



Online Education

Teaching in a Time of Change

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Online Education: Teaching in a Time of Change

EDITOR:

Zain Adil

EXECUTIVE EDITOR:

Eric An

COPYEDITOR:

Amany Marey

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INTRODUCTION

Online Education: Teaching in a Time of Change

This proceeding publication is the outcome of the virtual conference, Online Education: Teaching in a Time of Change, held in April 2021. It was coordinated the research group AMPS, its scholarly journal ArchitectureMPS published by UCL Press together with several universities: Ball State University, USA; Beaconhouse National University, Pakistan; University of Pretoria, South Africa; University of Kassel, Germany. It offered a platform for multiple and diverse perspectives and interpretation of online education and research as it stands today.

The unprecedented changes faced by the world in 2020 produced many challenges and opportunities for the global academic fraternity. Educational systems required a sudden shift in teaching methods, communicative techniques, the use of the latest digital tools, and a quick revision of learning outcomes. On the brighter side, teachers and students proved adept at embracing innovation, and “online education” helped academicians connect across the globe; although the success of the transference to online education was not uniform, with some struggling with questions of accessibility and the ability to explore the online possibilities of this new era.

In the midst of it all, platforms like the Khan Academy and Skillshare got more attention than ever due to their effective online education structure, and disciplines whose assessment and delivery modes are heavily lecture and test-based, tended to thrive. On the contrary, those disciplines that require a physical presence due to the nature of their teaching or reliance on peer-to-peer learning, tended to suffer. Skills-based courses and exercises such as model making lost contact with the “materiality” of their subject matter. Science programs, reliant on lab experiments struggled to replace the materials or prototyping they depend on and, for the main part, the dynamic interaction of the design studio was reduced to interaction through a smartphone or computer screen. Overall, the relocation to virtual classrooms, online studios and remote seminars affected the standard work cycles of educators and researchers to such an extent that the repercussions are still to be understood. It all affects the current debate on online education.

The papers collated in this publication, and the conference which it documents, reflect the diverse perspectives of educators at this point in time. They offer a synoptic view of researchers and professionals who together are reconfiguring the possibilities of the new and emerging pedagogical realm.

Zain Adil

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DIGITAL LEARNING: MAKING A CASE FOR SPACE. INNOVATIVE LEARNING, ITS SOCIAL FORMS, AND ITS SPATIAL DIMENSION

Author:

BELEN ZEVALLOS, MARC KIRSCHBAUM, CIDÁLIA SILVA

Affiliation:

HEIDELBERG UNIVERSITY, GERMANY; UNIVERSITY OF MINHO, PORTUGAL

INTRODUCTION

The COVID-19 Pandemic has shifted learning from a physical-spatial practice to a virtual-spatial one. Suddenly, students and teachers moved to their homes and from there, they've adapted the learning-teaching practice using a set of digital platforms such as Zoom, MS Teams, YouTube, and even Facebook to quickly respond to the crisis.

While some may believe that the pandemic has forced our hand and helped opening new opportunities and areas for education, others believe that things will eventually return to "normal". This paper argues that digital learning at home, aka remote or distance learning, won't be the "school of the future". On the contrary, the pandemic showed us that social-spatial exchange continues to be crucial. To be in the same physical space, at the same time is what transforms a space into a place for dialogical learning. The spontaneous conversations, connecting with your peers face-to-face, the feeling of belonging, and the appropriation attached to the spaces, cannot be replicated into the learning space of a digital platform. However, going back to "the way it was" would be a waste of the opportunity and experience we gained during the pandemic. Following this, educators and students have the chance to combine the benefits of virtual learning with face-to-face settings to form new and better learning and teaching practices.

The aim of this paper is to give an overview of the correlation between different types of spatiality and specific pedagogical approaches in order to shed a light on the spatial consequences of digital learning when added into physical learning spaces.

In the last decades, there has been a paradigm shift from teaching to learning. This transformation depends on the one hand pedagogy, and on other hand, the spatial environment. The association between architecture and pedagogy is not new; Comenius already mentioned its importance back in 1632¹. Maria Montessori, Loris Malaguzzi and other pedagogues have also addressed space as crucial for the learning process, even stating "space as the third teacher"².

