



B: INTER- AND TRANSDISCIPLINARY TEACHING AND LEARNING WITHIN THE *REALLABOR*

Natalia Pfau, Elke Uhl

The *Reallabor* (real-world laboratory) offered a space for testing new forms of university learning and teaching. The goal was to develop, apply, and assess innovative teaching formats within the field of “sustainable mobility culture”. Models of learning via researching were tested: cross-disciplinary, inter- and transdisciplinary, action oriented, explorative, cooperative, and participatory. They provided knowledge on systems, goals, and transformations and allowed participants to gain expertise as well as methods and communications skills.

0. INTRODUCTION

When the project “Future City Lab Stuttgart: *Reallabor* for Sustainable Mobility Culture” was initiated in 2014, closely linking interdisciplinary research and teaching as well as the transdisciplinary involvement of the urban community were already of central importance. The task of the specially designed working unit “Teaching for Sustainability” was to develop and test an interdisciplinary, explorative, and cooperative teaching format.

Interdisciplinary and transdisciplinary courses that offer a key interdisciplinary qualification in sustainable development design had until that point been an unmet need at the University of Stuttgart. This is where the teaching initiatives of the *Reallabor* came in. In addition to gaining knowledge and skills in the field of “sustainable mobility culture”, they pursued the overarching goal of fostering an interdisciplinary and transdisciplinary discussion culture at the University of Stuttgart at the level of interdisciplinary key qualifications, and of developing the structures necessary to ensure its success. The International Center for Cultural and Technological Studies (IZKT), in close cooperation with all scientific and practical partners, conceived, carried out, and evaluated one workshop each project year. It was offered to the students as an interdisciplinary key qualification (FÜSQ) while at the same time addressing interested members of the public and relevant political, administrative, and civil society actors.

These teaching and learning projects, described in more detail in chapter 2, resonated strongly with the students. Quotations from the evaluation materials testify to what the students

considered particularly valuable and how they assessed their learning gains. Overall, the evaluation results made clear that there is a great need on the part of students for inter- and transdisciplinary teaching formats that address societally relevant issues and respond to the challenges of sustainability. These experiences within the “*Reallabor* for Sustainable Mobility Culture” show that there is still considerable potential in this field. At the same time, they show that such ‘real laboratories’ can be a nucleus and driver for systematically implementing inter- and transdisciplinary, research-oriented teaching that promotes education for sustainability. They make an innovative contribution towards a “specific teaching culture”¹ as called for by the National Action Plan for the implementation of the UNESCO World Action Programme on Education for Sustainable Development.

1. THE IZKT AND ITS CONTRIBUTION TO THE REALLABOR

The International Center for Cultural and Technological Studies (IZKT) is a cross-faculty research institution of the University of Stuttgart. It links research on the junctions between culture and technology and, with the support of non-university partners, provides a forum for interdisciplinary and international dialogue and knowledge transfer. The IZKT has developed a series of research projects, events, lectures, and discussion formats in three programme areas that examine questions about the future that require integrative research and transdisciplinary dialogue.² As a project partner within the “*Reallabor* for Sustainable Mobility Culture” (RNM), the IZKT contributed its expertise and networks within and outside the university in the

¹ BMBF 2017: Nationaler Aktionsplan Bildung für nachhaltige Entwicklung. Der deutsche Beitrag zum UNESCO-Weltaktionsprogramm. https://www.bmbf.de/files/Nationaler_Aktionsplan_Bildung_f%C3%BCr_nachhaltige_Entwicklung.pdf (accessed 03.04.2020),

p. 54.

² For an overview, see the IZKT homepage at: <https://www.izkt.uni-stuttgart.de/en/about-us/>

field of sustainable development.³ It also brought experience in offering inter- and transdisciplinary seminars and knowledge transfer projects to the table.⁴

The RNM’s fundamental and specific approach was the close integration of research and teaching and the transdisciplinary, direct involvement of the urban community in the research process. This is also reflected in the research-based teaching committed to educating for sustainable development. It included practitioners and civil society actors as partners and co-researchers, which allowed for mutual learning. This required a format that could take proposals for meaningful transformations and feed these into the participatory-recursive process of *Reallabor* research, which was then offered at the University of Stuttgart as a cross-disciplinary key qualification (FÜSQ) for students of all faculties.

