Archeologia e Calcolatori
17, 2006, 71-82

INTERACTIVE LEARNING ACTIVITIES IN GREEK ART

1. Introduction

Art history and archaeology rely heavily on the study of images. In undergraduate teaching, digital images are commonly used as substitutes for slides. Useful though it might be for students to have access to high quality images, this new technology is not only about easily accessing images for information, but also offers opportunities for new ways of analysing images and using them in the development of computer assisted learning materials (e.g. the projects in Perkins 1995).

This article describes the pedagogical rationale behind the development of two interactive learning activities incorporated into two courses for Classical Studies offered through Massey University, New Zealand and my reflections on the design elements.

Analysis of students' needs through my classroom teaching experience made me aware of the problems faced by students at the introductory stages of learning in Greek art, as they seek to engage with the knowledge and methods of discipline experts. I have noticed that students especially lack strategies to advance their knowledge and apply it to new situations.

My intention, therefore, was to employ e-learning to enhance student experience of learning and promote a case-study approach. I wanted to foster the development of skills and strategies on how to examine ancient images that would lead to the development of critical and analytical skills required to understand works of art.

2. Pedagogical rationale

2.1 *Online tutorial*

My focus was especially on students studying at a distance, who do not have the opportunity to participate in face-to-face tutorials. The challenge was to offer the pedagogical experience equivalent to that of an on-campus tutorial to distance education students.

In face-to-face tutorials I apply action learning principles involving a variety of exercises where students analyse unknown images based on the material they have already studied. With the aim of adding a further dimension to distance learning, I sought to find out how the technology could fit my way of teaching. My intention was neither to duplicate the conventional classroom nor to add an online element to my courses just for the sake of it.

Educational research stresses that the quality of learning is determined by the teaching need that promotes higher order thinking and the sound instructional design focused on that need rather than by the type of technology (Durbridge, Stratfold 1996; Clark 2001).

I endeavoured, therefore, to create learning activities that would take advantage of the electronic medium to match closely sound instructional principles that I had found worked well in the classroom with learning expectations and online design features (Durbridge, Stratfold 1996; Bonk, Cummings 1998; Koszalka, Ganesan 2004).

With regard to knowledge acquisition and development of cognitive skills, research literature has shown that students' individual interaction both with other students and with the course content plays a crucial role (Collins, Berge 1996; Koszalka, Ganesan 2004). Scholarship also supports the conclusion that learning at a distance is more successful when students are given the opportunity to engage actively with the course material (Koszalka, Ganesan 2004; Laurillard 2005, 2), but also points out the difficulty of "translating" the material used in face-to-face teaching in an easy to use, yet informative and helpful, interactive form online (Grankovska, Heines 2002, 4).

2.2 *Case studies with feedback*

Educators argue that «the most effective learning contexts are those which are problem – or case – based and activity oriented» (Jonassen 1991, 36) and emphasise the importance of applying knowledge (with coaching and feedback) for effective learning (Merrill 2002, 49-50). The opportunity to participate and interact with case studies encourages deep learning by allowing students to use their knowledge in a specific case.

However, Kidney and Puckett (2003) lament the lack of opportunities in online courses for practice and appropriate feedback. In designing these activities, then, I first wanted to support and deepen students' learning by engaging them with the course content and giving them the opportunity to practise the ideas and concepts formulated in the course materials. An important consideration in the design of the activities was to help students meet learning expectations. The alignment of the activities' design to the course objectives would prepare students for future summative assessment (Biggs 2003, 27) and motivate them to engage with online learning opportunities (Alexander, Boud 2001, 6).

My second goal was to provide constructive, formative feedback and encourage the students to focus not just on the answer but on understanding the issues.

Students studying at a distance receive a printed study guide which, in addition to the images studied in the course, also contains the images and ques-

tions considered in on-campus tutorials. The distance education students are encouraged to do the exercises by applying the knowledge they have acquired in their interaction with the course material but they cannot get the feedback students receive in the face-to-face tutorials.

In order for students to be able to check their answers, I have attempted in some cases to supply the correct responses to the questions at the back of the printed study guide (i.e. out of sight of the activity itself). The extensive explanation, argumentation, and provision of alternative answers and possibilities, however, are cumbersome to include in the study materials and students might be tempted to look at the answers before they have time to reflect.

