of politicians to students’ interests is not high enough.

Looking at the technical aspects, the students evaluated the App as not too fast, the graphics as amusing and the quizzes as not too easy nor too difficult. However, the students considered the amount of text excessive.

From the study’s results, it was unfortunately not possible to give a definitive evaluation of the competences of students regarding politics. In fact, this was not the aim of the project, since further scientific research in the sector of civic education has to be conducted in order to go deeper into this topic. However, it appears very clearly from this specific project evaluation, that a playful or play-related way of learning consistently increases the concentration and motivation of students. This might be reflected not only in greater competence and knowledge but also, as observed in the evaluation results, in the general enhancement of political interest among the participants. Additionally, students have recognized the influence of politics in their daily lives, which could raise their future participation and active interest in political topics.

Figure 2: This pie chart shows the answers of the students in one class to the question above. The green part shows the advocates of the idea, the red part shows the opponents.

Figure 3: Question from the study before the activity: “I am interested in Politics.” Answer: Yes, absolutely – Absolutely not.

Figure 4: Question from the study before the activity: “Political decisions have an impact on my daily life.” Answer: Yes, absolutely – Absolutely not.

Figure 5: Question from the study before the activity: “Politics does nothing to do with my life.” Answer: On the contrary, it has a great deal to do with it – Nothing at all.

Figure 6: Question from the study after the activity: “I am interested in Politics.” Answer: Yes, greatly – Absolutely not.

Figure 7: Question from the study after the activity: “Political decisions have an impact on my daily life.” Answer: On the contrary, it has a very strong influence – Nothing at all.

Figure 8: Question from the study after the activity: “Politics does not have anything to do with my life.” Answer: On the contrary, it has a great deal to do with it – Nothing at all.

Figure 9: Question from the study after the activity: “Politicians do not greatly concern themselves with students’ interests.” Answer: Yes, I completely agree – No, I do not agree at all.
4. Summary and Future Goals

Contrary to common misconceptions of generation “C” today’s students have a higher degree of interest in politics than previous generations (Deutschland, 2015). We aimed to reinforce this political interest in high school students, contributing to the political education of tomorrow’s voters. The significance of politics in aspects of everyday life is under-represented in current political education, which could not be measured by an educational tool that would allow students to discover the complexity of political opinions and decisions embedded in everyday artifacts around them. By acknowledging this complexity within the school surroundings, students are encouraged to realize the relevance of politics in their daily life.

We created a mobile app that invites students to explore the politics behind their school surroundings in an active and engaging way based on a scavenger hunt in the school building. The narrative is that the students slip into the role of PiA, a member of parliament, and allows them to follow her daily schedule. In the app, students team up in small groups and watch videos to acquire knowledge and answer quizzes. Further, forming and giving one’s opinions is required for each topic. Both the quiz results and the distribution of opinions within the class can be visualized using a digital platform. The app and supporting material allow teachers to employ it without the assistance or presence of a team member. Therefore, PiA is now independent of its developers and might be able to reach more students in recognizing the importance and impact of politics in their daily lives. Finally, we hope that PiA supports teachers in their endeavor to educate politically interested and committed voters.

In all, our project shows that an interactive and engaging educational app can increase awareness of the importance of politics in students’ daily lives. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. As our primary interest was not to rise from rags to riches and to commercialize our project, nor to get involved with a political foundation etc., to transferring the project to a publishing house. But the effort we put into our project was not in vain. The best results we could not be measured and needs to be addressed by further development, we can now support our new partners with tips and ideas regarding further improvements and supplementary features. With great interest and pride, we are very much looking forward to observing how our project continues to “live on” and to doing our best to provide continuing assistance.

Furthermore we are glad to announce that many of the schools we visited during our project trial phase were so convinced by PiA that they have decided to run the digital political scavenger hunt with their own class and thus higher numbers of pupils. The best feedback we could possibly have wished for!
“Why do you think that high school students in particular should be given a better understanding of politics?”

“High school students are tomorrow’s electors and will influence and form our democracy of tomorrow. Therefore we cannot accept disenchantment with politics to spread and young people to be influenced by populists. This statement from one of our members sums up well our initiative to illuminate political education in German high schools. However, during the first weeks and especially in autumn 2017, we had some difficulties in concretizing our visions and transform it into a feasible project: “We discussed a lot but accomplished little.” This tested our motivation and we had some weeks with little progress. Our mentors and tutors helped us during these times of drought with practical recommendations (e.g., doing a timeline) and provocative questions like “What is your hypothesis?” and “How could this be realized?” However, when we overcame these early difficulties, our motivation and commitment to our developing project returned. “When we gained a common vision and our ideas took better shape, the atmosphere as well as motivation improved drastically.”

Another obstacle that had to be overcome concerned the management and coordination of our ten member group. Among those ten members, two were not located in Munich for nearly the whole project phase. “I welcomed it greatly when we decided to nominate a ‘liaison officer’ with special responsibility for communicating with the ‘foreigners’. This improved collaboration beyond Germany’s borders.” This member took responsibility for allocating current tasks and overseeing their fulfillment, as well as for communicating progress and issues at hand.

“Politics are very important and to engage in it is fun! Unfortunately, in the curriculum there is not much opportunity to teach more than fact-based knowledge. We wanted to improve this.” This statement sums up perfectly why we opted for “Politics and Fun” as our preliminary team name. We always aimed to promote something innovative and different from pre-existing classroom methods. Our mentors encouraged us to pursue this idea, giving us advice on how to realize it and raising awareness of how we can indeed make it pleasurable to play. “Bread and circuses – a concept that has been used for a long time. Young people can be addressed and wowed a lot better through playful methods. When something is fun, one likes to engage in it and tells others about it. To make it fun was, for sure, very important for us!”

But it was not only fun that was of high value for us, we also aimed to convey a message. We decided to thematize “politics in everyday life,” as we, too, were interested in areas where we are in contact with politics without realizing it. “We interact with many juridically detailed regulations every day without noticing it. Especially the complexity of the interaction of communal, cantonal and federal institutions surprised me.” For the stations of our treasure hunt, we chose controversial topics that could be related to objects found in every classroom or high school building. As the evaluation showed, students and teachers welcomed these new perspectives. It also illustrated that our initial hypothesis about students lacking political interest and motivation was not correct. Instead they demonstrated substantial knowledge and interest in discussing current topics. As one of our team members said: “I was astonished by how much the students know about politics and how thoughtfully they can advance their views. It is not true that students are not interested in politics. On the contrary, in these times of Trump and Brexit, rather the opposite is true. This intrinsic motivation makes it easier for us to make everyday politics also seem accessible.”

However, our goal was not only to create a pleasurable way to convey knowledge, but also to extend and diversify currently predominating classroom methods. We decided to do so by creating an App and, in this, we were greatly encouraged by our mentors and tutors, respectively. Although we were faced with a variety of difficulties to overcome – such as the commissioning of a server and the immense workload of programming for which only one of our team members was qualified – we eventually finalized a functioning and attractive App. We believe that by choosing a technologically up to date pedagogical approach, we ensured its appeal and sustainability. And, as the evaluation showed, students agreed and appreciated the opportunity to work on a tablet. As one PIA-Member phrased it: “It was my dream to create something sustainable. And I think we managed to do so!”

Of course we could not have realized our project without the great help of our three mentors, Prof. Dr. Sabine Maasen, Prof. Dr. Stefan Wurster and Dr. Alexander Lang. Their valuable advice was always welcomed and their in-depth knowledge and variety of contacts were a big asset to us. Thank you very much! We would also like to acknowledge the guidance provided by our tutors, Dominik lieber, Rupert Heindl and Matthias Lehner. Their practical advice on every step of our project navigated and helped us throughout. Thank you! Furthermore, we would also like to thank our partners, in particular PiXIDA, for help with the setup of the server, but also the regional high schools that gave us the opportunity to field-test our App. Thank you!
POSTER 1: This poster was our team’s contribution to the TUM: Junge Akademie’s annual conference 2017. Prior to the design of this poster, we had split from what would become Team Mucme. Parting ways had become necessary due to different opinions about:
a) whom we wanted to address as the target group of our project;
b) the tone of addressing them; and
c) how to coordinate a group of more than a dozen people.

After distilling two tendencies of interest and splitting groups, we explored and formulated our common ground. As this poster demonstrates, we decided:
a) to address students in secondary schools; and
b) to do so in an entertaining and amusing manner in order to stimulate their interest in politics.

The hypothesis is derived from the connection of these positions. Question c) was partly answered by reducing the number of perspectives in the group down to ten and sorting out our common interest. Additionally, we tested elements that would foster our team-building, such as the slightly provocative Trump-meme and fitting caps. We were playing around with the topic of “fake news” and “trolling” at that point of the process and irritated or amused reactions both allowed for a feeling of belonging to this team.

POSTER 2: Over the fourth quarter of 2017 we had to deal with many important decisions for the further course of our project. A major challenge we faced during this phase was the prolonged absence of a number of our team members. While we had known about this likelihood beforehand, it made the decision-making process itself problematic. When are we making this or that decision? Does a decision need to be backed up by everyone or does a majority vote always triumph over minority opposition? What about the votes of the team members abroad? How long should we wait for their responses?

On poster #1 we had written down the next step: We would need to research into the didactics of politics already existing. Distributing this task among team members was feasible, yet it delayed us from confronting these organizational questions. We knew that we wanted to come up with an entertaining way to teach about political topics, but at this stage we had to face more difficult sides of politics ourselves.

This situation kept us revolving around issues for a longer time than we had hoped. On the one hand, this predicament was slowly draining our motivation. On the other, it made us more pragmatic: We decided to elect a person responsible for scheduling tasks and decisions and for firmly reminding members that we would move along if they had not voted by a certain deadline. Decisions would now be suggested after face-to-face meetings and online tools would allow absentees to veto.

As a result, this poster offers a more concrete vision of how we decided to develop the project. Choosing a digital application instead of analogue-only methods proved controversial in our team, partly because it set so much of the course of how we would work together in the coming months. The timeline would change only slightly, although it was in peril shortly afterwards.
POSTER 3: An app’s interface does not tell you about the background struggles, compromises, workarounds and decision-making in a non-ideal world. All these challenges disappear behind smooth design, intuitive control, and transitions faster than eyes can track. Accordingly, this poster reports our project’s progress as if surrounding conflicts had never occurred.

When we made the controversial decision to focus on a digital application, we did so on the basis of an estimation of our resources. Unfortunately, it turned out that we were misinformed about the financial part of them. Barely had we nursed our bumps from the fights over digital vs. analogue, when this blow put us into crisis mode. We tried to reconfigure our timeline and redistribute tasks, but it was an evening walk together in the foggy Isar valley at the interim evaluation weekend at the end of January 2018 which restored our belief that we could nevertheless realize our project.

POSTER 4: Finally, we achieved the goals we had set. We were incredibly happy to see our app in completion. Unfortunately, there still was an issue to address, and that was the export to the iOS platform. We had previously tested the app on Android devices and had fixed the biggest bugs. But the devices that the TUM School of Education lent to us ran with iOS. The development policies of Apple made it much more difficult to build our app for iOS devices. In the end, we used up most of the two days before our first test run with trying to deploy the app to the devices.

But the effort we put in was not in vain: we were eventually able to make it work and to test the app in three schools. We were happy to see that the children were intrigued by the unusual format of lecture that they had the chance to experience. Also, we received positive feedback from the teachers. We were glad of all the experiences that we encountered during the project. Although we had our ups and downs, it all paid off in the end. Not only did we make a great project come to life, but we also – and more importantly – made new friends.
Management and Communication of Knowledge

Within the projects of the TUM: Junge Akademie, students learn, in interdisciplinary groups, systematic project work on an exemplarically socially relevant scientific topic in preparation for their future professional practice in a permanently changing world. Our project group has been formed with the topic “Management and Communication of Knowledge” in mind. It was clear from the outset that, within this very broad area, a more specific and delimited project had to be defined. The project group had set itself the goal of finding new ways to achieve more public interest in science and the students of the project group discussed ways to develop a new format in which scientific results could be conveyed to a wider public.

