

WOBBLY REALITY

**Analysing the experience
of stability underlying
spatial constructions in
the creative process in real
and digital space**

Doctoral dissertation
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Theses

In the 21st century, with the spread of digital devices, the skill development and knowledge acquisition effects of digital games are playing an increasingly important role in pedagogical research (Pásztor, 2014). Due to the regular use of digital devices and our interaction and active digital presence in digital environments, the primary question is not whether our skills develop better in real or digital space, but how to optimally develop skills in these two media. On this basis, I am concerned with the question of whether it is possible to gain adequate experience for the appropriate development of spatial skills during spatial creation activities on digital surfaces. In the process of creating in digital space, not only the visuality changes compared to real space, but also the difference in the manipulation of the hands on the digital device may be significant.

In my theoretical research, I explore the literature necessary for the emergence, development, evolution and measurability of spatial skills from the disciplines of neurobiology, cognitive psychology and pedagogy. I will examine the strategies and activities that have been proven to be most effective in developing spatial skills in 6-11-year-olds, with a particular focus on construction and the stability underlying spatial structures. Based on these results I formulated the main research question (MRQ):

MRQ- In real space, with real materials, how can the process of creation in egocentric space be optimally implemented in digital space in the aspect of developing a sense of stability?

To answer my initial main research question, I defined further research sub-questions along three topics, based on the focus of the disciplines explored in the theoretical research:

Topic 1:

Q1 – Can stability be experienced in digital space in the process of construction?

Q2 – Can loss of stability be corrected in digital space?

Q3 – Is the spatial knowledge of stability acquired on digital tools applicable in real space?

Topic 2:

Q4 – Are visuality, motion and hapticity different in the creative task of acquiring a sense of stability in real space and in digital space?

Topic 3:

Q5 – Is different brain activity required during the creative task of acquiring a sense of stability in real space and in digital space?

Answering the main questions and sub-questions of research is a complex research process that requires a complex measurement tool. My doctoral research is the first part of a complex research process, which is based on the research sub-questions under Topic 1.

The aim of my PhD research is to develop a prototype sub-measurement device based on a complex measuring instrument, that is suitable for experiencing, understanding, applying and measuring the stability of the spatial object creation process.

Based on my doctoral research goal, I further refined my doctoral research questions along the research questions Q1, Q2, Q3.

**Doctoral research question 1 (DRQ1)-
What experiences of stability can be gained in the creative process?**

**Doctoral research question 2 (DRQ2)-
How can levels of knowledge about stability be determined?**

**Doctoral research question 3 (DRQ3)-
What principles are needed to determine whether spatial knowledge of stability acquired on digital devices can be applied in real space?**

Due to the complexity of the measuring instrument, I set up a research group. Based on the pilot testing of the prototype of the sub-measurement device, the hypotheses were defined according to which I would like to continue my postdoctoral research, complementing the previously stated themes:

H1 – I hypothesize that the acquisition of knowledge and skills related to stability can also be phased.

H2 – I hypothesize that the stages of stability in construction in real and digital space are comparable.

H3 – I hypothesize that during the whole construction process, children perform nearly the same operation in real space as in digital space.

H4 – I hypothesize that children experience the correction of unstable situations in digital space to a less optimal extent than in real space.

H5- I hypothesize that spatial knowledge about stability acquired on digital devices is applicable in real space.

The structure of the dissertation is illustrated in the following figure. The larger units shown in the diagram are visually marked in the corresponding chapters to facilitate the tracing and understanding of the process.

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