Indeed, Merlenbacher *et al.* (2000) point out the disadvantages of interactive learning methods that allow no time for reflection and consideration of user mistakes (see also Laurillard 2002, 116). Immediate feedback, though highly desirable, may lead students to simply move on without developing their understanding further. In designing the activities I made sure students had delayed access to the answers, especially the correct ones, which would give them the opportunity to reflect before comparing their ideas with the answers.

3. Activity design

The learning outcomes, degree of interaction with content and extent of feedback I sought from the course could not be adequately represented by any form of quiz or test available in WebCT, the online course management system used at Massey University. The only way to achieve the desired interactive practice with extensive and progressive feedback was to programme it specifically and embed it in WebCT for student access. This required the employment of a programmer/designer.

In designing the activities, a wide range of users' computer graphics platforms were accommodated by making the web package rely on the lowest screen resolution (800×600 pixels). All pages were designed using the following three scripting languages: HTML (main structure of page), JavaScript (page dynamics interface) and Cascading Style Sheet (text, font and page properties). This method allowed the creation of an interactive, portable and platform-independent product.

Two activities, based primarily on vase paintings, were created, one for Greek Art and the other for Greek Mythology. The general aim of both courses is for students to practise looking carefully at images, describe them in a thorough manner, analyse their formal properties in terms of design principles and compare them with others. In this way students would hone their observation skills, develop their argumentation and acquire and retain a deeper understanding of works of art.

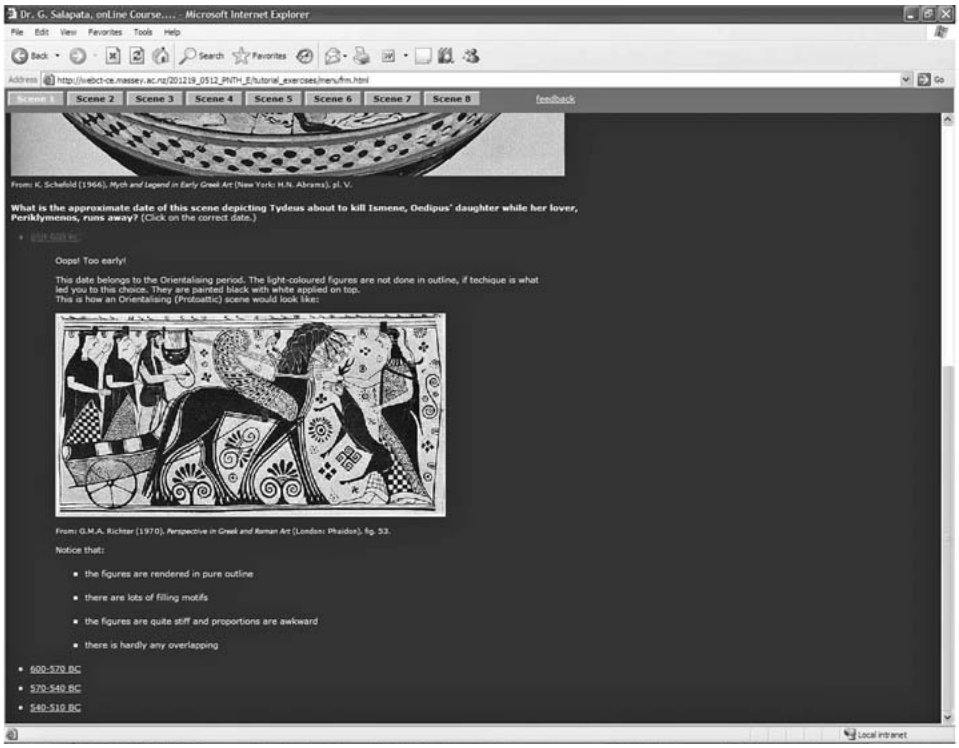

Fig. 1 – Screenshot of the feedback on an incorrect answer in "scene 1" of the Greek Art activity.

The non-linear design of the activities enables the user to go through them in any order. On the other hand, the hierarchical ordering of the information and the logical step-by-step approach within each example offers guidance and allows time for reflection.

