Fachhochschule Dresden
Staatlich anerkannte Hochschule
University of Applied Sciences

HOTEL ACADEMY

Report of IO1
Didactic Framework

Status Quo, Multiplier Event Version

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Stages of Development

Version 1
- Literature Review (Nov19-Jan20)
- Discussion on TNM

Version 2
- Literature Review (Mar20-May20)
- Discussion on TNM
- Report IO1

Version 3
- Expert Interviews
- Discussion on TNM

Version 4
- internal Group Discussion
- Presentation on TNM

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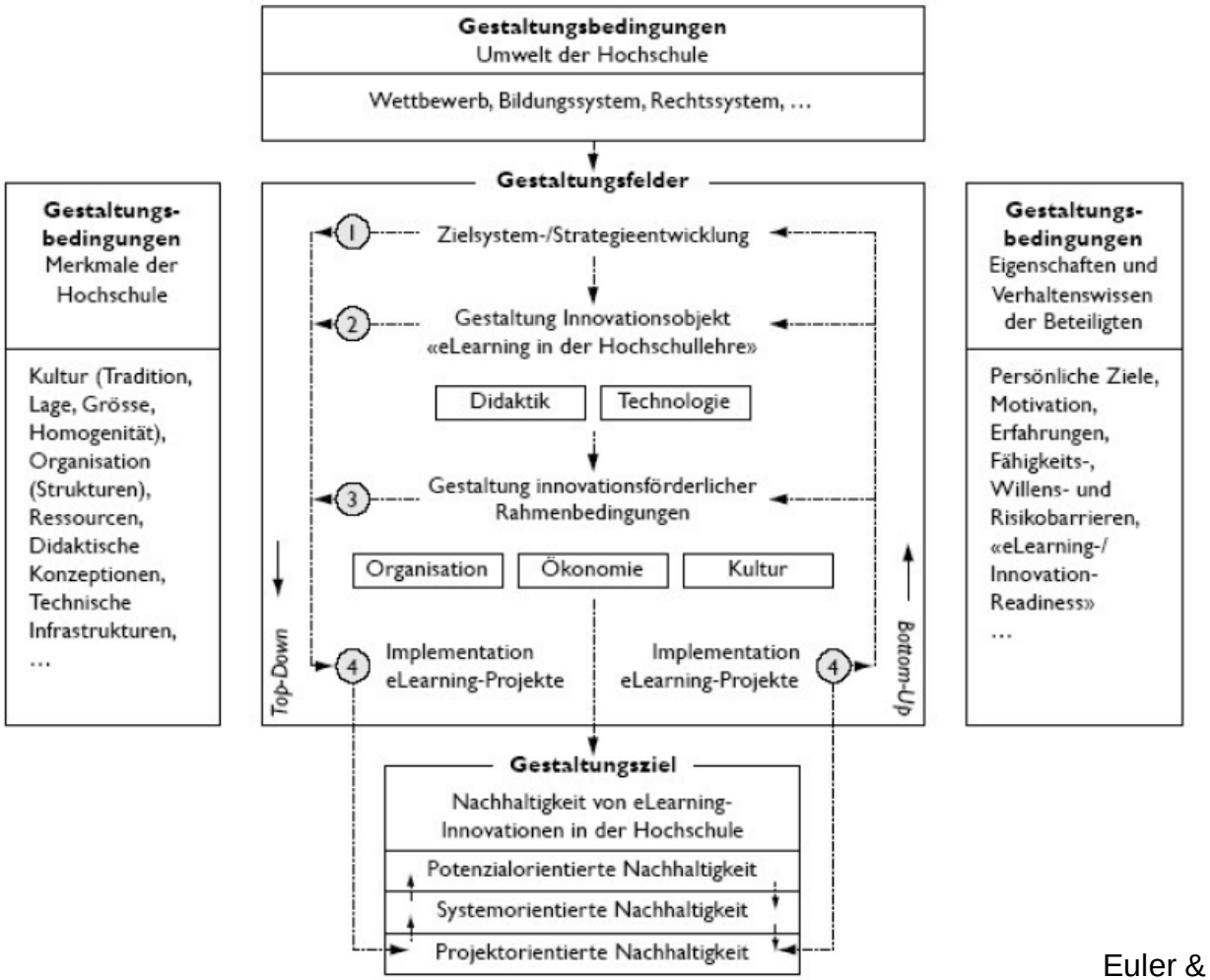
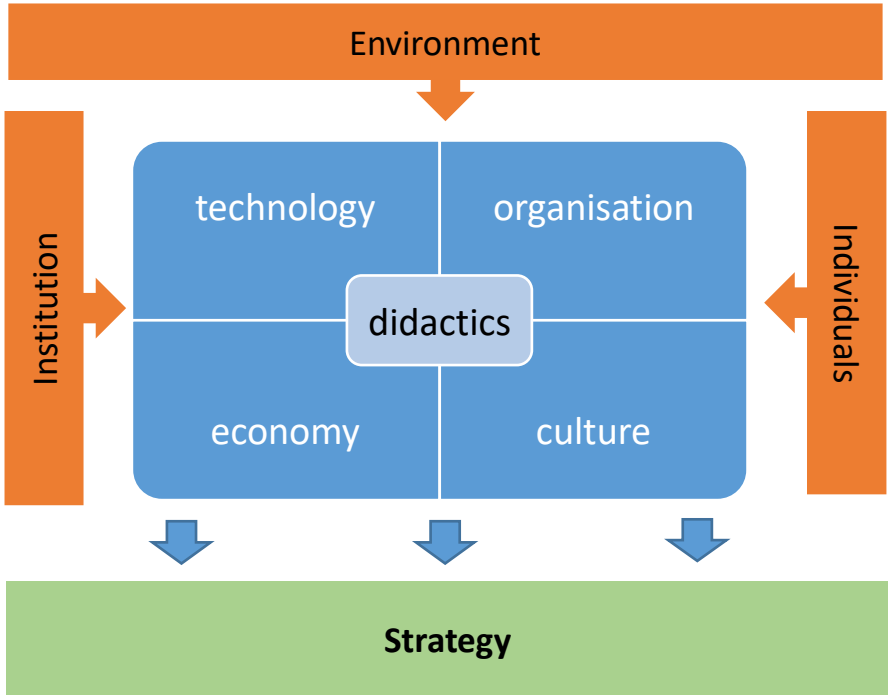


