

Setanta: A University-School Collaboration Project

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Abstract

This article reports on a collaborative project between the school of Computer Applications, Dublin City University (DCU) and St. Aidan's Secondary school.

The project involves the development of courseware, which takes the form of a Virtual Art Museum (VAM), for use in Irish Secondary schools. It suggests that a partnership between Second and Third level institutions is one way of facilitating the creation of courseware and it highlights the organisational and technical challenges inherent in such a project. The paper traces the design and development of courseware, offers suggestions for improvements, and notes the pedagogical advantages of the courseware. The openness of the participants' to the learning of new skills is a key factor if this type of project is to succeed.

Introduction

The paper reports on a project to develop an intranet system for use in the context of Irish Secondary schools. It describes the goals and challenges, traces the development of courseware, which takes the form of a Virtual Art Museum (VAM), and comments on the pedagogical advantages. The Project ran from October 1999 to May 2000, and formed part of the Setanta Project, which is a collaboration between the school of Computer Applications Dublin City University (DCU) and St. Aidan's Secondary school. The Internet is a very useful resource for schools; however, appropriate course content for the secondary school curriculum in Ireland is often difficult to find on the Internet. This poses a challenge for schools in their effort to integrate ICT in a meaningful and useful way into the curriculum. One possible solution to the problem is for second level schools to work in partnership with third level institutes, in order to draw on the programming and multimedia skills available in third level.

Partnership

This project involved close and dynamic partnership arrangements between pupils and teachers at St. Aidan's Secondary school and students and staff of the school of Computer Applications, D.C.U. It was hoped that by becoming involved in this process, pupils and teachers would learn useful, context based ICT skills in an area directly relevant to their Secondary school curriculum. At the same time, university students would develop their technical skills and skills of collaboration, as they worked with real users to complete project work for their B.Sc. in Computer Applications. In other words, both parties stood to gain by becoming actively involved in the project.

Two undergraduate students, Deirdre Pentony and Marie Mooney, opted to become involved in the project. They chose to design and develop the Virtual Art Museum (VAM) for their third year project, as part of their B.Sc. in Computer Applications. Margaret Farren and Ray Walsh, Lecturers in the School of Computer Applications at DCU, Ray O'Neill, ICT Co-ordinator, and Sonya Kinch,

Art teacher, both at St. Aidan's Secondary school, held regular team meetings to co-ordinate

various aspects of the project. As students in the School of Computer Applications developed VAM, pupils of the Leaving Certificate Art class in St. Aidan's Secondary school searched the Internet for specific paintings, multimedia files and artists'

details, relevant to the Leaving Certificate Art History course. These pupils also developed a Web site, which was to act as a support for Leaving Certificate Art History course.

Goals of Project

A list of goals was drawn up to give direction and focus to our work and discussion sessions. The principle goals were:

- To develop a subject based intranet;
- To develop courseware relevant to the Secondary school curriculum in Art History;
- To develop technology skills in all participants when and where required;
- To match the interests of undergraduates with the needs of second level pupils;
- To develop research skills e.g. locating, collating and summarising information;
- To develop skills of working as a member of a team;
- To learn how to work in a virtual learning environment;
- To attend to the specific needs of learners with different ability levels in Secondary school and offer appropriate ICT support.

Challenges

One of the challenges for Secondary schools is to find material on the Internet that is relevant to specific curriculum needs. This problem became apparent when the Art teacher wanted to use the Internet in the teaching of Art at Leaving Certificate

level. She suggested a VAM might help solve the problem. It was hoped that VAM would motivate the pupils in the learning of Art History and offer them a flexible learning environment where they can navigate in their own way and at their own pace.

As the project was a collaborative one, we had to match the needs of learners studying for the Leaving Certificate course in Art with the needs of undergraduate students who had to fulfil certain course requirements for the B.Sc. in Computer Applications. Undergraduate students were being offered a valuable opportunity to become involved in a real life project. Two students expressed keen interest.

Once interests and needs were matched the next challenge was for the undergraduate

students to explore how they could best develop appropriate courseware. There was no guarantee that they would be able to develop a working version within six weeks - the time frame that was allowed to them to develop the courseware. A plan of

action, timetable, records, deadlines and precise areas of responsibility had to be agreed on in order for the project to work efficiently.

Technical Challenges

The first task, carried out in October 1999, at St. Aidan's Secondary School, had involved re-cabling the existing network, upgrading the network server and reconfiguring the network to provide robust and secure access. By April 2000, each

classroom in the school was to be cabled to provide access to the Intranet and Internet.

