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My Dream School – An Experiential Learning Project for Elementary School Children

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Abstract. It is well known that experiential and group learning has beneficial effects on the development of skills and knowledge, understanding, motivation and relating to peers, whether adults or children. In primary education in Eastern Europe, alternative methods of teaching and learning continue to be under-used; optional classes in primary education fill this gap and are a fertile ground for pedagogical experiments. "De-a arhitectura" is a program developed by the association with the same name made of architects and teachers in 2013. The need to propose school-based education for the built environment comes from the idea that people should learn how to advocate for better living places and also as a response to the sustainability challenge. The name means "Let's play the game of architecture" and all programs are developed on the idea that the best way to learn is through play, promoting experiential learning and collaborative learning. The program was introduced nationwide firstly in third and fourth grade - "Let's play architecture in my city". The approach to these programs is free and based on a guide, so tutors can choose from the activities proposed in the guide or develop new activities. It should also be noted that the primary school teacher is complemented by a volunteer architect or student. This year the authors decided to do a model for a school - "My dream school" the children called it. Experiential learning is based on a cyclical loop: thinking - acting - experiencing - reflecting. In addition to this cycle the tutors wanted to make the transition from individual learning, to learning in pairs and finally to the level where the whole class has to work together for the success of the project. The steps are presented in the methodology chapter, which illustrates the passage from the drawing to the 3D model, from the individual approach, to the approach in teams of 2-3 children with specific tasks (a specific classroom, hallway, one of the courtyards, gym, etc.), to the three variants of floor plan made by the architect from which the pupils voted and chose the favorite design, to the realization of the model in pieces and finally the assembly of the model in two groups of 12-13 children. The final step was the presentation of the model as the final result of a year of "De-a arhitectura" in the third grade (9-10 years old) in front of the other classes in the city in a festive setting. From the educational process perspective, there is a chapter dedicated to observations at each stage, both in terms of group dynamics and output. For the teachers the process was particularly interesting, and the cohesion effects at class level were beyond expectations. As a conclusion, once such a process of experiential and collaborative learning is used, the results show that it is really worth the effort.

Keywords: Experiential learning; primary school education; collaborative learning; hands-on activities; sustainable development.

INTRODUCTION

This article presents an experiment in education carried out over several weeks with third grade schoolchildren in the extra-curricular discipline "De-a arhitectura" as an end of year project.

The main objective of this educational experiment was to study and analyse the combined experiential and collaborative learning methods, because this program is one of the very few that at this moment is trying an alternative approach in Romanian education.

The secondary objectives of the project were: the examination of group dynamics and interactions as a function of group size, the analysis of the quality of the deliverables as a function of group dynamics, the effects that the introduction of these alternative methods had at the classroom level, the benefits being already known from other previous studies.

“De-a arhitectura” is a program developed by the association with the same name made of architects and teachers in 2013 [1]. The need to propose school-based education for the built environment comes from the idea that people should learn how to advocate for better living places and sustainable cities. The name means "Let's play the game of architecture" and all programs are developed on the idea that the best way to learn is through play, promoting experiential learning and collaborative learning [2].

The program for the third and fourth grades has been the first one developed, with a curriculum designed by the architects in collaboration with primary school teachers and education specialists. The approach is based on a guide, so tutors can choose from the activities proposed in the guide or develop new activities [3]. In the "Let's play architecture in my city" classes, the primary school teacher is accompanied by a volunteer - an architect or a student in architecture or related fields (interior design, landscaping).

At the end of the 2-year cycle, in the fourth grade, a class of pupils makes a scale model of a city, based on all the knowledge about the built environment they have acquired. At the end of third grade, however, the classes present as their end-of-year work either a model of a simpler neighborhood or individual models of houses, as the children learn to make them out of thick paper, understanding the plan, the layout, spaces and volumes, learning about the human scale in architecture and urban planning, the importance of the light, different functions and sustainability issues.

As the activities during the year can have different degrees of difficulty, the proposals in the guide being adapted to the class, all those involved (children, teacher, volunteer architect) decided that this school year they would carry out an experiment inspired by the visit of a group of students from the Faculty of Architecture and Urbanism who told them about other schools. There are too few truly modern schools in Romania, both in terms of teaching and learning system and spatial configuration, as various studies and reports on education in Romania and Eastern Europe show [4], [5], the children were fascinated by the idea that their school could look different and wanted to realize the project "My dream school" - a project for a primary school (grades I-IV and preparatory class). On the other hand, the pupils were excited by the idea of working in pairs and in larger groups, because in the classical system of education there are very few team projects and only a few disciplines.

