

ORGANIZATION - PEDAGOGICAL USE OF THE SPACES IN THE SUSTAINABLE KINDERGARTEN: VIEWS OF PRESCHOOL EDUCATION GRADUATE STUDENTS

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Abstract

The current research studies the pedagogical actions in the various areas of the sustainable kindergarten. Its aim is to investigate the views of the graduate students- prospective preschool teachers on the pedagogical dimension of the areas of the sustainable kindergarten. The survey was conducted from April to June 2018. Case study was chosen as the main method, employing a questionnaire as the main methodological tool. The selection of the sample was based on random sampling. The sample of the survey consisted of 120 graduate students of the Department of Sciences of Preschool Education and Educational Design of the University of the Aegean in Rhodes (Greece).

The results of the research show that the majority of students believe that the coloration of a classroom, natural lighting, heating, natural ventilation and good acoustics affect the pedagogical process. They also regard that in the preschool teachers' office, paper should be used sparingly, they agree with the use of recyclable paper only and equipment with modern electronic devices. Moreover, they also agree on the electrical heaters, as well as the water heater, though, they are energy-consuming. Regarding the auxiliary premises within the building, they consider that they should have paper recycle bins and compost bins, which indicates that they do not know exactly what their use and operation is. They also think they should be cleaned and disinfected daily with chlorine, which has negative effects. With regard to the multi-purpose room, they state that they are necessary in the context of a sustainable school. As far as the library is concerned, they think it should be located in a familiar and accessible place for children. Finally, regarding the courtyard, they believe that it should also be used for the implementation of pedagogical and environmental activities, after taking care to protect kindergarten children.

Keywords: Preschool education, sustainable kindergarten, pedagogical activities, school premises

1. INTRODUCTION

The quality of school infrastructure has been linked to positive learning outcomes (Tascı, 2015). The design of the interior spaces of the kindergarten (size of the classroom, shaping, decoration, furniture, lighting, coloration and acoustics) and outdoor spaces (courtyard, garden and playgrounds) can contribute to improving the pedagogical process and the development of preschool children (Evans, 2006). In particular, the choice of furniture and equipment plays a very important role in the design and implementation of various pedagogical activities within the classroom. Nowadays, there are many types of furniture and equipment capabilities, allowing for a variety of options that are flexible, durable and offer not only relaxation but also multiple learning opportunities (Nelson, 2018).

Simplicity, elegance and care for proper coloration and lighting can shape appropriate pedagogical conditions in a safe and enjoyable learning environment (Butin & Woolums, 2009). Studies have shown that students learn better with natural light, thus it is important to utilize natural lighting. Simultaneously, the colors of the walls should be bright and cheerful instead of the standard white/beige walls. However, too intense colors should be avoided to prevent children's overstimulation. In addition, vivid colors can also be used in the general design through the choice of flooring materials, wardrobe and furniture (Nelson, 2018). Of course, construction materials and colors must be ecological (Yudelson, 2008).

Moreover, the right temperature inside the room is a positive factor that facilitates the pedagogical process. Thermal comfort should be achieved through appropriate design for utilizing climatic conditions (Brković & Milošević, 2012). In all cases, natural ventilation should be used and the use of energy-intensive devices should be avoided. In addition, research findings highlight the importance of good classroom acoustics and the harmful effects of noise on the learning environment (Tanner & Langford, 2003).

The staff office must be accessible and child friendly. Its operation must be in line with the principles of Sustainability and Sustainable Development. Heating and cooling, as well as all other spaces, should preferably be made using Renewable Energy Sources and non-energy-intensive devices. More generally, the use of energy sources should be cautious, just like water consumption. Finally, careful use of paper and the preference of recyclable paper and other recyclable materials is required (Yudelson, 2008; Tascı, 2015).

The goal of sustainable school is develop a love of reading books and respecting them. Within this context, the Sustainable Kindergarten library collection is rich and accessible to children, it operates as a lending library, and has many quality literary books (Roskos & Neuman, 2002), which are selected on the basis of their aesthetic, literary and pedagogical value. On the shelves of the library, there are also books of recyclable paper and environmental issues. More generally, it is well organized, contributing to the upgrading of the quality of education provided (Strong, 2014).

Several venues are being used for the artistic events of the Sustainable School. In particular, the school assembly hall, which gives many opportunities for artistic development of preschool children (Özsoy, 2016) and for nurturing environmental sustainability: environmental, economic, social and cultural (Papavasileiou et al., 2017). It is a place for music, theatrical, dance, literary, etc. forms of artistic expression of preschool children, space of creative self-expression and the implementation of cross-curricular activities (Papavasileiou, 2015).

