Chapter 16
Redefining School: Educational Spaces for Adolescents' Engagement in Learning

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Introduction

In a world that is shaped by innovation and becoming increasingly complex, it would be unreasonable to believe that the field of middle-level education could remain unaffected by ever-changing societal expectations, demands, and pressures related to the role education and educators play in preparing adolescents for life and work. Adolescent learners require an education that prepares them for a rapidly changing and, in some ways, unpredictable world (Trilling & Fadel, 2009). Given the level of change they will have to deal with as adults, this education must allow them to survive and thrive but, most importantly, unleash their natural curiosity and empowers them to contribute to a world in transition (Yee, 2015).

The good news is: Adolescents' learning needs can be aligned with twenty-first-century learning environments. Educators today understand learning as deeper learning (Bellanca, 2015; Fullan, Quinn, & McEachen, 2017). This implies that teachers must go beyond facilitating mere knowledge acquisition and encourage the development of problem-solving skills as well as the power to act (alone and in teams) in different situations based on sound knowledge (Pellegrino & Hilton, 2012; Sliwka, 2018). But how exactly does the learning environment meet these needs? How can traditional education spaces be developed to better support the core aim of schooling: individual student learning?

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Adolescent Students' Learning

Understanding the unique developmental needs of adolescent learners provides the key to ensuring their learning success. There is ample research evidence about the stages of physical, emotional, and social development and transition occurring for these learners (George, 2009; George & Alexander, 2003; Yee, 2015). Yee (2015) has recently shown that schools attending to how these changes impact teaching and learning can become remarkable places of learning that are responsive to the unique educative needs of early adolescents.

Schools that are unaware of these particular needs and how to respond to them tend to lose these kids. Many researchers have shown that adolescent students become increasingly disengaged and disconnected from their learning (Balfanz, 2009; Hancock & Zubrick, 2015; Spork, 2014; Wang & Holcombe, 2010; Wormeli, 2011), a situation which can lead to devastating consequences. Klinger, Mills, and Chapman (2011) found that only 21% of girls and 16% of boys reported "liking school a lot" (p. 52) by Grade 8. Furthermore, only 52% of girls and 54% of boys described their "teachers [as being] interested in them," and only 72% of girls and 70% of boys believed that "most of their teachers were friendly" (p. 54). Other studies have confirmed adolescents' lack of meaningful connection to school. The conductors of the large-scale 2010 Canadian survey "What Did You Do in School Today?" showed that 42% of adolescents are either apathetic or anxious towards their learning in mathematics, and even more, 48%, are so in languages (Willms & Friesen, 2012; Yee, 2015). There is ample evidence underscoring the importance of a closer examination of the factors that contribute to the establishment of developmentally responsive, intellectually engaging learning environments for students between the ages of 11 and 16.

Adolescent Students' Engagement in Learning

We know today that student learning strongly depends on their learning engagement (Sliwka, 2018; Yee, 2015). *Engagement* refers to students' enthusiasm, curiosity, involvement, and excitement and must be understood as a "growth-producing activity in which the individual allocates attention in active response to the environment" (Friesen, n.d., p. 1). Engagement in this sense implies that people learn best when doing things that are challenging and of deep interest to them. Adolescents who are engaged can more easily cope with setbacks and obstacles (VCOSS, 2016, p. 4).

When they feel strongly engaged, students enter a state in which they are so focused, so intensely involved in their learning that time seems to vanish and deeper learning takes place. Csikszentmihalyi calls this state "flow" (1990); Friesen defines it as "intellectual engagement" (2007) and distinguishes it from merely playing by the rules and "doing school." The authors of an OECD report describe this level of engagement as "the most intense pleasure the brain can experience in a learning context" (OECD, 2007, p. 73).

