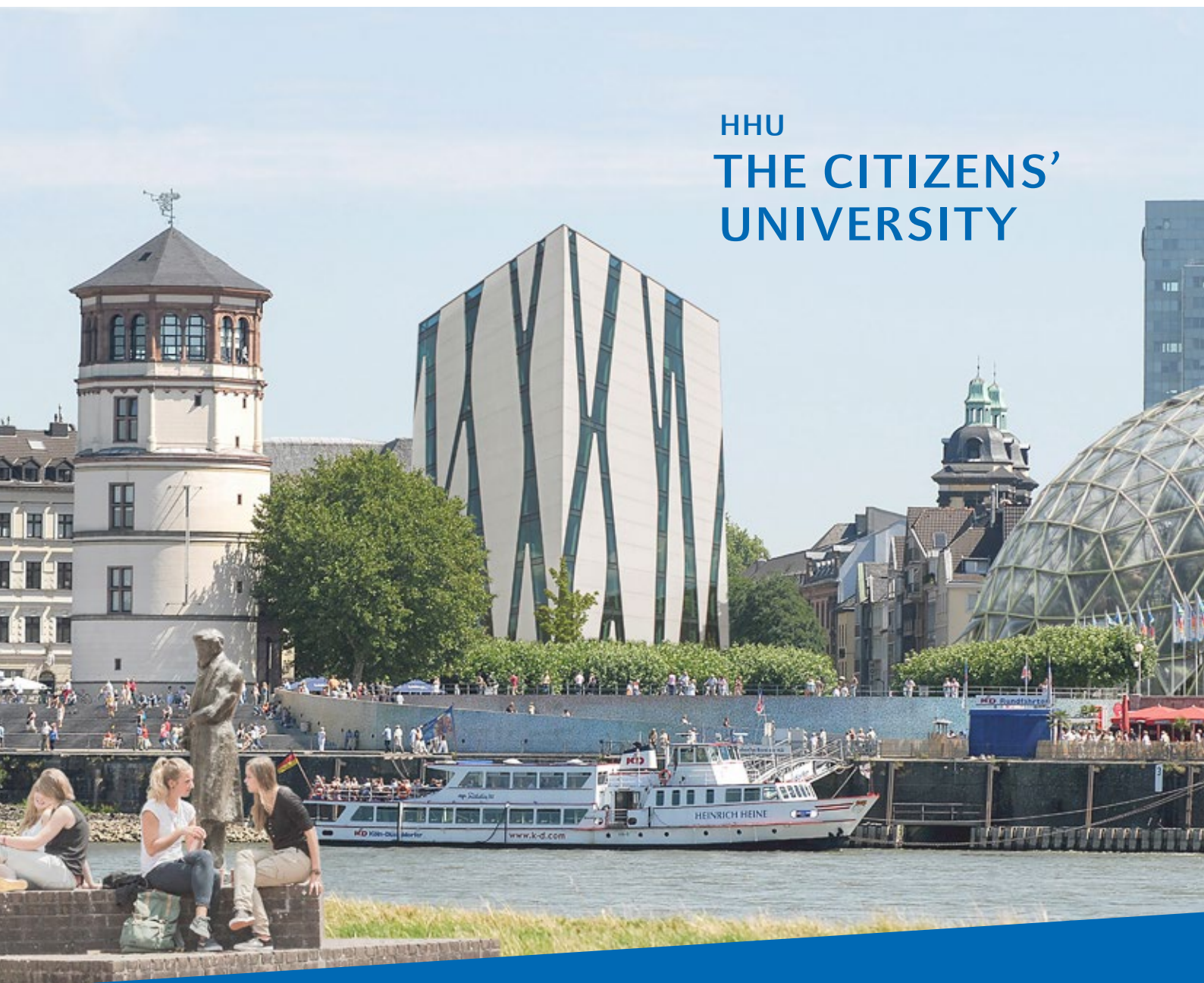


MAGAZINE

OF HEINRICH HEINE UNIVERSITY DÜSSELDORF

HHU
THE CITIZENS'
UNIVERSITY



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Analysing
Torah fragments

► **PLASTIC WASTE:**
Citizen's university
funds field study
in teaching

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Photo: Düsseldorf Tourismus, Composition: Paul Schwaderer



Photo: istockphoto.com – andresr

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Editorial



Photo: Ivo Mayr

Dear readers,

On 1 March 2019, I assumed the position of Vice-President for International Relations and Science Communications at Heinrich Heine University. I am delighted to be able to bring you news from both of those areas through the HHU Magazine in future.

President Prof. Dr. Anja Steinbeck's vision has become a reality: Not only is Heinrich Heine University a place of excellence in research and teaching, now it has also become a "citizens' university". In addition to current and exciting articles from our five faculties, this issue of the HHU Magazine is devoted to the topic of HHU as a citizens' university. This explains the montage on the cover: What is the OASE building (a space for meeting up and exchanging ideas and a centre for learning in the Faculty of Medicine), which is actually located on the clinic grounds, doing beside the Rheinturm? Why are the dome of the Botanical Gardens and the Heine monument from campus suddenly situated on the banks of the Rhine? For those of you who are familiar with the city and the campus and might be little confused by this: We are not proposing a new cityscape. But, as a citizens' university, the HHU wants to move closer toward the urban society and all those who are interested in science. This will

bring mutual benefits. On the one hand, citizens can find out more about the research carried out at our university, while in return the university will benefit from the interaction with urban society and the region. This is why we have transplanted the university landmarks into the city centre – at least on the cover page.

This issue of the magazine serves to promote that exchange of ideas. I hope you have an entertaining read and that we will all continue to enjoy a productive working relationship.

Yours sincerely

Prof. Dr. Stefan Marschall
Vice-President for International Relations
and Science Communications
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HHU AWARDED INTERNATIONAL SEAL OF QUALITY “HR EXCELLENCE IN RESEARCH AWARD”

Excellent working and research conditions at HHU

It's official: Heinrich Heine University Düsseldorf meets international standards in HR development and offers an attractive research environment for researchers. The seal of quality awarded to HHU by the EU Commission in December 2018 bears testimony to this accomplishment. HHU thus joins a list with just 13 other German organisations to have received the “HR Excellence in Research Award”.

As part of its “Human Resources Strategy for Researchers (HRS4R)” initiative, the EU Commission aims to improve the working conditions for researchers at all stages of their career at European universities and research institutes. The principles for achieving this goal are set out in the “European Charter for Researchers” and the “Code of Conduct for the Recruitment of Researchers”. These include fair and transparent recruitment processes for filling research positions, HR development offerings, facilitating transnational mobility, equal opportunities, ensuring scientific integrity and guaranteeing good working conditions. The EU requires any university that wants to take part in European research tenders to adhere to certain standards in these areas.

HHU commenced the HRS4R process in 2017 at the initiative of Prof. Dr. Peter Westhoff. The results were submitted to the European Commission in May 2018. In addition to documenting the current status, this also involved developing an extensive package of a total of 19 measures

that HHU intends to introduce in order to further improve conditions for researchers at HHU. For example, these include not only simplifying processes but also facilitating access to important information – especially for international researchers. There are also plans to extend the offering for career progression and further training.

