“How do architects ‘think and design space’?” An interdisciplinary investigation upon architects spatial knowledge, spatial ability and the possibilities for pedagogical improvements in architectural education

The research project pursues one fundamental question: “how do architects think about space?” It builds upon the (yet unproven) assumption that architects have high spatial abilities and spatial knowledge, and asks what the nature of these abilities is. To answer this, we will study spatial abilities among architecture students both developmentally – throughout their academic education – and in comparison to non-architecture students. Furthermore, we will distinguish between general spatial abilities, as typically studied in cognitive and educational psychology, and architecture-specific spatial abilities. For this we will develop a set of new test items that will tap spatial problems we believe are essential to the architects’ work, and are related to the quality of its outcome: “good” architecture. We will also examine how changes to standard architectural teaching methods may improve spatial-specific knowledge of young architects. While spatial ability in STEM disciplines has been extensively studied empirically, architecture, so far, has received relatively little attention. This negligence has to be put in relation to the complex nature of architecture and of its products, built spaces. Both the classical and the newly designed tests will be administered to cohorts of students of selected architectural schools in Switzerland and of other schools in Europe and in Israel, both at bachelor and master level. The project is composed of three work streams. In a first work stream we will study students’ general spatial abilities longitudinally and cross-sectionally in order to establish a ‘baseline’ of their spatial abilities and to identify change throughout their educational track. In a second work stream we will develop an architecture-specific spatial ability test, which we will administer to cohorts of architecture students at different time points throughout their studies. Finally, in a third work stream we will examine whether differences in teaching design studios influence changes in spatial abilities of advanced architecture students. About 4000 students per year learn across the schools involved. Thanks to the great interest of these schools in our study, and their cooperation, we expect to reach a sample of about 1000 participants in Switzerland across the three work-streams, with additional data collection in England and Israel. The results will allow us to find out whether architecture students start with higher spatial abilities than students from other disciplines, whether there exist school-, cultural- and gender differences among architectural students, and will have implications with respect to curricula and teaching styles as factors that impact spatial ability. The research project requires on the one hand specific knowledge about architecture in order to define what kinds of spatial thinking is to be evaluated. On the other hand, it requires the knowledge of cognitive and educational psychology in constructing reliable tests and in following high standards of empirical research.

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