Pedagogical advantages of Virtual Art Museum (VAM)

It was decided that the contents of VAM would be stored in a database on the school Intranet, and the teacher could select the specific content for VAM by choosing a theme. For example, if the teacher selects 17th century Dutch Artists' as the theme, all these paintings with relevant information (text, audio files or video clips) on the artists would be extracted from the database, and be used to dynamically create a virtual 3D world in which the relevant content material was embedded (Figure 1). If a different theme were selected, a new and different 3D world would be created.

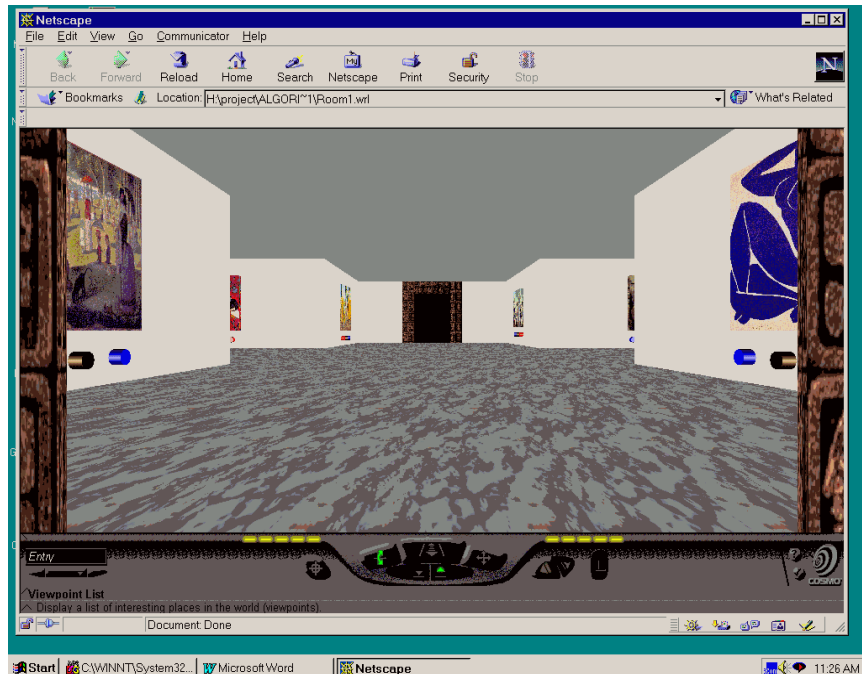


Figure 1.

With VAM, learners are able to take a virtual tour of the art gallery. They can explore and view paintings in a virtual museum type space. VAM allows for flexible viewing e.g. close up to full view of painting.

The use of multimedia caters for all modalities: pupils can view the painting, listen to audio information about the painting, view a video clip about an artist and read a text about the painting and artist. Furthermore, electronic worksheets can be built into the VAM environment. Teachers can use VAM in class and show it on an overhead screen.

Courseware Design

Java (JDK 1.2) was chosen as the programming language as it has many advantages: it is good at interfacing with other applications e.g. MS Access; it allows one to create Graphical User Interfaces (GUIs) appropriate for the user of VAM; VRML code can be written within the Java program. The main advantage of Java is that it contains packages that can carry out a number of useful functions.

The second language chosen was Virtual Reality Modelling Language (VRML). This was chosen, as it seemed to be the most popular 3D graphical language.

Several factors were taken into account when deciding on which database to use for our project e.g. size, complexity and availability. Options included Oracle, SQL Server and MSAccess. The latter was chosen, as the VAM project did not require a huge database.

Courseware Development

The following is an edited version of undergraduate student diaries. The entries take the form of notes. They are worth viewing as they show the various stages of courseware development during weeks 1-6.

Week 1

We start to use MSAccess database. Create a graphical user interface (GUI) to ensure ease of use in inputting and editing of details into the database. Create a GUI to help the user in selecting the required painting from the database. View other VRML Art Galleries. Arrange a meeting with our supervisor, Margaret Farren, to discuss the project goals and work schedule.

Week 2

We start to write VRML code to create different shapes. We want to become familiar with the positioning of an object in a Virtual world. This involves working out the VRML co-ordinate system. We search on the Internet for VRML tutorials.

Create a basic room and include lighting, shading and background. We attend a team meeting in St. Aidan's Secondary school for discussion on design of VAM e.g. use of different rooms, placement of sculptures in room and possibility of each painting containing a link to a video clip, audio file and text file. To give the VRML world more life-like appearance, we add texture to the room using a .gif or .jpg file.

Week 3

We start to input details about artists and paintings into the database. Carry out some initial searches to ensure that the database search queries worked and designed the output forms for the database results. Create four different sized rooms

i.e. Cross room, Square room, Lshaped room and Tshaped room. The pupils in St. Aidan's begin their research on the Internet and search for relevant paintings, multimedia files and artist details.