Within the context of a sustainable school, the cleanliness of the whole building, especially auxiliary spaces and sanitary areas, should be systematic. Nevertheless, chlorine and other dangerous chemicals to both children's health and environment should not be used (Rose, & Westinghouse, 2010). More generally, all areas of kindergarten must be configured in such a way as to provide a sense of security for children (Olds, 2001). Safety rules must be followed so that preschool children are not being at risk and feel comfortable in an environment that is familiar, friendly and enjoyable (Read, 2007).

Outdoors spaces provide play and learning opportunities (Maxwell, 2007). Outdoor play provides a great sense of freedom, even when the space is limited. The sky above them provides a great sense of space and an open atmosphere. Thus, play in the schoolyard and in other outdoor spaces has a significant impact on the feelings of preschool children, their personality, behavior and positive attitudes towards learning (Hodgeman, 2011).

The outdoor spaces of the kindergarten, if properly shaped (Moore & Sugiyama, 2007; Berris & Miller, 2011), play an important role in preschool children schooling. They can add an important dimension to the experience and development of children, as it strengthens and supports the ability of preschool children to do the same thing, take care of them, start and complete their activities, take control of their own actions and responsibilities, communicate and interact easily with other children and develop their perceptual and kinetic

skills (Inan, 2009).

Research findings show that the design of outdoor and indoor school spaces can promote the development of children (Curtis & Carter, 2005). The configuration of the kindergarten premises with its proper organization and decoration can contribute to better achievement of pedagogical goals (Segal et al., 2006). Therefore, cooperation between architects, educators, children and parents can contribute to better design of the kindergarten premises (Berris & Miller, 2011).

More generally, within the context of a sustainable school, at technical / economic level, the necessary conditions are the qualitative upgrading of the building infrastructure with environmentally friendly materials, the redevelopment of the school spaces, the reorganization of the external premises of the school, the prudent management of natural resources and in general its sustainable design and implementation (Posch, 1999).

2. METHODOLOGY

For the smooth operation of a sustainable school, the existence of modern infrastructure, which is the first basic level of its operation, is indispensable and interconnect with the other two fundamental levels: the pedagogical and the social/organizational (Ali Khan, 1996; Papavasileiou et al. , 2017). The aim of the present research is to investigate the views of the students, future kindergarten teachers on the possibilities of pedagogical utilization of the premises of the sustainable kindergarten. The survey was conducted from March to May 2018, and the case study was chosen as the main method, with a questionnaire for collecting multiple information being the main methodological tool. In the present survey the questionnaire contained mainly contained closed questions (Bell, 2010; Cohen, Manion & Morrison, 2011; Bryman, 2012).

The research population was the graduate students of the Department of Preschool Education and Educational Design of the University of the Aegean in Rhodes (Greece). Sampling was done by random sampling. Regarding the gender of the students of the research sample, out of the 120 students, 10 were men (8.33%) and they were girls (91.67%). The six axes of the survey were the areas of the sustainable kindergarten which are directly and indirectly linked to the pedagogical process: the classroom, the staffroom, the auxiliary spaces, the multipurpose room, the library and the preschool yard.

After the questionnaires were collected by the graduate students of the research sample, we proceeded to analyze the content and categorize the answers to the open questions of the survey questionnaire. The coding of the subjects' answers to all the questions followed and then the statistical processing and analysis of the research data.

3. RESULTS

The first questions refer to the kindergarten classroom of the sustainable kindergarten. 109 students (90.8%) replied "Yes" to the first question regarding whether the coloration of a classroom affects the pedagogical process, 6 students (5%), "No" and 5 students (4.2%) replied "I do not know". 108 students (90.0%) answered "Yes" to the next question, regarding natural lighting, 10 students (8.3%) "No", that is it did not affect the teaching process in the classroom and 2 (1.7%) replied "I do not know". To the question whether the heating of a classroom influenced the pedagogical process, 104 students (86.7%) replied "Yes", 11 (9.2%) answered "No" and 5 students (4.1%) "I do not know". To the same question, regarding natural ventilation, 106 students (88.3%) replied "Yes", 11 (9.2%) "No" and 3 students (2.5%) "I do not know". To the fifth question, whether the good classroom acoustics influenced the pedagogical process, 99 students (82.5%) answered "Yes", 11 (9.2%) "No", and 10 (8.3%) replied "I do not know".