After thorough discussions of various options, the students proposed the idea of presenting interesting areas of TUM research at an information booth at the Munich Street Life Festival. The Street Life Festival is a street party in Munich that has been organized since 2000 by the environmental organization “Green City.” Core topics are environmental protection, healthy living, urban design and renewable energies. The Street Life Festival is held twice a year, on a weekend in early May and early September. Its many showplaces attract numerous visitors. In recent years, about 250,000 people have visited the festival on each occasion. With its comprehensive technical equipment and infrastructure and its relaxed atmosphere, it offers ideal conditions for dialogue with the public and the organization of an interesting supporting program. People visit the festival for entertainment and the idea was to attract people to the TUM booth by offering entertaining presentations of serious scientific research and thus encouraging a greater interest in TUM research and a broader understanding of its significance. The students set themselves the goal of increasing awareness of the importance of public knowledge via public engagement of TUM scientists and of disseminating knowledge and raising enthusiasm for knowledge in wider circles of society. Research should be understood and made comprehensible in its meaning as a well-founded scientific activity, yielding consolidated and well-founded scientific knowledge. For the project group, the scientific aspects of the project consisted in the conception, planning and execution of the event and, in particular, the systematic evaluation of the audience’s reaction.

The idea was implemented through the conception and realization of the StreetScience event, in which scientists directly reported on their research at first hand. The first StreetScience event took place on Munich’s Leopoldstraße as part of the StreetLife Festival on May 5 and 6, 2018. For this purpose, and in a good location, a 50m² TUM-flagged tent with information booths and benches was built for the public.

The project group was able to attract an impressive number of TUM scientists to give presentations. Worth mentioning here is the enthusiasm with which renowned TUM scientists agreed to participate, as well as the fact that they then invariably captivated their audience with their excellent performances. The TUM scientists had one hour each for their presentations. This time was filled with demonstrations, short lectures, and answering questions from the audiences. The selected format very effectively engaged the interest of the audiences while also clearly conveying the scientific subject-matter. Children were welcomed and were encouraged to learn playfully from small experiments.

For the project work, a hypothesis was first established and this provides the basis for a systematic evaluation. This evaluation will consist of two questions:

- Did we reach the desired target group with the event?
- Did we achieve the desired effect with this method of knowledge transfer?

Questionnaires were prepared for the StreetScience events in May and September. By ascertaining the socio-demographic characteristics of the visitors, it was determined whether the visitors at the stand constituted a representative sample of the general population. The qualitative comment fields allowed for an evaluation of both the speakers and the event. There were also questions facilitating the evaluation of the event’s impact on the audience.

With the development of the event format for StreetScience, the Group “Management of Communication and Knowledge” has performed excellently and has demonstrated its ability to cooperatively and creatively execute an interdisciplinary project in an impressive manner. We strongly suggest that this StreetScience event should be continued and developed further by TUM in the coming years.

The task of the mentors and tutors was to share experience and knowledge with the students to help the progress and success of the project. The mentors guided the students through sensitive leadership and supported them as much as possible in developing their ideas, both on their own and within the group work. As the project progressed, the students made excellent progress and finally carried out the project completely independently, achieving a really impressive result.

At present, the systematic and scientific evaluation of the project has not yet taken place.

Ernst Mayer and Peter Russer

Ernst Mayer and Peter Russer
How to escape the ivory tower

To tackle the crucial problems of the future, further advances in science will not be enough. How, then, to escape the ivory tower? It is necessary for society to reconsider its behavior in accordance with the concerns identified by scientific methods. This process would need a general consensus on which predictions we consider to be reliable and on which our actions should be based. The issue of trust in science and its method must be addressed. Scientists must consider what new forms of communication will be needed to foster a true dialogue with the scientist. Lastly, as with all rock stars, the trust is bound to the individual. Problems arise when the audience one thing clearly: Acceptance of opinions over fact, high. Science has always been humanity’s best tool for searching for objective truth. However, trust in the method and in the community that wields this tool has decreased in the last half century. To re-establish trust in the scientific method and community, it is not enough to communicate this crucial information. To reduce the perceived distance between society and science and to involve both in a process of integration, society into science and science into society.

Science communication

Science journalists are not the place where the new-est scientific discoveries are communicated. Museumson the other hand, have emerged. Some mostly communicate about their own personal motivation of researching scientists are just as important. This means many scientists have to be motivated to communicate science to the broad public. Institutions like StreetScience and take an interest in science without practical expertise, and new ways have to be found to advance the mission of disseminating scientific knowledge in society and to encourage society to view science as an integral part of its general culture. Science communicators have to find the right formats to communicate science in open, non-scientific venues and still preserve the idea that science serves the search for truth and advice for the public. The approach is, if a large number of research scientists are involved in the endeavor, which makes this transformation of science communication also a problem of how to transform the view of scientific institutions as to what their scientists should be rewarded for. Furthermore, new formats of science communication have to complement the old, taking the process outside the enshrined loca-
tions such as research institutes. This is step one of culture transforms how we live our lives. As part of culture, science should not be reduced to the communication of findings. The process of how scientific discoveries are made and the personal motivation of researching scientists are just as important. Science has to be communicated by many researchers to have broad, high quality interaction between the public and science. The same conclusion was already drawn in 1985 by the Bod-mer report which describes it as “each scientist’s professional responsibility”2. This means many scientists have to be motivat-ed to engage in science communication with the public. This is still a problem, although finding fits with the topic has never been easier in Germany. Nowadays mostly reward them for high quality research and the number of talking directly to the research scientist and are located in places exclusive to the purpose of science communication.
StreetScience represents a format for science communication in a report of embedded lectures, experiments and exhibitions of science at a leisure-oriented festival.

Over both iterations of the event in May and September, we welcomed over a dozen scientists from TUM at the local Streetlife Festival Munich where they presented and discussed their research in front of roughly one and a half thousand pass-by visitors.

Using questionnaires completed by visitors during the festivals, we were able to prove that the format generates interest, is independent of publicity, and attracts visitors who pass-by visitors.

The composition of the team facilitated organization, given the representation at TUM and different faculties were represented within the team.

We were in general able to include topics from all subjects represented within the team.

Over both iterations of the event in May and September, we were able to prove that the format generates interest, is independent of publicity, and attracts visitors who pass-by visitors.

The Streetlife Festival offers multiple forms of distraction and unpredictability. Academic controversies about elemental contestations mostly within the scientific community formed the fact-based side of communicating science. The involvement of the society as a wider public for scientific insights took place in the form of cabinets of curiosities or similar approaches. These neglected relevant scientific backgrounds and the underlying scientific debates in favor of capturing the public attitude towards science, which strongly affects opinions on the public funding of research. Consequently, the focus of research switched towards the changing of attitudes and the understanding of science [5]. The overall goal of the following actions was summed up under the term of “public understanding of science” (PUS), which was coined and further defined in a report of the Royal Society [7]. The report not only claimed that the gap between society and the scientific world increased as a result of specialization, but also stated that as a consequence the

StreetScience – Reaching the unreachable? Embedding science communication in cultural events

Science communication is a vital element of scientific culture and even more relevant in these days of a more critical society. To reach people who are deemed outside of the range of conventional events for science communication we created a format embedded in a non-scientific event, the Streetlife Festival in Munich. The event attracts different sorts of visitors than comparable conventional formats of science communication. Additionally, the event creates a similar amount of “Situational Interest” as an exhibition at the "Deutsches Museum". The museum’s validated scale was adapted and included in the questionnaire to have a comparable metric. Overall, an event was created that has the potential to be replicated by other institutions at other venues.

1. Background

1.1 Science communication – rising importance and ongoing problems

Since the early beginnings of science, the dissemination of knowledge was an important driving force for the process of generating discoveries. Academic controversies about elemental contestations mostly within the scientific community formed the fact-based side of communicating science. The involvement of the society as a wider public for scientific insights took place in the form of cabinets of curiosities or similar approaches. These neglected relevant scientific backgrounds and the underlying scientific debates in favor of immediately perceptible facts. A phenomenon still found today. During the 15th century, the commitment to communicating scientific insight and led to the emergence of popular science. In the expanding industry of print media, for example, the focus was increasingly on science. This trend was supported by multiple debates, including the question of the origin of life solved by Louis Pasteur and developments challenging the prevalent worldview such as the Darwinian theory of the evolution of life. Even scientists themselves contributed to such popularization, using the

In this report, defined as “scientifically proven information” [1]. The set of such lectures was already being questioned at the time by contemporary newspapers [8].

3 Defined as every person in society and, consequently, a very heterogeneous group composed of many different groups with different needs, interest and attitude [4].

StreetScience
One important aspect of the above definition is the focus on the scientist to try to work against this rift. Bodmer calls upon scientists to take responsibility for improving science communication in order to increase the understanding and acceptance of science. However, the public attitude towards vaccination suggests that this can be challenged [8]. Despite improved sharing of information, no increase in the willingness for vaccination was found. It was shown that the opposite effect can occur and that in those cases, acceptance declined, or negative opinions were strengthened (the model did not necessarily re-acceptance but sometimes also encouraged skepticism and uncertainty. This finding led to a paradigm shift in science communication. Instead, we focus on the turn of the millennium. The deficit model was exposed as incomplete and error-prone and replaced by a dialog-based approach, practiced under the term of “public engagement” [9].

1.2 The principles of Public Engagement

Ever since it was coined in the late 1990s plenty of different de-scriptions and definitions have been offered for the term Public Engagement (PE). From the United Kingdom, it has spread around the world and, with increasing proliferation, variations of the term have occurred. As we seek to encompass a wide range of bene-fits, the definition of the National Coordinating Centre for Public Engagement (NCCP) is applied in this study [10].

“Public engagement describes the myriad of ways in which the activi-ty and benefits of higher education and research can be shared with the public. Engagement is by definition a two-way process, involving interaction and listening, with the goal of generating mutual benefit.”

On the one hand, there are permanent venues, like museums ded-icated to scientific knowledge such as the Deutsches Museum. These institutions present information throughout the year – mostly in the form of exhibitions. This limits the potential information gain to the presented content. Additionally, the degree of understanding is in the perception depending on the visitor. On the other hand, there are projects which only take place on specific days in the year. For example, universities and other scientific institutions present their work on multiple occasions and at various venues during “Münch-ner Wissenschaftstagen,” and also during open-door days at their own facilities. Even public lectures take place either in lecture halls or at other places, e.g., TUM@Research. These institutional projects are complemented by smaller events, like occasional science slams, “Wissenschaft im RWTshs,” and science cabaret.

The shared pattern is that all of the events listed above take place in a venue associated with science or specifically designed to communicate science. This limitsthe potential information gain to the audience to interact directly with science. People with a low interest in science or those who may feel intimidated by science are less likely to be attracted. This raises problems if the whole population is to be reached by science communication.

2.2 Quantitative evaluation

The evaluation of our venue is divided into two subcategories. Primarily our evaluation consists of the testing of our initial hy-pothesis: “Science communication embedded in a public event can reach an audience that better reflects the public structure.” And second, it was shown that classical formats of scientific presenta-tion consisting of a lecture and a question-session have worked well in the context of similarly structured presentations on other occasions. This in turn implies a research potential in the area of sci-enfific issues [16]. Hence, we approached scientists from almost all fields of study represented at Technical University of Munich (TUM) and asked them to give short lectures including the opportunity for questions during and after the talk. To encourage the audience to engage and ask questions, a non-scientific moderator supported the speaker. The lectures were held in a tent-like structure providing seating for around 30 persons. In addition, an unoccupied area provided space for at least one exhibit visible from the far dis-tance to help attract passerby. Therefore, the majority of visitors are projects which only take place on specific days in the year. For example, universities and other scientific institutions present their work on multiple occasions and at various venues during “Münch-ner Wissenschaftstagen,” and also during open-door days at their own facilities. Even public lectures take place either in lecture halls or at other places, e.g., TUM@Research. These institutional projects are complemented by smaller events, like occasional science slams, “Wissenschaft im RWTshs,” and science cabaret.

The shared pattern is that all of the events listed above take place in a venue associated with science or specifically designed to communicate science. This limitsthe potential information gain to the audience to interact directly with science. People with a low interest in science or those who may feel intimidated by science are less likely to be attracted. This raises problems if the whole population is to be reached by science communication.

