Developing a course for teaching space and nature values to student-teachers

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Abstract: Redefining educational curricula to address sustainability issues is something that could occur at all levels of formal education [1]. Spatial education could also be sought in the framework of formal education [2]. Spatial education contributes to raising awareness of space and nature values and of planning for sustainable development. This article presents a paradigm of a strategy drawing from "action research methodology." It was developed within the framework of an optional course offered to future primary school teachers at the Education Department of Aristotle University of Thessaloniki, Greece. The course sought to raise future teachers' interest in incorporating spatial concepts in their school's culture. The article also includes a preliminary evaluation of this initiative based on student teachers' interviews and their project designs. Participants demonstrated an appreciation of the course both for its contents and its methodology.

Key –Words: spatial education, education for sustainable development, school grounds, spatial values, student teachers

1. Introduction

To promote sustainable development at international level, we must encourage social participation in the planning and management of the environment at local level. To achieve this, activities should be combined with formal and informal education, so that the public is prepared to cooperate in the decision making process and is also equipped with the necessary skills to play a role in the local spatial planning process. [2].

In leading educational initiatives (UNESCO, UNECE), spatial values and spatial dimensions of development are recognized as top priorities of future societal interests. [3,4]

From the European perspective, the Council of Europe endorsed the European landscape Convention that strives among other things to promote the European landscape protection, management and planning. [5]

Education for Sustainable development (ESD), a major global and regional initiative for sustainable development, deals mainly with key concepts like action oriented teaching and learning, critical thinking, interdisciplinary and multidisciplinary approaches, problem and process oriented approaches, problem based learning and project work.[3]. ESD should be promoted so that it permeates all levels of the formal education systems and all aspects of the curriculum [4]. ESD puts emphasis on empowering individuals to understand, interact with and improve their milieu. The ability to manage space and exploit its developmental possibilities depends on the knowledge of individuals and social groups concerning values of space. Democratic decision making for spatial design involves inviting people both professionals and non-professionals to participate in the spatial planning process. This is also one of the main goals of sustainable development. On the other hand, spaces constitute learning environments, with their own hidden curriculum [6]. Places contribute to the creation of the sense of space for the young, which in turn influences their personal identity, through which they will formulate their attitudes towards the environment.[7,8].

Therefore spatial education closely relates to the ideas of Education for Sustainable Development and could be built-in as a new dimension to ESD.

School teachers can have a leading role in promoting awareness for space and nature values among young pupils through properly designed activities. Primary school teachers work with

children during the period when their views of life and the environment are shaped based on information and experience they are exposed to. However, in order for teachers to convey and instill environmental values, they need to be properly trained themselves.

The physical school environment offers itself as a means of raising awareness of spatial values. As Orr states "academic buildings have their own hidden curriculum that teaches as effectively as any course taught in them"[9]. School grounds are also academic learning environments and as such they have apart from pedagogical value, their own hidden curriculum as well [6].

The existing design of the open school space reflects the dominant perspective of the significance of the built environment. For example, a school yard that is cemented from wall to wall portrays a barren, uninviting environment not conducive to creativity and learning. However, this may be the environment young learners absorb in their daily life at school. Such an environment reflects the school's culture and ethos towards nature and at the same time, it defines the form of the desired man-nature relationship that society seeks to promote through school. [10].

As learning environments, school grounds could contribute to lifting spirits, stirring imagination, and fuelling intellect "[9]. Instead they usually fail to stir imagination and reflect little sense of place, respect for disabled people and ecological awareness. Moreover, they seldom reveal pedagogical intent. Often indifferent to aesthetic, ecological, educational and ethical aspects of space, school grounds fail to create a sense of place and transmit values of space ownership [11, 12]

There is a growing desire among young students to influence their living conditions and improve their environment.[13] If education is to encourage this active citizenship, young students have to be treated as equal partners, as social agents in our society and their views must be taken seriously. [14, 15].

Participation is necessary because many young students do not feel that school helps them to understand issues of social and environmental justice or to be involved in local or global action .[16]. As our young students get older they become more pessimistic about their personal involvement in making the planet a better place .[17].

2. The course

In light of the above, we developed a course for future Greek primary school teachers in order to introduce them to teaching practices and techniques for raising space and nature values to their students. The main purpose of the course was to raise student teachers' awareness of space and nature values and the importance of spatial planning and to alert them to the possibilities the concern for spatial quality can offer to their school's culture [18].

