

# Appendix

## Methodological Notes

### *Cooperation with the Advisory Board*

The Advisory Board<sup>1</sup> consisted of the following seven members:

- **South Korea**, Ki-Sang Song, Director of the Institute “Computers in Education,” Korea National University of Education.  
Prof. Song is a member of UNESCO’s expert group on educational technology and, with the support of the Korean research community, is conducting a project on learning analysis in education.
- **Norway**, Elisabeth Hovdhaugen, Senior Researcher at the Nordic Institute for Studies in Innovation, Research, and Education.  
Dr. Hovdhaugen is an international expert in higher education and participates in the Norwegian Research Council funded project “BRAIN - Barriers and Drivers in Adult Education in Acquiring Competences and Innovative Activities.”
- **Netherlands**, Fred de Vries, Program Director Digital Education at Saxion University of Applied Science.  
Dr. de Vries is also involved in supporting the development of strategies for the digital university and the European project “Higher Education Online - MOOCs the European Way.”
- **USA and Canada**, Alex Usher, President of Higher Education Strategy Associates.  
Alex Usher is an expert in the development of higher education in Canada and the USA and a founding member of the Academic Ranking and Excellence of the IREG International Observatory.

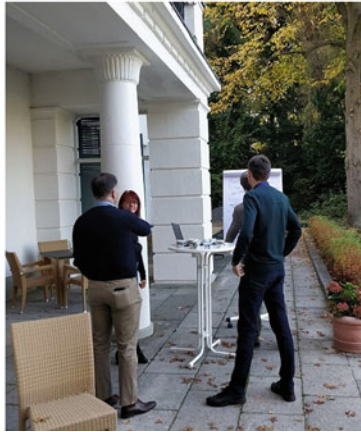
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<sup>1</sup>External link: <https://ahead.tugraz.at/en/our-team/>.

- **Great Britain**, Prof. Martin Weller, Professor of Educational Technology, Teaching and Learning Innovation and Director of the Open Education Research Hub at the Open University, UK.  
Prof. Weller has recently become a Principal Fellow of the Higher Education Academy in Great Britain, which thereby honors his outstanding teaching activities.
- **World Bank**, Nina Arnhold, Senior Education Specialist, World Bank.  
The focus of Dr. Arnhold is on Europe and Central Asia with topics such as competence requirements for higher education in the context of university administration, strategy development, and digitization.
- **Germany**, Prof. Ingo Rollwagen, Professor of Management in the Creative and Science Industry at the Fresenius University of Applied Sciences.  
Dr. Rollwagen previously worked as an expert for Corporate Foresight, Technology and Education for Deutsche Bank Research and the Alfred Herrhausen Gesellschaft, Deutsche Bank's international forum.

In the course of the study, the members were advised via video-conferencing about the task of the study and the fine-tuning of the content.

Following the development of the four learning paths, a two-day workshop with the experts was held in Berlin on October 15/16, 2018. The aim of the workshop was the validation and further elaboration of the concept. The meeting was very fruitful. The advisors found the four learning paths good and supported us in further elaboration.



### ***“Fragmented Worlds” Event***

The “Fragmented Worlds” event<sup>2</sup> took place as part of the “Shaping the Digital Turn”<sup>3</sup> topic week of the “Hochschulforum Digitalisierung” on September 26, 2018, and was very well attended. We had over 150 registrations and sent 110 confirmations (40 people on the waiting list). About 70 people took part. At the event, we introduced the topic and then presented the four models in small groups.

