Sweden

Centralskolan

This project focuses on math and science learning of students in grades 6 to 9 (age 12-16). The objective is to foster entrepreneurial learning and assimilate mathematics in a natural way into the students' daily work. Students are supposed to have the opportunity to take initiative and responsibility and work both independently and with others. They work mostly in traditional same age classes, but there are smaller groups for some subjects (e.g., crafts). If necessary, students participate in special education, particularly in the core subjects. E-mails, text messages and a contact book are used for teacher-student-communication. At the end of a project, the students evaluate whether the work increased their interest and skills by means of questionnaires.

Main Focus of Innovation: CONTENT

General Information

Name of the ILE: Centralskolan

Location/Address: Jon Jespersgatan 28, 467 80 Grästorp

Website: http://gastorp.se/

ILE submitted by: Swedish National Agency for Education

Rationale

Why do you suggest that it should be included in the project? How does it respond to 21st century learning challenges?

In a teaching situation based on the pupil's own experience, interests and knowledge, a life-long learning process can be developed. The use of modern technology is an example of how teaching can be enforced and used to exploit the interest of the pupils for a proactive and sustainable learning. In a teaching situation, which is based on pupil's prior knowledge and interests, conditions to develop competencies for the future, are established. An active work is being carried out in the municipality of Grästorp in specified areas of mathematics and entrepreneurial learning to raise the pupil's knowledge and abilities with the help and support of IT and technology. This work is based on the teachers observations that pupils show more knowledge and interest in a learning environment where the use of IT and technology subjects are taught.

Learning Aims / Intended Learning Outcomes of the ILE

What are the core learning aims and which knowledge, skills or attitudes are to be acquired? (These may include outcomes related to learners' social, interpersonal, or meta-cognitive development)

National level:

Sweden are on a national level interested in investigating how the learning environment in schools can help students to develop an approach that promotes entrepreneurship. One of the questions is therefore; how are teachers working in their classrooms to stimulate students' creativity, curiosity, self-confidence and willingness to test their own ideas and ability to solve problems? These are skills that form a foundation for entrepreneurship, which are underlined in the new curriculum. The curriculum also states that students shall have the opportunity to take initiative and responsibility and develop their ability to work both independently and with others. Participation in the ILE will enable us to examine how Grästorp formed a learning environment that provides conditions for innovation.

In a wider sense participation in the project gives Sweden the opportunity to compare our school system in relation to other countries as well as to broaden the understanding and learn how other participating countries are working with the same issues. The ILE project also gives us an opportunity to revitalize the discussion and understanding about the perception of learning environments and how it takes part of the learning process.

Municipality/project level:

The primary goals of the work in the municipality of Grästorp are to increase pupil achievement in mathematics and to take advantage of pupil's own interest and knowledge in science and technology. The teachers shall also improve their ability to use modern technology with a didactic approach to support the teaching of mathematics. The pupil's skills in areas as algebra, functions and geometry shall increase.

The school on its teaching of mathematics should aim to ensure that pupils develop:
- their ability to understand, carry out and use logical reasoning, draw conclusions and generalise, as well as orally and in writing explain and provide the arguments for their thinking.
- develop their ability to formulate, represent and solve problems with the help of mathematics, as well as interpret, compare and evaluate solutions in relation to the original problem situation.
- develop their ability to make use of pocket calculators and computers.

Learners

Which group(s) of learners is it aiming at? Who is eligible to take part? How many learners are there? What are their ages?

The project in Grästorp includes 286 pupils in grades 6-9. The pupils are 12-16 years old.

Facilitators

Who are the teachers/facilitators? Who are the leaders? What are their professional backgrounds? What are their roles?

6 teachers are participating in this project. The teachers have relevant education for the job. The project leader is **Nina Svensson**. In the school there are also housekeepers, electricians and bakers working.

Organization of the ILE

How is learning organised? How do learners and facilitators interact? What kind of pedagogy do they follow? What curriculum is used?

At the Central School of Grästorp municipality learning is organized through teacher instructions and homework. A typical school day starts at 8 am and ends between 2.20 pm or 3.20 pm, Monday to Friday. The lessons are between 40 to 80 minutes long and students have about 5-6 sessions per day. They have 16 different subjects. The school year comprises two semesters; fall semester lasts from August to December, and spring semester from January to June. Students attend school for nine mandatory years until they are 16 years old.

The teaching is most often organized in same aged classes (25 students) with one teacher per class. Some subjects, such as crafts, have smaller groups of students. If necessary, students go from class to participate in special education. This occurs primarily in connection with the particular core subjects on which the time for special education teachers is a priority. Sometimes the special teacher attends the regular class with focus on pupils with special needs.

