Space and Pedagogy
Three school models in Germany

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Extended Abstract

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INTRODUCTION

Although many pedagogical experiences have been tested since the end of the Industrial Era and democratization of education, in the search for new relationships between pupils, teachers and community, the research focused on the role of the learning environment which would permit these changes is still scanty.

Through this work we intended to investigate the instrumental status of school building as part of the educational process, as well as its contribution to the fulfilment of pedagogical goals.

We determined as case studies three schools in Germany, country in which are settled a diversity of non-conventional pedagogical approaches. The three schools are rooted in movements which changed the education scene in Europe and in the world during the 20th century: a Montessori school, a Waldorf school and a Comprehensive School (Gesamtschule). Although their educational models were developed between 1900 and 1970, the three buildings date from the mid 1990’s, and are relevant as examples of state-of-the-art architecture.

With this study we wish to encourage the thought over the importance of architecture in the learning process.

The general goals of the investigation are to:

1. Understand the relationship between learning method and learning environment;
2. Identify the spatial and functional conditions which contribute in a positive manner to the learning processes.

The specific goals of this investigation are therefore to:

1. Analyse the project strategies used in three specific school programs;
2. Characterise the morpho-typological principles in the three school buildings.
Development

School Building is a field of architecture which is currently in a process of change, breaking with the traditions that marked it for more than 200 years. Nowadays a greater concern is being given to the pedagogical effectiveness of the learning environment and spaces. Indeed, the general picture of school that most might recall, of a double loaded corridor of classrooms, is an already obsolete model which finds root in logistic matters dating of the Industrial Era, rather than any pedagogical concern (Gross and Murphy, 1971).

As read in varied bibliography (Schneider, 2004; Walden et. al., 2009; Encyclopaedia Britannica Inc., 2005: 59-60), even though the history of education has common grounds in most of the western European countries, with impact on the evolution of school building, the specific case of German history (especially political history) had direct impact on the development of education and school building in that country, mainly since the last quarter of the 19th century.

Until the 17th century, the school was an institution belonging to the church in Germany and most of Western Europe. The learning environments had barely changed since the medieval times, consisting most commonly of a big room in local parishes where all pupils would be taught by a single teacher (Raab, cit. in. Walden et. al. 2009).

The first evolution steps on school architecture were taken during the Industrial Era, along with the rural flight, the restrictions on child labour and the consequent massive growth of student population. These schools, recognisable in cities by their “endless rows of windows and several floors” (Walden et. al., 2009: 49), had as first intention to provide a minimum education to a maximum of children which would happen in a standardized way rather than focusing on the learning processes (Gross and Murphy, 1971).

From the early 20th century on, some pioneer pedagogical streams tried to alter and individualise the learning processes. Although kept as fringe movements, these brought slowly a greater concern over the child and his development in the mainstream schooling system. In the present study are focused three specific educational movements which remain in the current days: the ones founded by Maria Montessori, by Rudolf Steiner and the German comprehensive schools – Gesamtschulen.

The Montessori movement is a reformation stream which dates of the beginnings of the 20th century and was founded by the Italian doctor and pedagogue Maria Montessori. The groundwork of Montessori’s work is “to let the child behave freely according to his/her natural inclinations, with no surge of settled obligations or programme [...]” (Montessori and Luzuriaga, 1932). The child must be considered in the first place as the «sole operator» of his/her own development. The natural child nature must be respected and the adult must restrain his moulding influence upon children, explains Silva (1991). The methodology used in those schools is to incite free choice and the sense of initiative on the child (Kowaltwski, 2011).

The Montessori learning environment is usually adapted to the children size and needs, from the size and weight of the furniture to the height of the doorknob, the light switch or the faucet in the bathrooms.
Spacious rooms are needed to allow the free movement of the child and his/her work on the floor as well as at the tables. Commonly, when possible, the classrooms might be extended to exterior free areas or garden, stimulating the children’s interaction with their environment (Silva, 1991).

The Waldorf Schools were founded by the anthroposophist Rudolf Steiner in the 1920’s in Germany, and aimed to create a school where the political and economical bodies, as well as traditional competitive systems wouldn’t exert influence on education, forming students with autonomous and free spirit life. In these schools, where no grading marks are assigned, the personal and social skills are developed in the curricula by stressing arts and acting, as well as a special sort of dance called eurhythm, also developed by Steiner (Raab and Klingborg, 1983).

