Beate Weyland

New Challenges for the School of the Future, between Pedagogy and Architecture

Ente di afferenza:
()

New Challenges for the School of the Future, between Pedagogy and Architecture

Beate Weyland

ABSTRACT: *The challenge of designing schools of the future is affecting not only the world of education and training, but increasingly a large interdisciplinary group of experts in architecture, politics, sociology and economics. The recent Report on School Construction of the Agnelli Foundation (2020) illustrates a pitiless situation in which Italian school buildings find themselves. At the same time there is a strong commitment to their new qualification, in which the contributions of the various disciplines become fundamental. In this essay we intend to present a reflection on the relationship between pedagogy and architecture. The bets that we want to play are driven on the fields of shared design of school spaces. The task is to respond to new social, political, economical and cultural issues: competence orientation, diversified learning styles, prolonged time at school, inclusion. Further considerations are elaborated on the importance of movement and play, which if respected imply a transformation of both teaching and school spaces and could deliver a clear determination of their quality.*

KEYWORDS: *Pedagogy, Didactics, Space, Architecture, Learning, Environment*

Introduction

We live in a time where we can really ask ourselves which schools we want for our future. School buildings, built largely from the early twentieth century until thirty years ago, need to be revised. The interesting thing is that the discourse is no longer only structural, dealing with the building, but also pedagogical. Why does it still make sense to build a school? And which kind of schools can we design looking to future generations? In this essay, some theoretical arguments and research gains are made explicit, focusing on the challenge of the fruitful

Beate Weyland, *University of Bolzano*,
beate.weyland@unibz.it

relationship between pedagogy and architecture. In particular, attention will be focused on the idea that every pedagogical thought has its physical, material and concrete implications with the learning space. Spaces can be the best mirrows of our intentions and actions. For this reason, it is increasingly important to raise awareness and develop pedagogical skills to be fit to analyse and timely design physical learning spaces in which the educational adventure of the younger generations can be continued.

1. Pedagogy and architecture: A winning bet

The new paradigm of the school as a living space (Aminian *et al.*, 2015; Imms *et al.*, 2016; Weyland *et al.*, 2019) calls into question the interweaving of different disciplines such as pedagogy and sociology, architecture and design: pedagogy to develop well-argued proposals on how to use spaces, to explain what should be there and why; sociology to elaborate social meanings linked to the materiality of spaces and to describe how humans live in them; architecture and design to study the best solutions to give shape to ideas (Weyland and Attia, 2015; Landri and Viteritti, 2016). Currently, there are several experiences on the national and international scene that focus on strengthening the phases of participatory involvement in the start-up phases of the school building design (Tosi *et al.*, 2019; Montagstiftung, 2012; Woolner, 2015; Weyland and Watschinger, 2017). In Italy there is no delay in confirming a new role assigned to education in dialogue with architecture: on Thursday, 12 September, 2019, two secondary schools were inaugurated in Turin, as a result of the *Torino Fa Scuola* project (www.torinofascuola.it), based from Fondazione Agnelli and Compagnia San Paolo on the importance of a fair balace between pedagoy and architecture. The project worked following these basic concepts: the pedagogical thought comes before architectural actions, so the school community needs first of all to develop an idea of school and to justify pedagogically which spaces are needed and why; good schools are guaranted with the quality of a design competition, in which the most valid and coherent project is rewarded with the pedagogical requirements; the dialogue between architects and teachers in all the design phases is fundamental to harmonize the architectural project with the teaching and learning requirements.

The idea that a school can be built on the basis of a 'pedagogical concept of spaces' allows school communities to perceive themselves as responsible and active subjects in the process of transformation of learning places. Educational thoughts can really have a big socio-cultural and political power (Iori, 1997; Sergiovanni, 2000; Tosi *et al.*, 2018; Attia *et al.*, 2018; Weyland *et al.*, 2019) because they are aimed at constructing educational arguments in support of choices and appropriate investments.

On the same Thursday, September 12, 2019, in the afternoon, the jury of two important design competitions of a middle school in Via Pizzigoni and a school complex (ranging from kindergarten to middle school) in Via Scialoia in Milan was established. The novelty lies in the composition of the commission, which was provided with the presence of a pedagogical voice in the jury, which in the meantime also decided to give her the role of president. This is an important sign, that indicates the concrete will to give weight to the culture of educational sciences in the process of evaluating school architecture projects, in order to select the most suitable project to meet the challenges of the future.