3.1 *Greek art*

In order to study the development of Greek art one has to be able to place art works in a chronological period based on formal and stylistic characteristics such as technique, style, composition and subject matter.

The home page of the Greek Art activity provides access to eight different examples in random chronological order (scenes 1-8). By clicking on one of the links at the top an image appears along with a short description of the subject matter and three to four options of different chronological periods in

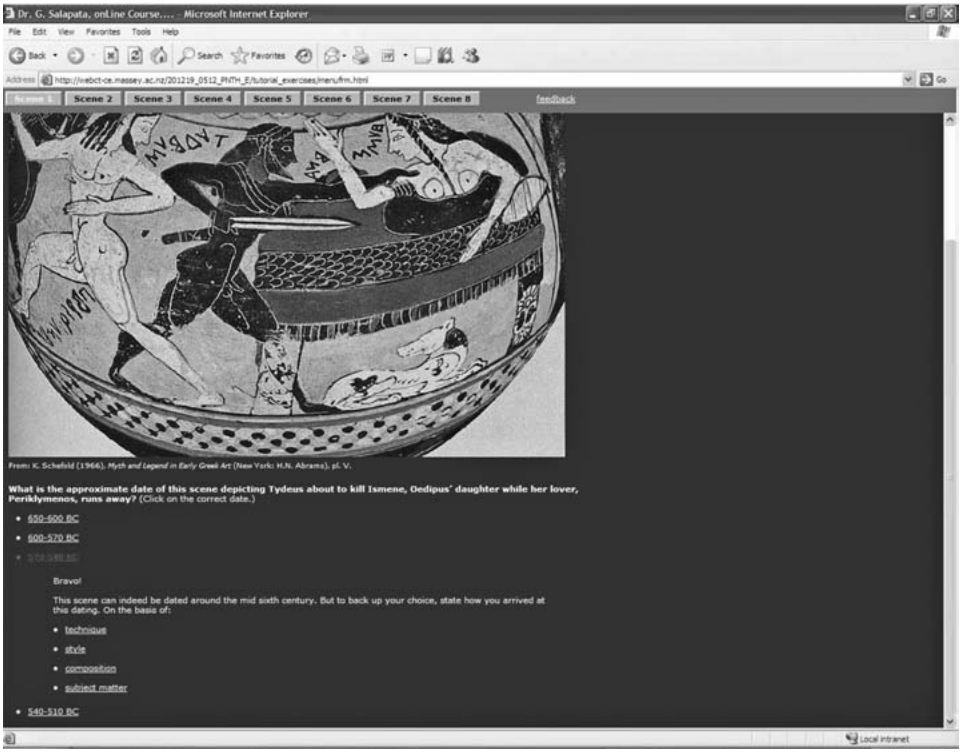

Fig. 2 – Screenshot of the feedback on the correct answer in "scene 1" of the Greek Art activity.

which to place the depiction. While only one option is correct, the "distractors" (i.e. incorrect responses) are plausible answers and include choices often confused with the correct answer (Tav. II, a).

If one of the wrong dates is clicked, a "sorry, wrong" answer appears together with an explanation. In addition, an image from the period corresponding to the selected answer appears together with pointers about the elements that differentiate this image from the assigned one (e.g. different technique, lots of filling motifs) (Fig. 1).

If the correct date is clicked, a congratulatory statement appears along with a request for students to justify their choice, in order to make sure that this was a considered one, based on the material studied, and not just a guess (Race 2005, 86). As guidance, a list of criteria for reflection is provided (e.g. technique, style, composition, subject matter) (Fig. 2).