2. PROJECT-BASED CROSS-DISCIPLINARY KEY QUALIFICATION WORKSHOPS

Cross-disciplinary key qualifications at the University of Stuttgart are qualifications that a person needs alongside the expertise of their discipline. These include social, methodological, communications, and human resources skills, competencies, and qualifications useful for complex societal and professional demands. The students choose their own FÜSQs from a diverse set of options, with only the number and timing of the courses in prescribed or recommended by the regulations of their degree programs. The students who chose the interdisciplinary key qualification courses in the *Reallabor* for Sustainable Mobility Culture did so out of interest in the current topic and curiosity about an unusual format.

³ Uhl, E., Görtz, H.-D., Brümmer, F. (Eds.) 2013: Nachhaltigkeit. Problemanalysen – Lösungsansätze – Perspektiven. Materialien Vol. 13. IZKT der Universität Stuttgart, Stuttgart 2013. Möser, K., Popplow, M., Uhl, E. (Eds.) 2013: Auto.Kultur. Geschichte. Materialien Vol. 11. IZKT der Universität Stuttgart, Stuttgart 2013. Uhl, E., Bott, H., Brümmer, F. (Eds.) 2014: Nachhaltige Stadtentwicklung – ein transdisziplinäres Projekt. Materialien Vol. 17. IZKT der Universität Stuttgart, Stuttgart 2014.

⁴ Uhl, E. (Ed.) 2018: Leitfaden für transdisziplinäre Projekte. IZKT der Universität Stuttgart, Stuttgart 2018.

6 2.1 ELEMENTS OF THE TEACHING DESIGN

INTER- AND TRANSDISCIPLINARY INPUTS

“Sustainable mobility culture” is a complex topic that requires approaches that transcend traditional disciplinary boundaries. The first step was thus to review the latest research insights at the intersection of different subjects and to bring them together using suitable questions addressed by the different teaching projects.

The greatest challenge in the conceptual phase was to precisely identify, describe, and structure the problems at hand. We began by mapping the lifeworld of the problematic areas, using the concrete experiences of the participants while also combining knowledge about global challenges with local problems. The “epistemic object” was always sought using the life-world approach with knowledge from different disciplines, be it on the topic of “urban space, mobility and health”, “future of mobility culture”, “communication strategies of a sustainable mobility culture”, or “Stuttgart’s auto(mobile)-biography”. In this way, the students gained insights into the latest research results at the juncture of a range of research areas—on a global level as well as in relation to the situation in Stuttgart—as well as into how the different approaches construct their epistemic object.

At the same time, perspectives from politics, administration, and civil society were included in the discussion to be able to develop an inter- and transdisciplinary approach to the problem. Actors from the *Reallabor* process were included in the teaching formats, both academics and community actors involved in the “real experiments” alike, which stimulated the students’ creativity and commitment. The lectures, discussion sessions, and results presentations were open to Stuttgart’s citizens, and a public evening lecture by a renowned expert also fostered the exchange between students, teaching staff, and civil society. In this way, the teaching projects built upon one another and were integrated into the further work of the overall project. Early insights with implications for learning and transdisciplinary teaching were presented in an article at the end of the first RNM funding phase.⁵

⁵ Uhl, E. 2018: Lernen im Reallabor. Perspektiven für die transdisziplinäre Lehre, in: Reallabor für nachhaltige Mobilitätskultur, Universität Stuttgart (Ed.): Stuttgart in Bewegung – Berichte von unterwegs, Berlin: jovis, 2018, pp. 125–131.

