

Computer Based Learning for Architecture Students; a methodology for evaluating the teaching and learning

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Abstract

The paper describes a methodology applied to the production, and evaluation of a computer based teaching package. In producing multimedia materials for teaching or for presentation, too much emphasis is sometimes given to the beauty of the images while not enough thought is given to the structure of the material. Is the student or "viewer" led through all the most important information? Can the use of computer based learning improve the quality of the teaching and learning experience? These issues are addressed, using as an example the production and testing of a package designed to complement a course on History of Scottish Architecture intended for senior students and especially to emphasise the Scottish context for exchange students. The package describes Linlithgow Palace in Scotland, showing how the contemporary political links between the Scotland and Italy were influential in the development of Renaissance architecture in Scotland.

1. Introduction

Research into learning technology has been conducted for many years. The main aim has been to look at it from the point of view of shifting teaching from a passive to an active mode, where learning is student centred. Originally the student would use paper based materials, perhaps supplemented by videos and tapes, but later computers were introduced, and multimedia applied. Many studies have examined the teaching and learning achieved (Mayes 1992). Along with the cognitive science employed, guidelines for screen design were developed which read strangely to practitioners in the visual arts(Clark 1992).

For those of us concerned with teaching in schools of architecture and design, the thrust has sometimes been from the other side; visual material has dominated the educational technology understandably; the computer screen and CAD have married well to illustrate and display the objects with which we are concerned. We all enjoy producing beautiful graphics. It may be that it is time for the two points of departure to take note of the divide.

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2. Educational Technology

A recommended development plan (Whittlestone et al 1993) suggests five steps:

- 1 Needs & Objectives
- 2 Design
- 3 Production
- 4 Evaluation
- 5 Delivery

It seems to me that many of the multimedia presentations coming from schools of Architecture concentrate on Design and Production, without sufficient thought being given to the Needs & Objectives or Evaluation stage. Too often it seems that the projects are driven by the subject matter and delight in the use of clever technical tricks. The questions, Who is this aimed at?, Will the user learn (i.e. retain information) from this? or does it fulfill its purpose well? are rarely asked.

Diane Laurillard (Laurillard 1993) points out that it is never too soon to begin Evaluation of the material, preferably by piloting it at every stage, early on with fellow staff, then with a variety of potential students enables revision and refinement of the design of the package. While questionnaires may be used to find out how the subject reacts to the material it is often even better to help individuals fill them in to start with, so that problems with the questionnaire may be resolved. Wider trials can use an updated version. It is also useful to observe **pairs** working through the material; as they talk to each other the tester, without intruding, can discover how they are navigating and whether there are misunderstandings.

A useful evaluation check list can be used when assessing the quality of a package :-

- Engagement
- Interactivity
- Tailorability
- Appropriateness of multimedia mix
- Mode and style of interaction
- Quality of interaction
- Quality of end-user interfaces
- Learning styles
- Monitoring and assessment techniques

Built-in intelligence

Adequacy of ancillary learning support tools

Suitability for single user/ group/ distributed use

Availability in terms of cost and delivery platforms

Outstanding strengths and attractive features

Outstanding limitations and weaknesses

3. Case study - Linlithgow Palace

In our school, history and theory of architecture are taught at every level of the course. While local (Scottish) examples are quoted where appropriate, we have a lecture series which looks directly at Scottish architecture, and seeks to place it in time and describe its influences. It is offered to our final year students and all visiting students so that the constitution of the class is predominantly foreign students. unaware of Scottish political and economic history. Indeed many of the British students are equally untutored in the historical background.

