LEARNING WITH 3D CONTENT- TEACHING WITH INUIT ARTEFACTS

Prof. Denis Gadbois Senior Instructor Faculty of Environmental Design University of Calgary Canada
dgadbois@ucalgary.ca  www.ucalgary.ca/~dgadbois/FML.html

Abstract
In this paper I describe an initial attempt at exploring the possible benefits of using 3D artefacts from the collection of the Prince of Wales Northern Heritage Museum in Yellowknife Northwest Territories Canada. Our findings indicate that utilising 3D scanning techniques and 3d software to construct engaging 3d environments has good potential.

Introduction
They are many application areas that rely heavily on 3D content. Simulation design and visualisation have utilised 3D for decades. Since the early 1990’s, 3D and virtual reality has also been introduced in educational contexts. Examples of applications include the teaching of physics (Dede, 1996), the greenhouse effect (Jackson, 1999), colour science (stone, 2000) and advanced mathematics (taxén and Naeve, 2002).

In addition, educators have recently shown an increased interest in computer gaming technologies, e.g. (Prensky, 2001). Games are known to be engaging, and increasing number of today’s youth have experience with an interest in computer game playing. Because of the importance of motivation and engagement for learning, it is felt the introduction of gaming elements into an educational context can be beneficial. Ultimately, our work aims to extend these efforts with design ideas from the Gupuk Artefacts collection of the Prince of Wales Northern Heritage Museum in Yellowknife Northwest Territories Canada.

Scanning Process
The process started with the selection of artefacts from the Gupuk collection. With Dr Charles Arnold, director of the Prince of Wales Northern Heritage Museum, we carefully selected a complete set of artefacts required to assemble a harpoon used to kill whales 500 year ago. The complete assembly required 5 components. The artefacts were chosen for their potential for both entertainment and educational value.

We used a laser based 3D scanner from Cyberware to scan the artefacts. Each artefact took 3 hours to scan and assemble. The final product was a 3d file with texture maps as shown in the following illustrations.
**Virtual Assembly**

The impetus for this project was to offer to instructors a gaming environment in which the students could learn how to assemble the harpoon. We worked with an illustrator at the museum to ensure authenticity of the techniques of assembly.

The software platforms were Maxon Computers Cinema 4D (3D Environment generator), Macromedia Director (interactive software) and Macromedia Dreamweaver (Web Based). The main goal was to achieve interactivity with the students by allowing them to assemble themselves the harpoon using a graphics workstation.

Several scenarios were developed. Using storyboard we generated bad assemblies and one good assembly scenarios. The typical poor assembly resulted either in the lost of the equipment in the sea or breakage. The good assembly was showing how the design is creative and resulted in a capture.

**Conclusion**

While we are still refining the aesthetics of the interface, the work so far shows that authenticity and proper 3D techniques have great potential from both educational and entertainment values. Interactive 3d content (VR) offers a powerfull way to provide both context as well as content, which can have a significant impact on improved learning by allowing for the simultaneous integration of both convergent and divergent learning approaches. We believe that more effort should be put to produce education content with a synergistic integration of three very important characteristics: education, reality simulation, and fun.

**References**