To challenge students and to provide them with opportunities to reach their full educational potential, teachers must engage them behaviorally, emotionally, and cognitively (Ockenden, 2014, p. 6). For this kind of engagement to be stimulated, students require a learning environment with incentives to show a serious emotional and cognitive investment, use higher order learning and thinking skills, solve complex problems, and construct new knowledge. Research shows that teachers can achieve this deep learning by creating authentic learning tasks, teaching the curriculum through real-world problems that need to be tackled. The closer the connection between learning and real life, the greater the effect on student engagement in learning (Kvalsund & Hargreaves, 2009; OECD, 2007).

To achieve this kind of quality in learning, teachers must become designers of learning, creating complex tasks that go beyond merely teaching their students ways of knowing the subjects in the school curriculum (Sliwka, 2018). An effective way of doing so is to extend the space of schooling to encompass outside perspectives and outside expertise. *Communities of Practice* (Lave, 1991), an approach that brings together teachers and community partners to jointly design learning tasks, has been shown to be particularly effective. Taking the world outside the classroom into account when planning for effective learning experiences requires schools to transcend traditional boundaries in two ways:

- Schools should open up to their communities to the world around them.
- Schools should actively embrace the digital world that their *digitally native* students already live in.

Both dimensions radically change a school's perception of space. When a school breaks down traditional spatial barriers, learning spaces encompass authentic relationships and locations in outside communities. Cultural identity can emerge more easily, and a more holistic way of educating children is facilitated (Freytag & Jahnke, 2015, p. 83). The second dimension is of particular importance in today's globalized context: Digitization is the main driver of change in how we perceive educational spaces today. The communities of learning we are able to create and cocreate can relate to local, provincial, national, and global spaces alike. It is through the digital space that geographical spaces shrink and social, situational, and temporal contexts that support learning processes merge to create learning spaces that are unique in exciting new ways (Tenorth & Tippelt, 2007, p. 428) (Fig. 16.1).

Creating and Connecting Learning Spaces for a Holistic Education

The idea of teachers and schools working closely with the community to enhance learning for their students is not a recent pedagogical idea. Early twentieth century proponents of progressive educational concepts (*Reformpädagogik*) in particular began to align in-classroom learning with their students' outside environment. More

The Elisabeth-Rummel-School in Canmore, Canada provides an example of one way of shrinking geographical spaces and enriching the learning environment at school. Within their learning commons (Klopsch, in press), a 21st-century learning space that encourages students to answer big questions in research projects, students are able to use everything that helps them engage with "a big question" to which they are seeking answers. They can use print, online, and human resources that do not even have to be close to the school. As one teacher explains:

"[H]uman resources—sometimes you just find them. One of the girls […] was studying ancient Egyptian medicine, because last year she had done a project on the plague in the Middle Ages and she was really interested in medicine and how each culture treated diseases and stuff. And we just happened to be searching and we found that the Metropolitan Museum of Arts in New York had done a display or thing on Ancient Egyptian medicine. So […] we said […] it would be neat to take her further questions and contact somebody at the museum, a curator or somebody, to see if they could answer the questions. So that is just something that happens sometimes. We […] contact them and can also set up video conferences with them. […] We are just finding things out as we go."

Fig. 16.1 Using digital possibilities bring the world to the school. Source: Design by author

recently, schools have adopted these reformist ideas to create a more balanced education, with teachers trying to achieve excellence and ensure the equity and wellbeing of students at the same time (Böttcher, Maykus, Altermann, & Liesegang, 2011; Kolbe & Reh, 2009; Sliwka, 2018). This move to a more holistic education achieved through bringing real-life issues into the classroom and letting students learn in real-life contexts outside the classroom can, for example, be observed in many of the schools that have won the German school award (Der Deutsche Schulpreis, n.d.). Those running these and other German schools predominantly name two different motivations for codesigning learning in collaboration with outside partners: On the one hand, some schools collaborate to enhance their curriculum through a variety of projects the school would not be able to offer all by itself. These schools consider themselves the center of the learning process. Their collaboration can be described as "low-cost cooperation" (Dizinger, Fussangel, & Böhm-Kasper, 2011, p. 116) or the "complementary model" (Böttcher et al., 2011, p. 109). According to this model, schools and partners are collaborating in the same space, in most cases the traditional school building. This cooperation takes place in simultaneous or successive activities. Schools open their doors, but not their organization.