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FIELD RESEARCH AND TRANSFORMATION CONCEPTS

The core of the four-day workshops was a concrete research assignment in Stuttgart, which the students pursued independently in interdisciplinary teams—the disciplinary diversity of the teams being a key to the success of the format. Introductions to different methods and tools prepared them for the field research, and they received a “toolbox”, analysis guides, guidelines for discursive-dialogical interview techniques, data protection guidelines, codes of conduct, and other supporting materials. A central goal was to gain both interdisciplinary methodological competence and communication and organisational skills. Tutors were on hand to help the students.

The assignment was not limited to analysis, data collection, and evaluation. Rather, it was much more about working out the transformation potential of the areas studied based on the results of the field research. Students developed neighbourhood concepts for health-promoting mobility transformations, designed future scenarios for different “mobility types”, worked out communication strategies and campaigns for a sustainable mobility culture. They built prototypes, produced images, and developed a narrative that allowed citizens to become involved.

PRESENTING THE RESULTS TO A JURY, EVALUATION AND DOCUMENTATION

A jury consisting of experts from the worlds of academia, politics, culture, and civil society provided comments and assessed the creative work of the interdisciplinary teams at a public event. Through earnest appreciation, the jury gave the students motivational feedback, while the workshops also provided jury members with new inspiration for their own work. All workshops were evaluated by the participants and researchers. They were documented in the MATERIALEN series of IZKT publications.

The following is a summary of the workshops of the first funding phase of the *Reallabor*. The third chapter is devoted to the workshop “Stuttgart’s Auto (mobile-)Biography”, which was conducted in the second funding phase.

8 2.2 URBAN SPACE ANALYSES, FUTURE SCENARIOS, AND COMMUNICATION STRATEGIES

SUSTAINABLE MOBILITY CULTURE, URBAN SPACE, MOBILITY, AND HEALTH

15–18 January 2015

Cooperation: A cooperation between the International Center for Culture and Technology Studies (IZKT), Institute of Sports Science and Kinesiology, Institute of Landscape Planning and Ecology, Institute of Urban Planning and Design, Institute for Road and Transport Science at the University of Stuttgart, as well as the StadtPalais—Museum for Stuttgart and City Library of Stuttgart. This workshop kicked off the “Future City Lab_ Stuttgart: *Reallabor* for Sustainable Mobility Culture”.

Focus: The workshop focused on the relationship and interaction between urban space—built environment, infrastructure, and open space—human mobility, and health. It considered walking as the most sustainable form of mobility, and ‘walkability’ in Stuttgart’s urban space, with special attention to older people and children.

Research Questions: Which elements of the built environment contribute to healthy living and how can they be described? What tools are available to examine the built environment from a health science and socio-ecological perspective? How can the various elements of an activity-promoting infrastructure be evaluated to derive targeted recommendations and initiate change?

Field Research: Investigations of walkability and the potential for positive transformations took place in four of Stuttgart’s districts (Frauenkopf, Karlshöhe, Sillenbuch, and Vogelsang) using methods and tools from the health sciences and urban studies

Results: Based on the questions “What are the local conditions?” and “What would have to happen to shape the place in terms of health-promoting mobility?”, the student teams developed innovative concepts and bold visions for the future of the city quarters via various creative formats (e.g. a screenplay) that were then presented to a jury.

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Jury: *Alexandra Bading* (Project Manager Sustainable Mobility, Location Development I, Stuttgart Region Economic Development Corporation), *Wolfgang Forderer* (City of Stuttgart, Department of the Mayor for Coordination and Planning, Head of the Mobility Department), Prof. Dr. *Johann Jessen* (Institute of Urban Planning and Design, University of Stuttgart, Department of Foundations of Local and Regional Planning), Dipl.-Ing. *Manfred Wacker* (Senior Academic Councillor at the Chair of Traffic Planning and Traffic Control Technology, Institute for Road and Transport Science, University of Stuttgart).

