"Build and share your world"

Vesela Ilieva   Ivailo Ivanov

Private Language School "St. St. Cyril and Methodius"

Geo Milev Str 158, Sofia, Bulgaria

vessela@mail.bol.bg, iivanov@fmi.uni-sofia.bg

Abstract

It presents the results from a 3-year project work under the Socrates-Comenius program. The partnership includes schools from Bulgaria, Portugal, Lithuania and Slovakia. In this project, the children worked with Lego Dacta materials. The children built models of well-known objects (their home, school, favourite pizzeria, surfing school etc.), using Lego construction material. The built model is documented and filmed by the specialized Lego studio packet. Some of the models are controlled by computer (short Logo programs) using Lego Dacta Control Lab or Robolab. After that, they documented their own products and shared them with other pupils via Internet.

Keywords

Lego, school partners, computers, creativity, collaboration, European partnership

1. INTRODUCTION

In his book "The Grammar of Fantasy", Gianni Rodari writes: "A mind that is always at work is creative, a mind that always asks questions, discovers problems where others find satisfactory answers. It is a mind that prefers fluid situations where others only sense danger, a mind that is capable of making autonomous and independent judgments. But exactly because the imagination constructs only with materials from real life, it is necessary that children be able to grow up in an environment rich in impulses and stimuli to nurture their imaginations, and to apply the imagination to appropriate tasks."

Modern technologies offer the child that variety of stimuli Gianni Rodari writes about. When combining the computer's unlimited opportunities to experiment with the Lego work and the challenge of its games, we create an environment highly provocative for the children. In such environment students and teachers from Bulgaria[11], Portugal[12], Lithuania[13] and Slovakia[14] had a chance to work in the frame of the Socrates-Comenius project "Build and share your world" (September 2002 – June 2005). 46 pupils, aged   7 to 16, from those European countries were involved in the project.

2. OBJECTIVES and ACTIVITIES

The aim of the project was to develop children's thinking and knowledge about the world by putting children in the role of creators. The tasks of the children in the project were:

---

[11] Private Language School "St. St. Cyril and Methodius" – Sofia

[12] Escola Secundaria de Pinhal do Rei – Marinha Grande

[13] Vilniaus Gabijos gimnazija – Vilnius

[14] ZÁKLADNÁ škola – Bratislava

- to master the work with the Lego constructor set and use it constructively for implementing their own ideas;

- to learn how to manage and control Lego models using computers and writing simple Logo programs;

- to learn how to make photos of the created models and short movies on defined subject using prepared in advance scenarios, sets and actors made from Lego bricks

During the first year, the children were creating models on different themes such as my room, my home, my school, my street (Fig. 1), my town etc. Thus, they managed to learn how to create the environment in which they can materialize their own imaginations and ideas.

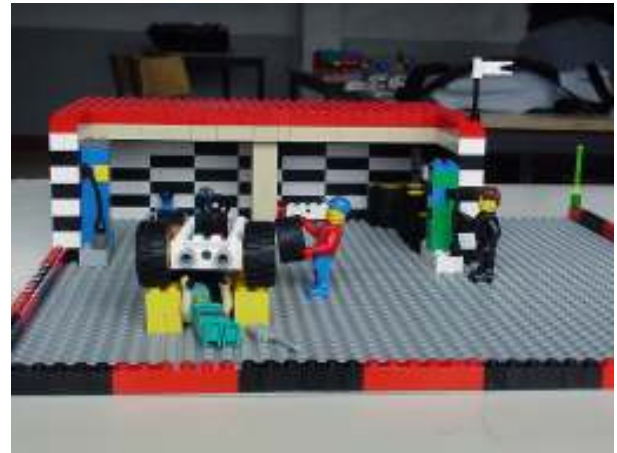*Figure 1.* Our street (BG, 8 y. o. students)

Figure 2. Boxes (PT, 13 y. o. students)

During the second year, the tasks for the children became more complex. They had to work on thematic projects in which some of the models were controlled by a computer, for example green house (Fig. 4); disco bar; Luna Park (Fig. 3) etc. These models were controlled by commands in Logo style. Such assignments helped the children to understand the mechanisms of the functioning of the models.