The following example in Fig. 16.2 shows how Evangelische Schule Berlin-Zentrum extends its space during the school year for long-term projects.

On the other hand, some schools consider themselves as just one of multiple spaces in a student's learning process. According to this model, learning is best supported when these spaces are interconnected and collaboratively stimulate and encourage the student's learning. These schools seek to create one holistic setting for learning together with a variety of partners (Klopsch, 2016, p. 51). This kind of collaboration is also known as "high-cost cooperation" (Dizinger et al., 2011, p. 116). Its proponents perceive schools as a space in which learning and living are profoundly interconnected. These schools open their doors and their organization, looking for the best support for student learning and development through a meaningful network of closely-linked partnerships. The real world and the school's community of partners are an active part of a student's daily learning process. Learning space is no longer restricted to the school itself, but rather encompasses multiple sites outside and inside the school building (Fig. 16.3).

A Lutheran school in the heart of Berlin has turned upside down what it means to be an adolescent in a German school. Fourteen-year-old Anton, for example, managed to talk Germany's railway operator Deutsche Bahn into giving a group of adolescents free tickets for a trip to the UK. The students were planning their three-week-long "challenge project." Anton and his team plan to go to Cornwall to study coastal economies as well as practice their spoken English. Another group of students decided to delve into fashion design. The girls asked one of their grandmothers, who lives in a rural area outside of Berlin, if she could teach them sewing. They intend to produce dresses in the style of Coco Chanel. The school has introduced two types of three-week projects. One is called "project responsibility," a social or ecological community service project; the other is "project challenge," a project that students perceive as personally challenging so that it will help them to learn new things and cross new thresholds on their way from childhood to adulthood. In small teams, the adolescents plan their projects themselves and present their project plan to the teachers and the parents. For the challenge, students aged 12 to 14 are given €150 and sent on a three-week adventure. Some go abroad (where they need to find hosts to keep their expenses down); some go kayaking on the many lakes north of Berlin; others produce a CD or film, or work on a farm. The core idea of the school represents a radical vision of what schooling for adolescents is about in the 21st century. The globalized and digital economy is radically transforming labor markets and the ways in which we live together and communicate with each other. The Evangelische Schule Berlin-Zentrum perceives the ability to motivate oneself for learning as the most important skill a school can pass on to its students. The ability to self-regulate helps young people to succeed in a labor market and world in which they are given endless choices but are also obliged to gain the necessary knowledge and skills to make these choices work for themselves. To enable adolescents to become self-sustaining, fulfilled, and happy adults who find their way in an increasingly open and complex reality, the school's educators have redefined the meaning of learning spaces by having students go out into the world to work on their projects.

Fig. 16.2 Changing Space: "Project Challenge" and "Project Responsibility" at Evangelische Schule Berlin-Zentrum (Yee, Sliwka, & Rautiainen, 2018, pp. 125–129). (For more information on the school see: Yee et al., 2018, pp. 125–129). Source: Design by author

When educators define learning space as existing both in and around schools, "hybrid learning environments" (Zitter & Hoeve, 2012) emerge. Schools and their partners work together to embrace traditional and nontraditional, nonformal and informal learning environments and to design learning tasks that are arranged fluently (see Fig. 16.4), depending on the students' multiple needs and aims in learning.