Public Presentation: All expert lectures, the final student presentations, and an evening lecture held at the Stuttgart City Library were open to the public. *Frank Oswald*, Professor for Interdisciplinary Ageing Science at the Goethe University Frankfurt, gave the evening lecture on the topic of “Ageing and Living in the City - Mobility and Connectedness as Conditions for Wellbeing”. Podcast of the lecture: <https://www.izkt.uni-stuttgart.de/podcasts/Podcast-Archiv/>

Documentation: Bott, H., Stokman, A., Uhl, E. (Eds.): *Nachhaltige Mobilitätskultur—Stadtraum, Mobilität und Gesundheit. Materialien*, Vol. 18. IZKT der Universität Stuttgart, Stuttgart 2016.

FUTURE OF MOBILITY CULTURE

21–14 April 2016

Cooperation: IZKT, Centre for Interdisciplinary Risk and Innovation Research (ZIRIUS), Institute for Landscape Planning and Ecology at the University of Stuttgart, StadtPalais—Museum for Stuttgart and City Library of Stuttgart, Initiative Stadtraum West. This workshop was a project of intergenerational learning focused on the future. Students from the University of Stuttgart worked together with older guest students. “Initiative Stadtraum West” supported the recruitment of test persons.

Focus: The workshop focused on approaches to the complex problem of “mobility culture” from an interdisciplinary and transdisciplinary perspective, developing scenarios for future mobility for specific “household types”. Introductions to urban space analysis, but also to interview techniques and the drafting of a normative-narrative future scenario provided the toolbox for the research assignment.

Research questions: How will people in the Stuttgart region be mobile in the future? What could a mobility culture look like that balances present mobility needs with the need to preserve the natural environment? What innovations will make it possible

to be mobile while not only conserving resources, but also supporting health and physical activity, promoting social exchange, and creating a new quality of life in the city?

Field research took place mainly in Stuttgart's West district. Interdisciplinary and intergenerational teams investigated the living environment and the "experiential space", i.e. the spatial and infrastructural living conditions, of five different households (single mother, married couple without children, family with three children, shared student flat, senior citizen in a multi-generation house). These people were interviewed about their mobility habits, needs, and wishes and the district was analysed using urbanist methods.

Results: The teams developed future scenarios for the mobility behaviour of the respective Stuttgart household in 2030.

- *Not all quiet on the western front*—Stäffeleexpress and Autostollen. Fictitious telephone interview conducted by a market research institute on mobile satisfaction.
- *The sharing Swabian—My Porsche, your Porsche*. A story.
- *Car-free district—Kräherwald 2030*. Fictitious municipal council meeting on the new planning of the district.
- *Autonomous through study*. Telephone conversation with students from the future.
- *We are not dead yet! Seniors 5.0 powered up*. A Skype conversation between grandpa (living in the pilot district S-West), son and grandson ("country boys").

Jury: Marie Bues (artistic director of the Rampe Theatre), Jan Lutz (communication designer), Quynh Nga Nguyen (advisor to the youth initiative of the sustainability strategy of the state of Baden-Württemberg).

Evening lecture: Stephan Rammler, Professor of Transportation Design & Social Sciences at the Braunschweig University of Art, in conversation with Felix Heidenreich of the IZKT on the topic "Volk without Wagen? On the way to a new mobility culture". Podcast of the lecture: <https://www.izkt.uni-stuttgart.de/podcasts/Podcast-Archiv/>

Documentation: Stokman, A., Uhl, E. (Eds.): Zukunft der Mobilitätskultur. Materialien Vol. 19. IZKT, University of Stuttgart, Stuttgart 2017.

COMMUNICATION STRATEGIES FOR A SUSTAINABLE MOBILITY CULTURE

4–7 May 2017

Cooperation: IZKT, Center for Interdisciplinary Risk and Innovation Studies (ZIRIUS), Institute of Landscape Planning and Ecology at the University of Stuttgart, and the Stuttgart City Library. The workshop focused on the planning, design and implementation of effective communication strategies for a sustainable mobility culture in Stuttgart.