A school building designed on a solid pedagogical basis and with the active involvement of users, recalling the principles of deliberative democracy (Hübner Mendes, 2014), is always a gift that is handed over to the universe of education and the future of our young people. It contains in itself a series of information that allows over time its polivalecy, able to be adapted to the new challenges of education and learnig (Attia *et al.*, 2018; Woolner, 2018). It is a building that 'does no harm', that facilitates an open and active teaching and learning process, unlike what happens with buildings built automatically on obsolete models.

Gaston Bachelard, in a phenomenological perspective, writes in 1957 that «spaces are telling us many things». Franco Lorenzoni (2019) warns that «teachers and students live in the furrow traced by architects». Dealing with this affimations, it is better to move in the direction of building well, aimed at future generations who will meet a school designed with awareness and foresight. Despite an outdated, plastered school system, incapable of acting and of agilely appropriating learning spaces, sometimes built with a good commitment, the indepth dialogue between pedagogy and architecture has become more successful than ever.

Nobody is building well only for the community that is present and/or participating in that dermined historical moment. Teachers and leaders will follow one another.

essays section 2 – Culture, innovation and training

True political-educational actions should be oriented towards the principle of responsibility and support for a future in which it is expected that the school will no longer really be what they were for a hundred years (Weyland *et al.*, 2019; Marcarini, 2016; OECD, 2017).

The next generations future offers us scenarios that are not always known. They has all to be explored: the contraction of births, the attention to climate issues, the strengthening of the cultural offer for the development of skills and the new investment in the educational factor rather than the educational one of the school. These and other situations of strong social, economic and cultural transformation are beginning to challenge us all. Prospectives for the future call for a complex treatment of facts and the analysis of possibilities with con-science and a strong heuristic and proactive spirit (Tosi, 2019; Thorn-burn, 2018; Imms *et al.*, 2016).

The challenge to play between pedagogy and architecture, sociology and de-sign is winning because it is based on two key elements: an approach aimed at improving change and strengthening the living conditions of the individual; a concrete approach that combines macro visions, on the school, as urban and city project, with those mi-cro, which take care of the details in the design of spaces and furnishings (Weyland and Attia, 2015; Landri and Viteritti, 2016).

2. New tasks and new arrangements

«The core business of schools is teaching», this was the sentence used to describe the most important task of schools so far. It was guided by a directional approach, now characterized as 'passive': pupils has to be instructed. The fundamental change that many schools are already working on lies in their grammar of educational action: recalibrating the balance between passive and active. The new core business of the schools is centred on learning and on the realisation that this is more effective when it is understood as an active and interactive process from the learner›s point of view (Hughes *et al.*, 2019; Bosch, 2018).

The new tasks of educational institutions and the new scenarios in which they are configured are also born from the expansion of their social and cultural mission: full-time schools are a response to the changed working and living environments of families, pupils stay at school much longer than in the past. In-

clusive schools are also a response to the need to recognise social heterogeneity and to create equal opportunities. Digitisation and its rapid and dynamic development is becoming another driver of innovation. For these reasons, school environments are becoming more than ever living places, where to exercise self-determination, creativity and practice. In order to this changes the materiality of spaces becomes a quality of great socio-pedagogical interest (Fenwick and Landri, 2014).

2.1. *Competence orientation*

The acquisition of competences is a process in which activities, emotions, cognitions and situations are linked in various ways. If this process is active and processes oriented and allows different approaches to learning, it is particularly effective. In the past, students will prefer to learn to solve problems themselves rather than just imitate finished solutions. They will learn that each solution can at the same time cause new problems.

Increasingly, the goal of learning is no longer determined by the individual subjects, but by the problems to be solved. For this reason, interdisciplinary learning processes are gaining in importance. Of course, the practice of the subject is still necessary, but it must be understandable for students (Guasti, 2017; Antonacci and Guerra, 2018).