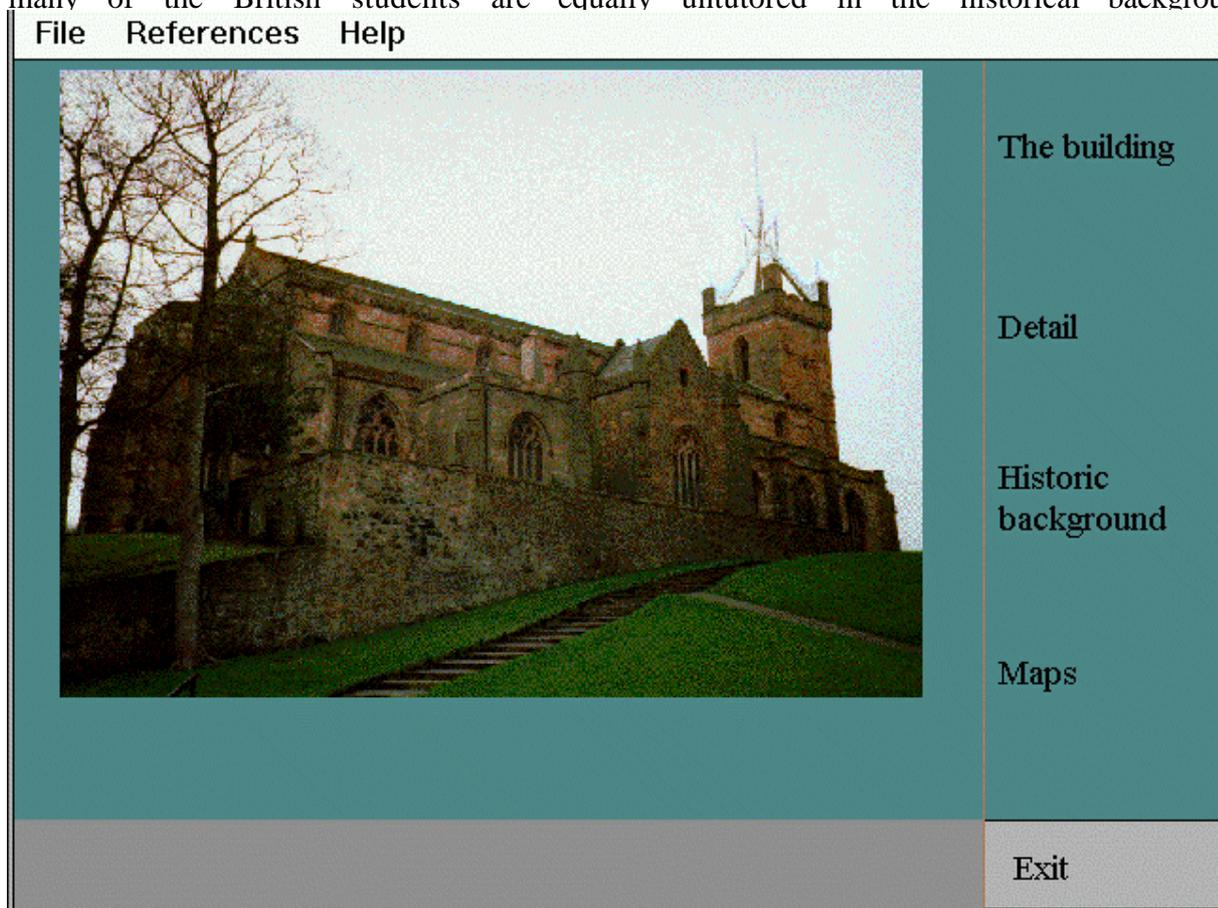


Fig 1 St Michael's Church, Linlithgow, with the main menus of the Authorware package.

A package was prepared which sought to expand the information on Linlithgow Palace which is used as one of the examples of the Italian influence on Scottish Renaissance architecture

(Campbell 1995) in one lecture of the series. An attempt was made to use the checklists above. The most useful results are noted below.

The package was originally written in Authorware on a PC with the option of converting it for MAC use. Later a Web version was prepared, and the two versions were tested with a number of students. The design methodology followed included the following iteration:-

Question For which students is this intended?

Answer Any student of architecture, particularly upper years and exchange students.

Supplementary question for pilot Is the text understandable to non-English speakers?

Q What should the student learn from this package?

A Features of the building, periods of construction, who commissioned it, where could they have found their ideas.

