Book Review

Spatial Abilities. A Workbook for Students of Architecture

Andri Gerber (Ed.): *Spatial Abilities. A Workbook for Students of Architecture.* Birkhäuser Verlag GmbH, Basel 2020, 160 p., ISBN 978-3-0356-2043-6, German Print-ISBN 978-3-0356-2210-2.

This editorial work offers a cross-disciplinary view on the topic of *Spatial Abilities* for students of architecture and shows a rich authorial *parterre*. Andri Gerber, the editor of the volume, is an architectural and planning historian and an urban metaphorologist; since 2017 he is a professor in urban planning history at the Zurich University of Applied Sciences (ZHAW), continuing his activity as a private lecturer at the ETH Zurich; his research interest focuses on space and metaphors, specifically from a cognitive perspective. Together with him, fifteen excellent experienced and young scholars and professors feed the pages of this editorial work, whose scientific profiles are mentioned in a dedicated section at the end of the book: Michal Berkowits, PostDoc at the Chair for Research on Learning and Instruction at the ETH; Teresa Cheung, member of ALICE EPFL; Dieter Dietz, member of ALICE EPFL; Beatrix Emo, PhD, director of Spatialist Arch, guest lecturer at ETH, Bartlett School of Architecture, UCL, and TU Kaiserslautern; Peter Holgate, Departmental Director of Learning and Teaching at the Northumbria University; Christoph Hölscher, Full professor of Cognitive Science at the ETH; Lucía Jalón Oyarzun, Head of Research at ALICE at the EPFL, and Director of Academic Affairs at the postgraduate Escuela SUR in Madrid; Stefan Kurath, Architect and urbanist, Professor of architecture and urban design at the ZHAW, and professional architect in Zurich and Grison; Julien Lafontaine Carboni, MSc Arch, currently pursuing his PhD at ALICE; Cornelie Leopold, Academic Director and Head of the section Descriptive Geometry at FATUK, TU Kaiserslautern, her background is in Mathematics, Philosophy and German philology, with a postgraduate specialization in Geometry, Aesthetics, and Philosophy of science; Thomas F. Shipley, Professor of Psychology in the area of Cognitive science at the Temple University, Philadelphia; Noah H. Shipley, fourth-year student at the Rhoden Island School of Design; Detlef Schulz, Founder of the GFA Gruppe für Architektur, lecturer at the Zurich University of Applied Sciences in Winterthur, and member of the BSA; Elsbeth Stern, Cognitive psychologist, Professor for Learning and Instruction at the ETH; David Uttal, Professor of Education and Psychology at Northwestern University, and Director of the Spatial Intelligence and Learning Center.

The book is organized in three main parts presenting in a clear sequence *theory, methodology,* and *applications* related to the topic, which is unequivocally stated by Stefan Kurath (Institute Urban Landscape, ZHAW) in the foreword: the mission of an architect is "to assemble the world over and over again" and this requires the "translation of knowledge into physical space", so making understandable why "architectural education changes [at least, it aims at doing it – *Ed.*] one's ability to imagine space". The first part of the volume, titled *Defining Spatial Abilities,* shows the very branched theoretical bases of this field, discussing the topic in six short but dense chapters dealing with the evolutionary nexus between space and architecture from several disciplinary points of view, including cognitive science, STEM and gender differences in spatial abilities, multiple intelligence theory, and a focus on the relationship between space representation and imagination in spatial abilities training, as well as on the effects of space transformations in the everyday life of individuals and communities. The second part, including four chapters and titled *Measuring Spatial Abilities,* deals with the methodology bases of the spatial ability tests, offering a synthetic retrospect

on some traditional milestones and presenting the logic inspiring the new series of tests that will be proposed in the third part of the volume, together with the criteria for grouping them by specific types; then the role of architectural geometry in fostering spatial abilities is discussed, and the meaning of spatial expertise in various disciplinary fields, concluding on the value of psychometric tests in specifically measuring spatial thinking in architecture. The abovementioned two parts prepare the reader to the third section, which is the core of the book, occupying about one hundred pages, that is, two third of the entire volume, where *Test Materials* consisting of targeted graphic exercises are finally displayed, after a short and closely targeted introduction by Andri Gerber on *Training Spatial Abilities;* the conspicuous series of graphic tests is organized in five groups, according to the following sequence: *urban layout, indoor perspective, packed volumes, mental construction,* and *mental cutting tests,* in order to gradually engage students within the increasing complexity level of the cases, from object recognition to abstract mental constructions; each group includes seventeen exercises based on multiple visualizations, which are to be correctly matched with certain assigned images; the clear and homogenous graphic feature of these original images, eliminating any unnecessary graphic redundancy or embellishment, facilitates students to focus on the core of the test, then this rigorous graphic approach deserves due appreciation; equally relevant is the fact that all the test cases presented, significantly refer, albeit in a simplified key, to a series of selected architectural and urban spaces, promptly cited together with authors and years in the graphic boards; in this sense this book also works as an early introduction to architectural education, carried out through the proper graphic language of an architect; at the end of this part, the *Solutions* to all the test cases are available. Finally, the *Appendix* includes *Acknowledgements,* short profiles of the *Authors,* and *Image Copyrights.*

The book matches the expectations of teachers and the educational needs of novel students, before and at the beginning of their university curriculum. However, although the volume is intentionally addressed to these typologies of readers, the topic developed can be considered of general interest and the methodology suitable for anyone interested in the multifaceted field of the human relationships with the everyday spaces of life, as well as a complementary tool for the civic education to the architectural world around us.

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