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RESEARCH ARTICLE

CREATING HARMONIOUS SCHOOL LEARNING ENVIRONMENT: WALDORF EDUCATION PERSPECTIVE.

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Abstract

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This paper investigates the challenges in creating learning environments modern schools facing today. The physical environment is undoubtedly playing an important role at education of 21st century being a part of much wider educational ecosystem and social culture. The task of modern learning environments is to ensure that every learner is provided with every opportunity to be an active participant in learning, to achieve highly, and to be celebrated for who he\she is. Waldorf School is taken as an example of the education system striving to humanize and harmonize the space of a school. The Waldorf Education approach by which the forms and spaces of the school are designed and built is based on the anthroposophical ideas of Rudolf Steiner, an Austrian scientist who developed a way of thinking that he applied to different aspects of a human being life. He suggested a number of principles of organic architecture, a philosophy of architecture that promotes harmony between human habitation and the natural world. The paper considers the key points of Waldorf Schools' architecture and design in connection to creating child-centred school learning environment for fostering the psychological well-being and collaborative culture of students. The Bochum Model or 'Moveable Classroom', a concept for the 1st and 2nd grades practiced at some Waldorf Schools is presented as a new concept that meets children's developmental needs in a new way.

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Introduction:

Most of the modern education systems try to change the old 'conveyor belt'-style school where "children entered the production line in batches by age, and moved from grade to grade through a pre-planned sequence of standard steps, as if on a conveyor belt" (Hood, 2015). This 'conveyor belt' carried with it certain design requirements: the need to support the paradigm of one: "one teacher, teaching one subject to one class of one age using one curriculum at one pace, in one classroom for one hour" (Hood, 2015). While this model of education has served some people well for a very long time, the changing nature of knowledge, technology, society, and the world means that schools are responding now to fundamentally different challenges to the ones they faced even 20 years ago (Osborne, 2006).

The pupils spend most of their time in one space, in their classroom. Therefore, educators began exploring the role of physical environment in addressing some of these educational challenges. Barret P., Zhang, Davies & Barret L.

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(2015) found that the physical characteristics of school environments "do impact on pupils' learning progress in reading, writing and mathematics". These researchers suggest that the impact of the environment is quite large, explaining 16% of the variation in the overall progress over a year (Barret P., Zhang, Davies & Barret L., 2015).

A 'learning environment' is understood to be the complete physical, social and pedagogical context in which learning is intended to occur. Modern learning environments are defined as a "flexible quality learning space, including adequate acoustics, lighting, heating and ventilation" as well as a "tool [that] encourages schools to think creatively about the way they teach, and introduces 'breakout spaces' – spaces where students can work independently, or cross classroom, in an informal environment" (New Zealand Ministry of Education, 2014).

Modern learning environments should
1. move away from teacher-directed whole-group instruction to create learner-centred workplaces for a collaborative culture of students at work (Pearlman, 2010);
2. activate the learning process and induce physical activity, which has a positive effect on memory by providing extra oxygen to the brain. It was recently established that supplemental oxygen administration significantly enhances memory formation in healthy young adults (Scholey, Moss, Neave & Wesnes, 1999);
3. use the organic design of the room and connect a child with the environment (natural light, air quality, optimal levels of colour, sound and temperature) creating a sense of security (Barrett P., Zhang, Davies & Barrett, L., 2015).

That is, the physical environment of a child is a part of a broad educational ecosystem and social culture. It provides an opportunity to be an active participant in the educational process. D. Kowaltowski (1980), a researcher of school architecture, proposes to humanize the space of a school, taking into account the following factors: unity with nature, aestheticism and color, "homeliness". Parents often search for home-like place for their children within the school environment.

Rudolf Steiner as a philosopher, educator and architect
Rudolf Steiner (1861-1925) an Austrian scientist developed a way of thinking that he applied to different aspects of a human being life. He formulated a path of inner development he called Anthroposophy. He gave practical indications for nearly every field of human endeavour: art, architecture, drama, science, education, agriculture, medicine, economics, religion and social organization. In September 1919 together with Emil and Berta Molt, he founded the school for the children of workers at the Waldorf-Astoria Cigarette Company. School attracted the families who were looking for more humane values and new educational methods.