Creating also an inclusive educational environment constitutes one of the major targets of sustainability education and space is a key factor for facilitating inclusion.

The course was designed as an experiential, action research project. School grounds were chosen as the experimental field for the project. Due to growth in environmental interest and concern and the recognition of children's capacity for and interest in environmental management, schools have begun to incorporate the outdoor environment of the school into their total approach to education [12,15,19]. School grounds constitute a daily environment, an environment to which both teachers and pupils have emotional bonds. For most people their close locality is their most significant action field [20]. Humans may also be genetically hot wired for local action because of their powerful emotional commitment to what is socially, spatially and temporally immediate [21].

Schools can establish in their outdoor environment a bio diverse landscape that can serve as a rich microcosm for children to acquire a wide range of environmental knowledge and skills. For urban children, outdoor recreation is usually centred around school play grounds. Such playgrounds can provide an island of safety for free exploration and play and can also be related to the study of many fields of the curriculum. [22].

Our experience from running a five-year National Environmental Education Network for the redevelopment of school grounds [12], demonstrated that students would be more easily engaged in a project concerning the upgrading of the environment of their immediate concern. This was justified by their active participation in the course.

The course was elective and it was offered during the academic year 2007-2008 to student teachers of the Department of Primary Education of Aristotle University of Thessaloniki. Despite the optional character of the course, more than 500 students attended in the two semesters it was offered. The student teachers' response to the course is probably also associated with the importance given to the

topic of space and its attributes for the promotion of the quality of life. Another fact that might have motivated student teachers to participate in the course was the possibility of making learning concrete.

2.1. Aims of the course

The course aimed at helping student teachers to

- increase the level of knowledge and awareness of the values of space through direct observation and experience
- realize the educational value of the school outdoor environment
- relate its qualities to the spatial values this environment transmits to young pupils
- stimulate interest as opposed to the passive or indifferent relation with the school outdoor environment
- raise awareness of the value of space for inclusion
- develop their own environmental sensitivity through direct experiences in nature
- help student teachers acquire the skills that would motivate them to act and invite children to conduct research on the quality of the school environment and communicate their findings to community leaders, planners and politicians
- help students to motivate children to act as partners in the formation of pleasanter school outdoor environments. The skills to be developed involved:
  - the combination of diverse data and their interpretation for determining the changes and decisions regarding spatial development
  - the survey, analysis and critical evaluation of the current state of space, its assets and drawbacks, the identification of problems and suggestion of solutions
  - the use of ecological and educational landscape design principles (For example, how might material, light, sound, water, spatial configuration, openness, scenery, colors, textures, plants, and animals be combined to enhance the aesthetic, functional and pedagogical qualities of space
  - the reflection of spatial and nature related topics in primary school curricula and their implementation for developing training activities for pupils
  - the increase of knowledge and skills for active participation in sustainability development actions
  - use a space development project as a means to explore whole school approaches that lead to community partnerships [18]

2.2. Content of the course

Theoretical sessions included topics such as principles and teaching approaches for sustainability education, spatial quality and quality of life, the environment as a learning setting and as a teaching tool; the aesthetic, functional and pedagogical principles for designing school grounds; the role of vegetation in the built environment. The student teachers were introduced to multi-sensory approaches to learning in order to develop their own environmental sensitivity through direct experiences with nature. These experiences were intended to lead them to appreciate, understand and develop values about nature's contribution to learning. There is considerable theoretical evidence that concern for the environment is based on an attraction to nature that can come only from autonomous, immediate contact with it [23]. One implication of this is that schools should allow young children to play in as diverse a natural setting as possible surrounding the school. Moreover, they should be given opportunities to care for that setting.

Student teachers were also introduced to various uses of plants in landscape design and to ecological approaches to design through their textbooks and visits to actual site.[24,25]. These student teachers were further motivated by being presented with selected case studies of upgraded school grounds. They were also asked to evaluate school grounds of typical Greek schools in comparison to these cases.

2.3. Implementation

After the completion of the theoretical sessions, student-teachers were asked to work in groups of 3-4 on selected school environments. Each group chose to work with a particular school, the same school where they were doing their field practice. In most cases, the existing grounds were aesthetically and biologically barren, serving limited functions. Most of them served for unorganized running activity that included unavoidable accidents, as the selected figures show. Bare school grounds do not complement the school building. They also reflect a pedagogical approach that disowns the environment as a factor of educational process and limits teaching and learning in the classroom.