Competence orientation includes skills and abilities of response ('What should I know?'), application ('How can I do something?'), understanding ('Why does it work that way?') and explanation ('How does it express itself exactly and understandably for others?'). The corresponding learning approaches provide more time and space for self-organised and practical learning. Direct and independent access to knowledge resources is made possible, for example, by properly equipped libraries or media centres and by equipping learning and learning areas with Internet-compatible terminals. In addition to creating concrete situations of application of what needs to be learned, practical learning also includes the promotion of project thinking and 'manual' skills. In view of the increasing virtualisation of everyday life, the intensive use of learning and sensory objects in all types of schools is becoming increasingly important (Weyland, 2017; Margiotta, 2013). The places where learning and teaching takes

essays section 2 – Culture, innovation and training

place are developing the character of a laboratory or atelier, such as important resources for this purpose.

Learning objects, technologies and phisical spaces will therefore become central protagonists of the educational action «to bring out multiple sociomaterial configurations that draw new orders, disorders and unprecedented uncertainties» (Ferrante and Orsenigo, 2017: 156).

2.2. *Diversified learning styles*

Contemporary schools should be designed to accommodate different ways, places and perspectives not only of teaching, but also of learning. Everyone learns, everyone can teach. Teaching itself is conditioned by a specific learning style of the teacher and he too should be free to carry out his professional activity doing justice to the scientific evidence that focuses on the enhancement of different learning styles (Kolb, 1985; Jonassen and Grabowski, 1993; Gordon, 1988). Only in this way is it possible to seriously design corresponding and fully relevant learning units. Traditional frontal teaching in the classroom or class group loses its domain to make place for self learning, learning in pairs and in small groups – analogue or digital – with tutorial and in-depth sessions coordinated by teachers who gain importance to the same extent.

Many scholars have already highlighted the differences in the way of learning (and therefore of teaching): Howard Gardner (1995) with the theory of multiple intelligences, highlighted different ways of understanding and approaching the world.

To strengthen these intelligences, space can act as an extraordinary pedagogical device, also physically giving home to interpersonal, cinesthetic and bodily intelligence, which for a long time have been lateralized to the advantage of cognitive and visual intelligence. Nair, Prakash and Lackney (2009) compared the various intellectual dimensions identified by Gardner with the types of spaces that can be created in education and training. They relate, for example, the presence of bleachers and meeting points with the development of interpersonal intelligence, niches with intrapersonal intelligence, internal squares with kinesthetic-body intelligence. They observe, therefore, that the development of linguistic and logical-mathematical intelligences can avail it-

self of multiple communicative configurations made possible by a flexible articulation of spaces. Among the 28 patterns that should guide the design of the 21st century school, Nair Praksah and Lackney include in particular the presence of individual spaces and containers (Home Base and Individual Storage), corners for eating and relaxing in an informal way (Casual Eating Areas), soft and welcoming seats (Furniture: Soft Seating). This means, for example, to allow a certain degree of free movement and posture (at the table, sitting on the floor, standing, etc…) or to create environments suited for relaxing, working and concentrating at the same time using the body in different ways, such as reading, discussing and searching sitting on a tap-peto or squatting on the stairs.

If we look at the cognitive styles of Honey und Mumford (1992) we see a variety of facets in learning that cannot be filled by classroom space and monochromatic, synthetic furniture (made up of desks, chairs, blackboards and chairs), like that of our current schools.

The greater individualisation of learning is therefore accompanied and enriched by forms of social learning such as exchange and discussion, recognition and criticism, and shared learning experiences. These learning experiences become essential, because they connect with the increasingly important role that they also play in the professional world.

The wide range of teaching methods and the growing importance of informal learning require physical spaces that allow a simple reshaping of the settings between education, individual work, group work and presentation of learning outcomes. This modifies the previous basic organisation of a school building (classroom and corridor) in terms of size, structure and equipment, as well as the allocation and equipment of the other functional areas.

2.3. *Extended time at school*

With the expansion of school time, school buildings are becoming more and more educational and living places, which need to be suitable for a wide range of activities that go beyond formal learning (Nair *et al.*, 2019). Contemporary school buildings needs to allow an easy transitions between places and stages of concentration and re-generation. Therefore, in addition to learning and work-

essays section 2 – Culture, innovation and training

ing areas, they require a differentiated range of recreational areas, both inside and outside the school, with gardens and courtyards.