These complex spaces tend to move away from constructed and artificial learning assignments to more real-life learning that helps students to connect knowledge, skills, and competencies on an advanced level and allow coconstruction as well as acquisition (Zitter & Hoeve, 2012, p. 8). In these kinds of learning environments, students are enabled to use their acquired knowledge in a situated project context in order to make cognitive connections between fragmented units of knowledge by means of their practical use and application in a real-world problem. Thus, knowledge that is implicit and fragmented is to be transferred into explicit and connected knowledge. Various processes such as critical thinking, creative activities, various forms of communication, and collaborative problem-solving drive this process (OECD, 2017). A precondition for such an innovative use of spaces is to enable well-organized interactions among all partners involved, connecting teachers, partners, resources, technology, and various kinds of locations (see Fig. 16.5, right side). Its impact is not based on one specific pedagogical approach but embraces different pedagogies with the aim to unfold and support the personal development of students in a holistic fashion.

Two things are decisive here. On the one hand, students need to acquire competencies that are based not only on understandings of concepts, ideas, facts, or pro-

The Australian Science and Mathematics School (ASMS) is an example of an institution that was purpose-built to reflect 21st-century learning principles and represents a "hybrid learning environment," whose educators are using space in innovative ways and involving partners in multiple areas to enhance learning. The State of South Australia established this public secondary school on the campus of Flinders University in 2003 to attract more students into STEM subjects and offer them state-of-the-art learning to prepare them for the emerging fields of science and engineering. Learning in the school is project- and inquiry-based, digitally supported, personalized and collaborative, interdisciplinary, and authentic. Students learn in projects designed by teachers in collaboration with industry and university faculty members. These "design groups" take about one to one and a half years to design a new learning project before students begin to work in the situated project context. Each project is digitally supported by means of interactive learning platforms that provide 24/7 access to the learning tasks, the knowledge base, and the communication tools. Interdisciplinary science and mathematics projects such as "Patterns of Change," "Medical Engineering," "Modelling Chance and Space," "Sustainable Futures," or "Communication Systems" combine core scientific concepts with hands-on experimentation and explorations and inquiry in the world outside the school (such as in companies and university laboratories). The school has four large ICT-rich open, flexible learning spaces, as well as smaller spaces for groups of different sizes. Educators here view learning as a social process and as supported by different social arrangements such as collaborative group work, mixed-age tutor groups, and lectures by teachers, students, or outside experts from companies or universities. Every student works with a digital individual learning plan and an electronic portfolio. A virtual learning environment facilitates collaborative work on complex tasks and various communication processes needed to complete the work, to receive formative feedback, or to present work to the outside world. Teachers work in teams to design new projects, to evaluate their work, and to develop new pedagogical processes to better scaffold and support student learning. Professional learning among teachers is frequent and ongoing, with the teachers aiming to co-construct new knowledge and share their work with practitioners from other schools. The school regularly receives visitors who either contribute to the learning by bringing in outside expertise or who want to learn from the school for their own professional development. Students and teachers frequently leave the school to explore, inquire, and work in settings and spaces beyond the school building, such as the nearby industrial innovation park, where companies like Tesla and Siemens develop new products. ASMS has developed into a fluid and hybrid learning environment in which educators facilitate learning within a space that seamlessly merges the digital and the real world both inside and outside the school building.

Fig. 16.3 Australian Science and Mathematics School/Adelaide. (For more information about the school, see OECD 2012. Innovative Learning Environments (ILE): Inventory Case Study Australian Science and Mathematics School (ASMS). Retrieved from http://www.oecd.org/education/ceri/49930609.pdf). Source: Design by author

cesses and procedures. Skills like critical thinking, creative problem solving, cooperation, and collaboration are intertwined with this process (Trilling, 2015). Teachers should help students work on an academic mindset (Farrington, 2013), in other words developing personal qualities like self-efficacy and a growth mindset (Dweck, 2009), performance qualities like goal-setting or reflection, and social qualities like using collaboration and social capital for reciprocal learning and mutual support (Trilling, 2015).