During our research in Real-Laboratory CITY-SPACE-EDUCATION³ we found that the most innovative schools had a wide "learning spaces portfolio", resulting in spaces for a variety of social forms like individual work, coaching, small group, instruction in class, but also spaces for informal learning or relaxation. These are the bases for achieving the main aim of this paper: to make a case for space where digital learning can be integrated.

The evolution of learning spaces

Learning spaces tend to reflect the Zeitgeist for which they were conceived and built. In the case of Germany, traditional learning spaces, regular classrooms, were designed under the slogan “education and structure for the masses” at the end of the 19th century⁴. This entailed a teacher-centered and content-centered practice, encouraging one sided instruction for an homogenic group. Consequently, the classroom became a space focused on the teacher and the blackboard, creating the so-called frontal or ex-cathedra instruction. These spaces have been strongly criticized due to its hierarchical structure, as Robson argues: “The system of public instruction is almost as military in spirit as that which governs the army.”⁵ Sarah Dahlinger also addresses the military spirit of education and explains, “The teacher directed, controlled, and dominated the classroom from a raised desk set up in front of the class, and usually made no reference to the students.”⁶ In this sense the students had a passive role, whose task was to listen and to respond when asked a question. Unfortunately, most schools around the world operate in this type of physical environment.

Towards the end of the 19th century, reform pedagogues developed concepts for pedagogy better suited for children. Maria Montessori, Peter Petersen, Célestin Freinet, Paulo Freire, Ivan Illich among others, strove for approaches such as self-activity, the school as a space for action in a community, communication, and cooperation as criteria for the design of space. These have not lost their significance to this day. Approaches such as the Waldorf pedagogy seeking to nurture capable individuals, who create meaning for their lives, and who become freethinking and acting individuals were also influential to a new understanding of learning. As Illich said back in 1973: “Most learning is not the result of instruction. It is rather the result of unhampered participation in a meaningful setting. Most people learn best by being "with it", yet school makes them identify their personal, cognitive growth with elaborate planning and manipulation.”⁷

Consequently, we advocate for the paradigm shift “from teaching to learning”, going towards a student-centered learning-oriented pedagogy⁸. This appears to be vital since, in today's society, which has been becoming more complex, diversified, global, and, above all, digital for years, competences directed towards tackling complex challenges are required. These so-called future skills or 4C learning aim at key competences for the 21st century. The four C's are: creativity, communication, critical thinking, and collaboration and it is almost impossible to implement these competences in traditional, frontally oriented spaces.

The concept of “learning spaces portfolio”

Learning is a practice that interconnects spaces and pedagogical approaches. In contrast to traditional pedagogy the new student-driven approaches address the heterogeneity of students. The learning spaces portfolio⁹ is the spatial translation of this concept, recognizing that everyone is different, implies acknowledging that everyone learns in a different way and at a different pace. In the Real-Laboratory CITY-SPACE-EDUCATION¹⁰ we were able to conduct research at multiple schools that used novel pedagogical concepts and non-traditional spatial settings.

Based on the research, we found that many ground-breaking schools had a wide “learning spaces portfolio”. Some of the schools did not even have “classrooms”, there were “learning ateliers”, “learning landscapes”, “market squares” and “coaching rooms”. The corridors become learning zones, where curtains, standing desks, and sofas create, among others, “learning cells” and niches. Figure 1 shows a variety of “walkable learning zones” that have been integrated into the access areas of the school building, taking advantage of every square meter.



Figure 1. Photo-Collage “walkable learning zones”; Source: Reallabor STADT-RAUM-BILDUNG 2019

In order to define the learning space portfolio of each school we categorized the variety of learning spaces according to learning situations regarding the social setting and interaction, such as: group learning, input in a class, input for a small group or a bigger group, and coaching among others. Figure 2 shows a graphical representation of the different categories of the learning space portfolio, where “individual work”, usually quiet, defines an individual learning setting from the perspective of the pupil, “coaching” a spatial setting designed for a quiet atmosphere and safe space, the “small group work”, usually louder, defines spaces designed for 2-5 people groups that might be enclosed (a separate space) or temporarily enclosed (like curtains or flexible furniture). The “instruction in class” describes a space designed for inputs/presentations for a big group, the “circle of chairs” portrays a setting for exchange and discussion.