According to Steiner, Waldorf Education was intended not only to be a holistic, child-oriented pedagogical system, but also a force for larger cultural changes. (Steiner, 1992). Rudolf Steiner felt that art was an urgent social need of the present, and worried that art had lost its connection with life and the environment. He stressed the following: "We see how inartistic our everyday surroundings have become. Art has made an illusory progress. All the buildings around us with which we come in contact in our daily routine are as devoid of artistic beauty as possible. Practical life cannot be raised to artistic form because art has been separated from life." (Steiner, 1972, p. 80). Other time in his address to the teachers, he said, "All the atrocities which surround us in any city of Europe we may happen to be in, would vanish if only we would cultivate for a few generations the sense of beauty which lives unspoiled in every child." (Steiner, 1931, p. 80).

One of Rudolf Steiner's often over looked ideals for Waldorf Education in this connection was the development of a certain harmony between the approach to teaching applied visual arts – handwork and crafts – and the approach by which the forms and spaces of the surrounding classrooms were designed and built. He suggested, "Imagine every schoolroom, not decorated in the way often thought artistic today, but shaped by an artist in such a way that each single form is in harmony with what his eye should fall upon when the child is learning his tables. […] art needs to take a quite different course during children's growing years from what is now accorded it." (Steiner, 1975, p. 38).

Steiner was never trained as an architect nevertheless he developed projects of 17 buildings and gave over 70 lectures on architecture in such a way becoming a representative of organic architecture, a philosophy of architecture which promotes harmony between human habitation and the natural world. Contents of the 'new' architecture he binds with a 'new impetus' realized in trinity nature of the form. Steiner argued that "a building is the body through which God can communicate with mankind". He suggested perceiving the building

1.   with its physical shape (foundation, frame, walls, roof);
2.   with the presence of a human soul in it. The building should be rich in colour, with its dynamic aesthetic flutter because "colour is the soul of the universe, which contains the movement";
3.   with the spirit living in (Sokolina, 2014, pp. 605-606).

Steiner emphasised that the best architecture and design does not arise only from considerations of structural and physical functions, but rather should be "living forms" that also speak to the emotional, psychological, mental, moral, and spiritual natures of human users. According to R. Steiner, the building should form "an environment that will express the human being's inner being in forms." (Steiner, 1999, p. 72).

Waldorf Schools' architecture and design
What do these principles mean in actual practice? How do they reflect in the design of the Waldorf School building?

Firstly, the building fits into the landscape of the territory: schools on the plains are flattened; schools in mountain area might be in-built into the hilly structure. For example, the Waldorf School in Wetzikon (Switzerland) has a 'staircase' construction where every floor seems to be on the ground level.

The school's roof, according to Steiner's recommendations, should have a maternal gesture of protection. Often one can find the shape of the wings covering the building, an oblique or rounded shape. Such a gesture also occurs in other premises of the school (for example, in the frame of the auditorium or scene, in the form of railing, balconies, etc.). The central entrance to the school should be clearly defined; rounded outlines and smoothly modelled entrance steps should invite a visitor to a school and offer easy upward movement. Similarly, all visible elements of the building design (windows, doorways, corridors, etc.) must be formed with awareness of their role. For example, corridors or hallways of Waldorf Schools often have arc shapes indicating the prospect of movement (Adams, 2005).

The classrooms should be arranged within the building in accordance with an awareness of the qualities of different spatial directions. Rooms for the more earth-related lessons (such as the sciences, gardening, physical education, woodwork, and metalwork) might be located on the ground floor. The spaces for more aesthetic or refined subjects, such as music, eurythmy, painting, and sculpture, better to locate on the upper floor (Adams, 2005).

