



Robots aid in exploring history and literature

Ireland

Project name:

Don Quihote: Impossible Dreamers

Teacher:

Tommy Maher

School:

Scoil Naomh Fiachra, Kilkenny County

Learning areas:

Language, Science, Mathematics, Art, Music, History

Objectives:

Engage pupils in personally meaningful, open-ended scientific inquiry, and make scientific exploration more cross-curricular by merging it with humanities

Outcomes:

Greater sharing of knowledge and of new discoveries among diverse groups of pupils

“Students have been enabled to learn about complex problems, to develop strategies in solving these problems, to develop high order thinking skills, to work co-operatively, and to present the project and their findings.”

— Tommy Maher, Scoil Naomh Fiachra

This uniquely named project was a control technology project, trying to use a story as a basis to investigate concepts of feedback and control. The objective was to explore how robots can mimic aspects of human or animal behavior, engage pupils in personally meaningful, open-ended scientific inquiry, to make scientific explorations more cross-curricular by merging them with humanities, and to devise project model for other schools.



Situation

Primary schools in the Irish Republic are currently engaged in phased implementation of a new curriculum, covering eleven subject areas, which presents an integrated proposal, stressing out the importance of 'interconnectedness of knowledge'. Many teachers are reluctant to devote blocks of time to activities, especially outside core areas of language and mathematics, fearing this will adversely affect their ability to implement all discrete curricular areas. Scoil Naomh Fiachra is located in a rural area in the north of County Kilkenny, in the south-east of Ireland, and currently there are three teachers and 58 pupils attending.

“This (way of working) leads to greater sharing of knowledge and of new discoveries.”

— Tommy Maher, Scoil Naomh Fiachra

Objectives

This project’s idea was to explore integrating scientific exploration across the curriculum in an interdisciplinary way, while weaving creative use of ICT into everyday teaching and learning. The basis of the project was built on the school’s experience with using control technology (since 1999) to create an animated robotic version of a novel.

In the process pupils and teachers were working together to select, study and discuss the relevant piece of literature and break it down into characters and events, which can be animated with robots. This in turn provided pupils with a range of personally meaningful problems to solve by means of scientific and mathematical exploration.

The construction, programming and animation of robots were divided among a number of groups, selected on a mixed age, mixed gender and mixed ability basis. The aim of the project was to promote the integration of science and mathematics across a range of curricular areas, and to use literature and narrative as a vehicle for this integration - a ‘science meets the humanities’ approach.

Outcomes

The work to date found that the optimum outcomes, in terms of peer tutoring and co-operation within and between groups, occur when groups work on separate parts of a project, but where all the parts are integrated to complete the project. In this way each group’s success is interdependent on the success of the other groups. “This leads to greater sharing of knowledge and of new discoveries” says Tommy Maher, principal of Scoil Naomh Fiachra.

The project introduced authentic scientific inquiry and creative problem solving into the study of literature and the visual arts. While ostensibly illustrating a story, pupils were designing, programming and debugging robots and were engaged in work analogous to that of ‘real’ scientists. Work of the pupils was guided and coordinated by teachers, assessing the educational value of the project and using the findings to develop ideas which can be replicated, adapted or even improved by other schools.

“There are several advantages that I have seen for our pupils. They have been enabled to learn about complex problems, to develop strategies in solving these problems, to develop high order thinking skills, to work co-operatively, and to present the project and the findings. A well known song from the musical ‘Man of La Mancha’ is ‘Impossible Dream’ and the more we worked at trying to achieve what we had set out to do, the more it occurred to the children, and even teachers, that we were very like the main character in the novel – impossible dreamers. Fortunately, the project ended with success”, says Tommy Maher.