2.2 Quantitative evaluation

The evaluation of our venue is divided into two subcategories. Primarily our evaluation consists of the testing of our initial hy-pothesis: “Science communication embedded in a public event can reach an audience that better reflects the public structure.” And second, it was shown that classical formats of scientific presenta-tion consisting of a lecture and a question-session have worked well in the context of similarly structured presentations on other occasions. This in turn implies a research potential in the area of sci-enfific issues [16]. Hence, we approached scientists from almost all fields of study represented at Technical University of Munich (TUM) and asked them to give short lectures including the opportunity for questions during and after the talk. To encourage the audience to engage and ask questions, a non-scientific moderator supported the speaker. The lectures were held in a tent-like structure providing seating for around 30 persons. In addition, an unoccupied area provided space for at least one exhibit visible from the far dis-tance to help attract passerby. Therefore, the majority of visitors are projects which only take place on specific days in the year. For example, universities and other scientific institutions present their work on multiple occasions and at various venues during “Münch-ner Wissenschaftstagen,” and also during open-door days at their own facilities. Even public lectures take place either in lecture halls or at other places, e.g., TUM@Research. These institutional projects are complemented by smaller events, like occasional science slams, “Wissenschaft im RWTshs,” and science cabaret.

The shared pattern is that all of the events listed above take place in a venue associated with science or specifically designed to communicate science. This limitsthe potential information gain to the audience to interact directly with science. People with a low interest in science or those who may feel intimidated by science are less likely to be attracted. This raises problems if the whole population is to be reached by science communication.

2.2 Quantitative evaluation

The evaluation of our venue is divided into two subcategories. Primarilyour evaluation consists of the testing of our initial hy-pothesis: “Science communication embedded in a public event can reach an audience that better reflects the public structure.” And second, it was shown that classical formats of scientific presenta-tion consisting of a lecture and a question-session have worked well in the context of similarly structured presentations on other occasions. This in turn implies a research potential in the area of sci-enfific issues [16]. Hence, we approached scientists from almost all fields of study represented at Technical University of Munich (TUM) and asked them to give short lectures including the opportunity for questions during and after the talk. To encourage the audience to engage and ask questions, a non-scientific moderator supported the speaker. The lectures were held in a tent-like structure providing seating for around 30 persons. In addition, an unoccupied area provided space for at least one exhibit visible from the far dis-tance to help attract passerby. Therefore, the majority of visitors are projects which only take place on specific days in the year. For example, universities and other scientific institutions present their work on multiple occasions and at various venues during “Münch-ner Wissenschaftstagen,” and also during open-door days at their own facilities. Even public lectures take place either in lecture halls or at other places, e.g., TUM@Research. These institutional projects are complemented by smaller events, like occasional science slams, “Wissenschaft im RWTshs,” and science cabaret.

The shared pattern is that all of the events listed above take place in a venue associated with science or specifically designed to communicate science. This limitsthe potential information gain to the audience to interact directly with science. People with a low interest in science or those who may feel intimidated by science are less likely to be attracted. This raises problems if the whole population is to be reached by science communication.
cial to the improvement of the event, as it gives insight into both the positive and negative experiences of all participants and can be used to further explore new scientific questions regarding the topic. The measurement was done by means of an anonymous questionnaire. Filter questions were used to determine the participants and to remove those who did not participate in our formats.

2.2 Sociodemographic analyses
The first part of our quantitative analyses tests our claim as to whether or not we reached an audience more representative of the public than other events. We measure the sociodemographic characteristics of our audience and compare it with the local population and audiences of other science communicating events and venues. More specific questions determine the audience has a higher interest in science (e.g., because of an academic background) than the average population. Another question explores whether our audience visits other events or venues and consumes media that communicates science to determine if they have needed the perception of StreetScience from another source or like social media to have the impulse to visit StreetScience when they saw it during their general visit. Visitors from category 3 may have heard of StreetScience from another participant in another category.

2.2.1 Sociodemographic analyses
One of the reasons why we planned to communicate science in a non-science-related public venue is the attraction of visitors that do not expect to encounter scientists talking about their work. For one, up-front advertising is not necessary to attract visitors. Second, the pass-by visitors that finally attended StreetScience took this decision without having to drive to a specific science communication venue. For this reason, they might be different from visitors of other science communication venues.

2.2.2 Pass-by visitors and degree of engagement
Before the festival, a minimal amount of advertisement was done on various social media channels including those of TUM and other stakeholders in the project. To determine the relation of pass-by visitors to those that planned to visit StreetScience two yes and no questions were asked in the questionnaire:

1. Did you deliberately come to visit StreetScience?
2. Did you know about StreetScience from advertisement?

The four different combinations of answers that can be given to these two questions assign any visitor to one of four categories (see table 1). Category 1 contains the expected pass-by visitors. Category 2 are those visitors attracted by the advertisement. Visits from people in category 3 and 4 are caused by being invited to the advertisement or the festival context. Visitors from category 3 may have needed the perception of StreetScience from another source like social media to have the impulse to visit StreetScience when they saw it during their general visit. Visitors from category 4 may have heard of StreetScience from another participant in another category.

Table 1: Classification of visitors to determine the impact of the advertisement.

<table>
<thead>
<tr>
<th>Categories/Question</th>
<th>1. Pass-by</th>
<th>2. Advertisement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deliberate</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2. Advertised</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Adv-Immune</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4. Secondary</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

In one question of the questionnaire, the visitors were asked about which activities they participated in. Visitors could indicate participation in multiple activities that were fixed on the questionnaire. These activities were not events on our program but a description of engagements possible at StreetScience. Further below they will be explicitly listed. In a second question, the visitors were asked to indicate if they agreed that it was interesting participating in the activities on a five-point Likert scale with the following options: “don’t agree at all”, “don’t agree”, “neither agree nor disagree”, “agree”, “totally agree”. This question served as a filter for non-participators. First, to filter out questionnaires of people who for some reason did not participate in any activity, an algorithm ranking activities based on ratings given by the same visitor was used. Not many visitors would participate in multiple activities and thus the interpercentral differences in how they rate the same degree of interest may give wrong results when averaging across all ratings given.

2.2.3. Our visitor at other venues
To determine if we reach an audience not captured by other types of science communication formats, we asked if our visitors had attended the Münchner Wissenschaftstagte, any open day initiative of a scientific institution or events like “Nacht der Wissenschaften” or “Lange Nacht der Universität” in the past two years. As a comparison, we asked the same about scientific museums and science festivals.

2.2.4 Determination of the situational interest by catch and hold analyses
Communicating science in the context of a street festival has similar goals as museums. Knowledge should be transferred, interest generated and to no specific audience but the general public. Museums are free-choice learning environments and the same can be said about science communication formats during a street festival. When trying to measure the generated interest in selected scientific topics, two types of interest can be distinguished: Situational interest and long-term interest. Situational interest is developed in a concrete learning environment [18]. It can be subdivided into two aspects: The catch-component describes the first appearance of situational interest when a person’s interest is aroused and directed toward an issue. The hold-component describes the longest-lasting and stabilized situational interest, where a person wants to deal with the issue more than once and perceives it more important and meaningful. In particular, the repeated activation of the hold phase is supposed to have a lasting impact on a person’s interest. The question is to understand the situational interest has already been shown to be crucial when trying to reach a museum’s audience and is therefore also a realistic aim for our format.

To measure the generated situational interest during the festival, the questionnaire used a validated set of items with a five-point Likert scale. The validation was done by removing items for each of the two corresponding scales. First, to filter out questionnaires of people who did not participate in any activity that people did not participate in and may have rated by mistake. The question that determined how strongly visitors agree that an activity was interesting served to determine which activities are important to get and keep visitors interested. To do this, an algorithm ranking activities based on ratings given by the same visitor was used. Not many visitors would participate in multiple activities and thus the interpercentral differences in how they rate the same degree of interest may give wrong results when averaging across all ratings given.

2.2.5 Indication for a long-term effect
As previously mentioned, situational interest is only one of the two types of interest one wants to generate with science communication formats. Long-lasting interest is the desired outcome and situational interest is supposed to lead to it [19]. However, measuring the long-term effect of science communication events is difficult. Rewards for participating in a long-term study have to be neutral so as not to further increase the selectiveness of an already highly selective sample consisting of people freely willing to participate in the studies. Handing out science-related consumables, such as entry tickets to a science museum, would have to be kept secret from the visitors until after they filled out the questionnaire so as not to influence participants’ intentions. In turn, this would mean that free entry tickets cannot be used as an incentive to attract the target group. This car-

StreetScience

TUM | Junge Akademie – Project Reports 2017/1

TUM | Junge Akademie – Project Reports 2017/1

120

121
2.3 Qualitative evaluation of the assessment of visitors and speakers

When evaluating the effectiveness of science communication events scientifically, quantiative, methods are not sufficient. Qualitative interviews are used to gain ecological and socio-economic information on specific conservation issues. They help to understand the knowledge, values, beliefs or decision-making processes of stakeholders, and strengthening research design and output as well as getting valuable feedback on how to improve the format. Although they are indispensable, their results and execution have to be discussed critically and transparency is needed on the sampling strategy and the choice of questions [23]. To meet these conditions, we designed a debriefing of the speakers containing the qualitative interview 2.3 Qualitative evaluation of the assessment where we asked all speakers the same nine questions. The first three focused on whether or not the speaker participated in other science communication formats, had thought that StreetScience was a valuable addition to these, and whether, after participating, helped them understand the point of view and concerns the own research and work. The last three questions asked for feedback on the format of StreetScience and an open question for general improvement advice and emotion-based experiences of the speakers. Because we did not want to scare off visitors during their leisure time, equally, it is important to capture with visitor the evaluation once. Doing a separate pre- and post-evaluation is not feasible because a visitor would have to be asked to take time twice for the evaluation process and not to scare off visitors during their leisure time. Equally, it is important to capture visitors with the evaluation once. Doing a separate pre- and post-evaluation is not feasible because a visitor would have to be asked to take time twice for the evaluation process unless one were to deploy a new type of evaluation that follows visitors throughout their visit of StreetScience. Gathering participants for a follow-up study is impractical as there would be either a specific subset of visitors that were more positively inclined toward the event or a subset motivated by a neutral reward offered to all visitors alike.

As of 2018, the collection of the necessary information for a follow-up study is even more problematic because of the newly established General Data Protection Regulation (GDPR) [24]. To argue about the effectiveness and efficiency of a new communication format, the comparison with similar formats is necessary. This, however, is only partially possible, due to big differences from established formats such as museums, for example. The only number of executed studies in the context of more similar formats. Especially in the case of similar events that took place in some public context, no comparable metric was available. This led us to compare our format with museum exhibitions according to the established metric of situational interest. When trying to compare similar formats to StreetScience one limitation hindered us from answering more precise research questions: the unavailability of raw data. This allowed us to only compare StreetScience with the published results of other formats but did not allow answering more differentiated questions on the composition of visitors.

3.1 Sociodemographic analyses

During the 8th and 9th of September, we used the same four questions to measure gender, highest acquired educational degree, and state of employment. For this reason, the results will be presented together and only relevant differences in the data will be presented. Such differences might exist because of the different seasons the two iterations took place in.

The variation for gender was negligible for StreetScience and Munich Wissenschaftern. When compared to publicly available estimates of the gender composition in society, StreetScience had a few more female visitors in May (f = 53.2 %, m = 46.8 %) and a few more male visitors in September (f = 47.7 %, m = 52.3 %). This, however, is only partially possible, due to big differences from established formats such as museums, for example. The only number of executed studies in the context of more similar formats. Especially in the case of similar events that took place in some public context, no comparable metric was available. This led us to compare our format with museum exhibitions according to the established metric of situational interest. When trying to compare similar formats to StreetScience one limitation hindered us from answering more precise research questions: the unavailability of raw data. This allowed us to only compare StreetScience with the published results of other formats but did not allow answering more differentiated questions on the composition of visitors.