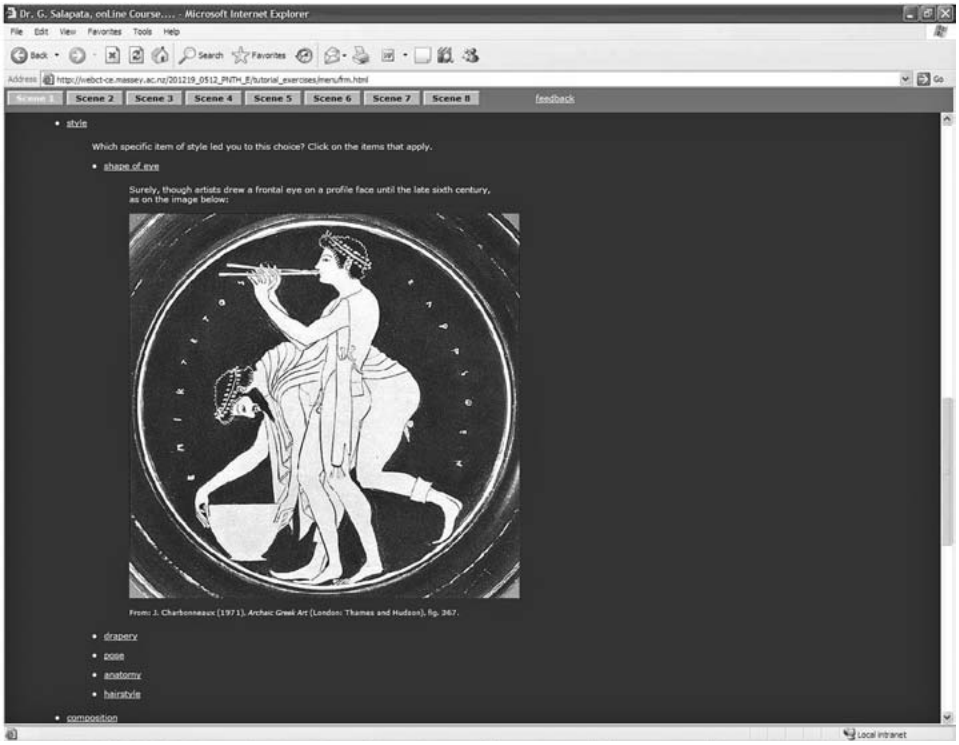

Fig. 3 – Screenshot of further layers of feedback on the correct answer of "scene 1".

If, for example, the "style" criterion is clicked, a list of further specific items to consider appears (in this case: shape of eye, drapery, pose, anatomy, hairstyle). Clicking on one of them could bring forth an affirmation, briefly elaborated, that this is indeed a good criterion on which to base the dating; or it could reveal a statement that this criterion is not of much help in this case, as shown in Fig. 3. Here, the "shape of eye" criterion is not very reliable because the eye was drawn in the same manner in other periods (as an example, an image from a later period is provided, showing a similar way of drawing the eye).

Thus the feedback students receive depends on whether they have selected one of the "distractors" or the correct answer. If an incorrect response is clicked, students are told not only that this was incorrect but also what was wrong with their choice. Explanations are provided for what they might have been confused about or got wrong. A partly correct choice is also acknowledged. Accompanying the explanation for an incorrect answer is an image

that would have fitted that choice, together with additional information and specific points to notice.

The feedback on the correct answer is multilayered. Confirmatory statements are accompanied by a list of questions guiding students to justify their selection.

3.2 *Greek mythology*

In the Greek Mythology course, students study how various myths were represented by visual artists. They are trained to identify the mythological episode and individual figures depicted, analyse the composition, and reflect on the messages projected. At the same time they practise comparisons between two different versions of the same myth in order to detect variations in its depiction, such as introduction of new elements or alteration in the appearance of figures, and possible reasons behind them that may affect the messages conveyed.

Thus the approach in this activity differs from that in the Greek Art course. The intention of the exercises is to assist students in the identification of mythological figures based on criteria such as physical appearance, attributes, gestures, composition, and train them in the detailed comparison of depictions of the same myth.

The home page gives access to seven examples in random order (myths 1-7). Clicking on one of the links reveals one image (or more in the case of comparisons), along with the name of the mythical episode and the date of the particular depiction. A series of "hotspots" are signalled by the appearance of the phrase "Who is this figure? Click to enlarge and find out" when the cursor hovers over them (Fig. 4). The students are supposed to examine the particular figure for clues of his/her identity before clicking to reveal the correct answer.

When a "hotspot" figure is selected, a pop-up enlargement and the correct identification come into view. Underneath the name of the figure, Zeus in the example shown in Fig. 5, appears a request for justification of this identification and then a few pointers, in the form of specific features to look at (e.g. equipment, appearance, composition). Feedback is provided for each of these features (see "composition" in Fig. 5).

In each example there are also some more general questions to think about, with pop-ups available to check answers.