To explain the decision, it should be noted that the primary school teacher has been doing the "De-a arhitectura" classes since the program began in 2013, the volunteer architect has been working with the same teacher since 2018, and this generation of children has been part of the program since first grade. This being the third year that the children are learning about the built environment, the decision to do such an experiment was warranted by the way the pupils responded to the activities in previous years, in which we integrated experiential and collaborative learning step by step.

The article presents the methodology that the teacher and the architect developed for the project, from the idea to the realization of the final model and its presentation to the other classes in a festive setting at the end of the school year. Experiential learning, free dialog and collaborative learning methods were used. Because this kind of project requires the children to work much more closely together than other projects proposed in the "De-a arhitectura" guide, the process was more challenging, but the result was far more rewarding.

METHODOLOGY

Experiential learning is based on the Kolb cycle (thinking - acting - experiencing - reflecting) [6]. Kolb's theory of the experiential style of learning is usually presented by four stages of the learning cycle in which the learner "touches all the bases": concrete experience (doing/having an experience), reflective observation (reviewing/reflecting on the experience), abstract conceptualization (drawing conclusions/learning from the experience) and active experimentation (planning/trying out what you have learned). David Kolb and others authors see learning as an integrated process with each stage being mutually supportive and feeding the process in the next stage [7]. You can enter the process at any stage and follow it in its logical sequences.

Following the stages described below, the learning cycle was completed and repeated every 2-3 lessons, in a spiral of learning that slowly integrated group learning into the spiral (from teams of 2-3 children, to teams of 6-7, to groups of 12 - half the class). In all stages the basic questions were: “why?” and “how?” so that children internalize the knowledge.

The methodology has the following stages:

1. a free discussion with the whole class about what their dream school means, what they would like - a discussion based on observations of the school they are currently learning in and examples given by architects of very interesting schools around the world; a drawing lesson in which the pupils worked on specific themes (classrooms, hallways, courtyard); everyone presented the result, argued why in first grade for example a particular piece of furniture fits or what should be in the classroom or adjacent hallways and outdoor spaces that is specific to what children learn in first grade (7-8 years old) and how they like to discover the world by play; the same presentation was given to all classes and the result was considered as a starting point for the models after discussions; the lesson was finalized by finding some desired commonalities for classrooms, hallways, courtyards;
2. a class dedicated to the choice of the type of floor plan, in which the architect together with the children more involved in the activities proposed 3 different approaches, and the schoolmates voted for their favorite; as a final result the architect made the plan for the model; the scale traditionally used in the "De-a arhitectura" programs is the Lego figure at a scale considered to be the height of the 9-10 year old child (scale of the model is 1:33);
3. a few time slots dedicated to the realization of the classrooms, hallways, etc., in teams of 2-3 pupils, including the specific furniture and the three courtyards (the access courtyard, the one for the small classes and the main courtyard); each team decided the materials, colors, etc. based on the discussions held in the second step;
4. the last classes were dedicated to the assembly of the final model, made of two pieces (teams of 12-13 pupils), during which they had to collaborate and help each other to finalize the model;
5. the presentation of the project and the model made by the pupils in a festive setting, together with other classes from Timisoara that took part in this program.

In presenting the stages, the authors deliberately used the first-person plural pronoun (we/ us/ our/ ours/ ourselves), considering that this way of expression shows more clearly that the methodology is a personal and assumed one, with the involvement of all (tutors and the whole group of children), with an emphasis on collaborative learning [8], [9].

Stage 1 - What does the dream school mean for each of us?

As a first step, the architect made a presentation of several schools around the world where learning takes place in manners other than the classical way, and there was a free discussion in which the pupils tried to identify what they would need and what a dream school would mean for each of them (one hour).

In the next phase, the students individually drew proposals for a classroom, a hallway or a schoolyard and then answered in writing a few questions: What shape do you think is most appropriate for the classroom you have been working on (from pre-primary to fourth grade)? What other activities do you propose to do in the space other than what you usually do now? What activities do you propose to have in the hallways? What related functions do you think are needed in the school? What special places do you propose in the courtyard? - figure 1

In this phase they had one hour of drawing and one hour of answering questions and free discussion based on the answers, so that the architect could incorporate all desires into future plan versions.

From an experiential learning point of view, a whole Kolb learning loop is completed here: we draw on previous concrete experience and examples that have been presented to us as ideal cases, reflect on problems and needs, think about what we could do to meet our needs, and act - answering the question how do we do it? (the children express themselves through drawing - figure 2 and in words - figure 1). This first loop ends with discussions that aim to systematize the information and find common points in the students' proposals.