Supplementary question for the pilothow to test learning. (Self Assessment Quizzes?)

Q Is the interface designed to make the student cover all of the material provided?

A The Authorware version permitted Note-taking, the Web version shows "Links visited"; two different ways of enhancing learning, but the Web version was more flexible.

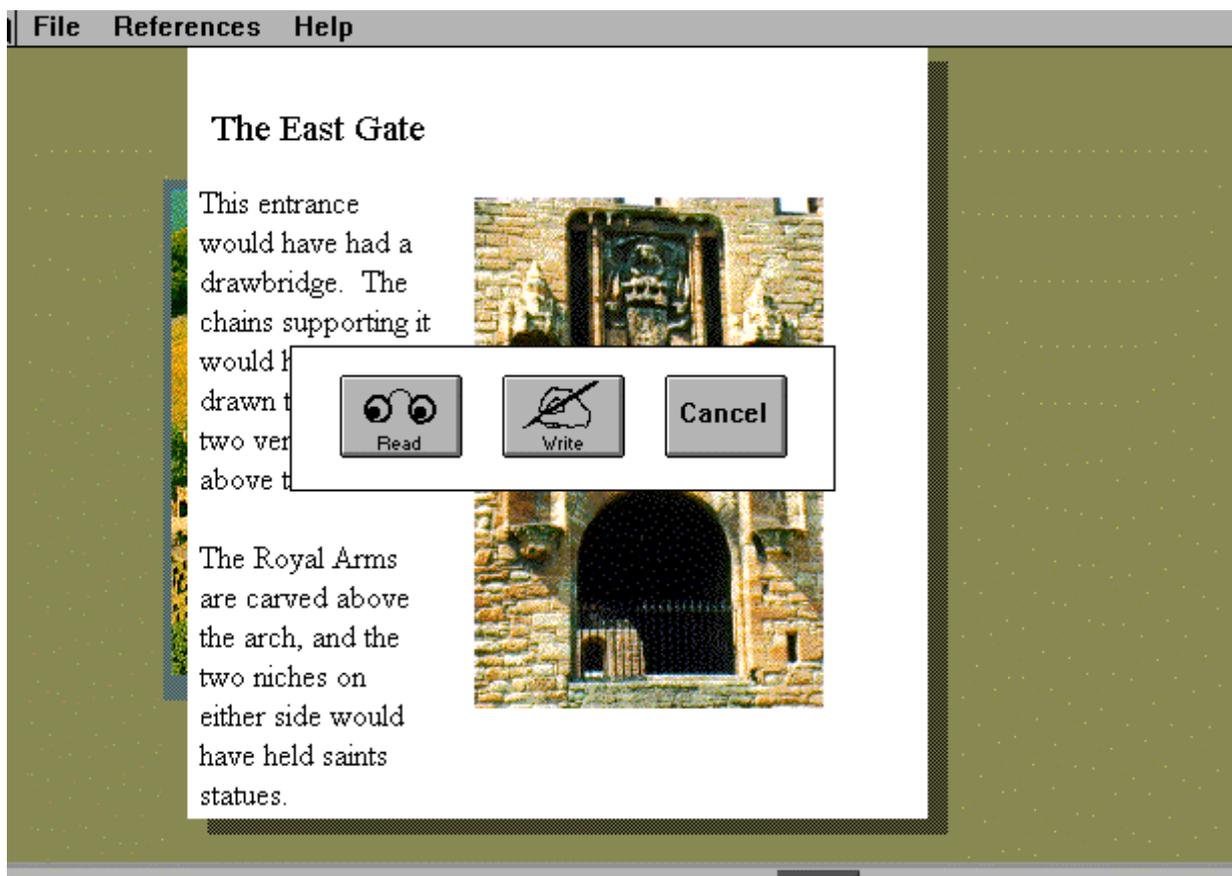


Fig 2 Information about the East Gate, with a pop-up Note-taking option.

Q Can the material be adapted or extended?

- A Much easier to extend and expand the Web version. There are further comparable buildings to add, both within Scotland and in Europe.
- Q How does it integrate with the taught courses?
- A Well tailored for the current course, an extensible version should be more able to accommodate changes in the courses.

