

Racing Academy

Racing Academy is a racing videogame built on an advanced physics simulation engine. It is intended to support an online community of learners' increased familiarity with engineering concepts, through racing and engineering realistic virtual models of cars. Online facilities allow teams and communities to collaborate and compete on the web. A prototype has been trialled with older teenagers, and there is scope for it to become a multi-generational learning environment.



Team

Lateral Visions
Futurelab



Drag race

Outline

Racing Academy has been developed in partnership between Futurelab and Lateral Visions, a small computer games start-up with previous experience developing mainstream racing games for a major international developer. Lateral Visions has created a real-time vehicle dynamics system more advanced than anything currently being used by mainstream games developers. Capable of recreating the experience of driving any automobile, it accurately models in real-time how cars behave and react. It has been developed as middleware to allow other developers to create realistic driving simulations around it, and could be used in the automobile manufacturing industry as well as in the commercial computer games sector. At present this technology is exclusive to Racing Academy.

This underlying game engine has the capacity to allow users to manipulate over 1,000 parameters of their vehicles. Students have to build and maintain their vehicles in order to enter and compete in races, monitoring and analysing their performance using data from a variety of telemetry outputs, competing as teams of practitioners within a virtual community of engineers and drivers.

The current prototype was developed and trialled with GCSE students at a specialist engineering school, although a full version will be sufficiently scalable for use at A-level and university level. It

will also be possible to enter Racing Academy outside school time – it will be a persistent virtual world perpetually available over the web, whose students will be able to come and go according to the demands of their teams.

Futurelab used the project as a testbed for exploring the development of online communities in multiplayer games. The existence of these communities around mainstream games is well documented, but to date there have been few attempts to investigate how online community-building tools can support learning. To address these ideas in the prototype stage of the project, Futurelab explored young people's use of online messageboards to complete a variety of engineering- and game-related tasks, included exchanging and assessing vehicle data, evaluating each others' ideas and arguments, and analysing game interface design.

The final prototype fuses this messageboard functionality with the racing and engineering game to create a rich simulation of participation in a community of engineers, mechanics, managers and racers. It is envisaged that in time the Racing Academy community could be populated by aspirant team bosses, expert engineers, apprentices and motor racers, and that, as in mainstream online gaming, these participants might span across age groups and levels of experience.

Learning and Research Objectives

In our research on Racing Academy we asked:

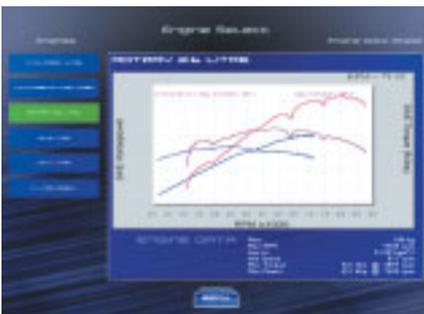
How can we exploit the opportunities offered by advanced simulations and by online communication facilities to create a complex, challenging and engaging learning environment?

As with all Futurelab projects we were also interested in:

- 1 What this project tells us about the best ways of designing educational digital resources.
- 2 What this project tells us about how learning processes can be transformed through use of these tools.
- 3 How this project helps us understand the potential of next generation technologies to create intrinsically motivating and engaging learning experiences.



Circuit race



Gear ratio options

Next Steps

Racing Academy coincides with increasing interest in engineering in schools. The establishment of 26 specialist engineering schools in England and Wales has put engineering firmly back on the educational agenda. The current focus is not on engineering as an isolated vocational syllabus but as a cross-curricular approach to enabling understanding of the relationships between design and technology, science and mathematics. Racing Academy, too, requires users to manage and manipulate information from disparate domains.

Currently, Racing Academy is being embedded in the Department of Mechanical Engineering at the University of Bath, in the BTEC course at Barnfield Further Education College and in the A level Physics course at Penwith Education College, as part of work funded through the JISC Innovations Fund. A series of design workshops with students and teachers, followed by trials in location, has identified modifications to Racing Academy that extends its ability to support learning across science and engineering curricula. Penwith and Barnfield have conducted a mapping exercise to show Racing Academy's syllabus coverage. The University of Bath are also putting their own resources into developing teaching materials to support undergraduate teaching with the game.

It is envisaged that the prototype will also be trialled in out-of-school contexts, with the online message-boards opened up to allow distributed working between young people in different geographical locations.

This idea was submitted to Futurelab's Call for Ideas programme by Lateral Visions.

Research and Development Process

Futurelab researchers worked with GCSE engineering students and an engineering teacher as co-designers, who helped to shape the online community aspect of the project and evaluate the challenges of the game.

A prototype is available to download from www.futurelab.org.uk/showcase/racing_academy/racing_academy.htm

Contact

Futurelab: Ben Williamson,
ben.williamson@futurelab.org.uk

Lateral Visions:
www.lateralvisions.co.uk

Futurelab
1 Canons Road
Harbourside
Bristol BS1 5UH
United Kingdom

tel +44 (0)117 915 8200
fax +44 (0)117 915 8201
info@futurelab.org.uk
www.futurelab.org.uk