In terms of collaborative learning, at this stage the answer is still an individual one, but the fact that all the classmates have given their opinion and there have been free discussions is just a first step: the one where we learn to listen to others, to enter into dialog. From this perspective, the group dynamic was harmonious, there were no divergences between the children's wishes, they rather complemented each other, and the results were extremely useful for the architect to be able to create three different plan proposals based on what the children wanted.

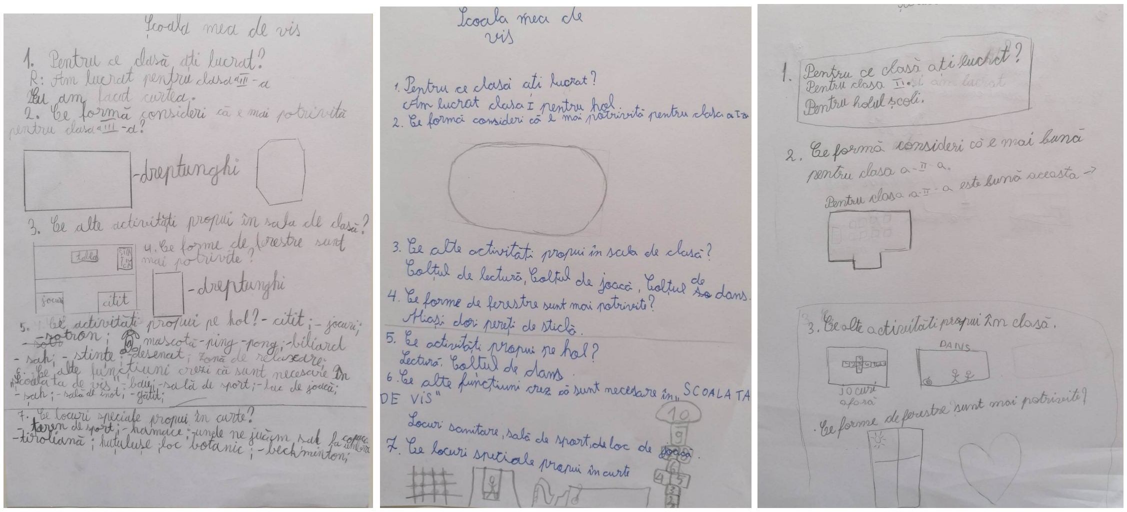

FIGURE 1. Questions and answers to decide forms and activities.

FIGURE 2. Drawings (2a – classroom, 2b – school hallway) to decide forms and activities.

Stage 2 - Which approach do we think is more appropriate? Analysis of three typologies

On the groundwork of the conclusions of the first phase, in discussion with the class members more involved, the architect proposed three variants of the plan:

-variant 1 - central: the central hallway and classrooms grouped around this space - the heart of the school, which is then connected to an access courtyard and the backyard;

-variant 2 - free: a looser development of the central variant, in which the hallway space is more fluid and the plan stands more loosely on the ground;

-variant 3 - "U-shaped": it is a variant that is more similar to what they are familiar with, the hallways define a main playground, the classrooms are located on two of the sides, with a clearly defined hallway for the small classes (preparatory, first and second classes) and respectively the hallway for the older classes (third and fourth), the third side being occupied by the multipurpose room: sports and/or festivities (figure 3).