The concept was subjected to an appraisal procedure by an international expert commission, which ultimately resulted in HHU receiving the “HR Excellence in Research Award” on 11 December 2018. Prof. Westhoff is proud of the achievement: “This seal of quality rewards the fundamental efforts at HHU to create the best working conditions and development possibilities for our researchers. This makes Düsseldorf an extremely attractive location for a career in research, both in a national and a European comparison.”

The award puts HHU in a strong position in Germany. A total of just 14 German higher education institutes, universities and research institutes have received this award, four of which are in North Rhine-Westphalia. The award makes it easier to take part in programme tenders, for example as part of the EU Framework Programme for Research and Innovation “Horizon 2020”.
A. C.

► More information on the award and the HRS4R process at HHU is available at: www.forschung.uni-duesseldorf.de/en/hrs4r



HR EXCELLENCE IN RESEARCH

The HRS4R process at HHU

A working group was set up for the process that was coordinated by the Research and Transfer Department and the Advisor to the Vice-President for Research and Technology Transfer. The working group included researchers from all faculties, representatives of different administrative departments, of Heine Research Academies (HeRA) and the Junior Scientist and International Researcher Centre (JUNO), among others. Other researchers at all stages of their career and from all faculties were also involved in the wide-ranging and inclusive process.

Scientific research now under way on religious texts hidden for years in the mud and in the basement

Students of Jewish Studies analyse fragments of the Torah

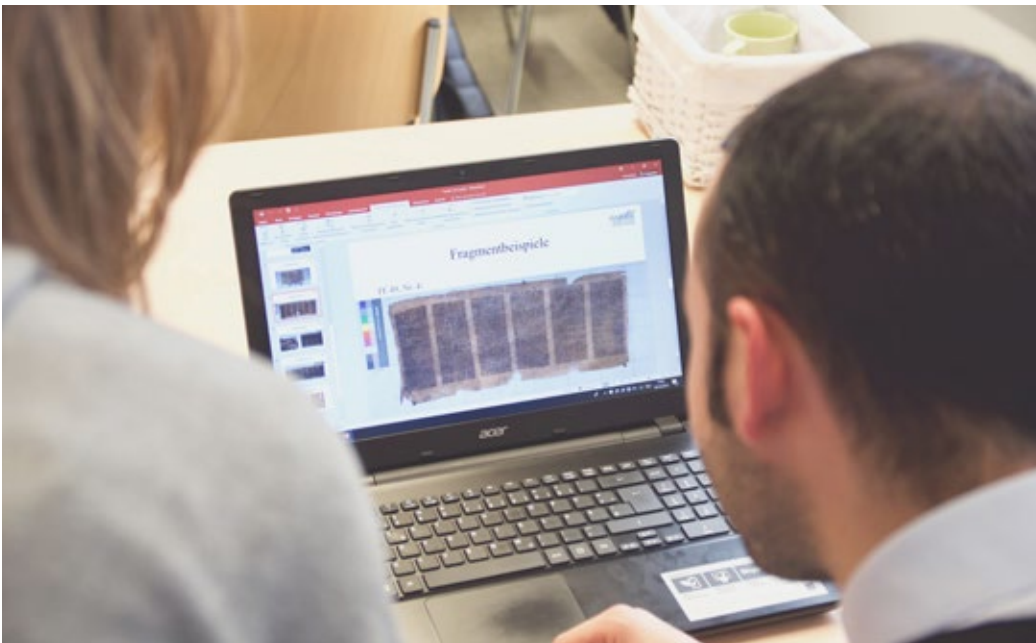


Photo: Ulf Oberländer

BY VICTORIA MEINSCHÄFER

50 pieces of parchment, buried for a long time in the mud and for even longer in a basement. Written in letters that most people are unable to read. What are these parchments, what do they say, and do they belong together? Finding the answers to these questions is the exciting task facing eight students of Jewish Studies in Farina Marx' block seminar.

the Hebrew Bible, the Torah. "They appear to be parts of at least two, probably even three different Torah scrolls", explains Marx. "The large ones are likely to have been used in the

Difficult to date

They were tasked with finding out more about the fragments and researching them for science. There were 50 pieces of parchment in total, 33 of which were approximately 54-57 cm in length and the others with a length of roughly 32 cm. All of the fragments contain text from

synagogue, while the small ones presumably have been part of a Torah used while travelling." Although the amount of text ultimately contained in the scrolls is not yet clear, what is apparent is that the scrolls are not complete. "A Torah scroll is an important and very valuable

“TORAH SCRIBES ARE HIGHLY TRAINED SPECIALISTS; AN EXPERIENCED SCRIBE CAN WORK FOR ABOUT A YEAR TO COMPLETE JUST ONE TORAH.”

Prof. Dr. Dagmar Börner-Klein, Department of Jewish Studies

possession for a synagogue”, explains Prof. Dr. Dagmar Börner-Klein. “Torah scribes are highly trained specialists; an experienced scribe can work for about a year to complete just one Torah.” Because Jewish tradition decrees that the scrolls must be written so painstakingly and accurately, prohibiting changes, deviations in the text or lettering, it is very difficult to date the scrolls. “The scrolls were presumably created in the 19th century, but they could be older. A scientific analysis is the only way to find out their exact age”, according to Marx. This is not currently possible for financial reasons. A Torah scroll must be written on kosher parchment in accordance with the strictest of rules. Even the type of lettering cannot be changed. The researchers assume that the scrolls were not all written by the same scribe, but even that is virtually impossible to ascertain. The existing frag-

ments are written in an Ashkenazi script that was commonly used in the Eastern European Jewish tradition. This fits with their presumed origin, which must be somewhere on the route between Thessaloniki and Celje in present-day Slovenia. Piece by piece, the students are analysing the fragments to answer questions like: What damage has been done? Have rats eaten some of the parchments? Which text from the Torah is recounted? Are there any deviations, no matter how tiny, that would provide further clues?

Rare fortune

For the students, this hands-on work is a real boon and something that can absolutely not be taken for granted on the Jewish studies programme. “Religious doctrine decrees that a Torah which is no longer in use must be stored in a genizah, a repository for liturgical texts”, says Marx. “Because our work is academic, we decided after thorough deliberation that we would restore and reconstruct the parchment. Working with finds like this one is a very rare opportunity for students of Jewish Studies.”

The results of the seminar will in turn be made available to the University and State Library (ULB), which will then have a thoroughly examined and researched treasure. “For us, the restoration of the pieces was a huge gift”, says Marx, “we are happy to be able to say thank you in this way.”

The long journey of the parchments

The fragments, owned by the ULB since August 2018, have an adventurous journey behind them: Dr. Bernhard Mannheims found them in 1944 or early 1945 when the German army was retreating out of Greece. As a physician and entomologist, Mannheims was an unarmed member of the Wehrmacht responsible for pest control. Although he was not a member of the Nazi party, he was conscripted as a trained biologist to perform this task. While retreating, he found parchments that he could not read and that had been used to stuff potholes.