Figure 2. The “social forms of learning” diagram; Source: Reallabor STADT-RAUM-BILDUNG 2019

According to the learning spaces portfolio the social forms of a school from the 19th century will be structured as shown in Figure 3. An architecture designed for the accommodation of students into the system, a repetition of same-size cells, with clear division between genders and barriers between outside and inside, determining when, how, and where it will be learned.

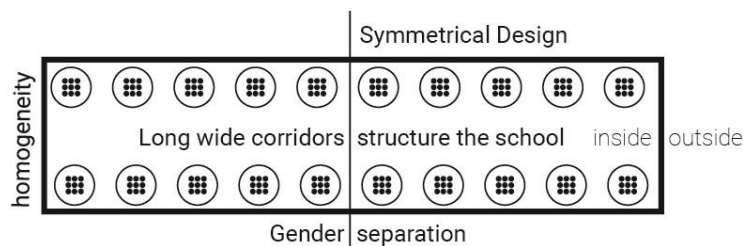


Figure 3. Old School Structure Diagram, Belen Zevallos 2021

From the analyzed schools, the Alemannenschule Wutöschingen / Germany stands out due to their extraordinary learning spaces. Its learning space portfolio was tailored to the pedagogy they have. For example, the input sessions, which pedagogically should not be longer than 20 minutes, were given in a small long room facing a whiteboard with a long table and no chairs, encouraging the students to

focus towards the board, and by this constraining the length of the input given, as no one wants to stand longer than 20 min. For discussion in class there is also a specific space with a round table and a circle of chairs. Figure 4 depicts the comparison of these two social forms and its spatial consequence; the left image represents a well-lit space with chairs arranged around a table in a circular setting, allowing all participants to see each other; in contrast, the right image shows the standing input space which focuses on the white board, encouraging students to pay attention to the instruction.



Figure 4. Photo-Collage “Discussion & input”; Source: Reallabor STADT-RAUM-BILDUNG 2019

The learning atelier (Figure 5), houses more than 100 pupils and is a double-height space with a treehouse like structure where the pupils have their individual desks. The atmosphere in this space is as quiet as at the library, kids come here to work on their individual projects. Figure 5 shows the treehouses with the individual desks and the teachers desks in the middle of the space. The pupils' desks are personalized by them.

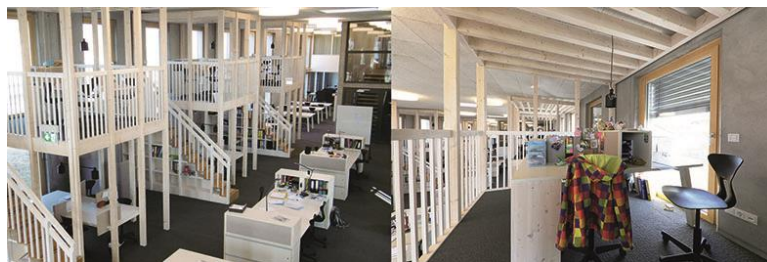


Figure 5. Photo-Collage “Learning atelier”; Source: Reallabor STADT-RAUM-BILDUNG 2019

In contrast to the “learning atelier”, at the “market square” (Figure 6) the pupils can be louder and communicate with their peers; there is group work in sofas, standing tables for quick inputs or explanations, comfortable carpets and pillows to sit around, temporary “learning cells” defined by curtains, while a variety of “chilling areas” expand the range of options.



Figure 6. Photo-Collage “market square”; Source: Reallabor STADT-RAUM-BILDUNG 2019

The Alemannenschule Wutöschingen has been using digital learning tools long before Corona called for it. It relies on the differentiated and pragmatic use of digital media to assure their individualized learning strategy. With this concept, the school won the “German School Award” in 2019.