3.2 Context-dependent limitations of the evaluation

StreetScience is implemented in the context of public non-science related events with an expected majority of pass-by visitors. For this reason, a questionnaire or interview for event-type science communication with an expectation to capture general improvement advice and emotion-based experiences of the speakers. Because we did not want to scare off visitors during their leisure time, equally, it is important to capture with visitor the evaluation once. Doing a separate pre- and post-evaluation is not feasible because a visitor would have to be asked to take time twice for the evaluation process and not to scare off visitors during their leisure time. Equally, it is important to capture visitors with the evaluation once. Doing a separate pre- and post-evaluation is not feasible because a visitor would have to be asked to take time twice for the evaluation process unless one were to deploy a new type of evaluation that follows visitors throughout their visit of StreetScience. Gathering participants for a follow-up study is impractical as there would be either a specific subset of visitors that were more positively inclined toward the event or a subset motivated by a neutral reward offered to all visitors alike.

As of 2018, the collection of the necessary information for a follow-up study is even more problematic because of the newly established General Data Protection Regulation (GDPR) [24]. To argue about the effectiveness and efficiency of a new communication format, the comparison with similar formats is necessary. This, however, is only partially possible, due to big differences from established formats such as museums, for example. The only number of executed studies in the context of more similar formats. Especially in the case of similar events that took place in some public context, no comparable metric was available. This led us to compare our format with museum exhibitions according to the established metric of situational interest. When trying to compare similar formats to StreetScience one limitation hindered us from answering more precise research questions: the unavailability of raw data. This allowed us to only compare StreetScience with the published results of other formats but did not allow answering more differentiated questions on the composition of visitors.

3.3 Sociodemographic analyses

During the 8th and 9th of September, we used the same four questions to measure gender, highest acquired educational degree, and state of employment. For this reason, the results will be presented together and only relevant differences in the data will be presented. Such differences might exist because of the different seasons the two iterations took place in.

The variation for gender was negligible for StreetScience and Munich Wissenschaftern. When compared to publicly available estimates of the gender composition in society, StreetScience had a few more female visitors in May (f = 53.2 %, m = 46.8 %) and a few more male visitors in September (f = 47.7 %, m = 52.3 %). This, however, is only partially possible, due to big differences from established formats such as museums, for example. The only number of executed studies in the context of more similar formats. Especially in the case of similar events that took place in some public context, no comparable metric was available. This led us to compare our format with museum exhibitions according to the established metric of situational interest. When trying to compare similar formats to StreetScience one limitation hindered us from answering more precise research questions: the unavailability of raw data. This allowed us to only compare StreetScience with the published results of other formats but did not allow answering more differentiated questions on the composition of visitors.
along with the age difference seen before but there seems to be no
deliberately intended to visit our stand and if they saw an adver-
possibility of showing how they are causally related. If we compare
the univeristy's social media channels. Additionally, a high number
of pass-by visitors indicated that the format is self-sufficient in an

closer to the scientific community because of advertisement over

% as visitors who were attracted because of advertisement. The
expected, 68% could be identified as pass-by visitors and only 8

the youthfulness of the sample. When looking at visits to other
venues, museums and scientific lectures during the course of the last two years – a fact
which is most likely to be attributed to the high number of students
among our visitors. 80% even visited a science museum in the last
two years, which may be due to the famous Deutsches Museum
located in Munich but might as well be positively correlated with
the youthfulness of the sample. When looking at visits to other

with dialogues and moderators for StreetScience.

Figure 3: Visitor types at StreetScience in relation to the impact of advertisements.

Figure 4: Situational interest.

3.4 Activities and rankings
We asked whether or not visitors took part in any of the following activities at StreetScience: “Listen to a presentation”, “talk to a scien-
tist”, “ask a question”, “view an experiment”, “look at an exhib-
it object” and “try something out”. When counting the number of the
different activities that were self-reported “listening to the presen-
tation of a scientist” was mentioned the most with 47 %, fol-
lowed by “looking at an exhibited object” with 18 %. According
to our ranking algorithm based on self-reported interest “listening
to a presentation” is ranked second place. With “trying something
out”. This emphasizes the importance of the lecture-style format
with dialogues and moderators for StreetScience.

3.5 Catch and hold analyses
From the answers to the five-point Likert scale, we computed the
generated situational interest and the sub-aspects of catch and
hold that we explained previously. Figure 4 shows the values and
the standard deviations. Compared with a report of the Deutsches
Museum regarding the exhibition "StreetScience: Biotechnology" [26]
we reach a very similar catch and hold ratio of the generated situ-
tional interest. Although being slightly lower, and with a slightly higher standard deviation, these results indicate the good
general arousal and retention of a visitor's interest during or his or her visit.
This is positive in the sense that, considering the less committed
audience in the first place, similar values of generated interest to a
museum's exhibition can be counted as a success.

We adapted a scale used and validated in the context of muse-
um visits and school teaching. So, the validity and reliability of the
scale in the new context can be questioned. To judge whether the
reliability of the scale is still maintained we recomputed the Cron-
bach's alpha values for the entire scale and all sub-aspects. With
the values for the situational interest (α = 0.866), the catch-com-
ponent (α = 0.81), and the hold-component (α = 0.836), the inter-
nal consistency can still be judged to be high enough for basic
research [22]. To identify the importance of the context commu-
nicated by the scientist and the scientist's style of presentation,
we filtered for the questionnaires of persons who “watched the
presentation of a scientist” and were able to associate them with
the specific slot of the speaker. A difference can be seen in num-
bers that would suggest that some topics or speakers were indeed
better than others in generating situational interest. The averaged
values for situational interest per slot ranged between 3.4 for the
lowest-ranked lecture and 4.3 for the highest one. Per lecture slot,
only between 12 and 32 questionnaires were available to give us
insight into the generated values for situational interest. So, the
sample sizes may not be enough to support the future selection of
topics and speakers.

3.6 Qualitative evaluation
The number of different interviews was too low to be used for
quantitative methods and the interviews were thus evaluated with
qualitative techniques. The 18 scientists who participated in the
lecture formats were debriefed after their presentation slots and we
transcribed these interviews.
When asked if they had gained a better grasp of the point of view and concerns of the public, five respondents that they had noticed that there was still a problematic lack of understanding regarding their research. Three reported that they noticed visitors being interested in their work but around festival, which, as one speaker also thought, is hardly avoidable in such a context.

The comment fields in the questionnaire were mostly filled out with supportive comments encouraging us to go on with the format. Some comments referred to specific content presented by scientists and we therefore did not include those as part of our overall evaluation. Only a small number of comments indicated a lack of complexity of the content, and these inclined in both directions: too complicated and too trivial. This will not lead us to recommend a specialization in either direction for future events.

4. Summary and Future Goals

During our project, we developed StreetScience as a format for public science communication which is able to be embedded in non-science-specific public venues. The common positive feedback from the visitors, as well as the speakers, showed that the tested structure is employable and has an impact. Our initial hypothesis, that we address the sociodemographic average, was falsified. Nevertheless, we were able to show that our format is a relevant complement to existing venues in Munich. First of all, many visitors reported attending no other comparable venues. Second, we were especially successful in attracting a younger audience than the Munich Wissenschaftstage. Furthermore, we evaluated the number of pass-by visitors and publicly-influenced visitors and were able to demonstrate independence from advertising as a principal means of attracting visitors. The high quality of our format we slightly modified an existing structure for situational interest. The result shows that a format resembling StreetScience is also applicable in comparable to studies done at a local museum. Additionally, the usage of a standardized scale allows for future comparability between science communication formats that take place in public spaces.

In line with our belief that science should be communicated broadly by many scientists, we also need our format to be carried over more efficiently. Therefore, our future goal is to establish StreetScience as an ongoing format supported and promoted by TUM. To increase the coverage of the public audience, future steps would include finding other public leisure-oriented events such as the StreetScience Festival to serve as hosts for the format. To broader the impact on society, additional research institutions should be encouraged to adopt such formats in the future. To further improve the effectiveness of StreetScience, more quantified benefits on the long-term effect of the generated interest and the scientists’ side-benefits need to be validated.

References

Self-reflection StreetScience

Looking back, our project was an elaborate but very instructive experience at the TUM: Junge Akademie. As expected, our activities went far beyond purely scientific work and we had a free crash course in project management and event organisation in all their aspects. In the course of our work, we were confronted with interdisciplinary problems which, originally, we had not even imagined. These especially concerned the organizational effort required. We secured the financing of our event, designed a website, employed helpers, designed several flyers and had intensive contact with numerous professors and chairs of TUM. We were often carried away by our project and much of what we had planned at some point was ultimately unfortunately not achievable. However, our expectations were far exceeded and we were able to take an interesting look behind the scenes. And that’s probably what makes the time as a scholarship holder at the Junge Akademie so special.

Right from the start, we were a comparatively small team with only five scholarship holders. This fact influenced our way of working during the project phase in many ways. Although we were slightly disadvantaged in terms of manpower and attendance, it also allowed for faster decision-making processes in a flat non-hierarchical team. All team members made the trend-setting decisions of our project work together after reaching consensus through discussion.

Coordination processes and the distribution of tasks among ourselves could also be managed relatively easily. In principle, everyone always had an overview of the entire project, regardless of their own specialization. In this way, a well-functioning system was established over the months.

Furthermore, we formed a really quite diverse team. There was no duplication within the departments and despite the technical orientation of TUM, our project consisted of only three natural scientists, supported by a physician and an architect. Everyone was able to contribute their personal strengths and the specific approach of “their” field of study. The resulting diversity of views was especially helpful in making some internal problems visible. However, joint brainstorming also provided possible solutions.

These were particularly helpful during the topic identification phase. Due to the almost unlimited choice of topics, this decision was more difficult than expected and our discussions ranged from atomic semiotics up to an analysis of the current brain drain. Here, the structures of the Junge Akademie did not set any limits for us and we were curious to see what could be achieved. After a comprehensive background research on the given topic “Management and Communication of Knowledge”, it was difficult to commit oneself to a single topic. Nevertheless, it was already clear to us at the beginning of the project that our commitment should also benefit people outside the university. This was what we set out to do and we were thus responsible for the success of our idea. This personal responsibility for the success of our own project is often not a matter of course outside the TUM: Junge Akademie at the university, because there is sometimes a lack of the support that is needed to carry through a plan to the end. However, we always received such support from the office or the Junge Akademie in general. And in some places, there was also simply no way back, so that our gaze was only directed towards the goal.

At some points, this pressure was certainly necessary for the success of our idea in its present form. Often our motivation declined unintentionally or was simply suppressed by more important university obligations. Then our mentors, tutors or the office of the Junge Akademie shook us up and the backlog was cleared again with motivation and commitment. Besides, numerous deadlines and “power projects” demanded our attention and reduced our personal free time sometimes to nearly zero. Especially in the last phase of our project before the first StreetScience festival, this project was certainly a full-time job, which caused some sleepless nights in front of the screen or during the dismantling of the festival tent. In the meantime, we can be more than satisfied with the outcome and the results speak for themselves. We are happy that everything went so smoothly and that we were able to realize our vision with the support of the TUM: Junge Akademie.

In the meantime, some team members are now scattered in different parts of the world. But nevertheless, we hope that our work can be kept alive by the people remaining at TUM or the TUM: Junge Akademie. It is certainly a very meaningful project for scientists, society and also the university. Hopefully, we were not only able to impart knowledge during the organized four days but also to give new insights and fun to all participants. We would, therefore, be delighted if we could continue to contribute to the preservation of our vision in the future.

Acknowledgement

We would like to offer our special thanks to our mentors and tutors who always supported us. They helped us back on track when we got carried away with a fixed idea and kept us on the correct path of scientific work. They provided us with their experience in organization and planning and established crucial contacts.

In addition, we wish to acknowledge the help provided by the office of the Junge Akademie and all other volunteers who made the implementation of StreetScience possible in the first place.

We would like to express our very great appreciation to all professors, chairs and student initiatives that took up the challenge of StreetScience and sacrificed their free time to support us and the Junge Akademie. Dr. Marc Dennis Weitze, Prof. Dr. Annette Noacka-Roos, Prof. Dr. Doris Lewalter, and Andrea Gapei all provided us with valuable information concerning the scientific background and possible approaches for the scientific evaluation of our project.

