

Co-operative parent-child learning:

In computerised technological environments

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Abstract: The paper describes parent-child interactions within two computerised and technological environments - the internet Forum and LEGO-Logo. Courses in LEGO-Logo were held over four years for sixth-grade gifted children, with the willing participation of their parents. LEGO-Logo lends itself to and allows for a rich choice of activities in various fields, by project-oriented teaching. During the last two years an internet Forum, in which they could present questions, suggestions, and ideas, was introduced. The findings show unequivocally that these courses help to foster and cultivate thinking and creativeness of the participants, as well as establish close familial relations and bring about better understanding between parents and their children. Applying the internet in order to help learning was a little disappointing, and there is a need to study more about how to improve it. Nevertheless, the idea that parents and children could learn together co-operatively has become a reality.

Key words: co-operative learning, team learning, parent-child relationship, learning environment, computerised-technological environment, project-oriented teaching, gifted children

1. INTRODUCTION

A child's world is reserved and restricted, kept at a distance from the adults' world. Many parents are too busy to be in contact with their children. Thus, it is often observed that children who grow up alone are under the influence of their peers. Consequently, we hear about crimes committed by frustrated youngsters who may be motivated merely by schooling failures.

Studies show that strengthened connections between children and their parents improve children's academic achievements (Bass, 1994; Poirot and

Robinson, 1994). A very wide and comprehensive study in the United States found that such strong and supportive ties help children to prevent risky behaviour, such as suicide, violence, and substance abuse (Schroeder, 1997). Thus, during previous years some interesting projects have been conducted to support the significance of parent-children relations. One of the above was undertaken through workshops organised for whole families of one school (Goodman, Sutton and Harkavy, 1995), while another provided computers to the students' homes with printed materials for use by parents and their children (Fullerton, 1995).

Now, let us think for a moment about teams of children and their parents learning together. Is it possible? After all, most children do not see their parents go to school, or sit in front of a teacher. Nevertheless, will such collaborative learning be worthwhile for children and their parents? How is it possible to use the internet to improve learning and understanding?

There are very few learning environments where team working is so intrinsic as it is in LEGO-Logo, which almost does not depend on any teaching method. Does it affect parent-children interactions as well? The following paper will give partial answers to these questions and will deal with six subjects:

1. A description of the LEGO-Logo system;
2. The educational approach;
3. The co-operative parent-child learning process;
4. Records of the follow-up activities at home;
5. The influence of shared learning on family relationships;
6. Using the internet Forum to foster learning processes.

2. LEGO-LOGO SYSTEM DESCRIPTION

LEGO-Logo, as its name indicates, is a combination of Technical-LEGO (the technological aspect) and of Logo (the computerised aspect). The combination of these two has a much greater effect than each one by itself. Recent findings (Jarvinen, 1998; Krumholtz, 1998) show that it is a suitable learning environment for designing technological systems and control programming. It encourages diversity in several ways: in project themes, working styles, entry paths, and with many different types of design: software design, mechanical design, and structural design (Resnick and Ocko, 1991; Carlsen, 1998). Thus, LEGO-Logo offers an abundance of activities within a well-defined framework, where everyone can find something personal and interesting to do, and thus can learn.

Inclusion of sensors in LEGO-Logo allows the transfer of information to-and-fro between LEGO and Logo through an interface-box. As a result, one can build LEGO-machines, operated and controlled by Logo programs.

3. THE EDUCATIONAL APPROACH

Any learning environment that allows activities in team projects can perform an astonishing positive change in the learning process (Denton, 1994). LEGO-Logo, like other active co-operative learning environments or methods, fosters respect for learning (Graves, 1993).

Learning processes are reinforced by feedback from computer programs, LEGO models, other teams, and the teacher. During study in class, students organise themselves in teams. Each team chooses an authentic project, plans, builds, and carries it out accordingly. Teaching, in this environment, is performed by project-oriented learning. Thus, rather than frontal-teaching, the teacher assists with problem-solving, by guiding questions and directing hints. The teacher may also be a catalyst or may introduce new ideas (in technology, programming, mathematics, etc.) such as the inverse ratio between motor speed and its strength, or how to structure a program. Teaching is performed by conversations with each team separately and by whole class discussions about general ideas, which may be common to all.

In LEGO-Logo students have to share, talk, debate and relate one to another. They learn how to work with others and how to help each other. Hence, this system has a positive effect on classroom social interactions. The students learn to work co-operatively in groups as well as use computers better and plan shared authentic projects (Barak, Waks and Doppelt, 2000). Does it affect parent-children interactions as well?

4. CO-OPERATIVE PARENT-CHILD LEARNING PROCESS

The LEGO-Logo course described here has been used for four years in the spirit of Papert's book 'The connected family' (Papert, 1996). The course was designed for sixth-grade gifted children with their parents. The sixth-grade students used to study once a week in a school for gifted children located in a central college, and during the rest of the week they attended regular schools in their regions. The whole year course was organised and supported financially by that school. The course teacher during the first two

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