On the other hand, the use of spaces for learning should always be based on the core principles of "Universal Design for Learning" (Rose & Meyer, 2002). Thus, twenty-first century learning spaces should provide multiple means of representation, meaning the input is represented in multiple ways so that everyone can "gain access to it that way they are going to benefit from it" (Rapp, 2014, p. 3) and multiple means of engagement, as in different types of learning tasks. To make student learning visible, these spaces allow for multiple means of action and expression, in other words giving students choices in how they want to show what they know and what they can do with their knowledge.

Whenever the concept of school is widened to encompass a whole range of spaces beyond the traditional classroom, students can be appreciated with all their
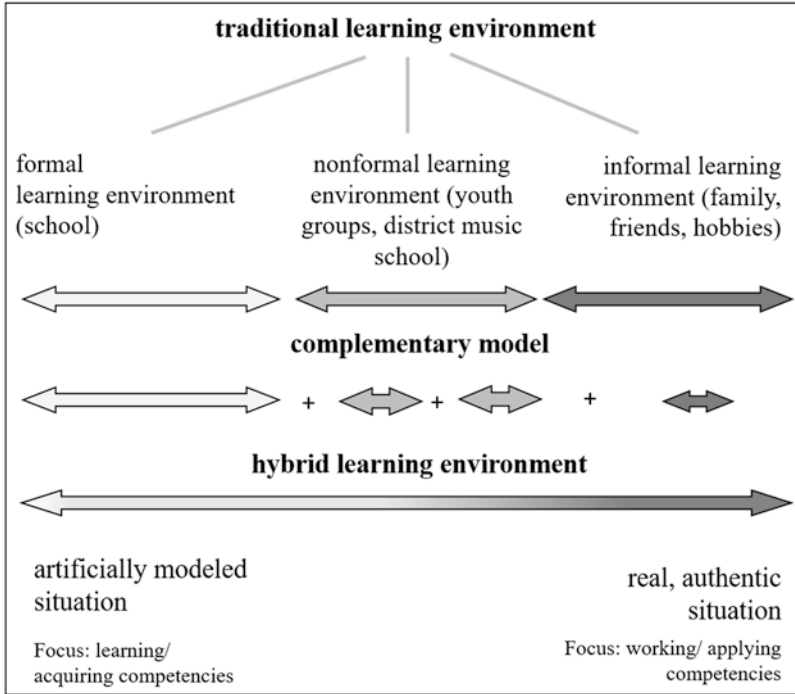
Fig. 16.4 Traditional learning environment versus hybrid learning environment. Adapted from Klopsch, 2016, p. 154. Copyright 2016 by Beltz Verlag. Adapted with permission