Figure 3. SofiaLand (BG, 10 y. o. students)

Figure 4. Greenhouse (SK, 12 y. o. students)

During the third year of the project, the children used Lego Studio to make photos and movies of their models. They created scenarios, built decorates and actors using Lego materials.

The active communication between the children from the partner countries played a significant role in the project. They discussed the project themes and the ways of realizing

them, exchanged information about the final product of their work (photos and films), exchanged and expressed opinions to the work of their partners.

The main activities done in the project are:

1. *Stimulating children's creativity using the sources of LEGO construction history and LEGO educational strategies*

The children were encouraged to gather materials that would help invent and improve the standard Lego construction blocks. While operating with the information of the specialized Lego Group web site, they developed different new thematic construction sets. The children solved a variety of educational tasks and many multicultural approaches between / among the children were the reason for an astonishing result.

2. *Intercultural exchange of constructed LEGO models*

The separate parts were interpreted by using non-verbal means – construction models, computer graphics, and photos. After completing each theme, an exhibition was organised as well as a multimedia presentation that showed the children's products both of our school and our partner-schools. During the presentation, discussions were carried out concerning the created models and products, the diversity of structure solutions while they were being made by the students at their schools. Through Internet, the photos of the models of the children were periodically exchanged at different stages. After they had been discussed in all schools, e-mails were sent with their opinions and then summarized.

3. *Complexing the tasks by development of robotic models*

"Fun and Games" was the starting topic that brought together pupils and teachers from all partner-schools for creating different robotic models. The national teams generated interesting ideas: "Luna Park" in Bulgaria, "Green house" in Slovakia, etc. The national teams used a variety of instruments. Bulgarian schools used Lego-DACTA Control lab and others – Lego Mindstorm. The ideas and solutions were regularly discussed inside the national team and among the partner schools. The next important step was to develop documentation on the finished Logo models using a video-camera. The work of the national teams was presented on a videoconference for a demo of robotic models. The partners discussed the models in a real-time environment.

4. *Integration of knowledge and skills by development of LEGO movies*

Complex creative activities were undertaken during the implementation of the task on Lego film development. The pupils and teachers from all partner-schools shared ideas and discussed opinions for a common project theme. They wrote scenarios and designed models and set-scenes by Lego, they also captured video fragments and edited movies. The results achieved were shared among the partners through the Internet. All the proposed solutions were discussed, spreading comments among the partner-teams.

3. ORGANIZATION

As working on the project, the Bulgarian school used lessons given by Lego construction and ITs. The additional classes, which are a part of the regular school curriculum, gave the opportunity to adapt these lessons according to the pupils` interests. Other schools, for which Lego is not an individual subject of the curriculum, organized their activities through the subjects "Technologies", "Information Technologies", or as optional activities.

The schools from Portugal and Lithuania (Portugal and Lithuania) did not have any experience in working with Lego before the project had started. A short workshop was

organised for these schools to teach them how to use Lego with students, how to work on thematic topics with standard Lego bricks, how to experiment with Lego materials.

4. OUTCOMES

The project team had the essential target always to reach a finalised product when children utilize Lego materials in solving different tasks. At the end of the project, the following was produced:

Picture material:

o moments of the children's work on designing Lego models;
o the Lego models designed;
o moments of the public presentation of the project results;

Video clips:

o completed models;
o shared scenarios;
o partner schools

Project calendar:

o 12 pages (A3 format) containing a photo of a Lego model per page (fig. 5);
o the names of the students-designers;
o the name and logo of the school;
o the national and EU flags;
o the logo of the Socrates Programme;
o the name of the project

The content of the calendar was presented in English and in national languages.