Furthermore, the school responded with a specific architecture that supports this kind of learning experience. Therefore, while some pupils are learning with videos in a group setting at the market square, others are having an input session with a teacher, and at the same time other pupils are learning individually at the learning atelier. In other words, digital learning encourages heterogeneity at school.

Here it is important to note that the learning portfolio of this school extends beyond the built limits of the school building. The school utilizes several spaces of the community as media centers, the town hall, libraries, local farms, the town’s swimming pool among other public facilities. The school’s principal defines the town as a “learning village” understanding the whole town as part of the learning process of the pupils, making the Igbo and Yoruba proverb "It takes a village to raise a child" a reality.

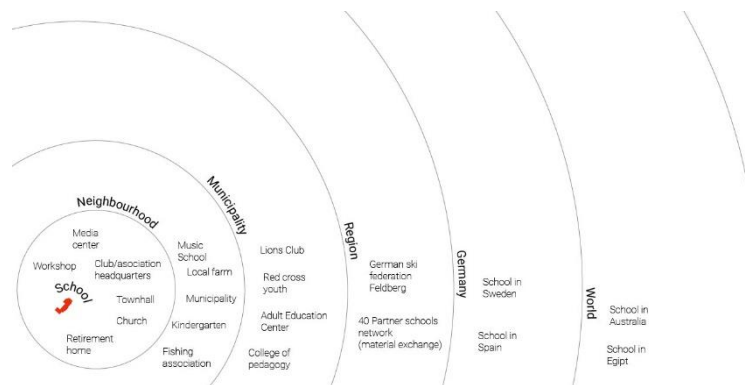


Figure 7. School as a Catalyst Map by Belen Zevallos, based on Reallabor STADT-RAUM-BILDUNG 2019

Learning at these kind of schools means you can decide what, when, and how to learn. Learning is understood as a self-paced process, determined by the learners, and discussed with the teachers in order to develop learning goals. The architecture of these spaces reflects diversity and choice, as their pedagogy. To do so, it transforms the once single instruction space of traditional classrooms into a potpourri of spaces and learning experiences engaged with the community. We see spaces that invite us to communicate and interact, spaces that embody Illich and Freire’s ideas.

Digital learning, the decentralization of learning and its spatial potential for opening up the school

The digital revolution changed the way we learn by dispersing information through space and time. In this regard, we cannot deny that one of the main advantages of digital learning is the decentralization of learning. Similarly as at the Alemannenschule Wutöschingen, the Ernst-Reuter-School in Karlsruhe uses digital tools to support the individualization and personalization of their pedagogical curriculum. As the first “Smart School” of Baden-Württemberg, the Ernst-Reuter-School incorporates technology and digital learning into every course. They realized that digitalization was not just helping but changing the way people learn. At this school, there are makerspaces (see Figure 9), virtual reality, and augmented reality spaces. Nonetheless being outside in the urban gardening project, reading at the

"outdoor classroom", meeting at the "no tech zone", helping out at the student-run café, advising the community's elderly at the student-run social office or doing an internship in the city are all important for their learning process.



Figure 9. MakerSpace at the Ernst-Reuter-School; Source: Hohenloher

In the majority of innovative schools we visited, the surrounding neighborhood and the city plays an essential role in the school community. Thanks to digital tools the school breaks its physical barriers and expands throughout the virtual and global world. Consequently, the learning space portfolio goes beyond the school walls, to the library, to the square or park, to public spaces in general. At the same time the community perceives the school as a public space for and within the community. Often the schools were perceived as community hubs where: the large school cafeterias were used for community events; some classrooms held night classes for refugees; on the weekends there are yoga classes for the neighborhood; in addition to community libraries being designed increasingly as part of schools.

Apps, software, and artificial intelligence (AI) can help us to identify patterns and to recognize our mistakes as well as to assist us in learning a specific topic or skill. However, we argue that digital learning will not replace schools. Schools will continue to be places of encounter, exchange, as well as a provider of basic learning infrastructure. If anything, the pandemic showed us the socioeconomic gap of several families in many levels and the lack of access to digital hardware and a stable internet connection was one of them.