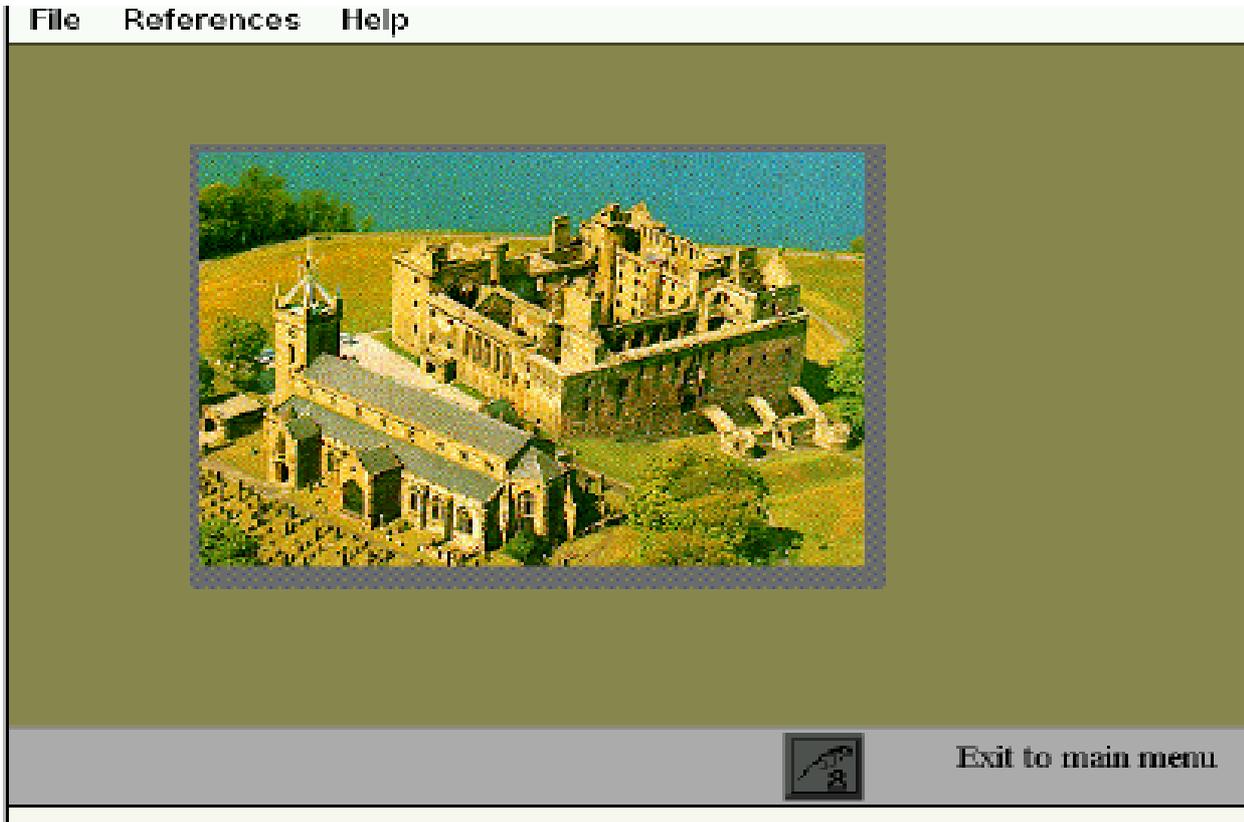


Figure 3 Point and click view of Linlithgow Palace and St Michael's Church from the air (photo courtesy West Lothian District Council)

4. Conclusion

Computer based learning can be applied to visual material, including architecture, but it is vital to avoid being seduced by the graphics and remember the purpose of the "text". The material should be extensible, and adaptable if the investment of the time required to produce it is going to provide adequate returns. In schools of architecture we have many creative people, it is

important that as educators we recall the fundamentals of educational psychology and make best use of educational technology.

5. References

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