“He didn’t know what the parchments were and was unable to read the script. Nevertheless he sensed that they might be something important – in any case, he put them in his backpack and brought them home to Bonn”, explains

Marx. As the fragments were damp or even wet when they were folded and because they dried out on the long journey, they had hardened and – as it were – solidified in this state.

Preserving fragments

In Bonn, they lay in Mannheims’ basement until his death in 1971 before passing to his son Wolfgang. Shortly before his death, Mannheims bid his son to preserve the fragments. After many years, Wolfgang thus decided to ensure that they would continue to be preserved and ultimately donated them to the ULB.

WITH STEAM AND PATIENCE

The documents, creased and illegible from soiling, were subjected to conservation treatment at the ULB (University and State Library) over the past year. However, the aim was not to remove the traces of history from the parchments, but instead to retain these traces and make the parchments available to science with all of the information they contained. Consequently, the heavily soiled spots were cleaned only enough to reveal the letters underneath and make them legible.

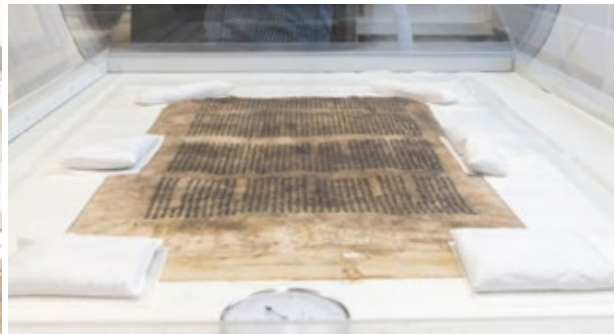
Ulrich Schlüter, head of the ULB restoration workshop, and his colleague Otmar Wetten, made

use of the property of parchment to absorb large quantities of moisture in order to make it soft and flexible again. They laid each individual piece into a mobile climatic chamber, where the parchments were carefully moistened using cold steam from an ultrasonic evaporator.

“Over the course of one day, the parchments absorbed the moisture and gradually became supple and we could lay them out”, explains Schlüter. “For some of the parchments, the humidification process had to continue overnight. It took 24 hours before they could be laid flat.” The next step was to dry the parchments between

paperboards for a period of several weeks, as they had been exposed to humidity of 99 percent. After that it was possible to package them for conservation purposes.

It is not yet certain what animal the parchment is made from and whether or not it was all made using the same method. The pores of the parchment are covered and sealed by mud deposits, making classification impossible. So there is still an air of mystery in researching and restoring the parchments and – depending on their academic relevance – transporting them into the digital world.



Photos: Agnes Lucas

Understanding the world – not just a grid square on a map



With the establishment of the citizens' university, HHU wants to take a big step toward the urban society

BY VICTORIA MEINSCHÄFER

A citizens' university tends to cater for lots of topics under one roof. The paper outlining the objectives and strategies of the citizens' university ('Bürgeruniversität') describes it as follows: "We understand it as a place of research and education that is focused on transparency and geared to dialogue." President Prof. Dr. Anja Steinbeck has a catchier analogy: "Education means understanding the world and not just a grid square on a map. Knowledge must be the basis for the value-based decisions of individuals or of political decision makers. This is why it is more important than ever before to strengthen trust in research and the acceptance of research results by means of an open and sincere dialogue with our citizens. Even if research does not lead to the ultimate truth, it is still the best way to arrive at reliable findings, i.e. knowledge."

There are currently four thematic focus areas: "Plants of the Future", "Internet and Democracy", "Competition and Regulation" and "Health and Society", but there could be more to follow. Heinrich Heine University aims to explore further thematic areas for the citizens' university. Since 2018, funding for the projects has been provided for the teaching arm of the citizens' university ('Bürgeruniversität in der Lehre'), with

roughly EUR 250,000 from the Central Quality Improvement Funds and maximum funding of EUR 25,000 for each project. From the summer, there will also be funds available for the research arm of the citizens' university ('Bürgeruniversität in der Forschung'), with two funding sources providing up to EUR 60,000 per project. All of this will be funded from the lump-sum grant obtained by the CEPLAS Cluster of Excellence and others. "The university receives this lump sum in

University: a place of interaction

addition to the conventional overheads. The funds are not supposed to be used in CEPLAS research or in administration. Instead, they are intended to support structural measures that benefit the university as a whole", explains President Steinbeck. "For us, the figure is EUR 500,000 per year. A little over a third of that amount goes to the citizens' university each year. This will allow us to finance the new staff unit and provide the funds for research, teaching and knowledge transfer to the citizens' university."

“NEW PLACES, NEW FORMATS,
NEW TOPICS – WE ARE OPEN
FOR EVERYTHING.”

Prof. Dr. Stefan Marschall

Picture: Düsseldorf Tourismus/ Paul Schwedener



The university is to be a place of interaction, where interested citizens reflect critically on current social developments together with researchers from all of the faculties. Many of the topics and activities already exist; they will need to be identified even more closely going forward. Another important factor is to bring these topics to a wider audience as part of the citizens' university. The aim is for researchers to communicate their research findings and methods to society and the media in an even more targeted way, and for communication channels to be tailored to the target groups.

New formats, new target groups

For example, this also means that the events do not always have to take place at University House or at the university itself: "We are thinking more and more about formats that will allow us to address target groups that are difficult to reach", explains Isabel Strauß, coordinator of the citizens' university. "To do this, we need to go to different places, which might be everyday places like parks, vacant retail spaces etc.

We can then also consider new interactive formats at those locations. It doesn't always have to be a classic lecture followed by a Q&A."

The citizens' university

The idea of a citizens' university ('Bürgeruniversität') relates to the 'responsible citizen' and follows the tradition of Heinrich Heine: "He was committed to the concept of an enlightened civic society that upheld the values of freedom, equality, tolerance and an open attitude towards the world. In the same way that Heine endeavoured to engage with an emancipated and enlightened civic society, it is important to HHU for citizens to be able to form independent and unprejudiced opinions about political and social developments based on research findings and their impact", explained President Steinbeck in her New Year's address for 2019.

"We want to step out of our ivory tower"

So what is a 'citizens' university', and what is it not?

President Prof. Dr. Anja Steinbeck and Prof. Dr. Stefan Marschall, Vice-President for International Relations and Science Communications, tell us more in this interview.

MAGAZINE: It seems that there are a lot of aspects to a citizens' university. Looking at the website for the citizens' university or reading the articles in this MAGAZINE, what is most striking is the wide range of different topics, ranging from collecting rubbish on Elba to parliamentary breakfasts and research on the topic of 'citizens' participation' in the expansion of the cycle paths network. How do you combine these topics into a clear picture of what a citizens' university means?

