This project was undertaken at Coventry University during the year 2004-2005 with the aim of overcoming the difficulties of teaching and assessing a very large group of students with wide-ranging experience and ability. The programs developed have been used with level one students in Coventry Business School for two consecutive years with great success. Each year, approximately 400 students take a mandatory quantitative methods module which they must pass in order to obtain their degrees. The spreadsheet programs written for this project serve to develop the students’ spreadsheet skills as well as easing the burden of teaching them and marking their assignments.

The spreadsheet macro generates a seemingly endless sequence of different critical path analysis problems in the form of a table of activities and their predecessors. Students are required to construct a spreadsheet model in the form of a network, displaying earliest and latest times, floats and critical activities. The spreadsheet model must contain appropriate formulae so that it will update correctly if any durations are changed, enabling the model to be used for “What if … ?” analysis in traditional Operational Research style. The macro then checks that all the formulae give correct results (making allowance for the choice of different formulae that anyone might reasonably think of using) and also deducts marks for poor presentation (e.g. crossing or backward-pointing arrows).

Two different forms of the spreadsheet macro have been produced. The first provides feedback, so that students can practise and learn from their mistakes. The second gives no feedback, but prints out a sheet of coded information for the lecturer, showing exactly where mistakes have been made and the mark calculated by the program. Students start by using a tutorial spreadsheet with step-by-step instructions to teach themselves how to construct a spreadsheet model for this kind of network. Then they can use the first spreadsheet macro in their own time, constructing as many different network models as they find necessary in order to gain confidence that they can do it correctly. The second spreadsheet macro might be used under test conditions to ensure that students are submitting their own work (although most university assignments are not subject to this level of rigour).

These spreadsheets and others previously developed for computer-aided learning and assessment of critical path analysis can be downloaded from:

http://www.mis.coventry.ac.uk/research/or/bmb_sheets/cpa.html

(Please note that, for security reasons, these spreadsheet macros cannot be run directly within Internet Explorer – the spreadsheets must be downloaded to your computer first).

Student feedback was positive, showing that students enjoyed using these spreadsheet programs and considered them useful for improving both their spreadsheet skills and their understanding of critical path analysis.

Further details of how the spreadsheet programs work are given in the paper by Baker [1], which can be viewed on-line at:


Reference