In the examples where a comparison of two versions of the same myth is called for, students are asked to compare some of the individual figures and answer specific questions about others (Fig. 6). Both similarities and differences are to be considered. In each case pointers regarding specific features to consider are provided (e.g. physical appearance, posture), which, when clicked, reveal the answer (Fig. 7).

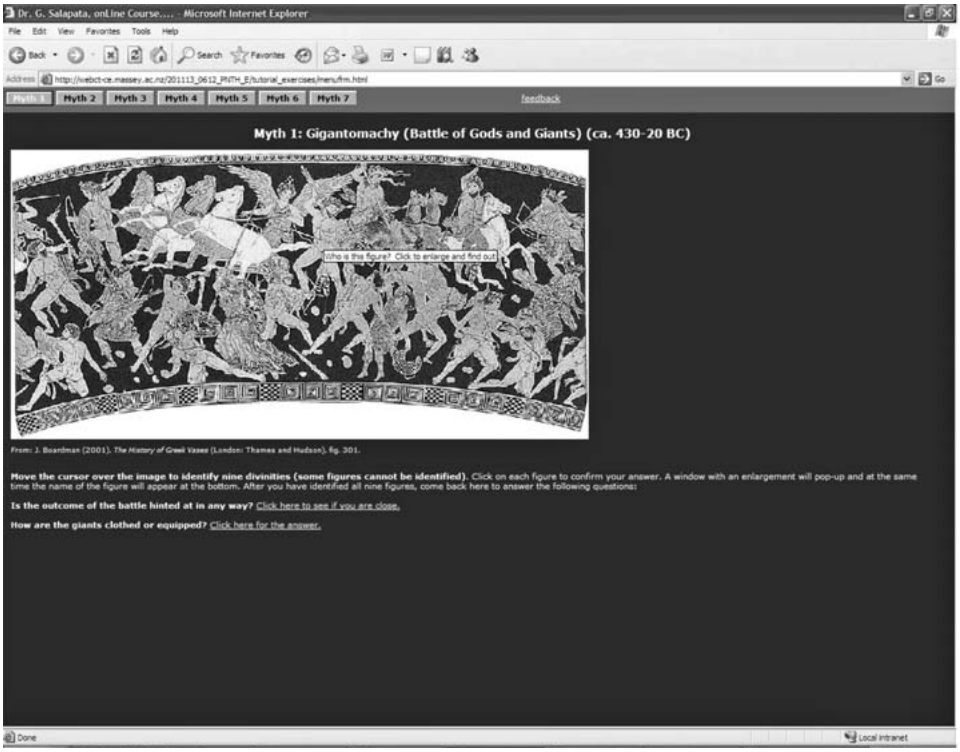

Fig. 4 – Screenshot of the opening page of "myth 1", the first example in the Greek Mythology activity, with "hotspot".