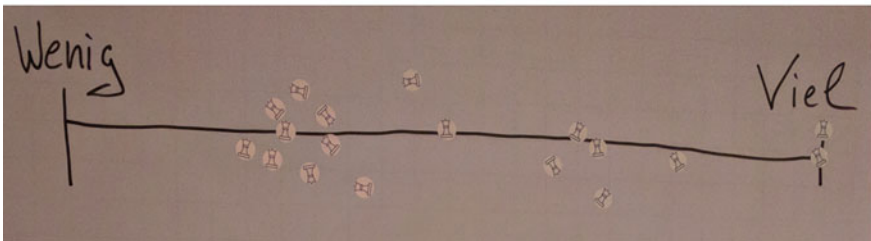
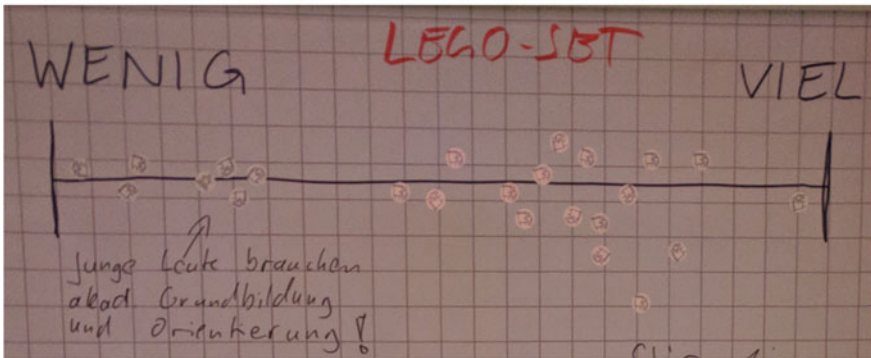
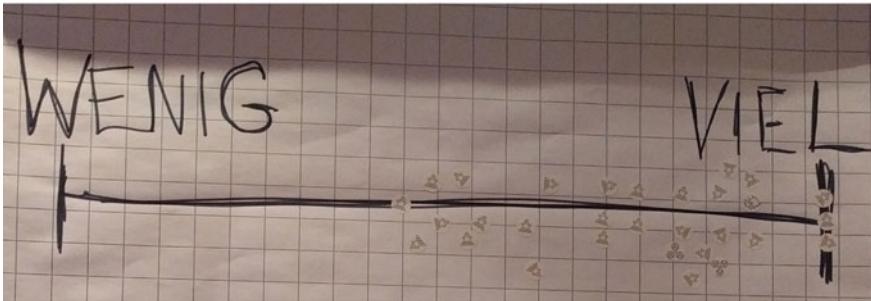
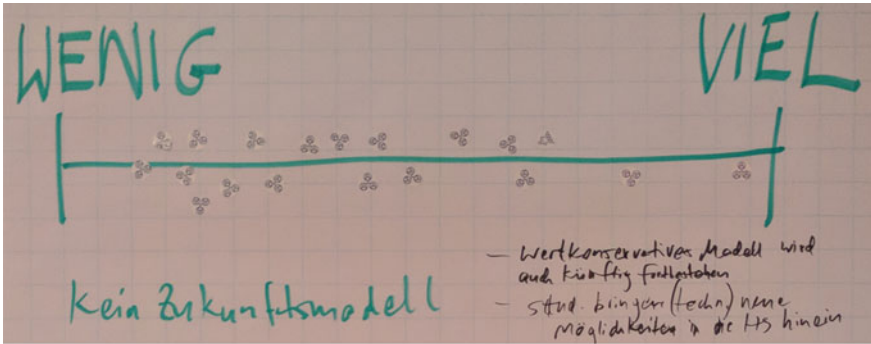
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<sup>2</sup>External link (in German): <https://hochschulforumdigitalisierung.de/de/zersplitterte-welten-projektvorstellung-ahead>.

<sup>3</sup>See: <https://hochschulforumdigitalisierung.de/de/zersplitterte-welten-projektvorstellung-ahead> (last viewed 08.05.2019).



The participants had the opportunity to listen to short “Lightning Talks” on the respective models of the AHEAD study and to discuss them with a team member. In these group discussions, it was also asked to indicate the proportion of students that the participants expect for the respective model in 2030. In each group, there was a dispersion, but the tendency was toward Jenga and Lego—see next page.



The pictures above (Source: own photographs) show a survey conducted with participants of the group discussions. The participants were asked to estimate the demand each of the four different models will generate in the future, ranging from

low (“wenig”) to high (“viel”). While “Tamagotchi” and “Transformer” lean more toward low demand, “Lego” and particularly “Jenga” are estimated by the participants to be the models in high demand in the future.

### ***Background Information on the Anonymous International Survey***

An anonymous international survey in English and German was launched on November 24, 2018. An international social media campaign accompanied the launch.

The survey presented the respective models in some paragraphs. Participants were asked for their assessment of their suitability for certain student groups (free text). Subsequently, the participants were asked to distribute all students currently and in the year 2030 among the four learning paths.

The perception of the survey was relatively high. About 800 people have visited the survey home page. However, the answers to the questions with 28 completed questionnaires were significantly lower (including in the English [German] version: 542 [43] visits to the introductory page, 63 [27] aborts of the survey, 18 [10] complete participants). These persons came from China, Colombia, Germany (12 persons), the Netherlands, South Korea, Norway, Scotland (UK), Slovenia, and the USA.

Students took part in the German survey and international university experts including a former Minister of Science took part in the English survey.

### **Detailed Descriptions of Developments in Individual Areas (Background Studies)**

#### ***A1 Literature Analysis on Higher Education and its Future***

Authors: Katrin Schulze, Dominic Orr

Please follow this link (in German):

- <https://cloud.tugraz.at/index.php/s/A9RPHWeFHFJaoHg>

#### ***A2 Knowledge and Competence Requirements Within a Digital Society***

Author: Dominic Orr

Please follow this link (in German):

- <https://cloud.tugraz.at/index.php/s/Tq7ZL8L3cRqbZkJ>

### ***A3 University Teaching Challenges Within a Digital Society***

Authors: Klaus Wannemacher, Maren Luebcke

Please follow this link (in German):

- <https://cloud.tugraz.at/index.php/s/fx8ALPYRF9DMCfR>

### ***A4.1 Technological Requirements for Higher Education***

Authors: Markus Ebner, Martin Ebner

Please follow this link (in German):

- <https://cloud.tugraz.at/index.php/s/TPW9476aYM5SAR2>

### ***A4.2 Digital Technology—The Outward View***

Author: J. Philipp Schmidt

Please follow this link (in German):

- <https://cloud.tugraz.at/index.php/s/824o9qigcyzNDJq>

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