We would further like to thank TUM for financing our vision.
POSTER 1: At the beginning of our project, we clearly had to narrow down our framework topic “Management and Communication of Knowledge”. We concentrated on science communication from the university into society in order to undertake a project that was useful for both sides, because we saw the potential for improving the current methods by which the university presents itself to the public as a whole. At that time, it was not yet clear how we wanted to establish an improved form of science communication.

POSTER 2: In the course of extensive scientific research, we came across the concept of “Public Engagement” which inspired us. We chose the Streetlife Festival as the place for our science communication as we hypothesized that this event and its opportunities for direct communication between visitor and scientist would benefit them both. In order to test our claim, we brought to life StreetScience, the concept of a stand for science communication embeddable into a leisure-oriented festival. At this point, our project’s task shifted from theoretical research to practical format creation, organizational work, communication, and evaluatory research.
POSTER 3: And so StreetScience took place both in May and in September at Munich’s largest street festival. This required the commitment and dedication of our entire team. Each one of us had his or her own personal field of responsibility though without losing track of the big picture. Thanks to numerous external supporters and many sleepless nights, our event was certainly a success. Our concept was scientifically evaluated by a visitor survey, which should help to test the further hypotheses we had developed in the meantime.

POSTER 4: After both iterations of StreetScience had been completed, the scientific evaluation of our collected data was carried out by statistical methods. For this purpose, we had intensive consultations with numerous experts from TUM as well as the Deutsches Museum. Our results suggest that we were unable to reproduce the average population accurately. Nevertheless, we reached a much younger audience than comparable events and we generated similar “Situational Interest” as recorded at a comparable museum exhibition. In the future, therefore, we hope that our concept will be continued.
Every year, the scholarship holders of the TUM Jungen Akademie celebrate their finalized projects and present them to an audience. This year’s annual conference, however, was replaced by a different format. Instead of simply presenting the final results of each team, much more emphasis was placed on the processes by which the projects were completed. Effectively, then, the TUM Jungen Akademie organized an event similar to a scientific symposium, with the key theme here being “The Creative Spark.” This event took place during TUM’s open day on October 13, 2018.

The symposium began with an exhibition of the final posters of year 2017/I as well as posters of year 2017/II showing their current status. This exhibition was accessible to everybody who was currently visiting TUM. Later that afternoon, Prof. Dr.-Ing. Gerhard Müller opened the internal part of the symposium for which prior registration was necessary. Subsequently, each team of year 2017/I gave a short presentation on different topics within the scope of the overall theme “The Creative Spark,” e.g. “Wir wollen das ganz anders machen.” – Über die Erfassung der Ausgangslage. The idea of these talks was to use the experience gained within the different projects to show how to cope with problems when accomplishing creative tasks. After the presentations, the audience had the chance to discuss the teams’ findings over a cup of coffee. Following a brief summary of the discussion, Prof. Krause (Hochschule für Film und Fernsehen) continued the input on “creativity” with a keynote presentation about his thoughts on creative work and how he challenges his students in this context. This talk laid the foundation for a subsequent panel discussion in which, besides Prof. Robert Krause himself, Prof. Dr. Oliver Alexy (TUM School of Management), Prof. Dr.-Ing. Klaus Diepold (TUM Electrical and Computer Engineering) and Andreas Vogler (Architect) took part. In the course of this, two scholars of the TUM Jungen Akademie volunteered to be moderators and successfully guided the discussion. Finally, Prof. Dr.-Ing. Gerhard Müller closed the symposium with acknowledgements.

We think that the evening and the new format of the annual conference of the TUM Jungen Akademie was a success. The presentations and discussions contained interesting and valuable information that is important to any project. We therefore want to again express our deepest gratitude to everybody who made this year’s symposium possible and hope that similar events will take place in the future.

Verena Eireiner and Simon Rehwald
Projects in Prospect 2017/II

ClusterME .............................................. 140
CreditoTUM ........................................... 142
SchachtsLEAK .......................................... 144
SciCom ..................................................... 146
Online search engines like Google are tools that most of us use in our everyday life to gain information. However, even though it might be implied that those tools provide us with a neutrally and objectively chosen selection of search results on a certain topic, there is a bias within every single search we do. This can easily be experienced when two people search for the same term and get different results or a different order of results on the first page of Google. The underlying principle by which Google “chooses” the top ranked results for a person is unknown to the public, but it is very likely that not only the popularity of the shown pages plays a role but also the personal search history of the respective person. This leads to the assumption that a group of people with a similar search history in a certain field (which could be based on a similar lifestyle or similar attitudes) will get similar search results in this field. In short, search engine users will find themselves in “clusters,” being provided with the same information other members of the cluster are provided with. This might be unproblematic in everyday life, but becomes relevant as soon as people try to base their opinions or decisions on supposedly neutral information.

The goal of ClusterME is twofold: To offer a tool to the public that makes people aware of this phenomenon, and to provide us with a means of investigating the phenomenon further. Therefore we programmed an online tool that is able to visualize the effect of clustering. For a certain search item the user’s first page of Google results will be represented by a dot within a cloud of dots that represent all other previous users’ first pages of search results. The distance between two dots indicates the level of dissimilarity. Within this cloud of dots there might appear areas with higher or lower density of dots. Areas with a certain minimum of density are then defined as clusters. By going through the selection of search items that we included in the tool, the user will realize that he or she might find him- or herself inside or outside of certain clusters, depending on the searched item. The next step will be to find out how the respective clusters can be described. Therefore every user has to fill in a questionnaire at the beginning to collect demographic, non-personal data, such as age, sex, diet and faculty. When clicking on a cluster, descriptive analysis will be given to the user (e.g. “80% of the people in this cluster are female”). Also, he or she has the option to see the first page of search results of a representative member of this cluster. This way, the user has the chance to change his or her perspective in order to become aware of the bias. We will also use the data to make our own descriptive analyses to find out if certain parameters are correlated with the clustering. In order to have a more homogeneous subset of users from the start, we will focus our investigations on university students only.

After having used the tool, the user will have the option to be provided with more information on the topic and with recommendations on how to avoid being influenced by the bias. This information section will be based on our research on the topic, including interviews with experts.

ClusterME

Online search engines like Google are tools that most of us use in our everyday life to gain information. However, even though it might be implied that those tools provide us with a neutrally and objectively chosen selection of search results on a certain topic, there is a bias within every single search we do. This can easily be experienced when two people search for the same term and get different results or a different order of results on the first page of Google. The underlying principle by which Google “chooses” the top ranked results for a person is unknown to the public, but it is very likely that not only the popularity of the shown pages plays a role but also the personal search history of the respective person. This leads to the assumption that a group of people with a similar search history in a certain field (which could be based on a similar lifestyle or similar attitudes) will get similar search results in this field. In short, search engine users will find themselves in “clusters,” being provided with the same information other members of the cluster are provided with. This might be unproblematic in everyday life, but becomes relevant as soon as people try to base their opinions or decisions on supposedly neutral information.

The goal of ClusterME is twofold: To offer a tool to the public that makes people aware of this phenomenon, and to provide us with a means of investigating the phenomenon further. Therefore we programmed an online tool that is able to visualize the effect of clustering. For a certain search item the user’s first page of Google results will be represented by a dot within a cloud of dots that represent all other previous users’ first pages of search results. The distance between two dots indicates the level of dissimilarity. Within this cloud of dots there might appear areas with higher or lower density of dots. Areas with a certain minimum of density are then defined as clusters. By going through the selection of search items that we included in the tool, the user will realize that he or she might find him- or herself inside or outside of certain clusters, depending on the searched item. The next step will be to find out how the respective clusters can be described. Therefore every user has to fill in a questionnaire at the beginning to collect demographic, non-personal data, such as age, sex, diet and faculty. When clicking on a cluster, a descriptive analysis will be given to the user (e.g. “80% of the people in this cluster are female”). Also, he or she has the option to see the first page of search results of a representative member of this cluster. This way, the user has the chance to change his or her perspective in order to become aware of the bias. We will also use the data to make our own descriptive analyses to find out if certain parameters are correlated with the clustering. In order to have a more homogeneous subset of users from the start, we will focus our investigations on university students only.

After having used the tool, the user will have the option to be provided with more information on the topic and with recommendations on how to avoid being influenced by the bias. This information section will be based on our research on the topic, including interviews with experts.
Résumé
Panel discussions play an especially important role in the context of modern knowledge transfer and expressions of opinion on socially relevant topics. Social controversies arise time and again in our society and animated organized discussions about such topics quickly make people think about them. Taking part in such discussions, one subconsciously forms an opinion through the influence of various established parameters or one seeks to form one’s own opinion after considering different viewpoints on the topics in question. The credibility of the panel’s participants plays a significant role that should not be neglected. Ultimately, everyone chooses the option that seems most plausible and trustworthy.

But how do you establish this form of credibility? Which personal indicators play a special role when trying to present oneself authentically and credibly in a discussion? Would it not be more appropriate to form one’s own opinion based on an understanding of these potential influencing factors? And above all: to be better aware of the methods that influence us subconsciously?

This is why our project is increasingly concerned with which personal indicators influence the credibility of a discussant and how, as a participant in such discussion rounds, one can be clear in advance about the possibility of subconscious influences on one’s opinions and credibility. Or also how one can perhaps exert a greater influence as a discussant oneself?

Our project differentiates itself from the other projects of our year 2017 / II as it does not explore the umbrella topic “truth and lies” in a digital environment, but instead focuses on the analogue aspect of life. Our project engages in a variety of different panel discussions to find out what makes their main actors seem more credible.

After intense discussions, we extracted the following research question: Which personal indicators influence the credibility of the panelists from the audience’s point of view within different panel discussions? To clarify the concept of “personal indicators,” we subdivided this term into three categories by using the MECE principle:

1) Outer Appearance
2) Way of Presenting (facial expression, gestures, voice and vocal range)
3) Track Record / Personal Background

Our hypothesis is that these three subcategories of personal indicators influence the credibility of the panelists from the audience’s viewpoint within a diverse set of panel discussions with different emphases.

It will help to clarify the process of our project’s development to explain that, to begin with, the members of our team were part of the group ClusterMe. During the first Interim Evaluation, we decided, as mentioned before, to choose a topic which does not only focus on the digital world, but also connects the overall topic of “truth and lies” to the analogue world. So, we decided to form our own group. Initially, we considered two options: arranging a theatrical piece about truth and lies, and organizing a controversial panel discussion. We decided to go for the latter option but then, following further discussions and exchange with our mentors and tutors, we realized that it would be even more expedient not to organize one’s own panel discussions, but to analyze a variety of existing panel discussion formats.

We are motivated to explore this challenging and exciting field of truth and lies in the analogue world.

The next steps are based on an extensive literature research on the subject. Our goal is to carry out a study of the diverse pool of panel discussions by the end of January. After that, we will evaluate the results in detail. Assuming that our study generates representative results, we want to translate the findings into a theatrical play or performance.

Our vision is to find out more about personal indicators and their effects on credibility, as they have a significant impact on our daily life. Whether we listen to a lecture in university, discuss political issues at dinner or have to present research findings in front of a large audience, credibility always plays an important part in our perception of daily life. So, we are hoping to contribute to a better understanding of how credibility is triggered in our minds.

Team
Luisa-Maria Kraus
Carolin Schimmer
Lea Luka Sikau
Hayden Liu Weng
Milena Wörsching

Tutors
Beate Lang
Nikolaus Pöchhacker

Mentors
Dominik Frank
Prof. Dr. (em.) Erich Sackmann
Prof. Dr. Elisabeth Wacker
Background
In our modern society, lies play an increasingly important role. Advances in communication media have made it possible to spread lies easier and faster. As a result, this led to a more complicated process of distinguishing between truth and falsity. This applies to all possible fields, including economic processes. In particular, the advertising industry plays a crucial role in this field. Commercials praise products in every imaginable way. Often, however, commercials include statements which are simply untrue.

Abstract
Our objective is to empower consumers to gain a sharpened view on common methods used by advertisers. In addition, we want to enable them to distinguish between truth and lies about products. This process should ultimately lead to consumers obtaining an increased sense of power over their own purchasing behavior to protect themselves from being manipulated by ever more sophisticated methods used in advertisements.

Hypothesis
An increase in consumers’ knowledge about common practices used by advertisers changes their purchasing behavior.