The following questions are relevant to the staffroom of the sustainable kindergarten. The first one explores the views of students whether it should be equipped with modern electronic devices. 90 students (75%) answered "Yes", 26 (21.7%), "No" and 4 (3.3%) "I do not know". The vast majority of the research sample agrees on the careful use of paper in the staffroom of the sustainable kindergarten, as 116 students (96.7%) answered "Yes", 3 (2.5%) "No" and 1 (0.8%) "I do not know". Regarding the exclusive use of recycled paper 92 (76.7%) answered "Yes", 24 (20%) "No" and 4 (3.3%) "I do not know". In relation to whether the staffroom of the sustainable kindergarten should be equipped with electric heaters, 65 students (54.2%) answered "Yes", 45 (37.5%) "No" and 10 (8.3%) "I do not know". Finally, to the question whether there was a separate staffroom at the kindergarten they went for their practicum, 71 (59.2%) answered "Yes", 39 (32.5%) answered "No" and 10 (8.3%) replied "I do not know".

The subsequent questions refer to the auxiliary premises of the sustainable kindergarten. To the first question, whether the auxiliary premises inside the building should have paper recycle bins, 114 students

(95%) replied "Yes", 2 students (1.7%), "No" and 4 (3.3%) "I do not know". To the next question regarding whether within the framework of a sustainable kindergarten, the auxiliary premises inside the building should have compost bins, 56 students (46.7%) answered "Yes", 27 students (22.5%) answered "No", and 37 students (30.8%) replied "I do not know". When asked whether they should have photocell light fixtures, 83 students (60.2%) answered "Yes", 19 students (15.8%) answered "No", and 18 students (15%) replied "I do not know". In relation to whether within the framework of a sustainable kindergarten auxiliary premises inside the building should be cleaned and disinfected daily with chlorine, 50 students (41.7%) answered "Yes", 34 students (28.3%) answered "No", while 36 students (30%) replied "I do not know". Finally, with regard to the question of whether within the framework of a sustainable kindergarten, auxiliary spaces inside the building should have plenty of hot water, thus, at least one electric water heater is necessary, 37 students (30.80%) answered "Yes", 56 students (46.7%) replied "No", while 27 students (22.5%) replied "I do not know".

Subsequently are presented the questions about the multipurpose room. With regard to the first question, whether the multi-purpose room is necessary within the context of a sustainable kindergarten, 78 (65%) gave the answer "Yes", 16 (13.33%) answered "No" and 26 (21.67%) replied, "I do not know". To the next question, about the use of the multipurpose room exclusively for cultural and art events, 77 (64.2%) answered "No", 24 students (20%) "Yes", while 19 (15.8%) replied "I do not know". Consequently, they were asked whether the multipurpose room could also be used as a resting area for kindergarten children. Out of the 120 students of the sample, 27 (22.5%) gave the negative answer "No", 64 students (53.3%) responded positively "Yes" and 29 (24.2%) replied that they were aware of it. Regarding the question whether the existence of a multiuse room is a luxury within the context of a sustainable kindergarten, 68 (56.6%) answered "No", 23 students (19.2%) answered "Yes" and 29 (24.2%) replied "I do not know". Finally, the question of whether at the kindergarten that students went for their practicum, there was a multiple use room, 54 (45%) answered "Yes", 55 (45.8%) answered "No", and 11 (9.2%) replied "I do not know".

The following questions refer to the Sustainable Kindergarten library. With regard to the area where the library should be located in the kindergarten, whether it should be in the staffroom, 30 (25%) students responded positively, 74 (61.7%) negatively, while 16 (13.3%) replied "I do not know". Concerning the strict preservation of the library by the kindergarten teacher, in order to keep her books in excellent condition, 62 (51.7%) students answered "Yes", 49 (40.8%) replied "No" and 9 (7.5%) replied "I do not know". When asked whether the bookcase should be placed at a high enough level to prevent children from reaching books, 33 (27.5%) students replied "Yes", 73 (60.8%) replied "No" and 14 (11.7%) replied "I do not know". To the next question about whether in a sustainable kindergarten the library should have eco-only books only, 16 (13.4%) students answered "Yes", 100 (83.3%) replied "No", while 4 (3.3%) replied "I do not know". Finally, to the question about whether at the kindergarten that went for their practicum, there was a lending library, 83 (69.2%) students answered "Yes", 22 (18.3%) answered "No", while 15 (12.5%) replied "I do not know".