Many schools are experimenting with new timeplan programmes that go beyond the traditional lesson time organization (Eichelberger, 2002). This needs a multi-professional teamwork that allows a greater variation in methods and more interdisciplinary forms of project-based work within longer learning units. In general, schools are asking for exended periods of time in the building to take better account of the individual work rhythms of pupils and teachers. Flexibility in the organisation of the learning time also offers schools with limited space the possibility of avoiding overloading at peak times (beginning of lessons, lunch, end of lessons).

In this way, schools, especially in northern European countries, are being reconfigured as new constituent elements of the local educational landscape (Kumpulainen and Krokfors, 2010), thanks to an important civic function of socio-cultural aggregation.

2.4. *Inclusion*

Inclusion aims to offer all students the best possible development. Each student is special and needs space and support for his next steps. This slogan goes far beyond the theme of structural accessibility. It meets the requirements of a pedagogy that takes into account the individual diversity of children and young people.

The main challenge of the educational system in these years is to ensure accessibility and equal opportunities for disabled pupils. The UN Convention on the Rights of Children obliges federal, state and local governments to create the necessary resources to achieve this goal. If implementation is pursued consistently, it will be necessary to work out quality protocols for inclusive spaces, which will no longer include support classrooms, but decompression spaces, group spaces, relax and play areas and so on for all the scool community.

The requirements for an inclusive school environment are not fundamentally different from those of a 'good school'. Contemporary schools today are working with a new culture of learning and teaching in and with heterogeneous groups. For this reason they need different or differently distributed resources

compared to the previous school system: spaces for individual differentiation and possibilities of retreat; environments for teaching in small groups; places for counseling and care activities; rooms for socio-pedagogical and psychological staff. Learning environments should be variable, as simple, intuitive and usable as possible, taking into account the different sensory capacities. All informations relevant for orientation should be designed in such a way to be perceived with at least two senses ('multisensory principle'). On the basis of the changed learning settings and their transfer to the corresponding spaces, models must be developed to respond spatially to the particular needs of inclusion without separating them (Galletti, 2017).

3. Perspectives: Movement and play as an indicator of quality for school spaces

There are two elements on which we are working to develop new educational scenarios in schools: the quality of movement through the spaces and the introduction of regular playing time for children.

On the educational quality of movement, interdisciplinary studies (Sibilio, D'Elia, 2015; Sgrò, 2016; Weyland *et al.*, 2019) agree to focus not only on the traditional hours of physical activity, but more generally, they deal with all motor activities related to the use of the body in school spaces. Studies show that motor intervention programs have positive effects on concentration capacity (Shephard, 1997), brain memory and blood flow (Kehne, 2011), and on the learning climate at school (Laging, 2017). In general, moving improves the perception of wellbeing (Carraro and Gobbi, 2016). This data are confirmed also from Ceciliani's studies on movement, who consider it as a key to animate the educational experience (Ceciliani, 2015; 2016). Movement for Ceciliani recalls the maturation of life skills that are also supported by Law 107 of Good School, such as the solicitation of students' motivation, pleasure of acting, well-being and a serene perception of oneself and personal levels of competence.

The most interesting aspect of Ceciliani's contribution concerns the conginuution of the themes of movement with those of free play as an activity that strengthens the individual in the sensomotor intelligence, that is in the mastery of his body and in the continuous relationship with the surrounding environ-

essays section 2 – Culture, innovation and training

ment, and as an extraordinary occurrence to activate all areas of his personality: motor, emotional, cognitive, emotional and social.

Starting from the assumption that playing leads to feelings of pleasure, fun and satisfaction and therefore can lead to an experience of well-being, Ceciliani invites to reflect on the possibility of developing a 'playful' teaching style, endowed with intention and flexibility such as to be able to divide the activities into free proposals, semi-structured proposals and structured proposals (again a scansion of the teaching that supports the alternation of routes led by the teacher and routes led by the students) in which the concept of 'repeat without repeat' means 'find the right way'.

Several scholars (Seydel, 2016; Grey, 2015) deepen the educational quality of playing, indicating that the key element that stimulates learning are pleasure and motivation. To play in this sense seems to be the macrocategory with which teaching can be rethinked. The relationship between teacher, student and contents can be relaunched in a playful way and promote the active involvement of all subjects. Playing in the background means learning to understand a system of rules, to know the opponents, to discover one's own limits, to develop skills.