Among other aspects of a school building design there are the following:
1.   use of natural materials. Contacting them removes fatigue, restores the cognitive function of the body and has the therapeutic effect in general. According to researches connection between man and nature one of the basic human needs (Kowaltowski, 1980);
2.   natural light is a very crucial factor in a Waldorf School, it is preferred over electric lighting in any situation. The design must be supported by daylight to the greatest extent possible. The dynamic qualities of natural light are much more pleasing than the stark and consistent light emitted by electric light fixtures (Jolley, 2010);
3.   window sills should be designed for children of all ages to be able to observe the natural environment;
4.   rooms should reflect the welcoming rounded gestures as well as the windows, doors, ceiling, and furnishings can have a rounded or curved form. That which is softer, more rounded, and more unified in the preschool and early elementary years gradually become firmer, more articulated, and more angular as students advance through their schooling (Adams, 2005).

Classroom murals, wall pictures, and colours should also change through the grades, as described by Steiner. For example, the walls of the first-grade classroom should be painted in warmer, reddish colours and feature images from fairy tales. By contrast, the walls of the sixth-grade room would be painted in cooler, bluish colours and feature images a human being in nature. Adams (2005) suggests that "being surrounded during each school day by pedagogically appropriate wall paintings can exert a powerful counter-force to the less helpful influence of the television, films, and advertising images that flood the experience of most students today".

While painting walls Steiner insisted on using of transparent layer-painting technique providing a certain 'dematerialization' and giving a person freedom in the perception and interpretation of space. In this way, one can get many shades to enhance the colour or to have transition of the colours. This technique also allows creating impressionistic images where the shapes are not completely formed, mobile, 'foggy' that gives the image a certain ambiguity, while the active colour scale causes a strong emotional impression. Essentially ornamental compositions,

symbolic images (letters, numbers, etc.) and obsessive, vivid, unambiguous images are not appropriate in the interior of the school as constraining the development of fantasy, capturing visual clichés. A similar technique is used while creating the board drawings that are an essential part of Waldorf approach and the means of developing a child's fantasy.

School learning environment fostering collaborative culture
The curriculum in a Waldorf School is designed so that the students are engaged on more than one level. Rudolf Steiner considered there to be three fundamental forces within the children that need to be engaged in the education (Jolley, 2010). These forces include mental, emotional, and physical activity; otherwise known as head, heart, and hand (Petrash, 2002). To support the three forces within every child, the classroom needs to have an open plan that allows the space to be modified and divided into different activity zones. In this sense, the separate activities are unified within the whole of the classroom. This same idea applies in Waldorf Education to the entire school, each space serves a particular purpose on its own, but must be integrated and related to the building as a whole (Jolley, 2010).

By maintaining the same students and teacher in each class, the group becomes their own community. The children begin to know each other very well, to the point where they know each other's strengths and weaknesses. When certain situations arise, those who are more proficient may help those who are less proficient. The bonds the students form allow them to grow and mature together and provides them with a sense of having a home they can rely upon. In a similar way, the teacher becomes an important authority figure whom the children are constantly looking to (Carlgren, 2008). Each classroom must have some unique qualities that separate it from the rest of the classrooms, just as one community is not exactly the same as another. This allows each students' group to have a space they can claim as their own and reflects the character of the group. One of the ways to achieve the individual character is using colour. Rudolf Steiner had strong convictions about the meaning of different colours and their application in spaces. He saw red as being a more active colour and blue being a more passive colour relating to mental concentration so that the first grade is painted pale rosy, second grade is orange, until eight grade where the colour is blue purple. An additional way to create individuality is for each classroom to have a slightly different shape, so that each room is not a direct copy of the previous one (Jolley, 2010).

Flexible learning environment for flexible thinking
The Copenhagen Consensus Conference 2016: children, youth, and physical activity in schools and during leisure time announced that physical activity in children and youth foster:
1. fitness and health;
2. cognitive functioning;
3. engagement, motivation, psychological well-being;
4. social inclusion and physical activity implementation strategies.

Researchers from a variety of academic disciplines stated that
1. Physical activity is important in the treatment of many chronic diseases in children and youth and predict the future cardiometabolic disease, such as coronary artery disease and diabetes mellitus.
2. Physical activity and cardiorespiratory fitness are beneficial to brain structure, brain function and cognition in children and youth and promotes scholastic performance.
3. Engagement in physical activity has the potential to positively influence psychological and social outcomes for children and youth, such as self-esteem and relationships with peers, parents and coaches that results in intrinsic motivation and participation behaviour.
4. Culturally and contextually relevant physical activity opportunities help to recognise and account for the diverse lives of children and youth, and to promote social inclusion. (Bangsbo, Krustrup, Duda, Hillman, Andersen, Weiss, … & Elbe, 2016).