The final questions explore the views of students about the use of the schoolyard of the sustainable kindergarten. To the first question, whether the schoolyard of a sustainable kindergarten should have recycle bins, 118 (98.4%) students answered "Yes", one student (0.8%) responded negatively and another one (0.8%) "I do not know". Regarding whether the schoolyard of a sustainable kindergarten should be just a place for rest and play, 29 (24.2%) students answered "Yes", 88 (73.3%) answered "No", while 3 (2.5%) replied "I do not know". In relation to whether the schoolyard of the sustainable kindergarten should be a place for implementing pedagogical activities, 109 (90.9%) students answered "Yes", 7 (5.8%) replied "No", while 4 (3%) replied "I do not know". Concerning whether the preschool yard should be a place for implementing environmental activities, 116 (96.7%) students responded "Yes", 3 (2.5%) answered "No" and 1 (0.8%) replied "I do not know". With regard to the necessity of care in the sustainable kindergarten for the protection of children from solar radiation, 114 (95%) students answered "Yes", 3 (2.5%) answered "No", while 3 (2.5%) replied "I do not know". In relation to whether the avoidance of pedagogical activities in the preschool yard of a sustainable kindergarten due to the risk of an accident, 7 (5.8%) students answered "Yes", 108 (90%) replied "No" and 5 (4.2%) replied "I do not know".

4. CONCLUSIONS

This research refers to the organization of a sustainable kindergarten and explores the views of the students on the possibilities of pedagogical use of its premises. The results of the research indicate that, with regard to the classroom of the sustainable kindergarten, the vast majority of graduate students think that coloring, natural lighting and natural ventilation affect the pedagogical process, as they have achieved very high response rates. In addition, they believe that heating and good acoustics have an impact on the pedagogical process with slightly lower response rates, though quite high.

Within the context of a sustainable kindergarten, the majority of students state that the staffroom must be

equipped with modern electronic devices, the use of paper must be careful and that only recyclable paper should be used. However, they agree with the idea that the staffroom must be equipped with electric heaters, the use of which is not in accordance with Sustainable School operating rules, as they are energy-intensive devices.

With regard to the auxiliary premises inside the building, most students of the research sample believe that they should have paper recycle bins. Moreover, the majority of the research sample considers that the auxiliary premises inside the building should have photocell fixtures. On the contrary, it is noted that a large percentage considers that the auxiliary premises inside the building should have compost bins, which implies that they do not know exactly what their use and operation is. Furthermore, the rates of the answers of the students who believe that auxiliary premises inside the building should be cleaned and disinfected daily with chlorine are high. They seem to be unaware of the negative effects of chlorine and unaware of the fact that its use is not consistent with environmental protection and sustainable schooling. Finally, they consider it necessary for the auxiliary spaces to have plenty of hot water, so there must be at least one electric water heater, though its use is not in line with Sustainable School operating rules, as it is one of the most energy-intensive devices.

Regarding the multi-purpose room, as shown by the results, almost two-thirds of the research sample consider it necessary within the framework of a sustainable school. However, it is impressive the high percentage of those who consider it as a "luxury". Simultaneously, it is suggested that it should not be used exclusively for cultural and artistic events and that it can also be used as a resting place for infants. Finally, when asked if there was a multiuse room in the kindergarten where the students implemented their practicum, according to their answers, it seems that there was one in almost half of them.

The following questions concern the Sustainable Kindergarten Library. With regard to whether the Sustainable Kindergarten Library should be in the staffroom, most students disagree with this view. They believe that it should be located in a different place, in a more familiar and accessible place for children. In relation to the strict preservation of the library by the preschool teacher for keeping the books in excellent position, almost half of the students agree. When asked whether the bookcase should be at a high enough height to prevent children from reaching them with the risk of destroying them, the majority disagrees, but the percentages of those who agree or state that they do not know are high as they cumulatively exceed one-third of the sample.

With regard to the question about whether the Sustainable Kindergarten Library should have only eco-friendly books, the majority of students responded negatively, understanding that a sustainable kindergarten should not only raise environmental issues but also other issues such as aesthetic issues as well as issues of literary and pedagogical value. Finally, the question regarding whether there was a lending library in the kindergarten where the students of the sample went for their practicum, the answers were encouraging, as there were almost in two-thirds of them.

Finally, in relation to the questions about the schoolyard of the sustainable kindergarten, the answers indicate that the vast majority of students state that the schoolyard is not only a place for rest and play but also it should be used for implementing other pedagogical and environmental activities, as it can be an excellent place for experiential learning. Of course, care must be taken to protect preschool children from sunlight and, more generally, the risk of an accident.

