

TERECOP-oriented Teachers' training course Istituto Tecnico Industriale 'G.Marconi' – Rovereto 6,8/9/2011 Short Summary

Organizer: ITI 'G.Marconi' – Rovereto (TN, Italy)

Components and collaborator of the TERECoP group involved: Michele Moro (Univ. of Padova), Gianfranco Festi (ITI Marconi Rovereto).

In preparation of the activities of the 2011/2012 scholastic year, all the teachers of two classes were invited to join to a 2 days teachers' training course on Educational Robotics. The trainees were therefore teachers of different subjects including humanistic curricular disciplines. We decided to structure the course following the TERECoP curriculum, tailored to the specific needs of the trainees and to the allocated amount of time. The robot kits used were, as usual, LEGO Mindstorms NXT. Almost none of the trainees has previous experience with this kit and in general with educational robotics.





The contents of the training course are so summarized:

1st day (6/9/2011)

- Methodological introduction

What we refer as Educational robotics, its relations with IBSE, lifelong learning, team work, project based learning, constructivism/constructionism, didactical praxeology

- How to start

The kit, the construction and the programming; the tribot, straight line motion

- Emulation of a metro line – part a

A metro line with fixed distance stations, time and angle as controlling parameters, integer calculation

- From arithmetic to algebra

The introduction of variables; how to introduce negative numbers

- Emulation of a metro line – part b

Stations with variable distances, the *My block* feature

- The turtle robot

Curved motion, steering; the equivalent of the Logo four basic commands; reproducing a regular polygon of n edges

2nd day (8/9/2011)

- Field data acquisition

How to use the robot as a data logger; example of an accelerated *Motor* command; other examples: the spring, the 'natural' accelerated motion on a slope

- Emulation of a metro line – part c

Stations with unknown distances, the use of light and rotation sensors; the state diagram as a design tool

- The robot as an experimental platform

The shadow, the Doppler effect, the realization of a motion profile, other examples

- Teamworks

The trainees are requested to design a didactical unit incorporating the use of robots. A representative of each group illustrates the designed unit.

1. The relationship between the *Power* parameter and the motor speed
2. Coloured jingle: how to code a sound as a colour
3. The problem of the statistical analysis of logged data
4. The slope
5. Landslides

Each group has also been requested to prepare a project table with the following items: Operating phase, involved knowledge, tools, actions by the teacher, actions by the student, expected results. The unit is described in terms of operating phases and, for each one of them, the other items are to be detailed.

- Conclusions

The TERECOP project objectives.