Prof. Dr. Anja Steinbeck: By not defining the citizens' university through topics, because they are truly diverse. Instead, the common strand is how we approach these topics. A citizens' university means that we step out of our ivory tower

and involve citizens in our research topics or in teaching. It's about starting an open and recursive dialogue with the citizens. Of course, it's very important to me that we don't get rid of good existing lecture series! But it's fair to say that there is an intention to structure even those formats somewhat more innovatively where appropriate, for example by suggesting the inclusion of an interactive element in a normal lecture.

MAGAZINE: Research and teaching are the original tasks of the university. Now you are adding another task with the 'citizens' university'. Why?



► “It’s about starting an open and recursive dialogue with the citizens”, says President Prof. Dr. Anja Steinbeck.

Prof. Dr. Anja Steinbeck: The fact that we have other tasks alongside research and teaching is nothing new. But what we need at Heinrich Heine University is a unique selling proposition. And I think the citizens’ university is a suitable profile for our university. Heinrich Heine is already our name-sake. In addition, here in Düsseldorf we have a suitable environment with a civic society that is very interested in research and science. Last but not least, this positioning will also benefit the researchers, because more and more tenders, for example in the EU, require precisely this transfer to the wider population.

Prof. Dr. Stefan Marschall: In my opinion, we have a societal responsibility as a university. This finds its expression in the citizens’ university. Particularly in this era of supposed fake science and general uncertainty, we have to keep our citizens on board when it comes to research and science. There are two sides to this: We have to consider the interests and concerns of the population in the process and take them seriously. We must also make research transparent and explain the methods and processes applied.

MAGAZINE: Prof. Marschall, you have been the new Vice-President since March, and your remit is “International Relations and Science Communications”. What is the relationship between science communications and the citizens’ university, and where do they diverge?

Prof. Dr. Stefan Marschall: The difference is the target group. The primary target group for the citizens’ university is citizens, while the people we call ‘decision makers’ form the main target group for science communications. We want to provide knowledge for people who frequently have to take

relevant decisions. That can include politicians as well as stakeholders in civil society. But decisions are also taken in business and in associations. And we have a huge advantage in Düsseldorf in terms of location. Because it is the state capital, there are already decision-making institutions and stake-

Taking advantage of the location

holders here. We should take advantage of this. And we need to approach these groups proactively and make it clear that we face a win-win situation.

MAGAZINE: So you are talking about special formats for special target groups?

Prof. Dr. Stefan Marschall: Yes. Each target group needs its own specific format that appeals to it. This format could even involve events that are not public, perhaps a fireside chat or background discussions. And there are already a number of initiatives in place. For example, this is what Cluster of Excellence on Plant Sciences (CEPLAS) does with its parliamentary breakfasts. The first step is to record all the activities already under way at HHU.

MAGAZINE: According to the strategy paper, the aim is also to address “remote target groups”, meaning people who don’t attend university lectures or events of their own accord. How do you intend to reach those groups?

Prof. Dr. Stefan Marschall: Science is made for society as a whole, not just for a specific clientele. We can’t have a situa-

“THE CITIZENS’ UNIVERSITY IS A SUITABLE PROFILE FOR OUR UNIVERSITY. HEINRICH HEINE IS ALREADY OUR NAMESAKE.”

Prof. Dr. Anja Steinbeck, President of Heinrich Heine University

tion where one third of society feels left behind, ultimately resulting in a group of people who have a difficult relationship with science and consider all science to be fake. It’s important to take everyone with us! All societal groups contribute to what we do here through their taxes. And we have to make it clear that what we are doing here is relevant. We have to engage with people where they are, with attractive content, maybe even using the types of media that they consume. New places, new formats, new topics – we have to try out everything.

MAGAZINE: What researchers are you hoping to attract with your ideas about the citizens’ university?

Prof. Dr. Anja Steinbeck: Everyone who is interested. Naturally there are research topics that are more or less suited to a wider audience. There is no obligation for all of the

researchers to take part. Instead, the citizens’ university is an invitation to researchers. It doesn’t have to involve everyone, it is a voluntary offering for topics that meet with interest beyond the realm of the academic world.

Prof. Dr. Stefan Marschall: I think we can get researchers enthusiastic about the citizens’ university if they have a positive feedback experience. This means getting feedback not only from colleagues but also from citizens or multipliers for a change. It has to become apparent that what we do has significance beyond the group of people with whom we normally interact.

MAGAZINE: And that will then influence research?

Prof. Dr. Stefan Marschall: Research is changed by an awareness of its social relevance. If I understand how citizens perceive research, and what fears and concerns they might have, then I can empathise and address those concerns.

MAGAZINE: Most of the events for the citizens’ university take place in University House, which is perfectly suited to engaging with citizens. Will there also be other event loca-

tions? And where are the geographical boundaries for the citizens’ university? Is it only for Düsseldorf’s citizens?

Prof. Dr. Anja Steinbeck: University House is the most obvious venue. But the citizens’ university can of course also take place on campus. If our medium-term plan is to also reach people who have not had much or any contact with research in the past, then maybe University House is not the right location. Instead, we will have to consider going to different neighbourhoods, bringing science to Oberbilk, Garath or Flingern. The internet era means that not everything has to take place in one location; we can also consider campaigns on social media.

Prof. Dr. Stefan Marschall: In terms of science communication for decision makers, we must also look to Berlin and Brussels. Brussels is important for networking. Another advantage of Düsseldorf as a location is that we are halfway between Brussels and Berlin.

MAGAZINE: The focus areas so far are “Plants of the Future”, “Internet and Democracy”, “Health and Society” and “Competition and Regulation”. Are there other areas that in your opinion have potential as focus areas?

Prof. Dr. Anja Steinbeck: These are the topics where there are contact persons who already have structures in place. But it goes without saying that this is not an exhaustive list. We are always open to new focus areas. What’s important is to choose topics that people know affect them. Medicine in particular has a lot of potential, for example diabetes research.

MAGAZINE: The citizens’ university is organised by a staff unit, and there is also a programme advisory board and a Round Table. Will citizens also have the opportunity to give feedback and propose topics?

Prof. Dr. Anja Steinbeck: Yes, there are plans for two or three citizens to take part in the Round Table. It is not yet clear how we will award these places. Citizens can be a good sounding board, because they may have a very different perspective on things. I think that would have a good regulating effect.

The interviewers were Dr. Victoria Meinschäfer and Achim Zolke.

STUDENTS AND PUPILS GATHER PLASTIC WASTE

Citizens' university funds field study on Elba

BY ARNE CLAUSSEN

In October, students and pupils from Düsseldorf travelled to the Mediterranean island of Elba together with PD Dr. Sven Gould from the Institute of Molecular Evolution for a field study on the topic of 'Awareness-to-go'. The objective of their project, funded by the citizens' university, was to scientifically analyse the plastic waste contamination on the island's beaches and water inlets.

"In April 2017, I was on Elba with Finnish colleagues to gather photosynthetic sea snails there and examine them", explains Dr. Gould. "We were shocked at how much plastic waste there was on Elba and in particular in the sea, particularly as the island is also advertised as

an eco-tourism destination." This spawned the idea for a project to bridge the gap between research and civic society.