Euler & Seufert, 2007
Education Management


Environment
Institution
technology
organisation
didactics
economy
culture
Individuals
Strategy

Literature Research (1)

- Initial Research via academia.edu and google academics
- Research on **VR and Mobile Learning**
- Approx. 75-80 papers/titles
- Filtration to approx. 18-20 titles
- Tabular structure of data:
  - according to didactic framework (5 different fields)
  - within the 5 fields:

    (a) potentials, (b) risks, and (c) implementations

Literature Research (2)

- Filtration to approx. 18-20 titles

formuliert

⇔

i) When Does Immersion in a Virtual environment Help Students Construct Understanding? (2002)
http://www.hitl.washington.edu/people/tfurness/courses/inde543/READINGS-03/WINN/winnpaper1.pdf
frühe Grundlagenstudie, die Begriffe und Kategorien zum Gebrauch mit VR aufschlüsselt und den Lernvorteil mit VR untersucht

ii) The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis (2016)
https://www.sciencedirect.com/science/article/pii/S0360131515300804

iii) Learning in Virtual Worlds (2016)
https://eprints.usq.edu.au/28739/21/Gregory_etal_2016_FrontMatter_PV.pdf

iv) Experience on Demand: What Virtual Reality Is, How It Works, and What It Can Do (2018)
https://vhil.stanford.edu/pubs/2018/experience-on-demand-what-virtual-reality-is-how-it-works-and-what-it-can-do/
aktuelles Grundlagenwerk, Einführung zu universellen Anwendungen und Gebrauch von VR nach gegenwärtigem Forschungsstand, jedoch selten Fokus auf Education bzw. Teaching

v) Blended Learning Using Virtual Reality Environments (2017)
https://www.iasj.net/iasj?func=fulltext&aId=125794

vi) Learning in serious virtual worlds: Evaluation of learning effectiveness and appeal to students in the E-Junior project (2010)
https://www.sciencedirect.com/science/article/abs/pii/S0360131510000060

vii) How does desktop virtual reality enhance learning outcomes? A structural equation modeling approach (2010)
https://www.sciencedirect.com/science/article/abs/pii/S0360131510001661?via%3Dihub

viii) Collaborative learning in multi-user virtual environments (2013)
https://www.sciencedirect.com/science/article/pii/S1084804513000040?via%3Dihub

ix) Virtual Technologies Trends in Education (2017)
https://www.ejmste.com/article/virtual-technologies-trends-in-education-4674

x) Investigating learners' attitudes toward virtual reality learning environments: Based on a constructivist approach (2010)
https://www.sciencedirect.com/science/article/abs/pii/S0360131510001466?via%3Dihub

xi) Handbook of Research on 3-D Virtual Environments and Hypermedia for Ubiquitous Learning (2016)
https://www.igi-global.com/gateway/book/142136

Literature Research (3)