So how to bring 'pleasure' to school? How to create stimulating and confortable, informal and playful environments, that in any case respect the institutional frames of the public school?

To play seems to be a natural right of children, not only in kindergarten. A right recognized and defended in words by all, but which in practice is not always respected. The activity of playing and especially the free play, as highlighted in Article 31 of the Convention on the Rights of the Child of the UN 2013, has not yet found its size and its concrete space: it mainly concerns moments of pause and is not understood as learning activity.

Peter Grey (2015), clearly highlights how the playing activites develop the basic human skills: the physical game to master the body; the exploratory game to master the understanding of the world; the verbal game to master the word; the constructive game to master the world; the fantasy game to master the thought and imagination; the social game to master the relationship with others.

Grey describes the need for a school that develops what he calls «human pedagogical instincts»: curiosity as an impulse to explore and understand; playfulness as an impulse to practice and create; human sociability and the natural impulse to share information and ideas.

Starting from these assumptions, both in the scientific field and in the area of teacher and professional training, as well as in the popular field (Aminian *et al.*, 2015; Imms *et al.*, 2016; Weyland and Galletti, 2018), wellbeing at school is increasingly focused and accompanied by the recognition of the paradigm of school as a living space.

In general, the design of a school building should always respect certain key elements, which refer to the rights of children as set out in the various institutional documents (UN Convention on the Rights of the Child, 2013; OECD, 2017; Guidelines on school building, 2013; Autonomy Law no. 89/97) and which refer to the right to learn, to be included, to move and to play:

• *the right to concentration* – with places organized for individual and group learning, with niches, places for group works, spaces to work undisturbed and not always observed;

• *the right to difference* – with spaces that are not too identical to each other and which can stimulate different people in different ways. Spaces capable of enhancing the value of the school disciplines, which are in themselves very different from each other;

• *the right to play and to free encounter* – with unstructured spaces for sociality, free play and self-determined activities;

• *the right to emotions and to sensoriality* – with places that enhance the body and the different potentialities of hearing, touching, smelling, watching and tasting, encountering the different sensibilities of students and teachers;

• *the right to movement* – with spaces that enhance the paths of children and teachers and the possibility to learn in places that allow different postures of the body at different times of the activities listed above.

In order for these rights in the design of buildings both educationalists and architects, teachers, principals and municipalities has to be aware and conscious of the power of space language. The efforts on which to develop interdisciplinary training lines and sharing platforms are as follows:

• skills in the ability to read building plans, to develop sensitivity to architecture, to master the language of design, to develop pedagogical criteria for evaluating interventions;

• ability to analyze the pedagogical qualities of school spaces and to recognize the presence of appropriate spaces for movement and play;

essays section 2 – Culture, innovation and training

• ability to elaborate proposals to inhabit with learning spaces with good ideas, good arguments and good projects involving the whole school community (school, clients and parents);

• ability to assess the sensory and bodily dimension of school: how to involve the 5 senses in learning and spaces;

• strengthening of a holistic vision of movement at school in dynamic educational spaces;

• enhancement of easy relationships with natural spaces outside the school and verification of the potential of outdoor education.

There are three fundamental variables of teaching and learning to which run documents of law that actually stimulate to change:

• *the school organization* (timetable, teachers, external collaborations) with Law 97 on Autonomy in School and Law 107 'La Buona Scuola'; these laws make it easier for school leaders to organise their activities independently and enable them to develop highly innovative and flexible rules for school life;

• *the task of conveying content*, which refers to the National Directions for the Curriculum. According to this legal document, the possibility of interpreting the quality and quantity of the contents is entrusted to the teachers and does not force them to an excessive extent;

• *the infrastructure* (spaces and furniture) which has as its point of reference the Law of 1975 on school building and the National Directions for School Building of 2013. These legal documents also provide a variable possibility of interpretation and, above all, the second offers guidelines for designers on the educational qualities of spaces.

To develop new models it is necessary to work on all three variables. One falls on the other. One activates the other.