Be it hybrid models, blended learning or flipped classroom strategies, people are bound to space. Even when learning remotely in a virtual class we are in a physical space. Moreover, to be in the same physical space at the same time is what transforms a space into a place for dialogical learning that cannot be replicated into the learning space of a digital platform. The social-spatial exchange continues to be crucial.

Let us bear in mind Mikhail Bakhtin's Dialogical Principle¹¹, which reminds us that there is no "I" without the "other". We thus affirm that the dialogical principle requires the coexistence of learners in the same physical space, especially in project-based courses where creativity and critical spatial practice¹² is fundamental. In these, it is also crucial to put hands into the matter¹³, which means uniting making and thinking as a connected practice; we need spaces with messy floors, where the experimentation and the process of creation unfolds. This can only happen in a collective atmosphere. Without this, learning becomes a flatland¹⁴.

In this context, digital learning is an important step in the process of dismantling schools' monotonous classroom structures and opening up the school to the community, allowing them to become more like "Learning webs"¹⁵, as part of a citywide network of public spaces and infrastructure dedicated to lifelong learning.

CONCLUSION: TOWARDS THE “SCHOOL OF THE FUTURE”

The pandemic showed us the potential and the limits of digital learning. While technology can very well serve many roles in education, such as instruction, repetition, practice, and even feedback, as stated in this paper, schools won't disappear, and distance learning won't be the school of the future.

Nowadays, thanks to new pedagogical approaches, we understand that, depending on the pupil, situation or even topic, children learn in a variety of ways; individually, in pairs, in small groups, in virtual groups, and even in very large groups (like in global virtual communities).

As mentioned before, technology can take over many teaching functions, but schools exist to serve multiple purposes, such as teaching kids useful skills for their lives and for society, like social interaction, empathy, tolerance, compassion, as well as, encouraging social cohesion. However, the classrooms might be the ones to disappear. This has been also discussed by Marc Prensky¹⁶ who once said “not to eliminate schools, but rather to eliminate the classrooms (...)” While traditional classrooms may have served a useful role in times when individualization and personalization were not as important, nowadays, the classroom, as the heart of the learning experience, has become obsolete.

As described in this paper, digital learning takes place in both virtual and physical environments. In this context, traditional learning institutions, such as schools and universities, must respond to digitalization with a holistic approach. This includes not only a stable internet connection, tablets, and additional plugs, but also, as shown in this paper, specific spatial settings.

Moreover, the physical space can not only be expanded by the digital space, but also transformed by the means of augmented and virtual reality. The latter has an incredible potential for teaching and unique learning experiences. As a consequence, the social forms from Figure 2 are expanded (see Figure 8): with video call where all participants are connected individually to a virtual room, video conference in audimax where several students in an auditorium attend a virtual session, hybrid settings where physical and remote attendees share the same instruction at the same time, virtual reality where a digital world is explored by the use of goggles and controller, and finally augmented reality where digital models are projected into a physical space.

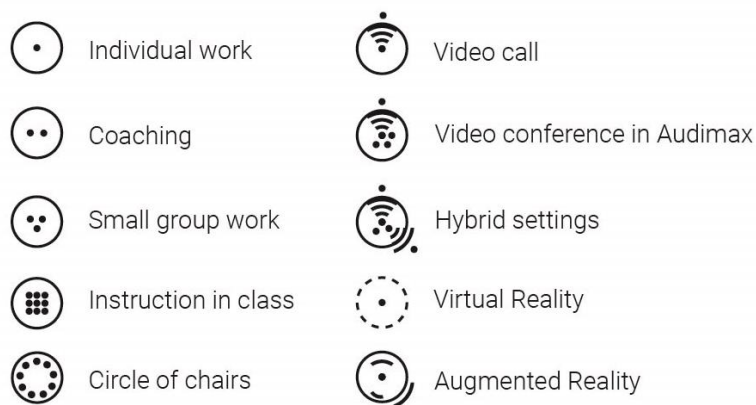


Figure 8. The “new social forms of learning” diagram based on Reallabor STADT-RAUM-BILDUNG 2019

Without doubt, digital learning plays a crucial role in supporting the pedagogical diversification, decentralization, and individualization of learning. Therefore, we make a case for space. Redefining education requires redefining the spaces in which it takes place, wherever they are located, inside or outside the school walls. We still must wait before seeing virtual reality classrooms in every school, but we think that the transformation of traditional classrooms and access areas into diverse learning zones, setting up temporary outdoor classrooms at a public space and involving the community is not that far away. However, there is still much to be discovered and communicated: the relevance of space must be conscious to every stakeholder in the process of planning future learning spaces. We see the future of learning spaces in the meaningful intersection of physical and digital spaces.