- Tabular structure of data

1. Didaktik

Titel	Potentiale	Risiken	Implikationen
A meta-analysis of virtual reality training programs for social skill development (2019)	- knowledge-based programs - improvement of social skills, such as public speaking, interviewing, and interpersonal communication abilites	-	- 4 different types were compared: practice space alone, instructions on emotional and knowledge/emotional levels, and just knowledge-based
Augmented Virtual Reality... (2017)	- meaningful context, education - improving learning outcomes - applications can be completely customized	-	- training content has to be adapted to the curriculum
Effectiveness of virtual reality-based instruction... A meta-analysis (2014)	- enhancing learners' cognitive skills - feedback effects	- games constructed too simple or too challenging (lose of interest / frustration) - skill acquisition requires time	- knowledge-based levels - abilities-based levels - skill-based levels
The Effect of Three Dimensional Virtual Environments... (2019)	- may be applied at all levels of education... - AR better for traditional classrooms scenarios	- ...especially in the groups with lower learning achievements	-
Examining the Effectiveness of Augmented Reality Applications in Education: A Meta-Analysis (2016)	- increase of imagination and creativity - increase of academic success - learning in which more senses are involved is powerful	-	- real learning experience is always neccessary
Factors Associated With	- individualized contents	- time of VR use is a factor:	- 4 types of content: 360°

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Literature Research (4)

VR-Learning

Didactics

Chances	Risks	Implications
• Discovery learning • Experience of presence & immediacy • Higher attention & motivation • Improvement of social skills • Adaptivity / individualisation of the learning situation • Promoting creativity	• Drop of concentration after 15-20 mins • Distraction from learning goal, cognitive overload • Task difficulty is decisive • Difficulties with group learning	• Appropriate instructions • Suitable for situational learning, role-playing and cooperative learning • Fitting task difficulty (not too easy, not too difficult) • Selective use (approx. 10-15 mins) • Virtual agents as didactic intervention

VR-L supports the development of social skills by integrating the VR setting into social learning arrangements (e.g. group learning, role-playing). Embedding of VRL scenarios in educational game situations (GBL) promotes positive learning effects. VRL promotes attention, motivation, concentration and presence and immediacy.

VR scenarios should only be used selectively in the learning process (10-15 mins).

In addition to the generally possible improvement of the learning environment, the cooperation among students is promoted, as well as between students and teachers. Group work and individual sessions are possible depending on requirements → group work: motor skills, interaction and behaviour are

VR-Learning: Didactics

- VR-L
  - supports development of social skills
  - ***important:*** integration of the VR setting into social learning arrangements
  - promotes positive learning effects (attention, motivation, concentration, presence and immediacy)
- VR scenarios to be used selectively during the learning process
  → 10-15 mins
- Promotion of the cooperation among students, as well as between students and teachers
- Group sessions and single sessions
  → Group sessions: supports motoric skills, interaction and behaviour are trained; single sessions: to promote explicit learning success (tests etc.)
- VRL heavily requires instructions and didactic interventions (e.g. virtual agents)

VR-Learning: Technology

- Use of wireless VR technologies recommended (fit-for-purpose headsets)
- Environement: enough space for the actors to move (to prevent motion sickness)
- Production of VR scenarios requires special programming and design skills
- Technology is susceptible to faults. Since the choice of equipment is essential, VRL scenarios should be accompanied by technological and didactic support and tested intensively in advance
- The interaction/navigation in the VR scenario requires instructions and training.
- In the coming years, an increase in design possibilities for interaction in virtual space, e.g. through gesture-based control, can be expected.
  → In the didactic planning these actual restrictions have to be considered, best by giving learners time to "get used" to these special forms of interaction.

VR-Learning: Organisation

- Goal: compatibility between the new VR technology and the existing technological infrastructure (faculty, university)
- Permanent coordination between the universities' internal IT and project-related special technology, e.g. WLAN network performance
- Teachers need – preferably personal – assistance in the form of didactic support for integration of VR
- Project management in the VRL is very complex, as many different professions are involved (IT, educators, designers, data privacy security, device manufacturers, etc.)
  → Need of VR experts with interdisciplinary knowledge

VR-Learning: Economy

- VR technology is getting cheaper (price reduction/last 5-7 years: about 70%)
- Big challenge: initial investment of VR technology (for universities, companies)
- Once established, costs ***can*** be saved thanks to VR, but this is not yet sufficiently empirically proven, as we are still in the early stages of this process
- The second and biggest challenge – also in terms of time and money – is the targeted training of teachers and students
- VR technologies bring general advantages through problem-free repeatability, if the intended learning goals in presence formats (before their simulation through VR) could only be achieved under difficult conditions
  → e.g. in laboratory experiments or medical and technical disciplines

VR-Learning: Culture

- In recent years, VR has been used increasingly in scientific (medicine, anatomy, geology), mathematical and technical (engineering) disciplines by mapping/ simulating complex but systematic processes
- Social science research is present, but still in early stages of immersive VR applications
- While younger students are mostly positive about VR, older teachers often have difficulties with it → Challenge: to reframe and rethink traditional habits of learning and teaching → New learning paradigm: "From Teaching to Learning"
- health aspects must be taken into account; otherwise, the use of VR can be counterproductive to motivation and learning success
- In intercultural VR scenarios, the individual teaching and learning cultures have to be taken into account (technical design & didactics)

Comments and Questions?