The Waldorf buildings follow Steiner’s claim whereby “school must be a utilitarian building which demands an artistic form” (Raab and Klingborg, 1983: 28). The built environments are designed in a most peculiar fashion, inherent to Steiner’s pedagogy, in which right angles and symmetries are avoided both horizontally and vertically and colour and light are manipulated in a specific manner, in accordance with Steiner’s colour plans for ages and activities.

The Gesamtschule, a.k.a. Comprehensive School, arose during the deutschen Bildungsreform – German reformation on education – which occurred in the 1960’s and 1970’s. The untimely children selection (around 10 years old) was found to tend to a restriction on student’s academic and professional horizons in an irreversible manner and that brought up a growing social dissatisfaction (Ader, 1975). The unconformities with the mainstream tripartite system lead to the creation of a more democratic school system, in which all children would be taught together in the same school, being given the individual choice of the syllabus and learning methods (Ader, 1975). The Gesamtschule would provide “equal opportunities to all children” (Schneider, 2004: 153), reflecting a more flexible social hierarchical model (Ford, 1969).

Due to the wide offer proposed by the Gesamtschule, this system works usually in big school complexes which allow a greater range of pedagogical approaches. The Gesamtschulen don’t have any specific space requirement, apart the one of flexibility, needed to adapt the variety of learning activities programmed for the school.

Although World War II and the inner German border had dramatic impact on the country’s state of education, in some periods limiting innovation on educational processes and school building1, Germany has evolved in this field in such a way that turns this country as a contemporary paradigm on education.

Besides these parallel pedagogical systems, also in the mainstream schooling programmes and buildings, the rapid development of information and communication technologies and their implementation on the school curricula demand today a greater flexibility from the school space, which must be able to adapt to the future

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1 During the Nazi era, all reformation movements which fostered independent thought were banned and during 20 years, East Germany’s state of education froze on a steady political controlled system which would decline individuality.
Spatial and pedagogical requirements. Also the demographic change of the past decades in Western Europe brought a drastic change to the educational and familiar traditional paradigms. School must be more flexible, diverse and accessible. A humanisation of school is needed to attend the individuality as well as the community feeling of the students. In general, the curricula, now relying on the autonomy of the students, demand new spatial and functional typologies which must welcome the use of state-of-the-art technologies in the learning process (Curtis, 2003).

In order to analyse the role of architecture in the fulfilment of pedagogical goals and the mutational requirements mentioned above, this present study focuses on three school buildings with pedagogical specificities which demand adapted architectural responses. Those are a Montessori school, a Waldorf school and a Gesamtschule, all located in Germany. Next follows a summary of the three projects:

The Montessori school of Ingolstadt (MSI) is located in Bavaria in a suburban residential area and provides schooling to 450 students, distributed over 10 academic years plus a kindergarten. Although the school works in accordance with the mainstream system, with a primary school and Hauptschule, the teaching method follows the one advocated by Maria Montessori, relying on the child’s natural development and curiosity. The learning space should thus propitiate a continuous interaction between the user and his/her environment, in a didactic manner.

The project consisted on the dissemination on the terrain of the conventional single school building into smaller functional units, linking them around a great communal garden. It was decided for the design to maintain a non-hierarchical organisation on the ground floor but to state it through the three upper floors, which represent in plan three primary shapes which give identity to the school: a circle, a quadrate and a triangle.

The Freie Waldorf Schule (FWS) is set in Chorweiler, a suburban area of the city of Cologne, in Nordrhein-Westfalen. The school made part of an urban regeneration programme and marks the frontier between a high-building residential area and a vast green area. The school provides education to 450 students, distributed over 12 academic years. The school works on a state independent basis, following the pedagogical
approach of Rudolf Steiner. Great emphasis was given to the artistic subjects, which implied the allocation of specific spaces such as a theatre with show stage and a eurhythmy room.

The design concept was to organise the building in a manner which would determine the social relationships developed in school (plus+ bauplanung GmbH, n.d.), centring the learning spaces on a social and circulation atrium. The project was also defined in collaboration between the architect and the school community, deciding over the rose as the inspirational natural model for the building design.