Fig1

Fig.2

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Fig.3

Fig.4

Student teachers visited the selected schools and discussed the project with the school community in an effort to raise awareness of the needed change. In an effort to assess the quality of the school outdoor environment, they drew the site map. This map was used for the survey and analysis of existing grounds. The existing grounds were assessed in terms of their aesthetic, functional, ecological and pedagogical criteria. This was done in collaboration with the instructor during the theoretical phase of the course.[11,26] Certain criteria dealt with issues of functional clarity, the compatibility of different uses of school grounds, and the flexibility of multiple uses of native vegetation..[27]. They were also instructed to look into safety issues.

They also took photos of the site in order to support their analysis and site assessment data. They presented the data to the school community, discussed and interviewed both the teaching staff and the pupils to identify priorities for change and propose their suggestions to be included in the redevelopment plan for the site.

They used the information they gathered for the assessment of the site: its relative strengths and weaknesses; the character of the surroundings and the school; the views within and outside of the site; micro-climate areas; identification of existing vegetation and the suggested use of vegetation; conflicts between site users, e.g., cars and pedestrians, accessibility and circulation; identification of different areas of use; and opportunities for play and teaching.

In most cases, as it is clearly shown in figures 5 and 6, vegetation was within the perimeter of the grounds. Access to this area was controlled by physical or symbolic barriers that ruled out spontaneous play. This type of designing plant life

did not permit direct contact with nature, thus restricting vegetation to a rather decorative role.

Fig.5

Fig.6

Data analysis allowed a thorough understanding of the site and facilitated, in combination with the interview data, the preparation of a concept plan and a draft layout plan. They used their photos of the site to make "before" and "after" sketches to support their plan and wrote a supporting report describing and justifying all proposed changes and the layout of various features with reference to their potential educational use.

Student teachers' plans had clearly marked separated areas for active spontaneous or organized play or for quiet play. They emphasized the inclusion of varied vegetation to introduce nature in the school environment, not only to create a pleasant environment but also to raise the pupils' sensitivity for nature. Nature as a venue for cross curriculum activities was introduced as a viable process in their portfolios.

Vegetation, in combination with a variety of surface materials and designs, was used to create subspaces. For example, vegetation was used to emphasize the school entrance and to screen undesired views of surrounding buildings. It was also used to mask eyesore iron fences and to create shade for a pleasant outdoor stay. The main purpose was to create nature-friendly school ethos. Some of the features of the proposed plans were vegetable and herb gardens; nurseries and orchards; compost areas; tree houses; various sitting areas for resting and for socialization; mazes and amphitheatres. The future teachers' plans included ramps for accessibility and focal points, such as sundials to meet educational and aesthetic purposes.

The future teachers also asked the school community to collaborate with the local community in order to develop a gradual action plan and seek possible sources for realizing this plan.

Part of the course requirement was to plan two experiential learning activities linked to the national curriculum. These activities had to be based on their redesigned grounds plan.

3. Conclusion

The student teachers' responses to the course, as they were recorded in the evaluation discussion that followed the implementation of the project, as well as in their written reports, were from positive to enthusiastic. A large number of them expressed their appreciation for the chance they were given to observe space in different ways and different standpoints, see what they had not expected to see and gain an insight of the school environment and its relation to learning. As some of the student teachers pointed out,

Int. 1. I began to notice things that I had looked at indifferently in the past and I was struck by what I was finding.

Int 2. We were used to seeing school-grounds according to what we experienced in our primary and secondary schools: a bare, asphalt surface used as an outlet for surplus energy. In other words, an environment that had little to do with teaching and learning.

The student teachers pointed out that the combination of theory with practice was one of the main assets of the course. They indicated that they enjoyed their active participation in designing and implementing the project, and it seems that they have gained a sensitivity that will inform their

practice in the future. Their own comments demonstrate their growing awareness:

Int.3 We enjoyed the fact that we did practical work in the schools. So far most courses were putting emphasis on theoretical aspects; it was exciting to practice our skills in a hands-on environmental project.

Int 4. In most of our courses, we were taught to use new approaches to teaching and learning, such as experiential learning, interdisciplinary teaching, and cross-curricular and extracurricular activities; however, all this was usually introduced in theory. Through this course, we had the chance to apply theory to praxis by dealing with real issues.