From school to practice

Dr. Gould applied for a field study to be funded by the university through the teaching arm of the citizens' university ('Bürgeruniversität in der Lehre'). During the October 2018 autumn break, a team comprising Dr. Gould, three biology masters' students and four pupils from Schlossgymnasium secondary school in Benrath set out for Elba.

Photo: Sven Gould



► Waste collected from the river course near to Seccheto.



► “In the evenings we made waste mosaics from the waste we collected that day. Unfortunately there was plenty of material”, says pupil Siham Boujatoui. (*above*)

There were lots of cigarette butts on the beach in particular. (*below*)



The research unit spent nine days in total on the island, living and working in the research station ‘Hydra’ in Fetovaia in the southwest of the island. From there, they went on collecting trips to various sections of beach, to the course of a river near Seccheto, along a hiking and mountain biking trail and to the highest peak on the island, Monte Capanne.

Four kilos of waste over 360 square metres

“Sometimes we got started really early, before the locals, who depend on tourism, had cleaned up the worst of the rubbish themselves”, explains biology student Simon Stockhorst. They scanned sections of a predefined size and took all of the plastic waste to the research station. Once they arrived at the station, the first step was to wash the plastic waste collected in order to then dry it and weigh it. The data collected was processed and supplemented using online searches.

“On one beach near Fetovaia, we collected 1.1 kg of waste in an area of 1.3 square kilometres within just an hour and 20 minutes”, says

One of the pupils, Sheyda Jarvid, has this to say: “We learned about plastics and recycling in our higher-level Chemistry course. I was immediately interested in the trip to Elba because we would be able to put into practise what we had learned in theory in school.” Her classmate Siham Boujatoui from the higher-level Biology course adds: “I knew that plastic waste in the oceans is an environmental problem, but it wasn’t until the field research on Elba that I realised just how extreme the contamination really is.”

“THE MEDITERRANEAN IS WELL KNOWN FOR ACTING LIKE A DEAD END FOR WASTE. UNFORTUNATELY THE VOLUME OF WASTE ENDING UP THERE IS INCREASING BY 40 PERCENT EACH YEAR.”

PD Dr. Sven Gould, Institute of Molecular Evolution

biology student Sibylle Kanngießer. Another student, Andrea Alexa, adds: “On the river course, we weren’t even able to scan the whole predefined area, because after just 360 square metres we had already collected four kilos of waste and all of our containers were full.”

Petrol canisters, plastic bags and clothes pegs

There was a clear difference in the types of waste found. While the waste gathered at the river was intact – including everything from petrol canisters and plastic bags to whole clothes pegs – the waste washed up on the beach had already been broken down. Bits and pieces of fishing nets as well as huge volumes of cigarette filters were the most commonly found items. This plastic waste may have travelled a long way and does not necessarily come from the island itself. Dr. Gould: “The Mediterranean is well known for acting like a dead end for waste. Unfortunately the volume of waste ending up there is increasing by 40 percent each year.” In the ocean, plastic parts are broken down and spread over long distances by the currents. They are washed up again at certain locations.

In addition to gathering waste at different locations, the study group members also made themselves the subject of the research. “We were self sufficient, buying and cooking for ourselves”, explains Siham Boujatoui. They collect-

ed all the plastic waste they created on Elba during their stay separately. “The result was 3.9 kg of plastic waste, a shocking result considering the size of our group”, adds Gould.

Back in Düsseldorf, the pupils from Benrath are making two posters to present the project to their school. Sheyda Jarvid: “One poster talks about the global waste situation in the oceans, while the second is about the results of our field study on Elba.” Smaller projects may also result, for example a project week on plastic waste. Sven Gould adds: “Our trip showed that projects like these can raise awareness beyond the realm of the university. The pupils can present the findings to their school and increase awareness of the issue.”

Developing a field study module

Dr. Gould is likewise considering further steps at HHU. He would like to use the experience gained from the waste-gathering trip to develop a field study module for biology bachelors’ students. “In addition to the important scientific experience, maybe we can raise the awareness of more students in this way. Because, at HHU too, we are still using too many disposable coffee cups and too much plastic packaging. Thousands of these items end up being thrown away every day.”

► **Contact:** PD Dr. Sven Gould, Institute of Molecular Evolution, gould@hhu.de



iGEM competition

HHU students successful in Boston

This is already the third time that a group of Düsseldorf students has taken part in the international iGEM competition. This year, the young biology students experimented with what are referred to as “co-cultures”, communities of microorganisms that mutually support each other. Their findings won over the jury and earned them a gold medal.

BY ARNE CLAUSSEN

IGEM is like a big family, with all of its ups and downs. When you work together so closely for so long, sometimes you also end up arguing.” That’s how Katharina Polzen, member of the 2018 Düsseldorf team, describes the very intensive and sometimes emotional work carried out in the past year. The students had three-quarters of a year to develop a project idea, procure laboratory capacities, devices and chemicals and above all else to learn to present their project. Sponsorship was another one of the tasks, especially for the team’s trip to the big closing event in Boston.

“You have scarcely any free time when working on iGEM. Instead, you work very long hours in the lab”, says Polzen. So why do students invest so much

time in this project with a name that does not exactly roll off the tongue (iGEM stands for “International Genetically Engineered Machine”). It refers to a major competition in the field of synthetic biology that was brought to life at Massachusetts Institute of Technology in the USA in 2003. It started out as a local competition between a small number of student groups, but it grew and became more international from year to year. Last year, roughly 350 teams from around 140 countries took part.

The competition is open to student groups with their own scientific project, which they typically work on at a university. At HHU, 14 students of biology, biochemistry, physics and computer science came together at the end of 2017 to work on their project. They wanted to carry out research into “co-cultures”,

i.e. communities of single-cell organisms that interact with each other. Prof. Dr. Oliver Ebenhöf and Junior Professor Ilka Axmann as well as a range of biology doctoral students and advanced master’s students – the “advisors” – supported them in their work.

“Our aim was to bring together different bacterial and fungal cells in one liquid culture so that they would complement each other and synthesise products relevant for use”, explains Svenja Hermanns. The point of departure for the project was fast-doubling E. coli bacteria that were mutated to slow their growth. This prevented the bacteria from other-

Tricky challenges

wise growing so fast that they would “overrun” any co-culture. The team’s second approach was to get E. coli bacteria and yeast to regulate each other by replacing essential amino acids. In a third step, they worked on creating a community of yeasts, cyanobacteria and E. coli bacteria that became interdependent by providing essential nutrients to each other. For example, the cyanobacteria were able to produce sugar by means of photosynthesis, making them the only sugar producer in the community. Partic-



▲ iGEM team Düsseldorf at the Giant Jamboree in Boston (from top left to bottom right): Kai Hufnätter, Nicholas Schmitt, Susanne Vollmer, Svenja Hermanns, Carina Gude, Katharina Polzen, Anna Behle, Sarah Seyffert, Jennifer Denter, Salima Rüdiger, Ylenia Longo, Max Dietsch. Other team members: Miriam Dreesbach, Thomas Bick, Jan Maika, Nicolas Schmelling, Philipp Rink, Tim Blomeier.

iGEM team Düsseldorf on a Friday evening in the lab. Thomas Bick supervises Sarah Seyffert and Susanne Vollmer, new to the lab at the time, as they isolate plasmid DNA. Ylenia Longo and Jennifer Denter discuss the lab plan for the coming weekend.