The *Evangelische Gesamtschule Gelsenkirchen* (EGG) is located in Gelsenkirchen-Bismarck, a mostly residential district on the former industrial area of the Ruhr, in Nordrhein-Westfalen. It provides schooling to 1150 students distributed over 6 academic years plus an upper secondary level (*Gymnasiale Oberstufe*). The protestant faith oriented school functions as a comprehensive school, aiming both social integration and individualisation of learning.

The design concept was to build a “school-district”, divided in individual functional units placed along a communal building inside which is set a «learning street»; the school also assumes a role as an urban structure with physical and social interaction with its surroundings, sharing some of its facilities with the local community.

To proceed to the analysis of the case studies, we followed a common structure, focused on identifiable features in the generality of school building and which might also comprehend the individual character of the applied pedagogical models.

In a first part we analysed the building as a whole, characterising its built formality and identifying its curricular functions. Secondly, still observing the building as a whole, we characterized the void spaces, identifying the space’s circulation and permanence. The third part consisted of the descriptive analysis of local spaces and/or characters inside each building. We branched the analysis in three realms: the functional realm, in which is made an assessment of the specific features of the programme of the building and their contribution to the learning process; the environmental realm, in which is made an assessment of the sustainability conditions of the building; finally the third realm focuses on the specificities of each project which don’t fit in the branches mentioned above.
CONCLUSIONS

The analysis of the case studies permitted us to observe that the pedagogical approaches that are affiliated to the schools are reflected in the design concept of the three buildings, in their functional organization and space hierarchy.

Broadly, the educational concept used in the MSI focuses on the individuality of the pupil and in the fostering of his/her autonomous education, by the promotion of freedom in movement and space appropriation as well as the interaction of the pupil with the inside and outside environment. MSI’s design consisted therefore on the organic disposition of the building on the terrain, optimising the relationships of the learning spaces with the garden. Yet in the FWS and EGG, the importance on the educational process given to the social and communal compounds has also a key role in the building’s design, which evolves from a large socialising space. In the EGG though, this social character is balanced with the one of the individualisation of education. This pedagogic duality is reflected in the spatial diversity of the building, which is divided into independent individual clusters.

In each particular case, we could distinguish specific spatial orders, which are enforced by the relationship that the pedagogical missions establish with the built space. If we focus on the formal classroom space, we can see that:
In the MSI, the educational method is the one to dictate the spatial frame of the classroom. Indeed, the space had to respond to the need for free movement with large spaces and possibility of interaction with the outside environment. The façade was therefore designed as a flexible structure with variable uses.
In the FWS, the built environment is itself a prerequisite for the fulfilment of pedagogical goals. Steiner defined specific formal codes for the design of school spaces, with incidence on the space’s scenic character, in matters such as the classrooms’ plan form, their colour and the role of the window. If compared to the conventional school spaces, this model reveals certain diversity, but is in itself limited, since it concedes prominence to visual rather than functional diversity: although the classrooms present asymmetrical form, they maintain their traditional function as mutually independent spaces.
In the EGG, space and learning method are interdependent. The demands of differentiated learning advocated by the Gesamtschulen have a direct implication on the differentiated school environment. Thus, the typological spaces are varied, providing informal learning spaces inside the conventional classrooms as well as polyvalent working studios. The importance attributed to the processes of formal and informal learning is reflected in the treatment of socialization areas, which articulate community spaces with individual recesses.

Among the three buildings we also enhanced adopted solutions with pedagogical and spatial interest which might contribute to the generality of school building. These are featured for example in the cluster design used for the MSI and EGG, the design of the common spaces and interior and exterior sights in the three projects, the design of the specialised areas and laboratories of the EGG, the stressing of arts and representation
patented in the FWS design, the allocation of teacher’s department which fosters their relationship with pupils in both the EGG and MSI, the community involvement in which are grounded the FWS and EGG projects and finally the environmental and sustainable character applied on the three designs.

The design of school space can inhibit or promote the richness of learning processes. Towards a more diverse school architecture, we find relevance in the study of pedagogic and architectural examples with successful impact on cognitive, personal and/or social education, comparing their past or present relevance with future pedagogical goals, in an exercise of understanding the spatial implications which can better serve educational processes.

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