Central research questions: The goal of reducing the negative effects of car traffic in the form of congestion, particulate matter, CO₂ and nitrogen oxide emissions, space consumption and noise, and promoting a shift to a sustainable mobility region, is now a social consensus - but how can such a change be achieved? How can it be initiated in Stuttgart? And what role does communication play? What characterises successful communication for a mobility culture that not only conserves resources, but also supports health and movement, promotes social exchange, and creates a new quality of life in the city?

The **field research** consisted of a qualitative survey conducted by the students in the pedestrian zones of Stuttgart. The teams collected and analysed data on the urbanites' mobility behaviour and ideas about mobility. They also addressed the future scenarios developed via the *Reallabor* project workshops.

Results: Commissioned (hypothetically) by the state capital, the teams developed target group-oriented communication concepts and campaigns for sustainable mobility. They started with a real problem—Stuttgart's fine particulate matter concentrations during inversion weather conditions.

- *Oi!—App for everything*. A campaign to publicise Stuttgart's mobility portfolio via an app that combines sharing, local transport and other mobility services, combined with a "Shot on Sharing" participatory campaign.
- *What does SHARING do for me?* An initiative for sustainable mobility of the city of Stuttgart. The campaign promotes the use of sharing offers in Stuttgart, including with the help of a radio competition launched by the city.
- *Pedal Commuter—Stuttgart Saddles Up!* A campaign by the city of Stuttgart encourages commuters to switch from car to bike.

- *Stutt-Gart—Staut-Grad—Fahr-rad*. Get on an e-bike! A campaign that makes the fun of riding an e-bike a tangible experience.
- *#stuttgartstauBtsich*. Traffic jam capital Stuttgart. A poster campaign to encourage people to switch to public transport.

Jury: Nils Boushila & Oliver Woye (advertising agency 'Die Wegmeister'), Prof. Dr.-Ing. Markus Friedrich (transport scientist, Institute for Road and Transport Science, University of Stuttgart), Laura Loy (media psychologist, University of Hohenheim), Sven Matis (Head of the Press Office of the State Capital Stuttgart).

Evening lecture: *Reinhold Leinfelder*, Professor of Palaeontology and Geobiology at the Free University of Berlin, inspired the audience with his lecture on "Welcome to the Anthropocene. Communicating concepts for the future".

Documentation: Stokman, A., Uhl, E. (Eds.): *Kommunikationsstrategien für eine nachhaltige Mobilitätskultur*. Materials Vol. 20. IZKT of the University of Stuttgart, Stuttgart 2021.

3. UNIVERSITY OF STUTTGART STUDENTS ON THE FUTURE OF THE ÖSTERREICHISCHER PLATZ

In the second funding phase of the RNM, the IZKT organised an inter- and transdisciplinary workshop, which related the challenges of a sustainable mobility culture to a specific location in Stuttgart: the Österreichischer Platz. The workshop served to incorporate and apply the results of the previous workshops—analysing, visualizing, and communicating—to a new field research object.

STUTTGART'S AUTO(MOBILE)-BIOGRAPHY. HUMAN-MOBILITY-URBAN SPACE

25–28 April 2019

Workshop Announcement:

Today's cityscape of Stuttgart is the result of urban planning interventions in the 1950-60s, the most conspicuous consequences of which are the city motorway, the squares that are now "squares" in name only and are primarily intended to facilitate the flow of car traffic, and the pedestrian "zones". How people use public space have long since adapted to motorized private transport.

Today, Stuttgart is trying to set a new course. Various measures are intended to curb the volume of car traffic in the city centre. The promotion of sustainable urban mobility and the necessary repairs to the urban space in pursuit of a liveable city "on a human scale" (Jan Gehl) have led many citizens to become active.

Cooperation: IZKT, Urban Planning Institute, Dept. of the History of the Impact of Technology at the University of Stuttgart, Dept. of the Sociology of Technology and the Environment at the University of Stuttgart, Institute for Mobility and Digital Innovation, Institute for Applied Narration Research at the Stuttgart Media University, Stuttgart City Archive, German Sustainable Building Council (DGNB), Stadtlücken e.V., St. Mary's Church.