Participant Svenja Herrmanns has this to say: "Our trickiest challenge was to adjust the experimental parameters such that all three types could co-exist and have a positive mutual impact."

In order to change the microorganisms in a targeted manner, the students added "plasmids" to them. These are small, generally ring-shaped, sections of the genetic DNA molecule, on which certain characteristics are encoded. The cells include these plasmids in their genetic material. This gives them new characteristics, allowing them to synthesise certain molecules for example. "These plasmids are one of the basic tools for iGEM", explains Salima Rüdiger. "Successful plasmids are sent to the 'iGEM Part Registry' after the end of the competition, where other teams can access and use them." A significant part of the competition involves presenting the findings. Only with a good presentation do participants have a chance to win a prize in Boston at the grand finale or 'Giant Jamboree'. Participating student Svenja Herrmanns says: "We underwent tough training: Every week, we presented our

project in front of our advisors, and they knew exactly what to look for."

The Düsseldorf iGEM team travelled to Boston from 22 to 31 October 2018, where the teams convened from all over the world. They presented their project in a 20-minute talk and a poster presentation. They won over the jury, earning a gold medal and receiving a nomination for one of the main prizes in the category "Best basic part". "Unfortunately, we didn't win the main prize", laughs Salima

A show like at the Oscars

Rüdiger: "One of the reasons was probably that our presentation was not 'US media-friendly' enough." What does she mean by that? "Everything you have done just has to be 'great' and 'amazing'; one of the jury members told us afterwards that we were too self-critical."

The final awards ceremony is a big show, "just like the Oscars". As a nominee, the HHU project even made it to

the big screen. The nominees for the "Grand Prize" – which included the teams from the University of Marburg and the universities in Munich – were invited to present their findings on the main stage. All members of the iGEM team received a certificate and a gold medal, which in reality was more like a sticker. "It was a unique experience", says Katharina Polzen, "and we would not have succeeded without the support of the university and other sponsors outside of the university!"

Some members of the 2018 team are so enthusiastic that they have now become advisors for the 2019 team. The new project will relate to the manufacture of synthetic milk. The two professors Prof. Dr. Lutz Schmitt (Biochemistry I) and Prof. Dr. Markus Pauly (Plant Cell Biology and Biotechnology) will also provide support to the new team. Another special aspect is that the HHU team is organising the 'German iGEM Meet up' in Düsseldorf from 5 to 7 July, which all of the German teams will attend.

► **Contact:** iGEM team, igem@hhu.de

DÜSSELDORF CITY COUNCIL AWARDS STUDENT INITIATIVE FOR VOLUNTEER WORK

‘Martinstaler’ award for Refugee Law Clinic Düsseldorf

Volunteering is often something that takes place behind the scenes. Dedicated helpers take care of others, generally without making a big fuss about it. Once a year, Düsseldorf City Council takes the opportunity to thank these helpers – traditionally in the period leading up to Christmas – by awarding them with the ‘Martinstaler’ award for volunteer work.

At the end of November 2018, the association Refugee Law Clinic Düsseldorf e.V. (RLCD) won the ‘Martinstaler’ award in the category “New ways for civic volunteering” for providing volunteer-based legal advice to refugees and asylum seekers. The association was founded by HHU students in 2015 and works closely with initiatives in Düsseldorf involved in supporting refugees and asylum seekers. For example, every two weeks it holds a drop-in advisory service in the Welcome Center rooms of refugee association “Flüchtlinge willkommen in Düsseldorf e.V.”, which is located behind the main station, directly across from the immigration authorities.

The RLCD has been assisting refugees and asylum seekers in filing their applications and liaising with the authorities since April 2017. But is it even possible for students to provide legal advice? The RDG [“Rechtsdienstleistungsgesetz”: German Act on Out-of-Court Legal Services] states that free legal services can also be provided by persons who have not completed their legal training if they are indemnified by fully qualified legal experts. As part of the General Studies programme at HHU, the association offers lec-

tures on immigration law together with specialists. The advisors are trained in asylum and residency law and receive continuous further training. This guarantees that the advice offered is

Free legal advice

of high quality. Founding member Lars Wasnick explains: “Our advisory offering includes informing clients of how the asylum procedure works, preparing them for the hearing, subsequent immigration of dependants, labour market access and temporary suspension of deportation, the prospects for remaining in Germany and being deported. At our drop-in service, those seeking assistance describe their legal problems, often accompanied by an interpreter. We sort the cases there on the spot and pass them on directly to our legal advice team. The advisory findings and problems they work on are checked by fully qualified legal experts after three weeks in the course of the supervision meetings.”

No deadline-related matters are handled, as immigration law involves people’s individual

“THE REFUGEE LAW CLINIC ALLOWS US TO GATHER PRACTICAL EXPERIENCE BEFORE GRADUATING FROM OUR STUDY PROGRAMME.”

Lea Prehn, student at the Faculty of Law

fates rather than claims for damages, for example. Because of the urgent nature of those cases, the RLCD refers them to specialist lawyers with whom it works regularly. Similarly, students are not permitted to assist in court proceedings.

The first Refugee Law Clinics in Germany were founded roughly ten years ago. The basic idea is to contribute to a fair hearing for refugees by providing free legal advice, mainly by law students, and at the same time to integrate practical problem-solving in the heavily theoretical law degree programme. Lea Prehn, who was

encourages a lot of people to come to us. We see it as a win-win situation: The students can work with real-life cases for the first time and get an insight into the profession. In return, people receive high-quality, free legal advice who would otherwise have difficulty accessing such services.” The RLCD has already provided advice to more than 50 clients – including four proceedings completed in the past two months alone.

The Refugee Law Clinic Düsseldorf uses flyers to ‘advertise’ in numerous refugee accommodation centres, and much of its advertising is by word of mouth, via Facebook and online. As a comparatively recent initiative, the RLCD is particularly reliant on the help of lots of volunteers from all professional areas: “Our doors are always open to anyone who would like to help out, not only specifically with legal advice, but also with general organisational and interpreting duties”, says board member Lisa Qashou. C. G.

Two problems at once

one of the representatives to accept the ‘Martinstaler’ award, adds: “The Refugee Law Clinic allows us to gather practical experience before graduating from our study programme. That

► Further information: www.rlc-duesseldorf.de



► The association Refugee Law Clinic Düsseldorf has won an award in recognition of its particularly exemplary volunteer work. The City Council bestowed the ‘Martinstaler’ award on the RLCD to recognise its innovative involvement. The founding members: Lea Prehn (2nd from left), behind her Lars Wasnick and Lisa Qashou.