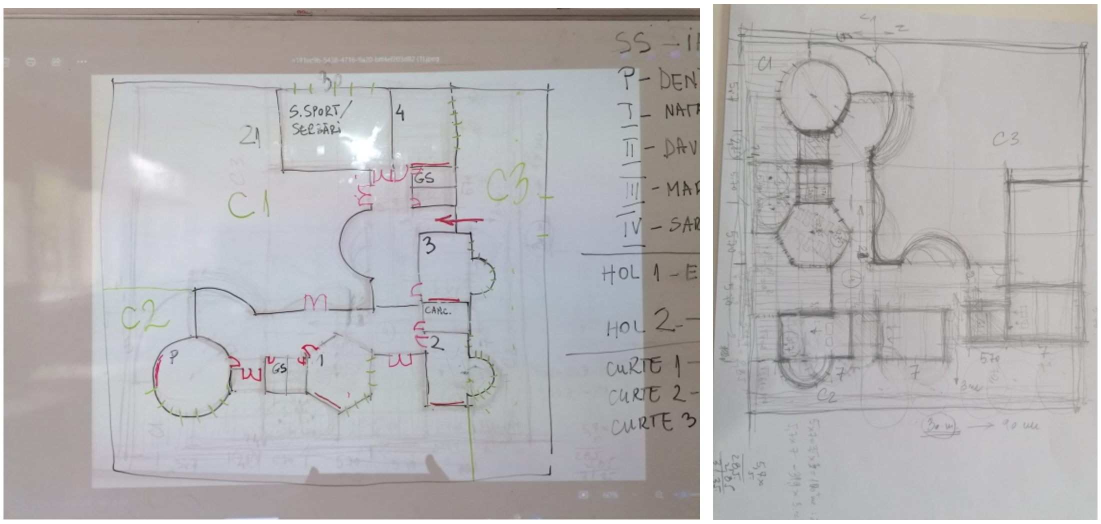

FIGURE 3. First ideas and first plan for variant 3 combining the ideas from the previous stages

Surprisingly for the teachers, the children voted overwhelmingly for the third option, perhaps also because it is a familiar space and shape.

From the experiential learning point of view, here we go through a new learning loop: we build on the results of the first loop, we act - we propose the three options, we experiment - we discuss the pluses and minuses of the three options, we reflect on the proposals and the fourth phase is the next stage - we each have to think about how we will realize the part of the model for which we are responsible.

From a collaborative learning perspective, discussions and differences of opinion are starting to emerge in terms of the choice, but still, as mentioned, the results tended to go towards unanimity of votes. The group dynamics, as in the second stage, were harmonious and the output generated the idea of a plan on which to build the models.

Stage 3 - What and especially how do we do it? Working in small and medium teams

A new learning loop starts: the architect proposes the plan that includes all the observations from the first and second stages, from the general U-shape and the location of the classrooms, to the different shape of the classrooms (starting from the circular shape of the preparatory class, then moving on to hexagon and rectangle), to the way the hallways expand or receive "pockets" for activities, to the delimitation of the spaces for the courtyards: the main access courtyard, the one for the small classes and the large school courtyard.

At this stage the pupils work in pairs in the classrooms, hallways and sports hall, and in teams of three in the courtyards. The fourth phase of the previous stage naturally links in a spiral of learning with the first phase of this stage - acting - this time to model the objects in the space we will use everything we have previously learned in all three years of "De-a arhitectura" to create a classroom/ hallway/ courtyard as they were envisioned in the previous phases. But because a classroom cannot be conceived without considering the adjacent hallway and dedicated outdoor space, the children also had to collaborate with neighbouring teams.

The team of 2 or 3 students chose the materials, first made the floors, furniture elements, other accessories (blackboard, bookcase display, etc.) for the interior spaces, and the vegetation and outdoor furniture for the courtyards (figure 3). Thus the experiential stage is passed and the learning loop is completed, because it remains to reflect for the next lesson on how the walls, connections, windows will be realized, and the loop is resumed, this time with medium-sized teams (4-6 or 6-8 pupils) working together.

From an experiential learning point of view, here two loops are run: one in small teams (2-3 students) and a more complex one in medium teams (4-6 or 6-8 students) where small teams have to collaborate.

From a collaborative learning perspective, the challenges are different: while in the case of working in small teams the students chose their teammates as best friends and worked very well together, in the next phase they had to interact with another group or two groups, which led to an increase in difficulty and thus to a higher group dynamic: arguments and disagreements start to arise, but in the end the groups manage to work together and help each other. The result of this stage was the components, which were to be assembled together in the fourth stage, in the two halves of a large model.

FIGURE 4. Works from the beginning of stage 3: floors, furniture elements, trees

Stage 4 - How do we put all the pieces together? Working in big teams

The fourth stage, the most challenging in every respect, involves pupils working in two large teams, assembling together all the elements on the two pieces of the model and finalizing the things that were left unfinished from the previous stage (figure 5). The learning loop is resumed with the theming "what have I done and what am I going to do next", group decisions are made on how to assemble the completed elements and then the actual work is done, aiming that as the making of the model progresses the students collaborate and help each other so that it is well completed as a whole class outcome.

As a group dynamic, it's obviously more difficult to manage, but things happened in an organic and natural way; as in any group, there are students who work hard because they enjoy what they do and there are students who expect help. As in any larger group, there are tensions that required the intervention of the tutors to defuse conflict situations, but the two halves of the model were completed very well.