Week 4

The main challenge is to work out how to dynamically place each painting around the room and in most appropriate position. In order to do this, we have to calculate the size of each painting and get the sum of all selected paintings. The overall size of all paintings is subtracted from the room size, taking away the door width and spacing for each painting. Placing the paintings on the wall involves the use of an algorithm. We talk to the Sonya Kinch and decide to allow up to 20 paintings to be selected from

the database and be dynamically placed around the room.

Week 5

Ray O' Neill and Sonya Kinch visit DCU to view VAM. Sonya suggests that we use a lighter colour background for the walls and floor of room. We create three buttons and place underneath each painting. The buttons link to text file, audio file and video clip. Ray and Sonya are working with the pupils in St. Aidan's School, using the Internet to find relevant paintings and multimedia files. The pupils are writing summaries of artists and paintings. We start to experiment with the placing of paintings on the wall. We have to ensure that the paintings are of a certain thickness to prevent a fading image when the painting are being viewed from a distance (Figure 2).

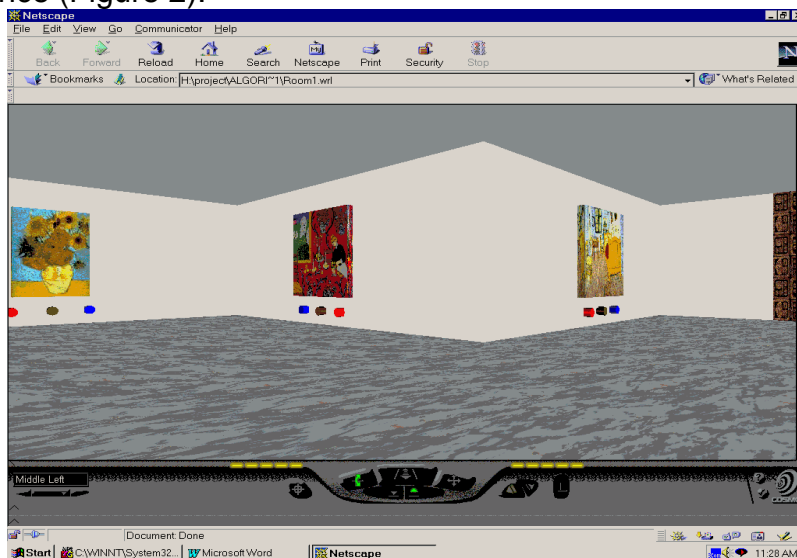


Figure 2

Week 6

There are three different types of lighting available within VRML world. We decide to use directional lighting as all paintings can be viewed without having the painting directly in front. The buttons to sound files and text files are working and we

get the button to the video files working. We save the video, text and audio files in arrays under the same name as the painting names, for easy access.

Feedback

The following comment was made by one of the pupils from St. Aidan's school who took part in the project. It highlights the positive feedback received from pupils studying Art at Leaving Certificate level and shows how the pupils' views on the usefulness of the project are important.

"Last October, we started working on the school's art database for Setanta, with each student being assigned a particular artist to work on. I was covering Jan Van Eyck, which was interesting because I had heard about him before as part of the

Junior Certificate Art History course. At the time I didn't realise that it would take the best part of a year to finish, but I soon found out that there was a lot more information on Van Eyck than I thought possible. Eventually, I managed to sort through it all and learned a lot at the same time."

Suggestions for Improvements to VAM

Because of the time constraint of 6 weeks to develop the courseware, the undergraduate students didn't manage to complete certain tasks. In their evaluation they suggested that the following improvement be made to VAM:

- More user- friendly graphical user interface - easier for teacher to use;
- A database which would offer more advanced features-Access can be quite limited;
- A map showing the layout of the Gallery;
- Within the Gallery:
 - Index to allow learners to move to specific paintings;
 - More rooms available in the gallery;
 - Electronic worksheet to be completed before pupils move to another room;
 - Place 3D sculpture in room to give impression of real gallery.

Conclusion

The success of the Project was due to many factors e.g. communication, clear goals, effective management, co-operation, team work, developing learning, research and technical skills. As part of the project, appropriate courseware was developed in response to the specific needs of Secondary pupils studying Art at Leaving Certificate level. The next part of the project is for VAM to be evaluated within St Aidan's Secondary school before any necessary modifications are made. As a measure of the importance attached to this type of project, An Taoiseach, Bertie Ahern, launched the project at St.Aidan's Secondary school in May 2000. The Project shows how the technical expertise in Third level institutes can support certain curriculum needs of Second level schools and how ICT can be integrated effectively into a subject area.