Step by step

Medical research into paraplegia

BY SUSANNE DOPHEIDE

Last summer, track cyclist and Olympic champion Kristina Vogel collided at full speed with another rider while training. The young athlete's spinal cord was severed at the seventh thoracic vertebrae in this serious accident. Vogel has been paraplegic ever since. This makes her one of an estimated 1,000 people in Germany who each year experience a similar fate as the result of a trauma. Because their spinal cord was partially or entirely severed, nerve impulses can no longer be transmitted from the body to the brain. This affects the motor nerves, sensory nerves and autonomic nervous system, which controls the cardiovascular system, digestive organs and the body's elimination function among other things. A huge limitation by all accounts.

For decades, medical research has been considering the question of whether and how an injured spinal cord can be regenerated. Prof. Dr. Hans Werner Müller, Head of the Molecular Neurobiology Laboratory, and his fellow researchers have

now presented their research findings from microsystems technology in a current publication in the journal *Communications Biology*.

Huge challenge

While it is already possible nowadays to achieve a considerable degree of regeneration of injured nerve fibres in the peripheral nervous system, the successful regeneration of the nerve extensions and recovery after a spinal cord injury pose a huge challenge. "Recovery after complete spinal cord injury is very limited even in animal models receiving elaborate combinatorial treatments", says Prof. Müller, who has been researching into this topic for the past 25 years with his Laboratory for Molecular Neurobiology in the Department of Neurology at University Hospital Düsseldorf. "The big prob-

“THE SATISFACTORY RESTORATION OF MOTOR, SENSORY AND AUTONOMIC NERVOUS SYSTEM FUNCTIONS AFTER SPINAL CORD INJURY IS STILL A VERY LONG WAY OFF.”

Prof. Dr. Hans Werner Müller, Head of the Laboratory for Molecular Neurobiology

lem is not just the injury itself; the subsequent pathophysiological and pathomorphological degeneration in the spinal cord tissue also play a major role”, he explains.

This “secondary degeneration” involves the widespread death of injured neurons and their companion cells (glia), demyelination of the nerve fibres, the development of obstacles to regeneration such as scars and cysts, as well as inflammatory reactions through activation and migration of immune cells. Additionally, it would appear that nerve cells in an adult’s central nervous system are unable, once the nerve extensions have been severed, to independently switch to a genetic growth programme in order to re-grow the shortened nerve fibres so that the original target tissue can be innervated once again.

Together with engineers at the Institute of Microsystems Technology at Hamburg University of Technology and casualty surgeons at BG Klinikum Hamburg, the Laboratory for Molecular Neurobiology has developed an implantable mechanical microconnector system (mMS). The mMS is designed to apply a small vacuum to push together and stabilise the severed tissue stumps of the spinal cord in order to allow the development of a tissue bridge. Very broadly speaking, the principle is the same as that of a broken bone, where the breaks are

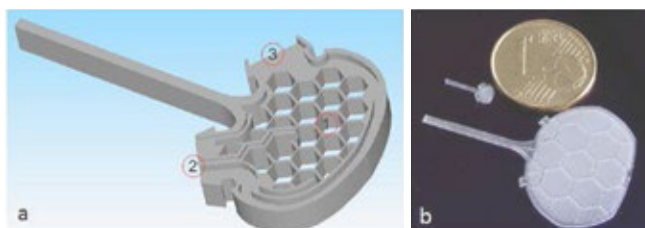
brought into a position from which they can grow together again. It takes a lot of time and effort to develop and optimise the microconnector. This involves selecting suitable biocompatible materials, microtechnical fabrication methods, special surface structures, size adjustments to the diameter of the spinal cord as well as appropriate implantation procedures.

Structural tissue regeneration

The researchers carried out long-term experiments on rats to examine the use of the optimised biocompatible microconnector and monitored structural tissue regeneration and locomotor recovery over a period of five months (see publication). They found that the re-adaptation of the severed spinal stumps supports formation of a solid tissue bridge and the migration of endothelial cells to reform blood vessels as well as the growth of descending motor and ascending sensory nerve fibres. There is also an invasion of glial cells, which myelinate the newly formed nerve fibres. The researchers were able to prove that the regenerated nerve fibres can also trans-

Structure of the microconnector

- 1: A side wall with a honey-comb structure
- 2: Internal microchannels
- 3: Tube connection



Size comparison of two mMS with a EUR 1 cent coin: for the rat’s spinal cord (*above*) and adjusted for the human spinal cord (*below*)

mit electrical signals. One particularly significant finding, however, is the remarkable extent of locomotor recovery for complete spinal cord transection. With the help of the innovative microconnector, the researchers observed right-left alternation of the hind limbs, plantar foot placement and weight support in the animal groups for the first time.

Innovative microconnector

The therapy study shows that microsystems technology can make a major contribution to long-lasting functional recovery after paraplegia. Thanks to its internal microchannels, the mMS is also perfectly suited to future combinatorial therapies. For example, pharmacological substances or cell suspensions of an appropriate dosage and composition can be infused locally in the lesion centre. Unfortunately, there are not yet any causal therapeutic treatments for traumatic brain and spinal cord injuries. The extent of the rats' improved locomotion after implantation of the microconnector into a

complete spinal injury as described in this publication is unique to date and has not yet been achieved by any other method. As a reputable researcher, however, Prof. Müller does not wish to create any unrealistic expectations: "The satisfactory restoration of motor, sensory and autonomic nervous system functions after spinal cord injury is still a very long way off. Nevertheless, the approach described here from microsystems technology constitutes an important step in this direction."



Photo: UKD



Publication

"Low-pressure micro-mechanical re-adaptation device sustainably and effectively improves locomotor recovery from complete spinal cord injury", Estrada et al., Zeitschrift Communications Biology, www.nature.com/commsbio

 <https://rdcu.be/boQ7t>

Advertisement



Künstler: Matthew Cusick

How effective is the influencer campaign?



CEDUS assists five students with their start-up venture

BY CAROLIN GRAPE

What do twins Lisa and Lena, Bibi, Caro Daur, Julien Bam and Stefanie Giesinger have in common? All of them are influencers enjoying major popularity on social networks at present. Young people and adults follow them on Instagram, YouTube and Facebook, look at their photos and videos, like their hashtags and want to have a similar lifestyle to their idols.

Ten years ago, it was traditional media that held the gate-keeper role, deciding who would become famous and who would not. By contrast, nowadays it's the digital world that decides who will be at the centre of the hype. The new currency is the number of followers the influencers have. Their closeness to their followers makes influencers extremely attractive for companies. In their search for attention and visibility in the digital jungle, influencer marketing has become an important component of their marketing strategies. But what companies does it really benefit, what are those benefits, and what contribution do influencers make to the success?