The school and education follows the national curriculum.

Learning Context

In which context does learning take place? What does the physical learning environment look like? Are community resources used to facilitate learning and how?

Teaching is carried out in classrooms with a few extra, smaller, study rooms. Most teaching is teacher-led, with some variation of more cross-cutting themes, where students work more independently with fact-finding and presentations in different ways. Some teachers' starts class with coherent teaching for the whole class and then lets students work in different ways with the new subject matter. Here learning takes place in different ways; individual work, group discussions, review questions, group work followed by presentations etc. The teacher supervises the students who have questions and ask for help. Teaching is usually organized in such a way that the students contribute with their thoughts, ideas and knowledge. The students can, to some extent, control the content of the teaching, but they have the most influence over accounting means and methods. Reports and tests are adapted to students' needs, often given the opportunity to carry out tests both verbal and / or in writing.

In addition to the daily contact between teacher and student, pupils in some classes connect via a contact book. The primarily purpose are questions regarding social issues and working atmosphere. Other ways for students and teachers to keep in contact are through e-mail and text messages on cell phones.

On some occasions every academic year ordinary teaching patterns are broken in favour of work with a greater theme, usually for all the students of a certain age. Here, students are able to make greater work than usual in some areas of their own interests or needs. Work is also done in groups of students that are not usually in the same class. The school also has an ambition to increasingly work with a perspective of entrepreneurial learning. The goal is to let pupils' own interests and dreams take more place than normal and to some extent let them control the content of teaching.
Parents are not involved in the project.

History of ILE

Who initiated it? For what reasons was it started and with what purpose? Have these changed since?

The Swedish school system is currently undergoing a comprehensive reform. New curriculum, new grading system and several national tests are just a few examples of changes in the national school system. In addition, there are numerous major government initiatives to improve teaching and raise student achievement, particularly in mathematics and science.

The background for these changes is several. Sweden has for some years shown declining performance in international studies (such as PISA and TIMSS), especially in mathematics and science. In addition, activities in the classroom in several subjects have increasingly come to be characterized by students' own work and less of activities lead by the teachers.

The government has also in the new curriculum, which comes into force in autumn 2011, highlighted entrepreneurship as an approach that should permeate the entire Swedish school system. Some municipalities are already working with entrepreneurial learning and Grästorp is one of those municipalities.

The schools in Grästorp have, for some years, been working to develop entrepreneurial learning in many school subjects. During the academic year 2009-2010 a development project in mathematics is carried out where focus is to assimilate mathematics in a natural way of the pupil's daily work – also in other subjects. The pupils have showed that modern technology is something that they are interested in and feel comfortable with. Noteworthy is that many of the pupils, which is hard to reach with traditional teaching, shows more interest and pays more attention in class when modern technology is used. It is therefore important to pay these pupils some extra attention when using modern technology in class, perhaps foremost in math class. Many teachers feel that they do not themselves have enough knowledge of relevant and modern technology and thus cannot enhance pupil's interest in technical aids. The teacher's goal is to take a didactic approach in which they intend to use digital aids and modern technology in the teaching of mathematics.

Funding of the ILE

How is it funded?

The project is funded by government grants and by grants from the EU.

Learning Outcomes

What are the learning outcomes achieved by the ILE, including academic, social, interpersonal and meta-cognitive outcomes? How is learning assessed?

We assess student's work by tests, oral presentations and written assignments. The assessment is done both in a summative and formative way. The formative assessment is often done in the form of diagnosis or in oral form and is the basis for planning the coming teaching in the class. The summative assessment is usually done through written tests, as well as oral presentations and group work also occurs. Students often receive a briefing on the knowledge objectives for each knowledge area before work is started, and are then evaluated against these.
Students receive written reviews of their performances each semester throughout compulsory school and receive formal grades in school year 8 and 9 (when they are 14 and 15 years old).

At the end of the project the pupils will answer a questionnaire that evaluates how the project has seized their own interest and skills. The national tests in grade 9 will be analyzed in order to make a comparison of knowledge in algebra, functions and geometry. Teachers will be interviewed and the teaching will be observed.

The interviews and observations will be analyzed to find out if teachers use technology to support teaching and also to examine if teachers experience a greater expertise in technology.

Documentation describing or evaluating the ILE

Is there documentation on this learning environment? Is there a website? Films? Research reports or evaluations? Other forms of documentation? (please supply references or links)

In addition to the previous question, the project is also documented with notes from meetings.