These future teachers also saw the value of authentic collaboration as they experienced it not only among themselves but also with the children and the teaching staff of the schools in which they worked. As some of these student teachers pointed out,

Int.5. It gave us the chance to work together with the school staff and pupils in a more friendly, relaxed and constructive way.

Int.6. It was so interesting that we collaborated with the children to identify problems and propose solutions for their immediate environment!

Int.8 Never before have we thought of the various attributes of vegetation as elements of spatial design.

Most of these student teachers admitted that they came to understand the close relationship between space and its use. This was supported by their proposed redevelopment plans and the reports they wrote to support their plans. As one of them suggested,

Int.7 Realizing the impact of outdoor school surroundings on building young children's concern for the environment, we felt deeply disappointed by the fact that so little attention has been given to this issue so far by educators.

Despite the fact that these student teachers had attended compulsory courses on inclusion, less than 50% of them considered space as a factor for accommodating disabled students. Few of these student teachers brought attention to the lack of spatial arrangement for the disabled as a drawback to learning. Neither did they make suggestions for improvements regarding accessibility for disabled pupils. This attitude toward the disabled is deeply rooted in our culture. It is reflected in outdoor space design and in daily behavior of people in the urban environment. This social attitude and its implications could inform the future development of the course.

Concerning participation issues, they also realized that the design of space is not merely an "expert's job" but the users have an equally important role to play, if the environment is designed to address their needs. Student teachers worked with eagerness and produced a large range of creative and imaginative ideas, as shown in the attached pictures. These ideas were also indicative of their deep understanding of spatial and nature values and their acquisition of space planning skills, as their proposed plans and written reports reveal.

5. Examples of existing and proposed redevelopment plans

In most cases, the student teachers were successful in developing a proposed plan that changed bare asphalt covered ground to a diverse natural setting offering plenty of opportunities for play, for inter-disciplinary teaching and learning, and for raising awareness about spatial values.

Figure7. Existing grounds

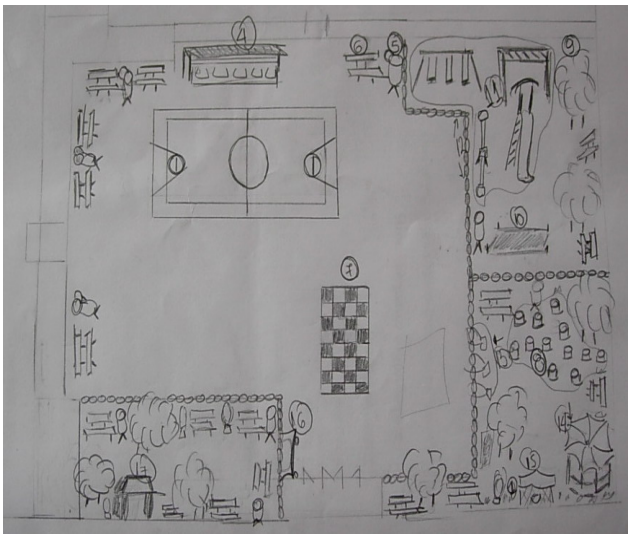

Figure8. Proposed plan for grounds of figure 7

Figure 9. Existing bare grounds

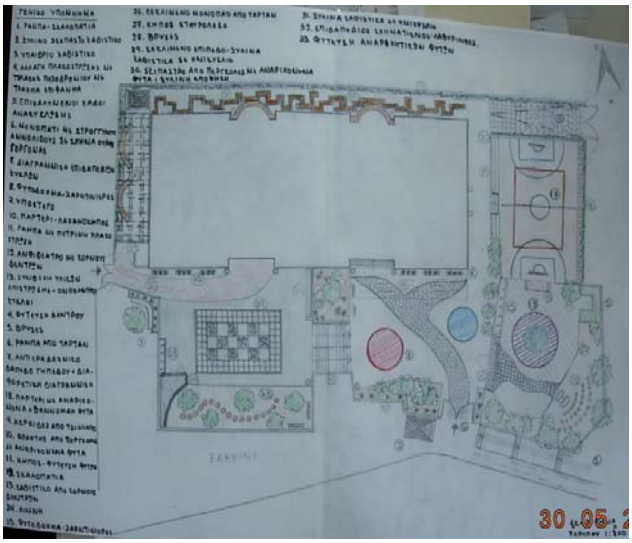

Figure 10. Example of student teachers' created redevelopment plan for existing grounds in fig.9.