A team made up of Nadja Chylla, Lara Lauc, Pranjali Dhole, Jonas Winkelmann and Mehmet Karakus has been working on a project called Valuencer that is based around the development of a business idea which can be used to calculate the added value of an influencer campaign in euros and cents for the first time. The team was formed at a start-up workshop offered by the Center for Entrepreneurship Düsseldorf (CEDUS), which is open to all HHU students with an interest

in business ventures in the summer semester of each year – regardless of what they are studying. Based on their own ideas, the students learn the practical steps to setting up a new company. Using market, customer requirements and competition analyses, they work in teams to develop their own product, which they test on customers by designing an appropriate marketing strategy. At the end of the workshop, students use an investor pitch to try to win over relevant interest groups.

Examine business idea

Lara Lauc: "In the start-up workshop, we initially wanted to use 'Groupfluencer' to create a matching platform for companies and micro-influencers. But then we found after intensive market analysis and customer surveys of companies and influencers that tons of these platforms already exist – there was no unique selling proposition. When we evaluated our requirements analyses, however, we found that it is a major challenge for companies engaged in influencer marketing to calculate the return on investment (ROI). That prompted us to overhaul our tool to focus on this issue. We want to calculate the added value of influencer campaigns for the first time. The second step will be to use the data for a transparent satisfaction rating by companies and influencers."



Jonas

Data Scientist/IT Developer

15.834 38%



Lara

Design/Marketing

1.834 73%



Mehmet

Project Management/Finance

19.302 35%



Nadja

Sales/Marketing

17.834 56%



Pranjal

Data Scientist/IT Developer

10.834 44%



Number of followers



Sales increase as a result of the influencer campaign



The start-up 'Valuencer' by Jonas Winkelmann, Lara Lauc, Mehmet Karakus, Nadja Chylla and Pranjal Dhole evaluates influencer campaigns.

Photos: private

But did their business idea developed in the start-up workshop have the potential for a start-up? The start-up team entered the annual HHU Ideas Competition to find out. This event is likewise organised by CEDUS in order to raise university-wide awareness of the professional options of being self-employed and founding a company, to establish a creative start-up culture and to encourage and support an entrepreneurial mindset and behaviour amongst all HHU members from an early stage. The team won 2nd place in the 'Ideas from students' category, confirming the potential of 'Groupfluencer'. This made it possible to take the next step toward realisation: an application for the start-up grant totaling EUR 50,000 offered by the GFFU, HHU's society of friends and sponsors ('Gesellschaft von Freunden und Förderern der HHU'). For two years, this grant from the GFFU has been helping to move a chosen start-up idea into the implementation and post start-up phase.

The path to entrepreneurial independence is not a walk in the park. It requires courage, initiative and motivation. In addition to these intrinsic qualities, entrepreneurs have to acquire professional expertise. Help was on hand from CEDUS with its numerous advisory offerings, which are free of charge to

Informal meet-up

HHU students, such as the CEDUS Networking Event: "This informal meet-up allowed us to network in a relaxed environment and talk to well-known personalities and experts from Düsseldorf's start-up scene", says Mehmet Karakus.

For their pitch for the start-up grant, the five-member team refined the original business model and developed a business plan. 'Groupfluencer' became 'Valuencer': "Valuencer"

makes it possible to measure the effectiveness of influencer campaigns, i.e. we calculate whether and how much of a sales increase results from the campaign. In the longer term, we also want to create a rating platform where companies can rate their level of satisfaction and compare it with other companies. Using these two factors, we will calculate the actual market value, or what the influencer is actually worth for the campaign”, explains Nadja Chylla. It’s a major advan-

Awarded by the GFFU

tage that all of the skills needed to realise the business idea can be provided by the team members themselves. They do not have to buy in expertise, so the financial risk is limited. Lara Lauc and Nadja Chylla are both master’s students in business administration and therefore have the fundamentals of entrepreneurial knowledge. They are responsible for marketing and design. As Computer Science students, Pranjali Dhole and Jonas Winkelmann (from Düsseldorf University of Applied Sciences) cover the technical side and develop the necessary algorithms for their database-supported platform. Mehmet Karakus (Business IT) is the team leader and ensures a smooth combination of the findings and the finances.

The start-up workshop is a practice-based course that requires strong initiative and motivation. Students who take part successfully will be able to start their own company.



Photo: CEDUS



Every founder at HHU will at some stage encounter the Center for Entrepreneurship Düsseldorf (CEDUS). From start-up theory to advice, all start-up support measures are bundled within the Centre.

IMPORTANT DATES IN THE SUMMER SEMESTER

- 1 April:** Start of the HHU Ideas Competition
- 9 April:** CEDUS Start-up Speed Dating as part of Düsseldorf Start-up Week
- 22 May:** CEDUS Founders’ Lounge at the campus fair
- 28 May, 24 September und 19 November:** CEDUS Networking Event in the co-working space super7000, starts at 7 pm

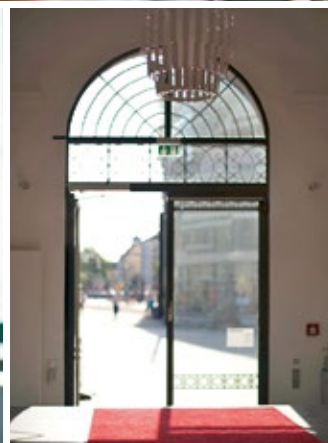
[For details, see: www.cedus.hhu.de/en](http://www.cedus.hhu.de/en)

The GFFU was also inspired by the idea behind ‘Valuencer’. Last October, it selected the start-up as one of two business ideas and is now providing one year’s funding of EUR 25,000 for the team to realise the project. Now the plan is to put all of these resources into implementation: “By the end of 2019, we want to have the technical logarithm-based structure of our platform in place and have a beta version (prototype) on the market. To do this, we need to develop a landing page or website in order to provide a first point of contact for companies where they can register. Because, to develop the prototype, we have to acquire companies or start-ups that are willing to share their data with us for evaluation”, says Lara Lauc, explaining the next steps.

Finding people on the same wavelength and supporters

Data security plays a central role in their business model. The team members honed their skills in this area by making use of free legal advice and further training on the EU GDPR (General Data Protection Regulation) on campus within the framework of the CEDUS ‘Experts-in-Residence’ programme.

The young entrepreneurs gave us one more word of advice: Anyone who would like to set up their own company should simply take the plunge, regardless of whether or not they already have a business idea. Like with ‘Valuencer’, the path to professional independence is a work in progress. Generally, it does not follow a straight line from A to B. It is important to find people who are on the same wavelength and get professional support – for example with the different CEDUS offerings – to find out step by step where you want to go.



University House

University House was placed at the disposal of Heinrich Heine University by the van Meeteren Foundation. Its purpose is to provide information and advice as well as foster an exchange between science, culture and education. In the framework of a large spectrum of events, the University offers local citizens the possibility to experience cutting-edge research and research findings and shares university life with the city.

Further information, programme, bookings:

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Director: Professor Dr. Georg Pretzler Deputy Director / Programme Development: Dr. Christoph auf der Horst Event Planning and Support: Angelika Kumpernas M. A., Susanne van Putten