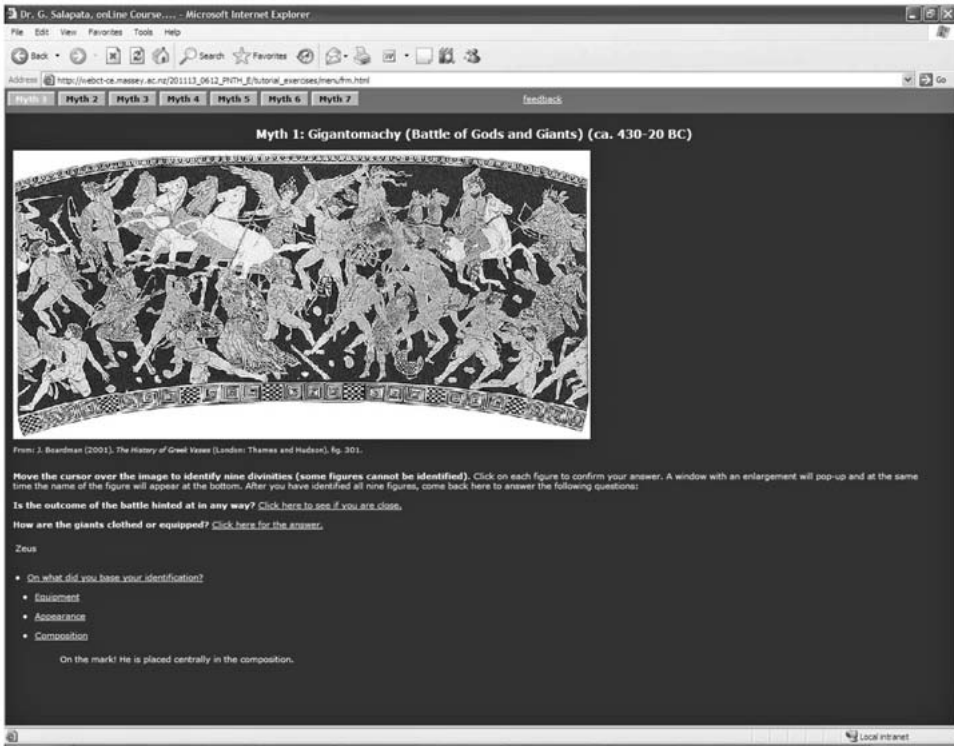

Fig. 5 – Screenshot of feedback for the figure of Zeus in "myth 1" of the Greek Mythology activity.

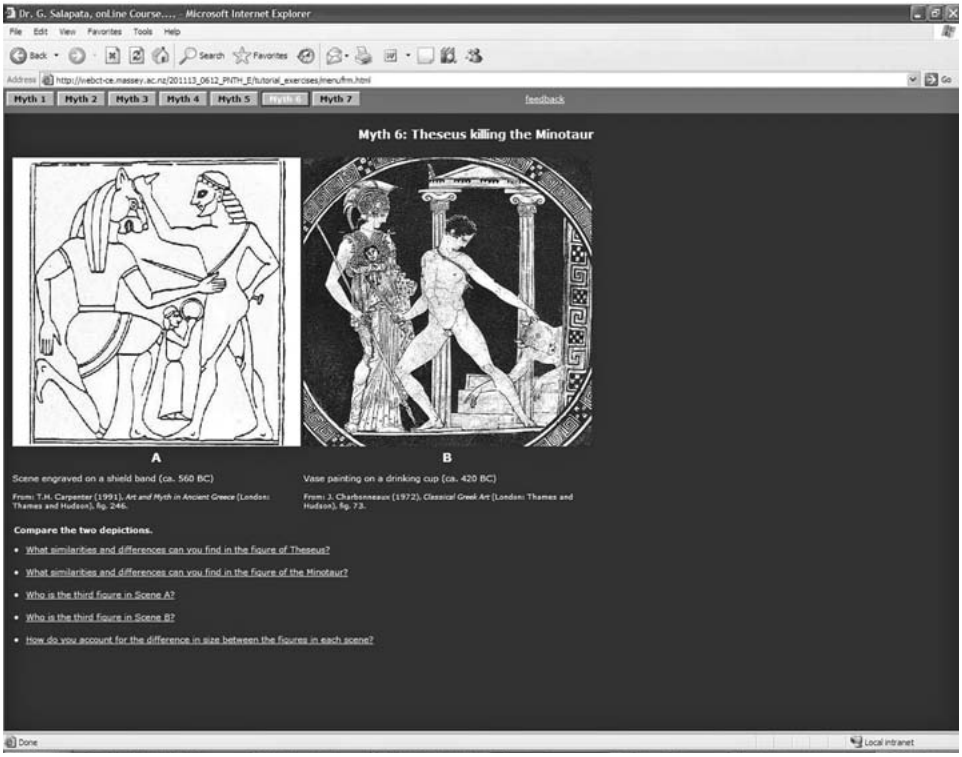

Fig. 6 – Screenshot of the opening page of "myth 6", requesting a comparison of two versions of the same myth.