REFERENCE LIST

- Ali Khan, S. (1996). A vision of a 21st-century community learning centre. In: J. Huckle & S. Sterling (Eds), *Education for Sustainability* (222-227). London: Earthscan.
- Bell, J. (2010). *Doing your research project: a guide for first-time researchers in education health and social science* (5nd ed.). Maidenhead: Open University Press.
- Berris, R & Miller, E. (2011). How design of the physical environment impacts early learning: Educators and parents perspectives. *Australasian Journal of Early Childhood*, 36(4).
- Brković, M. & Milošević, P. (2012). Sustainable Schools as 3D Textbooks: Safeguards of Environmental Sustainability, *FACTA UNIVERSITATIS, Series: Architecture and Civil Engineering* Vol. 10, No 2, pp.

179 – 191, Retrieved 31-8-2018 from <http://www.doiserbia.nb.rs/img/doi/0354-4605/2012/0354-46051202179B.pdf>

- Bryman, A. (2012). *Social research methods*. 4th ed. Oxford: Oxford University Press.
- Butin, D. & Woolums, J. (2009). *Early Childhood Centers*. Washington, DC: National Clearinghouse for Educational Facilities, retrieved on 23-6-2018 from <http://www.ncef.org/pubs/earlychild.pdf>.
- Cohen, L., Manion, L. & Morrison, K. (2011). *Research methods in Education* (7th ed.). London: Routledge.
- Curtis, D. & Carter, M. (2005). Rethinking early childhood environments to enhance learning. *Young Children*, 60(3), 34-39.
- Evans, G. (2006). Child development and the physical environment. *Annual Review of Psychology*, 57, 423-451.
- Hodgeman, L. (2011). *Enabling Environments in the Early Years'*. Early Childhood Essentials Series. London: Practical Preschool Books.
- Inan, H. Z. (2009). The third dimension in preschools: preschool environments and classroom design, *European Journal of Educational Studies*, 1(1), 55–66.
- Maxwell, L. (2007). Competency in Child Care Settings: The Role of the Physical Environment. *Environment and Behavior*, 39 (2):229 - 245.
- Moore, G. & T. Sugiyama (2007). The Children's Physical Environment Rating Scale (CPERS): Reliability and Validity for Assessing the Physical Environment of Early Childhood Educational Facilities. *Children, Youth and Environment*, 17(4), 24-53.
- Nelson, S. (2018). *Early Childhood Learning Spaces*. School Planning and Management. Retrieved 26-8-2018 from <https://webspm.com/articles/2018/01/01/early-childhood.aspx>
- Olds, A. (2001). *Child Care Design Guide*. NY: McGraw Hill.
- Özsoy, V. (2016). Arts and Design Education for Sustainable Development, *Global Journal on Humanites & Social Sciences*. pp 487-497. Retrieved 30-8-2018 from: https://www.researchgate.net/publication/295397405_Arts_and_design_education_for_sustainable_development.
- Papavasileiou, V. (2015). *Sustainable Development and Education: A multidimensional relationship*. Athens: Diadrası. (in Greek)
- Papavasileiou, V., Nikolaou, E., Xanthacou, Y., Papadomarkakis, I., Matzanos, D. & Kaila, M. (2017). Student preschool teachers' views about the pedagogical context of sustainable kindergarten. *Proceedings of INTCESS 2017 4th International Conference on Education and Social Sciences*. Istanbul, Turkey, 6-8 February, 2017
- Read, M. (2007). Sense of Place in Child Care Environments. *Early Childhood Education Journal*, 34(6), 387-392.
- Rose, L. & Westinghouse, C. (2010). *Cleaning for Healthier Schools – Infection Control Handbook*. Report funded by the Toxics Use Reduction Institute, University of Massachusetts Lowell University of Massachusetts Lowell. Retrieved 30-8-2018 from: <https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/WRAPP/CDPH%20Document%20Library/CleanSchoolsHandbook.pdf>.
- Roskos, K. & Neuman, S. B. (2002). Environment and its influences for early literacy teaching and learning. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 281-294). New York: The Guilford Press.
- Segal, M. Bardige, B. Woika, M. J. & Leinfeider, J. (2006). *All about child care and early education*. A comprehensive resource for child care professionals. United States: Pearson education.
- Strong, C. (2014). Importance of School Library Programs. *SPU Works*. 3. <https://digitalcommons.spu.edu/works/3>.
- Tanner, K. and Langford, A. (2003). *The Importance Of Interior Design Elements As They Relate To Student Outcomes*. Dalton, GA: Carpet and Rug Institute.

Tasci, B. G. (2015). "Sustainability" Education by Sustainable School Design. *Procedia-Social and Behavioral Sciences*, 186, 868-873.

Yudelson, J. (2008). *The green building revolution*. Washington: Island Press.