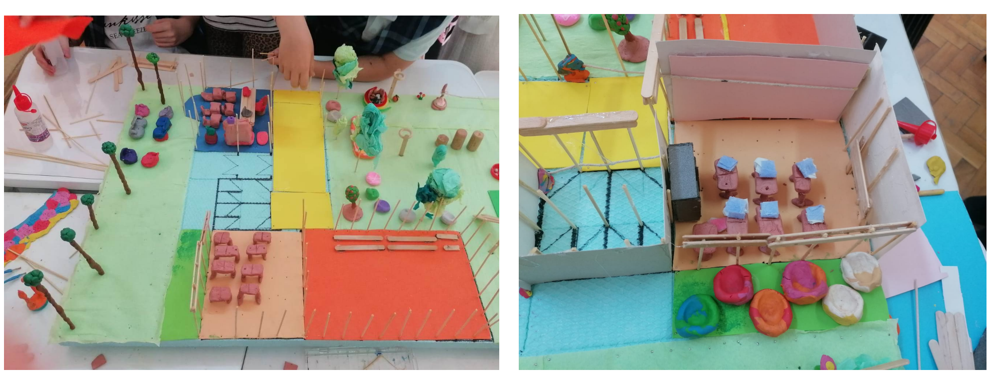

FIGURE 5. Works from the beginning of stage 4: assembling together all the elements

Stage 5 - Presenting the work and the result to others. "All for one and one for all"

The last stage involved the presentation of the models in a festive setting with all classes in Timisoara that participated in the program in the current year. As there was no time for everyone to present, the children decided who would speak and which part of the final object or process they would present. This is the last loop of the learning spiral, but even though the steps are similar, this time it's no longer about how to do hands-on, but how to present what we've accomplished. Integrating what they had learned into the group dynamic as well, surprisingly again the children made clear and quick decisions about who would represent them in public, this time with complete confidence that things would turn out well (perhaps also because the most demanding part had passed).

FIGURE 6. Stage 5: the model prepared for the final presentation

BRIEF ANALYSIS OF THE STAGES AND ROLES IN EXPERIENTIAL AND COLLABORATIVE LEARNING

The analysis of this learning spiral, which takes up the Kolb cycle for five times, initially building on previous knowledge and then step by step on the knowledge acquired at each stage is presented in table 1 - a sum of the stages presented in the previous chapter. The colors used refer to the degree of difficulty perceived by the tutors in the following aspects: experiential learning, collaborative learning and group dynamics (green - easy, yellow - moderate, orange - difficult).

TABLE 1. Learning spiral - analysis: types of learning and group dynamics

Stage	Experiential learning	Collaborative learning	Group dynamics
1	Theoretical framework – spaces; needs, special places	Individual; presentations in front of the class	All class; open talks
2	How to translate theory into design; understanding the layout	Discussions and differences of opinion	Different participation according to interest
3	Hands-on activities; transforming an idea into reality	Small groups (2-3 children) and medium groups (4-6 and 6-8)	Good dynamic in small groups; some tensions in medium groups
4	Hands-on activities; big model - the entire school project	Big groups (2 groups of 12-13 children)	Some tensions, but finally cooperation prevailed
5	Presentation of the work in front of other peers	The whole class with representatives	Very good; "all for one and one for all"

The process has been conceived as a gradual one, starting from theoretical aspects (observation of the environment and identification of needs), to their assimilation through two successive learning curves, then moving on to the practical aspects and the realization of the object, also through two learning curves, and finally to the presentation of the result which concludes a complete process.

Following the stages, one can observe in this spiral of learning a curve of increase and decrease, both in terms of the two types of learning pursued and in terms of group dynamics. In these types of complex group exercises it is important to control the following aspects: the dosage of the learning effort and the incremental increase in group interaction.

CONCLUSION

The project presented was carried out over three months, De-a arhitectura having only one non-mandatory hour per week. To achieve optimal results, sometimes two-hour sessions were combined. Beyond the theory, both types of learning - experiential and collective - offer the possibility to tailor methods perfectly adapted to the characteristics of the group, while still being challenging in every aspect.

For the tutors, the primary school teacher and the architect voluntary - also a university teacher, the process was particularly interesting and the coagulation effects at class level as well as the final result were beyond expectations. The analysis presented briefly in the previous chapter reveals that the most important issues to be addressed by the tutors in complex group projects that involves different types of interactions in order to achieve a successful project are the learning curve management and the care for how interaction takes place within the group, depending on its size.

Although this experiment on experiential and group learning was conducted with children aged 9-10, the authors believe that the issues are similar for other age groups when it comes to complex activities involving many different participants with different ways of thinking and carrying out different tasks within a project.

In conclusion, for children there is no such word as impossible, and once such a process of experiential and group learning is started, if well managed, the results show that it is really worth the effort to make this approach more widely used in both formal and non-formal education.

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