A multimedia CD "Build and Show Your Community": The CD contains all the photos of the models created by the children, short video clips presenting the models in English, photos and presentations of the partner schools and the children working on the project. [2]

Figure 5. Calendar

5. IMPACT

Several on-line meetings were organised during the project implementation. Teachers and pupils from all schools take part in them. They had possibilities to get familiar with the education process in the partner schools, to learn more about everyday life of students in different European countries.

While working on the project, the pupils learned more about Lego construction materials and different tools and techniques that can be used when designing models of real objects. They gained knowledge and such skills as utilising modern information technologies for creating multimedia projects.

During the work process on the particular projects, the development of the constructive skills of the children was traced, as well as their abilities for non-standard constructive decisions using standard materials.

The development of skills for communication in one international and multicultural environment is one of the most significant contributions of this project. The pupils learned how to share their ideas, how to cooperate in common tasks and support each other, considering their individual peculiarities to lead their joint effort to successful end-products.

In such an environment the development of children's constructive skills was traced. Non-standard constructive decision taking when using standard materials was trained.

The teachers` role was also changed during the project implementation. From a man who teaches and examines, he became the children's partner in a common activity. This new position gives freedom to communicate with the children and changes his work style in the classroom. The teachers had an opportunity to observe closely the children's individual approach and guide their progress.

The common work on a thematic project gives the teacher the opportunity to organise students in a team with clearly distributed tasks. Thus, he helps the children to develop their creative and communicative abilities when implementing the main idea.

The necessity of continuous exchange of materials and ideas among the project partners demands keeping correspondence between all the participants (teachers and pupils) in the English language. Such an approach stimulates the development of communication skills with the use of modern methods of telecommunication.

Example: Bulgarian, Slovak and Lithuanian schools have done video conference via Internet on 20 May 2004. Pupils from one country show their Lego models to pupils from others countries and explained what they were.

Sofia: This is our mad house in "SofiaLand".
Sofia: Did you see it?
Bratislava: We see.
Sofia: This is our spinning ride.
Sofia: This is a 50 meter tower that we have in our country.
Bratislava: Very nice.
Sofia: This is our spinning wheel and all of our rides are connected to the computer and we move it with a special program.
Sofia: This is made by a 4-th grade and spins very fast. so fast that when it spins you can see a image.

According to the project action plan, two or three teachers from each school had to be involved. However, more   Arts and English language teachers were involved as consultants. The collaboration among the teachers from the partner schools was extremely active and beneficial. The activities done within the framework of the project revealed the potential of modern technologies to enrich the methods of teaching.

Parents accepted   the participation of the children in the project performance with great satisfaction and interst. They were invited to attend the exhibitions and multimedia presentations. Pupils and teachers presented their work to the guests from the Ministry of Education, deans and lecturers from Sofia University.

6. Dissemination

During the week of Comenius (10-17 November 2003) the work on the project and its results were presented on two of the Bulgarian TV channels (bTV and BBT, 11 November 2003); at the fair of the Bulgarian Association of Private Schools (March 2004); on the day of Information Technologies and Lego constructions as a part of the "Cyril and Methodius" days of our school (11-24 May 2004); at a press-conference of BTA, concerning participation of the private schools in European educational programmes (10 June 2004); in the third National Workshop "Working with computers and IT in the primary school" (11-12 June 2004) [3]; in the Bulgarian National Radio programme titled "European Projects"; at the informatics conference "Infovek" (October 2004, Slovakia) [4]. Current information about the project can be found on the school web pages [5], [6], [7], [8].

REFERENCES

1. http://europa.eu.int/comm/education/programmes/socrates/comenius/index_en.html
2. http://comlego.hit.bg
3. http://www-it.fmi.uni-sofia.bg/kids/teachers.htm
4. http://www.infovek.sk
5. http://kmschool.hit.bg
6. http://www.esec-pinhal-rei.rcts.pt
7. http://www.zs-lazaretska.sk
8. http://Gabija.w3.lt