

Theme: TECHNOLOGY RESOURCES IN SUPPORT OF TEACHING

Titel: USING LEGO DACTA TECHNOLOGY AS AN AGENT FOR PROBLEM SOLVING

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BACKGROUND

Rösjöschool is situated in a suburb of Stockholm, Sweden. Our pupils are between 6 and 12 years old and there are about 375 pupils in the school.

The suburb was built in the late –50´s and most children live in apartments. Almost 50% of our children are from imigrant or refugee families and have Swedish as an additional language. In the last few years Rösjöschool has been chosen by families from other areas and 10% of our pupils are now travelling each day to get to our school.

One of the reasons our school is chosen is because of the teaching of technology and the computer skills children achieve. Our pupils have access to computer and Internet. They work in programs like MS Word, PP and Publisher. They all have their own e-mail address and good connection to the Internet. They know how to scan in a picture and they can use digital cameras.

LEGO DACTA PROJECT

Sweden is a country, where computerskills are highly wanted. Schools in Sweden can´t educate enough engineers to our industries. To be good in technology is a ticket to higher education and to a good job and living. We want to give our kids that opportunity. One way to achieve that aim is to use Lego Dacta as an agent for problem solving.

Lego Dacta is a material in technology education. Children learn how to build models and include sensors. They then connect the model to a computur by an inter fall cabel. With help of icons they can make a program that make the model work the way they want it to. We have used this material for a couple of years.

AIMS AND OBJECTIVES

- 1 We will integrate learning through
 - A design process requiring student problem solving activities
 - Activity based and project driven modules
 - Learning by Doing (Hands On)
 - Independent and Small Group Activity
- 2 Develop teacher and peer evaluation

- 3 Ensure that set of outcomes for this technology project is concerned with pupils in school developing and understanding of the evolution of technology – technology as a product, technology as a creative process and technology as an activity that is related to other disciplines.
- 4 We wanted to find out if a child learn a strategy to solve a problem like make a robot move the way the child wants – is it possible to use that problem solving strategy to other similar situations?

We wanted children to

- be aware of "real-life" contexts in which subject based knowledge and techniques are used, and be able to analyse appropriate problems using them
- be able to communicate, in appropriate media, the outcome of such an analysis
- be aware of the benefits and problems of working with others in a group
- be able to acquire a range of "transferable skills"
- be challenged to the limits of their abilities, for that is when optimal learning occurs
- all benefit from the experience

All children in year 5 and 6 had the opportunity to make simple set models and connect that model to a computer to make it move.

Those who wanted could apply to an after school technology class. Boys and girls in separated groups. Each class (10-12 pupils) divided in smaller groups of 3. They were exposed to a problem. We wanted to give problems they could find in every day life.

We wanted the children to

- Research a particular problem
- Design and make models
- Use system components to design and build machines
- Report on a particular problem
- Evaluate and report the results of design solutions

The Lego Dacta gives inspiration and is easy enough for the children to use. They connect their built creation to a Lap Top and the language they use is a symbol language, that enable them to do it without being experts in English, which is the language for most computer programs in Sweden.

Each child kept a diary, where they recorded their work, the discussions with fellows and staff and experiences they made. The teachers made the same. They wrote down when and why they gave help.

In the end of the project the children invited family and friends for an exhibition, where they told about their invention, their struggles and the outcome and showed their models. Part of their work was published on our homepage.

This project gave not only the participant children a but also the whole school a bigger interest for Educational Engineering.

The way for an idea to be physical is over a computer screen.

- To visual what you think
- To make what you think visual
- Will the robot do what you wanted it to – what you thought it would
Probably not the first time. A conceptual conflict between what you think will happen and what happens

The project was also a teacher training project

- to identify particular pedagogical factors and aspects of teachers' choices in deciding when, and when not to intervene in offering additional information which might be linked with increased pupil attainment
- Knowing what to teach knowledge/principles
- Understanding pupils
- Knowing how to present the problems and content to pupils
- Bringing about change
- Teaching behaviours – lesson clarity, instructional variety, teacher task orientation engagement in the learning process

CONCLUSION

By letting the pupils use their creativity in an interactive learning environment we hope to increase their interest in technology, for now and for future education. We hope they will choose science and technology and become the engineers and entrepreneurs Sweden need.

Learning together in discussion and intervention and by asking questions, guided by a teacher make a child construct new knowledge (Vygotskij).