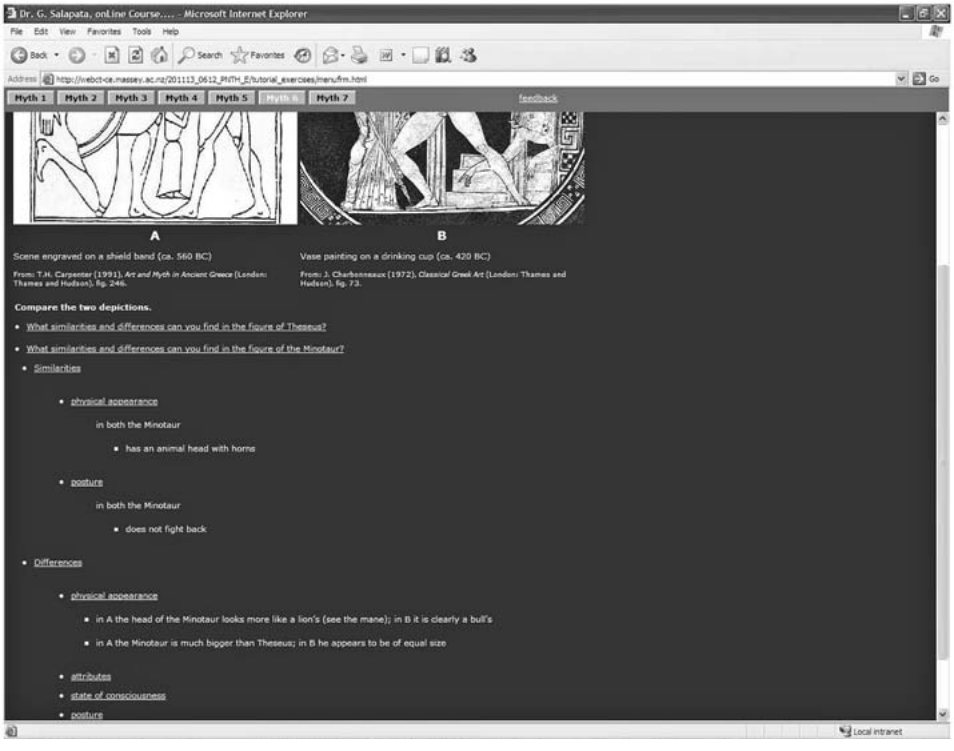

Fig. 7 – Screenshot of layers of feedback on the comparison of the figure of Minotaur in "myth 6".

4. Formative feedback

The dynamic hierarchical interface, allowing for the gradual revelation of answers, guides the students and grants them time for reflection before giving access to increasingly specialised information. This is particularly important in the case of the correct answers which are thus revealed in small successive steps to make sure they are the product of critical thinking and reasoning. On the other hand, errors in selection are used constructively, providing hints on which elements of the image to pay attention to in order to arrive at the correct answer. Students therefore can afford to get things wrong and learn from their mistakes (Race 2005, 79).

Even if students clicked on all items in turn, learning would still take place: they would confirm their knowledge or learn the reason for that answer, thus being provided with extensive formative feedback.

The feedback responses are written in a conversational style with some humorous overtones. Confirmatory feedback ranges according to the difficulty of the question, providing appropriate praise without being patronising or boring. In very difficult or tricky questions some words of comfort are added (e.g. "this was tricky"), as a gesture of sympathy. The question and the choice learners made remain visible on screen when the feedback response appears (Race 2005).

5. Evaluation

Students reacted very positively to the activities, described by one of them as a "visual exam of Greek vase painting". The exercises were found to be "easy to use", "engaging", "thought provoking", "challenging", "entertaining" and in general a good learning experience that facilitated learning and increased their level of understanding of the course content. The activities helped them clarify any doubts they might have had about the various techniques and better understand some of the terminology, such as what is exactly meant by "sketchier lines", "rigidly patterned drapery", "foreshortening", etc.

Students found that the additional images for incorrect answers assisted in emphasising the features to look for. They found the immediate feedback very useful, though scrolling up and down between pictures and questions seemed a little tedious to one.

As another student wrote, "the WebCT tutorials were of great value as they broadened and helped organise the learning process, especially in analysis. The added bonus: they were most entertaining and stimulating". Yet another student commented that after locating the correct answers she found it beneficial to explore also the rest of the answers in order to reinforce the learning process and systematise her knowledge.

6. Conclusions

These innovative computer-assisted activities based on images are aimed at supporting and facilitating meaningful student learning. They allow learning by doing and provide students with strategies with which to construct knowledge and transfer acquired skill to new cases. They are easy to use and can be conducted at the student's own place, time and pace, and can be repeated many times. They are especially valuable for distance learning, but are useful also for on-campus students who have missed tutorials or want to revise course material. The activities are linked to learning outcomes and prepare students for future summative assessment.