strengths and weaknesses and work with different approaches, assignments, and social settings (Istance & Dumont, 2010, p. 326). Learning tasks can range from tasks assigned by teachers to tasks coconstructed by teachers and students and tasks chosen and designed by individual students. All these types of situations are needed at a school whose educators view the enhancement of "learning engagement" as a key factor and a priority for adolescent development. There is room for many different formats: Although there may still be a need for a traditional lecture format that presents theoretical knowledge necessary in building a sound knowledge base, there will certainly be group assignments that are thoroughly predesigned and constructed for scaffolded learning. In this kind of setting, self-constructed and self-directed learning activities by individual students or small groups of students are also a normal part of schooling. Redefining school by a new way of looking at and using space in learning usually goes hand in hand with a shift towards more authentic learning. Adolescent students' learning is enhanced by enabling many different experiences: Listening to a lecture by a bee keeper on the potential extinction of bees and the implications on our ecology and nutrition in the school building, taking part in a service learning project in a retirement home for elderly patients with dementia, or setting up an art exhibition showcasing the student's own art work in a local museum (Sliwka & Klopsch, 2018).
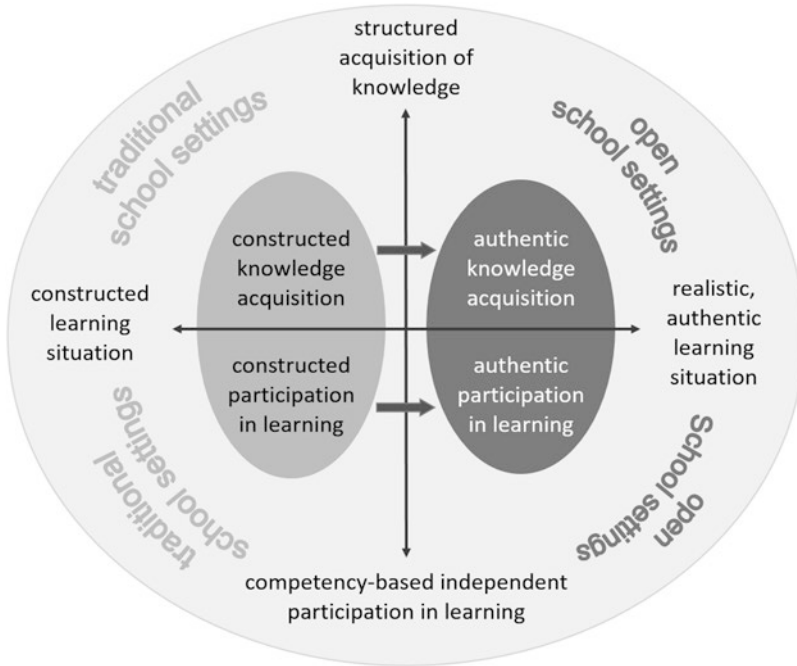
Fig. 16.5 Dimensions of a learning process. Reprinted from Klopsch, 2016, p. 156, based on Zitter and Hoeve, 2012. Copyright 2016 by Beltz Verlag. Reprinted with permission

These examples illustrate how redefining space in schooling not only impacts the way lessons are taught, but also on students' experiences beyond the classroom setting.

Redefining Schools as Multiple Hybrid Spaces for Learning

An effective way of creating new learning environments for adolescents is to build networks between schools and partners based on common learning goals. These jointly defined goals ensure that learning projects are based on the concept of symbiosis rather than coexistence. To make this work, it is important to initiate change through *bottom-up* approaches rather than *top-down* regulations by the school administration (Gräsel, Jäger, & Willke, 2006). "Symbiotic" here means acting together from different starting points: Partners, teachers, students, parents, and school administrators coconstructively develop one collective learning space involving multiple different subspaces for learning. This way, the multiple perspectives can be equally taken into account rather than imposing one teacher-centered perspective on all the other partners involved in the enterprise of redefining spaces for learning. But what should be the guiding idea for this joint venture? This

brings the argument back to the starting point—the gloomy diagnosis that many adolescents in traditional schools lose their intrinsic interest in learning between the ages of 10 and 14. Loosely-coupled, low-cost approaches to school partnerships can be an interesting addition to traditional schools but will not help to solve this fundamental problem. To enhance learning for all adolescent students, to make it interesting and relevant for them, schools must provide authentic and demanding tasks in real-life settings for learning. In this crucial phase of human development, the core developmental task young people have to work out is the question of personal identity: Who am I? What are my talents, interests, and passions? Where do I want to go, and how do I get there? (Sliwka, 2018). To open up schools, to redefine them beyond a mere "building with teachers in classrooms," to make them hybrid and connected to the real world has never been as easy as it is now. The digital revolution has made it easier than ever before to get in touch with potential partners, to communicate on an ongoing basis, to coconstruct a conception of learning in multiple and relevant ways. All of the teenagers in our schools are digital natives. Their world and their personal lives are more connected and fluid than ever before in human history. Why not learn from them and redefine schools to encompass many spaces instead of just one? Spaces in which adolescents can discover learning as the most exciting possible journey on the way from childhood to adulthood.

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