The subject of the workshop was the Österreichischer Platz (literally: Austrian Square) in Stuttgart, examining it from a historical, urban planning, traffic, and sociological perspective. This prime example of urban design oriented towards car traffic was the starting point of the *Reallabor* experiments in the second project phase.

Central research questions: What hinders future-oriented development in the field of urban mobility and how can it be accelerated? What are the factors and who are the people driving the change? How should Stuttgart be mobile in the future and how will the new mobility behaviour change the city? The project brought together an inter-disciplinary team of experts and students as well as political, administrative, and civil society actors. The knowledge shared and synergies created were used to weave together positive images of a future, more liveable Stuttgart into a narrative. Instead of an “auto(mobile)–biography”, the success story told of a sustainable city with diverse, sustainable urban mobility.

Field research took place at Österreichischer Platz and in the surrounding neighbourhoods. The field research assignment included an urban space analysis in which different methods were used to compile an urban spatial analysis checklist (product 1). Using the observations made, the team members developed, presented, and discussed creative ideas for a “repair” of Österreichischer Platz using a model. Prototypes created from handicraft materials showed new possibilities for using the redesigned square, complemented by a short story about the use of the square from the perspective of an imaginary person (product 2).

Results: Based on the insights gained and following the rules of successful storytelling, the workshop participants wrote stories whose plots revolved around the square in the year 2050 (product 3). Five creative, humorous, thought-provoking stories were presented to a jury of experts:

- *Günther F. Wir Kinder vom Österreichischen Platz.* A pastiche of the book “Wir Kinder vom Bahnhof Zoo” (“Christiane F.–We Children from Zoo Station”), widely read in the 1970s–80s. The presentation of the story—read aloud by an automatic speech system—was a tongue-in-cheek reference to an imagined fully automated future.
- *New paths.* A love story with a happy ending that required the destruction of Österreichischer Platz.
- *The story of Frank.* A tragedy as a turning point in the perception and design of the Österreichischer Platz.
- *The poisoned cauldron—the legacy of a car city.* An action story about the transformation of the city into a showpiece for the merging of nature and human living space.
- *Untitled story.* Life story of a man whose fate mirrors that of the Österreichischer Platz.

The winning story, written by Jan-Simon Boschen, Michael Harder, Steffen Kuhne, Philipp Lukas Metzler, Annabel Stoffel

and Luise Sanders was published in “KONTEXT: Wochenzeitung”¹. It imagines an exchange between a young person and an old man, Günther F., at the Österreichischer Platz in the year 2050. The man details his mixed memories of the old square, his eventual descent into crime and time in prison, and his opening of a kiosk at the redesigned square. The young protagonist and his friends listen, while enjoying the square as a place to meet and retreat from the heat and bustle of the concrete metropolis.

Jury: *Jørn Precht* (Professor of Storytelling and Dramaturgy, Stuttgart Media University), *Veronika Kienzle* (Head of the Stuttgart Mitte district), *Dietrich Heißenbüttel* (freelance journalist for *Stuttgarter Zeitung*, *Kontext* and others)

Evening lecture: *Kurt Möser*, Professor of History of Technology at the Karlsruhe Institute of Technology (KIT) gave the evening lecture on the topic of “Mobility and the city—pasts and futures”.

Documentation: Bauer R., Pfau, N., Uhl, E. (Eds.): *Stuttgarts Auto-Biografie. Mensch—Mobilität—Stadtraum. Materialien Bd. 22.* IZKT der Universität Stuttgart, Stuttgart 2020.

¹ Boschen, J.-S., Harder, M., Kuhne, St., Metzler, Ph., Stoffel A., Sanders, L.: Günther F.: Wir Kinder vom Österreichischen Platz, in: KONTEXT: Wochenzeitung, Ausgabe 422 vom 01.05.2019 unter <https://www.kontextwochenzeitung.de/schaubuehne/422/guenther-f-wir-kinder-vom-oesterreichischen-platz-5891.html>

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