Leaving/Junior Maths On-Line

It is a common complaint that not enough Irish students are getting on well with mathematics in Secondary School and consequently there is a "maths. shortage" at Third Level and in the country's work force. The objective of this suggested project is to test whether the subject could be made more attractive and interesting by means of on-line software. Specifically, the project involves specifying, designing and implementing a prototype of such software, and validating the prototype by having a sample of students evaluate it.

The idea is that it should be possible to create a dynamic on-line alternative (including interactivity, graphics and sound) to regular mathematics text books. There are many existing resources on-line that could be used as starting points or as sources of ideas. For example, the site http://www.calculusapplets.com/informalcontinuity.html looks quite attractive and could well be used as a basis for building components specific to the Leaving or Junior Certificate.

A key and unique point of the project is that it should be based on the published syllabus for the chosen course (Leaving Higher or Ordinary, Junior, Applied Maths, etc) http://www.education.ie/robots/view.jsp?pcategory=17216&language=EN&ecategory=17313&subject=17625.

There are several other on-lines sites, such as

http://www.tsm-resources.com/mlink.html#usa
http://www.teachnet.ie/omcconway/
http://www.sip.ie/sip069/Documents/mathematicspage.html

that might give ideas on how to proceed.

It could be particularly interesting to include use of a symbolic package (e.g. maybe http://sourceforge.net/projects/jscl-meditor/) to show examples of calculations in algebra etc, and to allow practise.

It would be interesting to add biographical details. For example,
- Galois for groups (http://images.google.com/images?hl=en&source=hp&q=Galois&um=1&ie=UTF-8&ei=Ase4StbDCYTm-QbyvrS4BQ&sa=X&oi=image_result_group&ct=title&resnum=4)
- Cardano on early algebra (http://www.gap-system.org/~history/Mathematicians/Cardan.html)
- Gauss on linear algebra and many other things (http://www.idsia.ch/~juergen/gauss.html)

Of course, one could also include worked-out solutions to exam questions but the software is not intended a grind tool!

A particular outcome of the project would be guidance on how a full system might be deployed. For example, how would it be hosted, would users need to install software on their machines, would users need to have PCs or could the system be run on mobile devices, etc.