Current progress
So far we have created posters and flyers showing slightly modified famous advertisements, as well as a website called “schaschleak.de.” Furthermore, we have written a screenplay for a movie and have planned its making. A very important part of our work so far has been the creation of a project plan with milestones and deadlines. Alongside the project, we have been improving team spirit by, for example, organizing a team Christmas party.

Future plans
In the future, we want to evaluate the reaction of students to our posters and flyers by means of an online survey, embedded in our website. Furthermore, we have written a screenplay for a movie and have planned its making. A very important part of our work so far has been the creation of a project plan with milestones and deadlines. Alongside the project, we have been improving team spirit by, for example, organizing a team Christmas party.

Details about our movie-project:
Why did we decide to make a video about TUM Muesli?
We want to create a short movie which features the advertisement of TUM Muesli. Our aim is to show how advertisements can influence feelings about a product. To do this, we will include several techniques used by professional advertisement makers in our movie. We have chosen TUM Muesli as product-to-be-advertised because it is a standard product without any special features. Therefore, there exists no quality difference to other similar mueslis. As a result, it should be very clear from the movie what techniques are being used. As mentioned above, we want to show this advertisement-movie in the “TU Kino” as this provides an effective way of reaching a lot of people.

How will we film the movie?
We have already fixed a date for filming the movie. This was not as easy as thought at first. As location for filming, we need the TUM library. This means that we can only film very early in the morning or very late as we mustn’t interrupt other students. The movie will feature two young students, who are very tired in the morning although they must study in the library because of the “Prüfungsphase.” In order to overcome their tiredness, they just eat TUM Muesli and all of a sudden they will be fresh and can focus on learning. It is very important to stress how easy it is to project a positive light onto nearly every single product, independent of its real uniqueness.

Team
Veronika Bauer
Simeon Beinlich
Gabriele Fruth
Bertram Fuchs
Christos Gazanis
Frederik Heetmeyer
Thomas Just

Daniel Kühner
Frank Latuch
Alina Mirit
Michael Reichert
Jakob Scheffels
Philipp Scholl
Patricia Wild

Tutors
Vanessa Buchwaltz
Evi Schmidt
Christoph Schenk
Leonard Przybilla

Mentors
Dr. Manuel Wiesche
Dr. Alexander Lang

144 TUM: Junge Akademie – Project Reports 2017/I
145 TUM: Junge Akademie – Project Reports 2017/I
Our project aims to examine the significance of scientific advice in the political decision making process. There are three systems which describe how the process of scientific policy advice can work: the technocratic model, the decisionist model, and the pragmatic model (see figure). This last model is the one typically applied in German politics and also the one we are investigating by talking to the involved stakeholders viz. politicians, scientists and NGOs to learn more about the practicalities. The scope was restricted to the local level in and around Munich. The preliminary findings offer a first impression of issues:

1. In local Munich politics, the scientific advice process is less formalized, and plays a less significant role than on the Landtag or higher levels. Money and time constraints, combined with the reduced specialization of local politicians due to their volunteer status are the underlying reason.

2. Consulting scientists are not always aware of the complex administrative process, preventing them from providing their advice at the most suitable time.

3. Paid scientific consultants may be hesitant to provide parties that they consult with advice that differs from the party’s opinion.

4. NGOs do not directly conduct scientific research and often use student interns to prepare reports.

In order to increase the role of scientific evidence in local politics, we aim to develop an app/web-tool to network local politicians with young scientists who can consult on projects and provide scientific insights.
Our industrial partner
PIXIDA is an innovative technology consulting company with focus on digitalization and mobility solutions.

We are over 200 passionate technology consultants and developers with expertise in the Internet of Things, Telematics, Location Based Services, Multimedia, Driver Assistance Systems, Embedded Systems, Full Stack Software Development, Cloud Solutions, Data Analytics, Project Management and Agile Processes & Methods.

With more than 500 successful projects, our experts design and develop tailor-made solutions for highly challenging technical environments and applications. We offer complex product developments, for different industries such as Automobile, Commercial Vehicles, Public Transport, IT, Insurance, Energy, Rail, Environmental Data Sciences, Industrial IoT, and Motorcycle.

PIXIDA is international. Our cooperation and knowledge exchange transcend national borders beyond Germany, USA, Brazil and China.

PIXIDA’s unique corporate culture is based on an employee-oriented leadership. This led to 8 employer and economic awards for PIXIDA.
Since 2016 PIXIDA GmbH is a cooperation partner of TUM: Junge Akademie. Together with excellent and passionate students our experts in Digitalization, Internet of Things (IoT) and Mobility were delighted to exchange knowledge on challenging and complex social issues.

Digitalization and urbanization are fundamentally changing our society and requiring new technical approaches. Smart City and IoT are important fields of activity at PIXIDA. IoT enables new processes to gain and analyze data for social benefits.

In 2017 we organized a workshop at PIXIDA’s Headquarter in Munich raising the question “How to use data to shape smart urban environment?”. We started our event with short keynotes by our Data experts on the topics of IoT, Data Analytics and Cloud. In different workshops we visualized and discussed several IoT- and Data Analytics-Solutions and dealt with questions such as “How to gain higher added value from collecting data in cities?” or “How one could visualize Data”.

In a further collaboration in 2018 our technical experts from Business Unit Software Development advised an ambitious project to strengthen Munich resident’s participation in political processes. Muc.me is a web-platform by students of TUM: Junge Akademie and allows especially young citizens to engage in their local community. On muc.me they can anonymously contribute their ideas to district committees by e-mail.

We would like to thank all students for their high degree of social commitment and performance!

Let’s continue our exciting and constructive cooperation in the future!
The Academy ........................................ 156
The Boards of the Academy.................... 158
Committed: Taskforces, Tutors, Mentors, Office........... 161
A different scholarship program................. 177
"TUM: Junge Akademie is the launch pad to develop your own ideas and bring them into live in a supportive and familial surrounding. You are allowed to make mistakes and can test your skills in various disciplines, which concern your academic profession as well as your personal development." Stefan Röhn, Year of 2014, Electrical and Computer Engineering.

"I particularly appreciate the work on a topic which is relevant for society together with an intercultural and interdisciplinary team. Especially, the experience to answer a research question by using scientific methods is certainly an excellent preparation for my bachelor and master thesis." Sabrina Schwarzmeier, Year of 2018, TUM School of Education.

"Especially for engineers, recognizing social implications of academic and technological advancement is crucial. TUM: Junge Akademie teaches this in a creative way by challenging members to explore issues outside our own field of study." Justus Wolf, Year of 2016, Munich School of Engineering.

"TUM: Junge Akademie offers space for engagement in socially relevant areas, and thus supports personal growth and further flourishing of young, prosperous talents. TUM: JA kick-started my career and opened doors beyond my imagination." Alexander Biederer, Year of 2016, Informatics.

The Academy

The TUM: Junge Akademie is TUM’s scholarship program for exceptionally talented and dedicated students with a special affinity for research and teaching. The scholars are students from all departments of TUM and our partners, University for Television and Film Munich and University of Music and Performing Arts Munich. The Academy prepares young talents to further the development of an advanced society. Within the scope of an active network, the TUM: Junge Akademie provides the necessary space and support for its scholarship holders to flourish, giving students the opportunity to work freely on self-imposed questions, to unfold their individual talents and to learn to take responsibility for their technical and scientific ideas.

To build a productive and innovative environment for our young talents, we challenge the scholarship holder to engage in ambitious and socially relevant projects and initiatives. Therefore they become involved in a project team, which develops a hypothesis linked to their year’s call. After the team has been formed, a hypothesis will be developed, based on several observations realized by the scholarship holders. Together with their mentors and tutors an appropriate methodology to test the assumption of the group is designed and applied. To empower our members’ personal development, we offer them workshops, interdisciplinary exchange and cultural activities. We bring together Alumni and Newbies to build a pool where everyone can share their ideas or help the younger Academy members by tutoring the project teams. By coaching and supporting the students in challenging situations that might occur within the project development, our team aims to encourage creative freedom, unconventional ideas, analytical thinking and the consideration of scientific insights. The program fosters a mutually beneficial relationship in which students are helped to achieve their full intellectual potential while also contributing directly to the shaping of the Academy’s future. In this connection, we encourage the scholarship holders to take responsibility for others by, for example, serving on the Board of Members or the Advisory Board.

Right from the beginning, the participants are involved in a vibrant network consisting of alumni of the Academy, currently active professors and the TUM (Ernst) of Excellence, as well as the young researchers themselves. There are exclusive workshops and cultural events as well as financial resources to implement project ideas and to facilitate comprehensive measures of training and personal development beyond the respective fields of study.

"TUM: Junge Akademie is the launch pad to develop your own ideas and bring them into live in a supportive and familial surrounding. You are allowed to make mistakes and can test your skills in various disciplines, which concern your academic profession as well as your personal development." Stefan Röhn, Year of 2014, Electrical and Computer Engineering.

"I particularly appreciate the work on a topic which is relevant for society together with an intercultural and interdisciplinary team. Especially, the experience to answer a research question by using scientific methods is certainly an excellent preparation for my bachelor and master thesis." Sabrina Schwarzmeier, Year of 2018, TUM School of Education.

"Especially for engineers, recognizing social implications of academic and technological advancement is crucial. TUM: Junge Akademie teaches this in a creative way by challenging members to explore issues outside our own field of study." Justus Wolf, Year of 2016, Munich School of Engineering.

"TUM: Junge Akademie offers space for engagement in socially relevant areas, and thus supports personal growth and further flourishing of young, prosperous talents. TUM: JA kick-started my career and opened doors beyond my imagination." Alexander Biederer, Year of 2016, Informatics.

The Academy

The TUM: Junge Akademie is TUM’s scholarship program for exceptionally talented and dedicated students with a special affinity for research and teaching. The scholars are students from all departments of TUM and our partners, University for Television and Film Munich and University of Music and Performing Arts Munich. The Academy prepares young talents to further the development of an advanced society. Within the scope of an active network, the TUM: Junge Akademie provides the necessary space and support for its scholarship holders to flourish, giving students the opportunity to work freely on self-imposed questions, to unfold their individual talents and to learn to take responsibility for their technical and scientific ideas.

To build a productive and innovative environment for our young talents, we challenge the scholarship holder to engage in ambitious and socially relevant projects and initiatives. Therefore they become involved in a project team, which develops a hypothesis linked to their year’s call. After the team has been formed, a hypothesis will be developed, based on several observations realized by the scholarship holders. Together with their mentors and tutors an appropriate methodology to test the assumption of the group is designed and applied. To empower our members’ personal development, we offer them workshops, interdisciplinary exchange and cultural activities. We bring together Alumni and Newbies to build a pool where everyone can share their ideas or help the younger Academy members by tutoring the project teams. By coaching and supporting the students in challenging situations that might occur within the project development, our team aims to encourage creative freedom, unconventional ideas, analytical thinking and the consideration of scientific insights. The program fosters a mutually beneficial relationship in which students are helped to achieve their full intellectual potential while also contributing directly to the shaping of the Academy’s future. In this connection, we encourage the scholarship holders to take responsibility for others by, for example, serving on the Board of Members or the Advisory Board.

Right from the beginning, the participants are involved in a vibrant network consisting of alumni of the Academy, currently active professors and the TUM (Ernst) of Excellence, as well as the young researchers themselves. There are exclusive workshops and cultural events as well as financial resources to implement project ideas and to facilitate comprehensive measures of training and personal development beyond the respective fields of study.
The Advisory Board – Where decisions are made

The Advisory Board represents the Academy’s governing body, whose members meet twice a year. It primarily decides on the medium to long-term strategic and organizational issues of the TUM: Junge Akademie.

Since 2016 the President of the University of Music and Performing Arts Munich, Prof. Bernd Redmann and the President of the University of Television and Film Munich, Prof. Bettina Reitz have further enriched the collaborative nature of the Advisory Board.

The strategic themes include in particular the purpose and direction of the TUM: Junge Akademie as well as its interaction with TUM’s several institutions and their programs, such as the Munich Center for Technology in Society (MCTS), the TUM School of Governance or the TUM University Foundation. New proposals from the Board of Members are also discussed here.