Figure 11. Another example of existing bare grounds

Figure 12. The proposed plan for grounds shown in fig.11

6. Figures 13-17: Examples of before and after sketches to support draft redevelopment plan

In order to create their "before" and "after" sketches these student teachers used photos of the existing school grounds. The student teachers relied on the drawing skills they had developed through the compulsory art courses they had attended as part of their studies in order to create their actual space design.

These future teachers showed signs of great promise for implementing change in the school

culture so that it becomes possible to develop safe and attractive educational environments that are conducive to learning. It is up to them to meet this challenge and up to us, teacher trainers, to continue showing them the way.

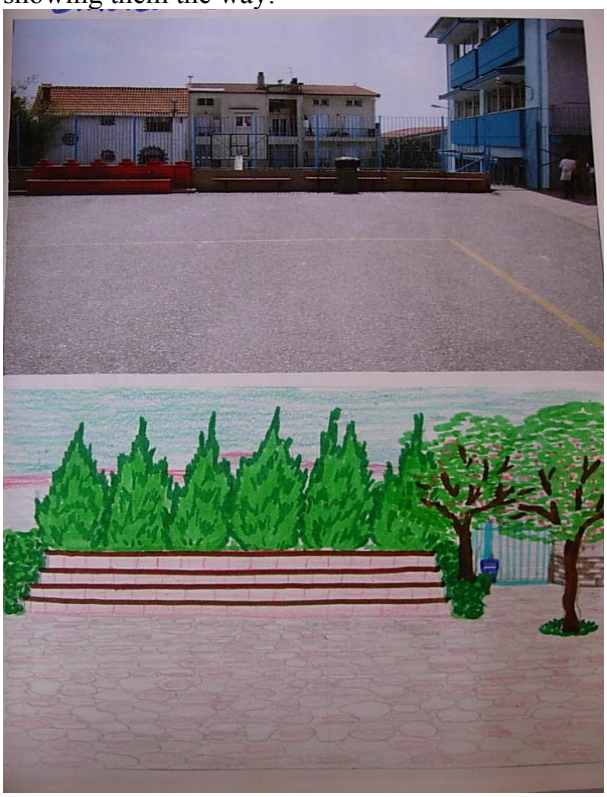

Figure 13. Using vegetation for screening undesirable views

Fig.14. Creating a safe and reach environment

Fig 15. Incorporation of functional elements

Figure 16. Transformation to a safe and diverse environment

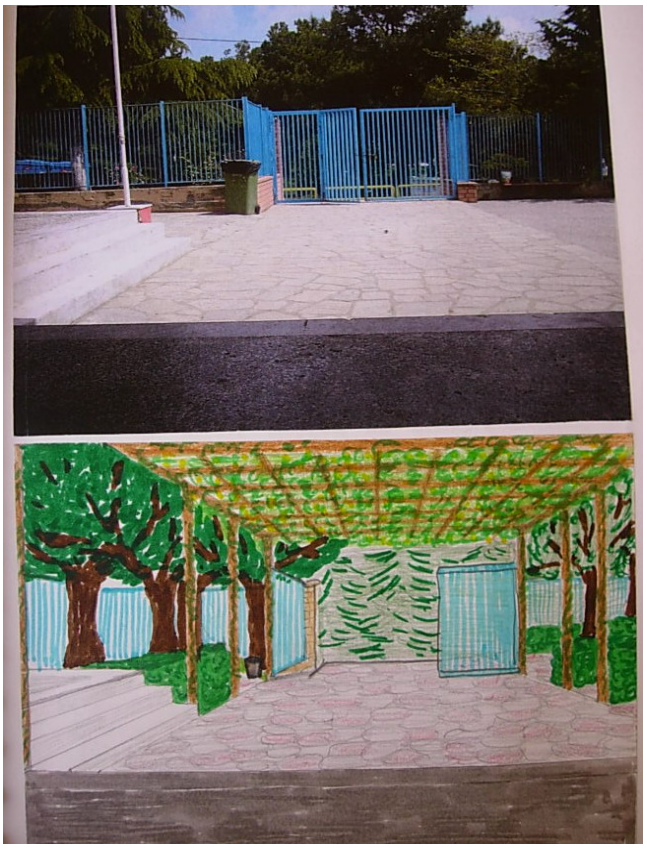

Figure 17. A proposed change for a friendly to nature school entrance

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