Although it is not possible to identify a general model for the school of the future, we can say that good pedagogical ideas can never generate design errors and can always be reinterpreted and loaded with new meanings for the future generations.

It is important to verify whether a project has considered the possibilities of carrying out both structured and self-organized activities in the school building and in the open air. The study of the flows through the school, the design of walking and resting, the possibility of organize activities between the classrooms and laboratories, the quality of good designed common spaces

and gardens, can be considered as the key factors to assess the quality of architectural projects for education and to describe the effectiveness of a particular pedagogical approach.

At the end, if moving and playing are powerful tools to develop skills and competences for the future generations, if the qualities they bring with, like wellbeing and joy, are keys to measure people health, it is possible to start evaluating learning spaces in which these essential actions and rights can be explained and then continue with all the rest.

References

Aminian, S., Hinckson, E.A. and Stewart, T. (2015), «Modifying the Classroom Environment to Increase Standing and Reduce Sitting», *Building Research and Information*, 43 (5), 631-45.

Antonacci, F. and Guerra, M. (2018), *Una scuola possibile*, Milano, Franco Angeli.

Attia, S., Weyland, B., Bellenzier, P. and Prey, K. (2018), *Progettare scuole insieme*, Milano, Guerini.

Bachelard, G. (2006), *La poetica dello spazio*, Bari, Dedalo.

Barrett, P., Dvies, F., Zhang, Y. and Barrett, L. (2015), «The Impact of Classroom Design on Pupils' Learning: Final Results of a Holistic, Multi-Level Analysis», *Building and Environment*, 89, 118-33.

Blackmore, J., Bateman, D., Loughlin, J., O'Mara, J. and Aranda, G. (2011), *Research into the Connection between Built Learning Spaces and Student Outcomes*, Victoria, Department of Education and Early Childhood Development.

Bosch, R. (2018), *Designing for a Better World Starts at School*, Abingdon, Routledge.

Carraro, A. and Gobbi, E. (2016), *Muoversi per star bene*, Roma, Carocci.

Ceciliani, A. (2016), *Gioco e movimento al nido*, Roma, Carocci.

Cleveland, B. (2016), «Addressing the Spatial to Catalyse Socio-Pedagogical Reform in Middle Years Education», in K. Fisher (ed.), *The Translational Design of Schools: An Evidence-Based Approach to Aligning Pedagogy and Learning Environments*, Rotterdam, Sense Publishers, 27-50.

Conrado, H.M. (2014), *Constitutional Courts and Deliberative Democracy*, Oxford, Oxford University Press.

Council of Europe (2016), *Competences for Democratic Culture. Living Together as Equals in Culturally Diverse Democratic Societies*, Strasbourg, Council of Europe.

essays section 2 – Culture, innovation and training

Eichelberger, H. (2002), *Einführung in die Daltonpädagogik*, Innsbruck, Studienverlag.

Fenwick, T. and Landri, P. (eds.) (2014), *Materialities, Textures and Pedagogies*, London, Routledge.

Ferrante, A. and Orsenigo, J. (eds.), *Dialoghi sul postumano. Pedagogia, filosofia, scienza*, Milano, Mimesis.

Fondazione Agnelli (2020), *Rapporto sull'edilizia scolastica*, Roma-Bari, Laterza.

Galletti, A. (2017), «A Proposal for a Flexible Tool for Inclusive Design of Primary School to Reduce the Causes of Exclusion of Children Affected by DMD», in M. Medici, V. Modugno and A. Pracucci (eds.), *How to Face the Scientific Communication Today. International Challenge and Digital Technology Impact on Research Outputs Dissemination*, Firenze, Firenze University Press, 157-66.

Gardner, H. (1995), *Educazione e sviluppo della mente. Intelligenze multiple e apprendimento*, Trento, Erickson.

Grey, P. (2015), *Lasciateli giocare*, Torino, Einaudi.

Guasti, L. (2017), *Didattica per competenze. Orientamenti e indicazioni pratiche*, Trento, Erickson.

Hughes, H., Franz, J. and Willis, J. (eds.) (2019), *School Spaces for Student Wellbeing and Learning: Insights from Research and Practice*, Heidelberg-New York, Springer.

Iavarone, M.L. (2008), *Educare al benessere*, Milano, Bruno Mondadori.