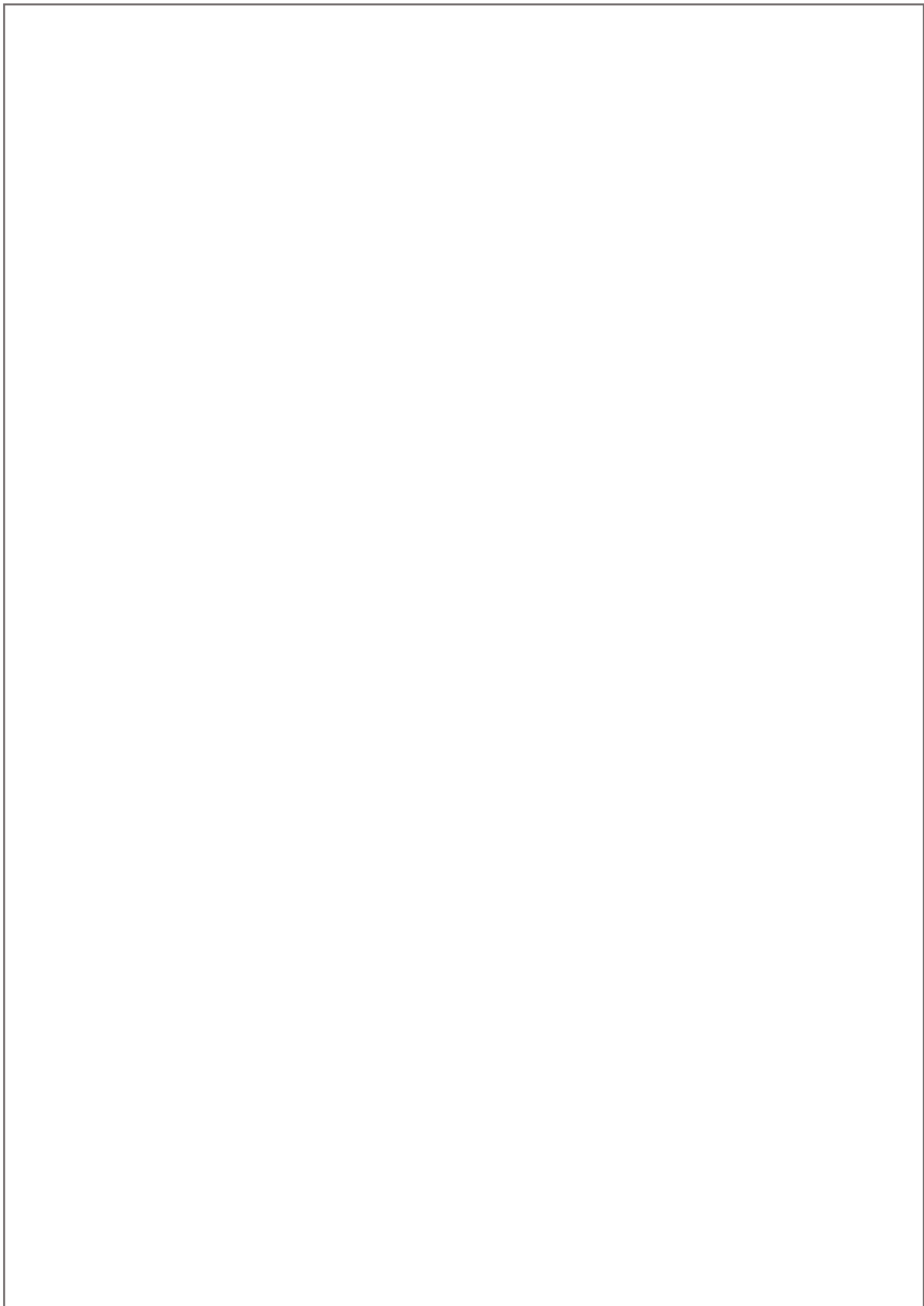
NOTES

- ¹ Jan Amos Comenius, "Didakta Magna," in *Reformpädagogik in Geschichte und Gegenwart eine kritische Einführung*, ed. Ehrenhard Skiera. (München; Wien: Oldenbourg, 2003), 25.
- ² Petra Hoffmann, *Der dritte Pädagoge. Das Klassenzimmer*, (München: GRIN Verlag, 2010), <http://www.grin.com/de/e-book/168372/der-dritte-paedagoge-das-klassenzimmer>.
- ³ Reallabor STADT-RAUM-BILDUNG, see: <https://stadt-raum-bildung.de/>
- ⁴ Michael Göhlich, "Schulraum und Schulentwicklung: Ein historischer Abriss in Schularchitektur," in *Schularchitektur im interdisziplinären Diskurs: Territorialisierungskrise und Gestaltungsperspektiven des schulischen Bildungsraums*, ed. Jeanette Böhme (Wiesbaden: Springer Fachmedien, 2009.), 94.
- ⁵ Edward Robert Robson, *School Architecture. The Planning, Design, Building and Furnishing of School-Houses* (London: John Murray, Albemarle Street, 1874), 71.
<https://archive.org/details/schoolarchitectu00robsuoft/page/70/mode/2up>.
- ⁶ Sarah Dahlinger. *Schulbau und Schulraumgestaltung gestern und heute. zur Geschichte der Schularchitektur*. (München: GRIN Publishing, 2014), 6.
- ⁷ Ivan Illich. *Deschooling Society*. (Harmondsworth: Penguin, 1973), 29.
- ⁸ Robert B. Barr, John Tagg. "From Teaching to Learning: A New Paradigm for Undergraduate Education." *Change New Rochelle*, 27, 6, (1995): 12.
- ⁹ Marc Kirschbaum, Albrecht Wacker, Belen Zevallos. "Das schulische Lernraumportfolio: vielfältige Räume für das Lernen von morgen." *Schulen. Neubau | Umbau | Sanierung. Ernst & Sohn Special*, (2020):18–22.