They emphasise that "time taken away from academic lessons in favour of physical activity has been shown to not come at the cost of scholastic performance in children and youth" (Bangsbo, Krustrup, Duda, Hillman, Andersen, Weiss, … & Elbe, 2016).

In January 1999, the Bochum Model or 'Moveable Classroom', a new concept for the 1st and 2nd grades of the Waldorf School was introduced. Today there are about fifty schools, some of them in Austria and Switzerland, which have taken over the Bochum Model, completely or in part, or modified it for their situation (Aurer, 2005).

The Moveable Classroom is a concept that meets children in a new way. Instead of traditional desks and chairs, teachers use comfortable cushions and multipurpose benches tall and wide enough to be used as tables or benches and light enough to be arranged and rearranged according to the lesson in a multitude of ways: a circle, a horseshoe, as a long lunch table, or grouped for children working in pairs. Besides one can form an obstacle course or a balance beam, put them in rows like a 'normal classroom'.

Benches and cushions are only part of the concept. The author of this concept W. Auer (2005) admits that children in school today are "missing the sense development, mobility, attachment, social behaviour and rhythm ability that forms the basis for fruitful learning in school" (Aurer, 2005).

According to Auer (2015), some core areas have emerged in the development of the Bochum Model concept.
1. Children need a stable foundation of their body senses (sense of touch, vital sense, sense of motion and sense of balance), otherwise not only reading, writing, arithmetic, but also attention, efficiency and self-confidence are needed life qualities. Therefore, games and other forms of experience of these senses must take up a lot of space to strengthen the children.
2. This is especially true for the second area, the movement. It does not only take time in the timetable, but it should stream through all the lessons, it should be the main element of learning. The Moveable Classroom gives the best external condition for it.
3. Only strong attachment experiences increase a secure social ability. That is why the third element is a strong role of a class teacher as a caregiver. A teacher accompanies the children, does not leave them alone, gives them protection and experience (Aurer, 2005).

Assessments for first grade readiness are wildly discussed education topic. Some schools implement desks and academic lessons as early as kindergarten. Assessors generally have an eye to whether a child seems capable of sitting in a desk and calmly receiving information. However, very few six-year-olds are truly ready to fill this tall order. Even past the age of seven, many children are still 'thinking with their bodies', and their memory for rules and instructions is not something they can easily turn on and off from a static, seated position. This explains why Waldorf School Curriculum is brought through 'real' work (i.e., work you do with your body).

The Moveable Classroom does not intend just stimulating the cerebellum and the vestibular system, Waldorf Schools are particularly celebrated for movement between lessons, outdoor activities, and free play, but not every school has the outdoor space or flexible curriculum for 'out-breaths' between the lessons. The Moveable Classroom gives a unique opportunity to apply movement as a healing treatment to the social dynamic of the classroom.

Conclusion:
Today most of the school building constructions are the blocks filled with square classrooms often presenting "teacher-directed whole-group instruction" (Pearlman, 2010) model. These environments do not support students acquiring 21st century skills. If a school plans to fit into 21st century education tasks, it should increasingly link education and space creating modern healthy learning environment.

Waldorf Education, the largest free schools movement in the world with 1182 Waldorf and Rudolf Steiner schools in 66 countries and 1911 Waldorf Kindergartens in more than 69 countries (Waldorf World List 2019) presents a good example of creating harmonious, child-centred school learning environment fostering the psychological well-being and collaborative culture of students. Waldorf Schools' architecture and design goes under the following principals:
1. interaction of the architectural environment and the educational process;
2. adaptability and flexibility;
3. environmental friendliness;
4. age perception of the space;
5. involving arts when creating the learning environment.

Waldorf Education is probably one of the most controversial education system, at least in the communities of educational scientists. Therefore, it might be interesting to understand this education from the perspective of educational sciences especially in its approach to create a harmonious learning environment.

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