Imms, W., Cleveland, B. and Fisher, K. (2016), «Pursuing that Elusive Evidence about What Works in Learning Environment Design», in W. Imms, B. Cleveland and K. Fisher (eds.), *Evaluating Learning Environments: Snapshots of Emerging Issues, Methods and Knowledge*, Rotterdam, Sense Publishers, 3-18.

Kehne, M. (2011), *Zur Wirkung von Alltagsaktivität auf kognitive Leistungen von Kinder*, Aachen, Meyer & Meyer.

Laging, R. (2017), *Bewegung in Schule und Unterricht*, Stuttgard, Kohlhammer.

Landri, P. and Viteritti, A. (2016), «Introduzione. Le masse mancanti in educazione», *Scuola Democratica*, 7 (1), 7-22.

Lorenzoni, F. (2019), *I bambini ci guardano*, Palermo, Sellerio.

Lorenzoni, F. (2014), *I bambini pensano grande*, Palermo, Sellerio.

Mallgrave, H.F. (2015), *L'empatia degli spazi. Architettura e neuroscienze*, Milano, Cortina.

Marcarini, M. (2016), *Pedarchitettura. Linee storiche ed esempi attuali in Italia e in Europa*, Roma, Studium.

Margiotta, U. (2013), *Didattica laboratoriale*, Trento, Erickson.

Matteoli, L. (2002), *Il disagio*, in N. Sinopoli and V. Tatano (eds.), *Sulle tracce dell'innovazione. Tra tecniche e architettura*, Milano, Franco Angeli.

Ministero dell'Istruzione, dell'Università e della Ricerca (2012), «Indicazioni nazionali per il curricolo della scuola dell'infanzia e del primo ciclo d'istruzione», *Annali della Pubblica Istruzione*, 88, special issue.

Nair, P., Fielding, R. and Lakney, J. (2009), *The Language of School Design*, http://www.designshare.com/images/TheLanguageofSchoolDesigneBooksummaryweb.pdf.

OECD (2017), *How's Life? 2017: Measuring Well-Being*, Paris, OECD Publishing.

Parricchi, M. (2015), *Educazione al consumo. Per una pedagogia del benessere*, Milano, Franco Angeli.

Sgrò, F. (2016), *Metodi e strumenti per la valutazione del movimento umano*, Milano, Franco Angeli.

Shephard, R.J. (1997), *Aging, Phisical Activity and Health*, Champaign, IL, Human Kinetics.

Sibilio, M. and D'Elia, F. (2015), *Didattica in movimento*, Brescia, La Scuola.

Thorburn, M. (ed.) (2018), *Wellbeing, Education and Contemporary Schooling*, New York, Routledge.

Tosi, L. (2019), *Fare didattica in spazi flessibili. Progettare, allestire e utilizzare ambienti di apprendimento*, Firenze, Giunti Scuola.

UNESCO (2015), *Quality Physical Education*, Paris, UNESCO.

Weyland, B. (2017), *Didattica sensoriale. Oggetti e materiali tra didattica e design*, Milano, Guerini.

Weyland, B. and Attia, S. (2015), *Progettare scuole insieme*, Milano, Guerini.

Weyland, B. and Galletti, A. (2018), *Lo spazio che educa*, Bologna, Junior.

Weyland, B., Stadler-Altmann, U., Galletti, A. and Prey, K. (2019), *Scuole in movimento tra pedagogia, architettura e design*, Milano, Franco Angeli, open access, available at http://www.francoangeli.it/Ricerca/Scheda_Libro.aspx?CodiceLibro=10449.1.

Weyland, B. and Watschinger, J. (eds.) (2017), *Lernen und Raum entwickeln*, München, Klinkhart.

WHO (2011), *Global Recommendations on Physical Activity for Health 5-17 years old*, Genève, WHO.

Woolner, P. (2018), «Collaborative Re-design: Working with School Communities to Understand and Improve their Learning Environments», in R.A. Ellis and P. Goodyear (eds.), *Spaces of Teaching and Learning: Integrating Perspectives on Research and Practice*, Singapore, Springer, 153-72.

Woolner, P. (ed.) (2015), *School Design Toghether*, Abingdon, Routledge.

essays section 2 – Culture, innovation and training