In addition, the Advisory Board is responsible for key operational tasks, which include the selection of new scholarship holders or the definition of possible project topics from the wide variety of the submitted project ideas.

The Advisory Board is composed of the director, three representatives of the former professors, three representatives of the active professors and six elected student representatives of the TUM: Junge Akademie.

Members of the Advisory Board 2018:

**Directors:**
- Prof. Dr. ing. Gerhard Müller, Senior Vice President Academic and Student Affairs

**Scholarship holders:**
- Alexander Biederer (from October 2017 to October 2018)
- Julian Biendarra (from April 2017 to October 2018)
- Carl Ebbinghaus (until October 2017)
- Beate U. Lauer
- Dr. Matthias Lehner
- Philipp Reinl (from April 2017 to October 2018)
- Jonas Riedt (from October 2018)
- Sabrina Schwarzmüller (from October 2018)
- Konrad Wolf (from October 2017)

**Professors:**
- Prof. Dr. Sonja Berensmeier (from April 2018), TUM Department of Mechanical Engineering
- Prof. Dr. ing. Klaus Diepold, TUM Department of Electrical and Computer Engineering
- Prof. Dr. Jürgen Giast (until April 2018)
- TUM School of Life Sciences Weihenstephan
- Prof. Dr. Sabine Maasen, Munich Center for Technology in Society
- Prof. Dr. med (em.) Michael Molls, Speaker Emeritus of Excellence
- Prof. Bernd Redmann, University of Music and Performing Arts Munich
- Prof. Bettina Reitz, University of Television and Film Munich

The Board of Members

The Board of Members synthesizes and represents the scholarship holders’ various interests within the TUM: Junge Akademie. Here, representatives of the current projects, the Taskforces and interested members of all years meet regularly and discuss the current state and the further development of the academy.

At the meetings problems of the project teams, topics of the Taskforces, and ideas for continuous improvement – introduced by members – are discussed.

Proposals for changes of the scholarship program are handed to the Advisory Board, the director and the office team. Together with them the scholarship holders take action to implement these changes.

The Board of Members elects six student representatives in the Advisory Board. By this integration of the Board of Members into the Advisory Board the scholarship holders are able to actively participate in the decision making process and can represent their interests.

All scholarship holders are invited to participate in the Board of Members meetings and give their opinions and ideas in order to help the TUM: Junge Akademie to evolve into scholarship program that empowers the scholarship holders’ personal development.

---

**The University’s Boards**

The Board of Members (BM) is one of the boards of the TUM: Junge Akademie. It is comprised of six student representatives who are elected by the student body of the TUM: Junge Akademie.

The BM is responsible for the organization of the TUM: Junge Akademie and for the implementation of the tasks agreed upon by the Advisory Board (AB). The BM works closely with the AB, which includes representatives of the former professors, active professors, and the director of the TUM: Junge Akademie.

The BM’s main tasks include:
- Organizing the TUM: Junge Akademie’s activities
- Representing the student body in discussions with the AB
- Implementing decisions made by the AB
- Providing feedback to the AB on the TUM: Junge Akademie’s activities

The members of the BM are elected by the student body and serve for one academic year.

---

**The Boards of the Academy**

Director:
- Prof. Dr. ing. Gerhard Müller, Senior Vice President Academic and Student Affairs

Scholarship holders:
- Alexander Biederer (from October 2017 to October 2018)
- Julian Biendarra (from April 2017 to October 2018)
- Carl Ebbinghaus (until October 2017)
- Beate U. Lauer
- Dr. Matthias Lehner
- Philipp Reinl (from April 2017 to October 2018)
- Jonas Riedt (from October 2018)
- Sabrina Schwarzmüller (from October 2018)
- Konrad Wolf (from October 2017)

Professors:
- Prof. Dr. Sonja Berensmeier (from April 2018), TUM Department of Mechanical Engineering
- Prof. Dr. ing. Klaus Diepold, TUM Department of Electrical and Computer Engineering
- Prof. Dr. Jürgen Giast (until April 2018)
- TUM School of Life Sciences Weihenstephan
- Prof. Dr. Sabine Maasen, Munich Center for Technology in Society
- Prof. Dr. med (em.) Michael Molls, Speaker Emeritus of Excellence
- Prof. Bernd Redmann, University of Music and Performing Arts Munich
- Prof. Bettina Reitz, University of Television and Film Munich

Since the Academy’s foundation in 2010, the Advisory Board represents the organisational unit of the TUM: Junge Akademie with decision-making power. At the scholarship holders’ request, the Board of Members was launched in order to collect the members’ views as a design committee and to pass those ideas on to the steering committee.

The Board of Members synthesize and represent the scholarship holders’ various interests within the TUM: Junge Akademie. Here, representatives of the current projects, the Taskforces and interested members of all years meet regularly and discuss the current state and the further development of the academy.

At the meetings problems of the project teams, topics of the Taskforces, and ideas for continuous improvement – introduced by members – are discussed.

Proposals for changes of the scholarship program are handed to the Advisory Board, the director and the office team. Together with them the scholarship holders take action to implement these changes.

The Board of Members elects six student representatives in the Advisory Board. By this integration of the Board of Members into the Advisory Board the scholarship holders are able to actively participate in the decision making process and can represent their interests.

All scholarship holders are invited to participate in the Board of Members meetings and give their opinions and ideas in order to help the TUM: Junge Akademie to evolve into scholarship program that empowers the scholarship holders’ personal development.

---

**The TUM: Junge Akademie – Project Reports 2017/I**

Since the Academy’s foundation in 2010, the Advisory Board represents the organisational unit of the TUM: Junge Akademie with decision-making power. At the scholarship holders’ request, the Board of Members was launched in order to collect the members’ views as a design committee and to pass those ideas on to the steering committee.
The statement “Members for members” is understood as a leitmotiv at the TUM: Junge Akademie. Scholarship holders are actively taking part in the creation of the Academy’s programs. This is reflected, among other things, in the selection of workshops, such as the workshops on “scientific and journalistic writing”, which bolster the development of the participants’ skills concerning editorial work.

In addition, the Academy provides access to experts at the Technical University of Munich as well as to external experts, it financially supports the realization of events and it offers its scholarship holders the necessary space to carry out activities in support of the Academy’s network.

In this way, members of all years and alumni get involved in the Taskforces or as tutors for one of the project groups. To facilitate the operations, the office team supports and encourages all scholarship holders in their commitment and work.
Taskforce Members

TUM: Junge Akademie provides a framework that allows its scholars to develop their ideas and personality in an interdisciplinary environment. Any activities within this framework, however, arise from the contributions of all individual members. Thus, our task is to support everyone within the program throughout and beyond their active membership.

Starting with the application phase, we help inform potential candidates at a central info event. Interested students gain first insights into TUM: Junge Akademie and they can meet active members and alumni to get first hand experiences. We provide further support during the application process, e.g. by helping to sort out applications and holding a workshop for applicants during selection days.

After the application phase, we prepare a welcome package for all new members and contribute to the kick-off event to increase identification with the academy right from the beginning. Constantly gathering feedback from the active project teams, we identify room for improvement in processes and communication. As we are involved with recruitment as well as important milestones during the project phase, we implement changes that help align member perception with the academy’s actual strategy. As we are involved with recruitment as well as important milestones during the project phase, we implement changes that help align member perception with the academy’s actual strategy.

In the last years, we worked together with the academy office to improve the conditions for members of TUM: Junge Akademie during the project phase. We introduced changes in the early course of the project phase to provide a creative climate for the teams in which they could develop inventive new ideas for their projects. Our focus now lies on evaluating these changes as well as other components of the program, like the mentoring system or the structure of the Taskforces themselves.

Recent achievements of the Taskforce Members mainly concern the administrative IT infrastructure. By simplifying the data management for both the administration and the scholars, we ultimately aim at providing fast and reliable tools to structure data and also at achieving more clarity in storing and sharing relevant information throughout TUM: Junge Akademie.

Apart from recurring tasks and operational improvements, we strive to establish long-term contacts between active members and the growing number of alumni. Not only can alumni share with other members their experiences about projects inside and outside the program, but also might fresh ideas from the project teams inspire alumni in their professional life.

As always, every member of the academy is cordially invited to leave us feedback, questions or suggestions. Contact us at members@jungeakademie.tum.de or talk to us directly.

Dina AlAdawy
Severin Angerpointner
Thomas Bickel-Haase
Rishith Elath Meethal
Sonja Fuchs
Christian Grätz
Friederike Groschupp
Bernhard Hafner
Hayden Liu Weng
Mohammad Mahfouz
Christian Petzoldt
Eva-Maria Schmid
Patrick Strobl
Veronika Bauer
Lea Sophie Seier
Maryam Tatari
Taskforce CAP

Contacts – Alliances – Partnerships. These three terms all frame the CAP Taskforce of the TUM: Junge Akademie as acting mostly in an external-facing capacity. However, these terms cannot be considered equal, not only due to their differing implications of formality – a contact is inherently less formal than an alliance – but also because only partnerships exist as formal structures. Consequently, most of our work is related to partnerships, but for more than just semantic reasons.

On a strategic level, Taskforce CAP has two goals it seeks to accomplish in managing the relations of the TUM: Junge Akademie to its external partners. These are (1) the material goal of securing funding for all activities not covered by the budget provided by TUM and (2) the immaterial goal of maintaining and building connections to institutions both within and outside of TUM. To accomplish both, a close coordination with the Management Office is essential, especially in the case of the former goal. In order to achieve funding goals, the TUM: Junge Akademie offers sponsoring partnerships to companies, who are in return provided with opportunities to contact our members. Maintaining contacts is more straightforward, because in practice many are kept up through institutionally assured interactions. That is, for example, Mentors are important contacts for the TUM: Junge Akademie, but keeping up regular exchange with them does not require intervention by the CAP Taskforce since the very purpose of their position already includes exchange with Akademie members and management. Conversely, maintaining contact with our current company partner, Pixida GmbH, is not easily accomplished through once a year meetings to organize the workshops, since they are too far apart. Additionally, the yearly workshop hosted at Pixida requires set-up, which is also provided by the CAP Taskforce.

Given this context on what Taskforce CAP is and does, the main task at hand for the Taskforce can be introduced. In our current situation with only one active partner company, funding goals require either additional revenue streams or additional partners. Naturally, the first option we investigated was signing up more companies to become sponsors of the TUM: Junge Akademie since this is already an established structure. One of our early attempts at this was using contacts via alumni to pitch this prospect. Unfortunately, this was rarely successful, but the reasons why were not immediately apparent to us. An unusually open and honest talk with one such alumnus helped us clear up the reasoning behind what was a relatively consistent strings of declined offers. From a corporate perspective, the first issue is that small-scale sponsorships related to educational institutions do not have a fixed organisational layer to which they are associated – especially in large companies. In simpler terms – who should we even talk to? HR departments are commonly very interested in
recruitment opportunities but tend to shy away from the TUM: Junge Akademie and not just confining it to heterogeneous make-up. A specific complaint is that we have only a partial share of company IT focus, as they also have the students working on specific topics that are easily related to interests of specific companies. Fortunately, Alexander Biedere of the Event Taskforce had, at around the same time (the beginning of the past summer term 2018), developed the idea of hosting a hackathon (Hacking + Marathon) event at the TUM: Junge Akademie. This type of event, in which ad hoc teams work on broadly IT-related tasks during a non-stop workflow, unlike all of our previous attempts at attracting partners. Because of the IT focus, they are usually focused on recruiting students of computer science or adjacent fields and commonly allow corporate sponsors to set up task descriptions. In summary, we decided not to promote the TUM: Junge Akademie itself, but rather our capabilities. The main goal is to create an interest in transitioning to sponsorship due to the demonstration of our capability as an organization.

Now, having this goal in mind, the CAP Taskforce set about finding companies to partner us in this endeavor - with the hope that this would be an easier task than finding sponsors for the TUM: Junge Akademie itself and that such an event would be more successful than our previous attempts at attracting partners. Fortunately, we had already had set up cooperation with KOM, which turned the career fair, from our perspective, into a sponsorship fair. Despite our fear that we might encounter misunderstanding or confusion, we were able to spark interest in numerous company representatives - subsequently producing for our event.