- ¹⁰ The Real-Laboratory CITY-SPACE-EDUCATION (German for Reallabor STADT-RAUM-BILDUNG) dealt with the sustainable development of learning spaces and educational environments addressing paradigm shifts such as community schools and full-time-schooling. Conceived as a real-world laboratory, the research project was a transdisciplinary collaboration of three universities along with experts for participatory processes, partners with experience in the educational landscape in Germany, and specialists in transdisciplinary research as external partners. Besides multi-layered and transdisciplinary research methods in the project as a whole, case studies and the field research were an essential element in the concept of this project along with the cooperation with local authorities in Baden-Württemberg/Germany. <https://stadt-raum-bildung.de/>
- ¹¹ Mikhail M. Bakhtin, Caryl Emerson, Michael Holquist. *The dialogic imagination four essays*. Austin: University of Texas Press, Slavic Series, 1981.
- ¹² Jane Rendell, *Art and Architecture: A Place Between*. (London and New York: I. B. Tauris, 2006).
- ¹³ Tim Ingold. *Making: Anthropology, Archaeology, Art and Architecture*. (London; New York: Routledge, 2013).
- ¹⁴ Edwin A. Abbot, *Flatland*. (London: Penguin Books Ltd, 1998, 1884).
- ¹⁵ Ivan Illich. *Deschooling Society*. (Harmondsworth: Penguin, 1973).
- ¹⁶ Marc Prensky. "Do Schools Disappear, Or Do Classrooms?". *Educational Technology*. (2015), accessed May 16, 2021: https://marcprensky.com/wp-content/uploads/2013/04/Prensky-Do_Schools_Disappear_or_Do_Classrooms-EDTEC-Mar-Apr-2015.pdf

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