To make optimum use of the contacts the TUM: Junge Akademie already has, especially within TUM, we decided to put a unique spin on the hackathon. Task prompts will not only be provided by our sponsors, but also by researchers at TUM, thus incorporating our Academy's goal of promoting interest in science. This means broadening our target audience to all TUM students who have some programming skills and leads to our branding of the event as "Science Hack 2018" (with the hope of repeating it in future years).

At the time of writing, the state of the Science Hack is as follows. We have secured funding for it and have fixed a time and a place for it: 1-2 December, Magistrale, Faculty for Informatics and Mathematics. We are in the process of developing the task prompts as well as designing our marketing campaign directed towards motivating students to participate. Additionally, the precise schedule of the event is also being worked on.

Beyond the Science Hack, the future of the CAP Taskforce is unclear. Pluses have just renewed their partnership for another year and the organization of a workshop for Academy members in January is a parallel project to the Science Hack. Depending on the reception of our hackathon, repeating it yearly might well become a constant fixture. Alternatively, there is a chance that the TUM: Junge Akademie funding becomes secure enough for the CAP Taskforce to focus more on the first two letters of our name - Contacts and Alliances - thus potentially returning to a former idea of cooperation between student-organized groups from several members of the Euro-Tech Alliance.
Taskforce Event

The Event Taskforce strives to make the TUM: Junge Akademie fun, to allow scholars to build a stronger network and to broaden the scholars’ horizons by enabling them to participate in interesting, enjoyable, and educational social events!

These range from culturally enriching events like visiting the opera with insightful visits behind the scenes, to challenging sport events like the annual sportfest, and from scientifically valuable events like a visit to the Leibnitz Supercomputing Centre, to social events like our running dinner and our “Stammtisch”.

In addition to that, we organize the summer celebration and the annual conference of the TUM: Junge Akademie.

All these events are organized by scholars, for scholars, in order to keep the TUM: Junge Akademie fun!

Some Events the Taskforce organized last year:

Boxing Training
On May 16th, eight brave members of the TUM: Junge Akademie entered the boxing club Impact Fight Academy to receive their first boxing training. Under the supervision of an experienced boxing trainer they got to know the course of such a training and learned their first boxing techniques and punching sequences.

Photo Workshop, June 08th
Take the camera – activate flash – subject to the center – press the trigger! But how to take photos that are better than 90% of all snapshots?

In this very interactive workshop, scholars first experienced the (technical) basics then and how to use them creatively. Continuing with picture design, they tried out the “rule of thirds” different perspectives, using foreground ... Finally, they had a short introduction to picture processing.

Summer celebration, June 29th
“Every year, the TUM: Junge Akademie celebrates summer by gathering and enjoying delicious grilled food and cold beverages. This year the celebration was enriched with an enjoyable sports challenge, which had teams of scholars compete in different disciplines like Frisbee-Golf and sack races. At the end, two teams fought over prizes in a Bobby Car race.

Running Dinner, June 16th
After the great successes so far, on Saturday 17th November, the 7th Running Dinner of the TUM: Junge Akademie took place!

At the Running Dinner, the participants had a three-course menu (aperitizer, main course and dessert) at three different places. In teams of two, the participants were responsible for preparing one of the three courses, while being the guests for the other two courses. Thus, during the event, the participants got to know twelve other people. To conclude the evening, all participants met in a bar after the dessert.

Taskforce Members
Alexander Bladerer
Dominik Viber
Vadim Goryainov
Katherina Tropschuh
Jakob Schaffels
Bartram Fuchs
Kya Klaine
Aina Minth
Philip Scholl
Ramos Alejandro Grande Fraile
Victoria Tressel
Christos Gazanis
Gabriela Fruth
Luisa-Maria Kraus
Nicola Stadler
Taskforce Marketing

Our Taskforce strives to enhance the brand image and recognition of the TUM: Junge Akademie. Our targets lie both within our university, in relation to potential applicants, members and employees, as well as externally, in relation to current and potential corporative partners and the employers of our alumni. Moreover, our involvement includes support for scholars in their projects, whenever graphic materials, branding strategies, general tips and valuable contacts around project marketing are of interest. Finally, as much of our work is centered around events, such as “Fit for TUM” or “Tag der Initiativen” in Garching, we seek close collaboration with the Event Taskforce. The nature of our responsibilities requires that we work closely together with the TUM: Junge Akademie main office.

The specific projects we are involved in are of a very diverse nature, and depend on current needs just as much as on members’ skills and interests to develop themselves and grow. Examples of successful past projects include:

- Website restructuring for better clarity
- Marketing material, e.g., our new image movie, posters/flyers for publicity during the application periods and giveaways
- Public appearances of the TUM: Junge Akademie, e.g. the day of student initiatives (“Tag der Initiativen”) in Garching and information events for nominated applicants

For participation in our Taskforce, experience in graphics design, marketing strategies and event coordination are helpful, but absolutely not required. Much rather, we always seek for scholars enthusiastic about what we do, who believe that with the right public image and high-quality internal work, the TUM: Junge Akademie can be positioned as a prime student initiative in Munich. Moreover, members of this Taskforce are given the freedom to pursue their preferred projects, as well as to propose and assume responsibility for new ones. There are plenty of chances to grow personally as a member of this Taskforce!

In the past year, our largest projects were a new image movie and our concept for an easier way of collecting and distributing news about the projects of the TUM: Junge Akademie.

Image movie: Passion for Science

In order to make the TUM: Junge Akademie more visible in the public eye and to provide future scholars with a more detailed insight into the inner workings of the scholarship program, the Marketing Taskforce created image videos. The footage was collected during interviews with various volunteering students who received prepared questions before filming. With the assistance of Michael Obermeier from TUM ProLehre, the video material was cut into three different variants, all to be published on YouTube.

The first cut had to be delivered in time for the IAS Symposium 2018, so planning and filming had to be done on a tight schedule. In contrast to the two other, later cuts, which provided a scholar’s view on the TUM: Junge Akademie, it highlighted the program itself, its past achievements and future possibilities.
The shorter video was designed to represent a compact overview of the experiences and hopes of current members concluded by a mission statement from Prof. Dr.-Ing. Müller. It serves as an eye-catcher and teaser-trailer for people using the website or social media of the TUM: Junge Akademie.

The longer cut features a more in-depth exploration of the students’ motivation and their thoughts on their journey through the TUM: Junge Akademie program. This version gives a more detailed idea of what the program actually is and does and therefore is especially suitable for future scholarship applicants.

Project news: Simplifying the information flow

The TUM: Junge Akademie issues a regular newsletter to all active scholarship holders, alumni and partners. In the past, the summaries from the project groups’ work were time-consumingly collected individually. A similar procedure was in place for Facebook posts about the projects.

We wanted to avoid these problems and proposed a scheme reusing content as much as possible: The teams would compose their own short and concise news posts and publish them directly to a “project news” section on our homepage. These can then be optionally cross-posted to Facebook or selected to be distributed via the TUM: Junge Akademie newsletter.

At the time of writing, we are testing this scheme with the projects of 17/I. They are supported by a guideline indicating each post’s nature and purpose. Eventually, we hope to achieve a better quality of content with a process taking less time for everyone involved.

Future goals

As mentioned previously, our Taskforce is mainly concerned with short-term project work for upcoming events. For example, the planning for this year’s “Science Hacks” marketing campaign is currently starting at the time of writing. Apart from this event-based work, our long-term goal is to standardize the TUM: Junge Akade-
The taskforce “Mentoring” wants to establish a mentoring program for current scholarship holders of TUM: Junge Akademie. The mentors will be alumni of the latter. We strongly believe that mentoring offers great benefits for both parties and it is a valuable part of the curriculum of TUM: Junge Akademie.

Currently, we are still in the planning phase, but the general concept is set: After reaching out to possible mentors, this winter, interested members of the year 2018 and alumni will be asked to hand in some details about themselves and their preferences regarding a mentor and mentee, respectively. For that, we will provide a survey which addresses both mentees and mentors with standard questions regarding the professional and personal life. This allows us to find tandems that fit to each other. For now, we focus on alumni, but will be extending the group of potential mentors with TUM professors and Emeriti of Excellence in the future. In contrast to the rather impersonal setting in lectures with hundreds of fellow students, our program thereby provides a means of initiating one-on-one contact between active members and alumni. Thus, individual advice and inspiration can be passed on from experienced alumni to younger students of the TUM: Junge Akademie. At the same time, mentees get a chance to keep in vivid contact with their Alma mater and can benefit from the next generation’s knowledge and enthusiasm. Furthermore, mentees and mentors are matched across disciplines with the aim to increase interdisciplinary exchange. The actual matching shall happen in the beginning of 2019 so that the kickoff of the mentoring program can take place at the beginning of the next summer term, i.e. around April 2019. In our current concept, the program is planned to run for one year. During that time, mentor and mentee should meet at least three times. The frequency as well as location and topics discussed are set individually. Academic questions as well as personal topics are encouraged to be discussed. At the end of the program, there shall be a closing event, which is the kickoff event for the next year of mentor/mentee tandems.

We are looking forward to performing the next steps. Stay tuned!

Your Mentoring Taskforce

Taskforce members
Simon Rehwald
Robin Wall
Jana Meier
Kerstin Pfister
Florian Tichy
Jana von Trotz zu Solz
Marna Able
Julian Albers
Barbara Gleißl
Thomas Just
Sebastian Mair
Janna Nikonov
Sabrina Schwarzmeier
Sebastian Siegel
Tutors
To take on the task of a tutor is one of the ways of involvement within the TUM: Junge Akademie. Several tutors support each group of students with respect to their ideas throughout the whole project year. They assist and advise the teams in the project realization, from concept to practical implementation. In this context, the tutors draw on experiences from their own project work. In the search for and the address of experts and other contacts they represent important interfaces for the project teams because of their already existing networks. The tutors benefit from their commitment as well, as they gain important experiences that strengthen their skills by taking over management tasks, motivating the team, giving feedback and moderating conflicts, without interfering with the team’s own freedom of decision.

Mentors
Mentors are recruited mainly from the group of active and retired professors of the Technical University of Munich. However, they might also be employees in TUM’s scientific management or TUM alumni with specific expertise. As part of their mentorship, they support their respective project team throughout the whole project work. Due to their years of experience they are ideally prepared for this task. They advise the project groups regarding the orientation of their concepts, they critically question the aims and methods used, they bring expertise in scientific issues and keep quality standards in mind. Due to their work inside and outside TUM they are also part of a large network that can often be used to support and promote the projects and this therefore represents a profitable factor for all sides.

Office
In order to assist the scholarship holders develop their projects and work on different ideas within the Taskforces as well as the Board of Members, the office team oversees the general operation. That includes, amongst other things, the proper management of finances, the development and implementation of attractive training opportunities and communication with external and internal partners. The office team acts as specified by the Advisory Board and ensures that current and former members of the TUM: Junge Akademie perceive and experience themselves as a network.

The TUM: Junge Akademie is managed by the Senior Vice President for Academic Affairs of the Technical University of Munich, Prof. Dr.-Ing. Gerhard Müller. In this regard, he is operatively supported by the office team that currently consists of the Managing Director, the Team Assistant and Student Assistants.

The Office Team
Peter Finger, Maria Harradner, Johanna Ghafir, Lisa Hamm, Nicola John, Sweety Mohanty

A different scholarship program
"TUM: Junge Akademie fosters your creative ideas and lets you test your own limits to discover new strengths and opportunities. I sincerely recommend this program to everyone who is seeking personal growth."
Artem Bliznyuk

In addition to the invaluable experiences, learning and networking directly associated with the projects, the TUM: Junge Akademie also offers scholarship holders the benefits of an attractive supporting program of training with varied opportunities for personal and professional development. In this context, they are able to participate in a wide range of events such as discussions and workshops, and cultural events such as concerts.

In addition, the annual summer festival, the monthly regulars’ table and the Academy’s festive Symposium a pleasant setting to meet and exchange views. The scholarship holders are integrated actively by the Event Taskforce in both the selection of event formats as well as in their organisation and implementation and so can contribute their ideas, wishes and expectations. In this way, each semester anew the TUM: Junge Akademie is able to offer a unique programme to its scholarship holders, alumni, friends and supporters.