The dynamic interface provides comprehensive but not ready-made feedback that guides students' thinking towards the correct answer and helps develop reflective learners. Learning takes place both when the correct and the incorrect answers are selected.

These instructional resources accord with the learner-centred psychological principles that emphasize the importance of helping students link new information with existing knowledge, achieve complex learning goals, build and use thinking and reasoning strategies and monitor their knowledge (Bonk, Cummings 1998, 84). They also stimulate curiosity and motivation by providing exercises of novelty and adequate challenge.

Gina Salapata
Classical Studies Programme
School of History, Philosophy and Politics
Massey University, New Zealand

References

Alexander S., Boud D. 2001, *Learners still learn from experience when online*, in J. Stephenson (ed.), *Teaching and Learning Online: Pedagogies for New Technologies*, London-New York, Routledge/Falmer, 3-15.

Biggs J. 2003, *Teaching for Quality Learning at University: What the Student Does*, Buckingham (2nd ed.), Open University Press/Society for Research into Higher Education.

Bonk C.J., Cummings J.A. 1998, *A dozen recommendations for placing the student at the centre of web-based learning*, «Educational Media International», 35.2, 82-90.

Clark R.E. 2001, *A summary of disagreements with the "Mere Vehicles" argument*, in R.E. Clark (ed.), *Learning from Media: Arguments, Analysis, and Evidence*, Greenwitch, CT, Information Age Publishing Inc, 125-136.

Collins M., Berge Z. 1996, *Facilitating Interaction in Computer Mediated Online Courses*, Background paper for FSU/AECT Distance Education Conference, Tallahasee FL, June (http://www.emoderators.com/moderators/flcc.html).

Durbridge N.H., Stratfold M.P. 1996, *Varying the texture: A study of art, learning and multimedia*, «Journal of Interactive Media in Education», 96.1 (http://www-jime.open.ac.uk/).

Grankovska S., Heines J. 2002, *Course web sites: State-of-the-art*, «USDLA Journal», 16.12 (http://www.usdla.org/html/journal/DEC02_Issue/article01.html).

Jonassen D. 1991, *Thinking technology: Context is everything*, «Educational Technology», 31.6, 35-37.

Kidney G.W., Puckett E.G. 2003, *Rediscovering first principles through online learning*, «The Quarterly Review of Distance Education», 4.3, 203-212.

Koszalka T.A., Ganesan R. 2004, *Designing online courses: A taxonomy to guide strategic use of features available in course management systems (CMS) in distance education*, «Distance Education», 25.2, 243-256.

Laurillard D. 2002, *Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies* (2nd ed.), London-New York, Routledge/Falmer.

Laurillard D. 2005, *E-Learning in higher education*, in P. Ashwin (ed.), *Changing Higher Education*, London, Routledge/Falmer.

Merrill M.D. 2002, *First principles of instruction*, «Educational Technology Research and Development», 50.3, 43-59.

Merlenbacher B., Miller C.R., Covington D., Larsen J.S. 2000, *Active and interactive learning online: A comparison of web-based and conventional writing classes*, «IEEE Transactions on Professional Communication», 43, 166-184.

Perkins P. 1995, *The development of computer assisted learning materials for archaeology and art history*, «Computers and the History of Art», 5.2, 79-91.

Race P. 2005, *500 Tips for Open and Online Learning* (2nd ed.), London-New York, Routledge/Falmer.

ABSTRACT

This article describes two learning activities on Greek art and my reflections on the design elements which were influenced by the principles and recommendations that are particularly useful for distance education. The project arose out of a desire to emulate online the classroom experience of studying and analysing images of Greek art and had two goals: to provide students (1) with an opportunity to practise on their own visual analysis and interpretation of Greek images and apply them to new examples; and (2) with comprehensive but progressive feedback that would guide them in their way of thinking to reach the correct answer.

In the Greek Art module, the activity assists students in dating vase paintings. Each example offers a choice of chronological periods in which to place the image. Errors in selection are used constructively, with the feedback providing hints on which elements of the image to pay attention to in order to arrive at the correct dating. Correct answers are accompanied by questions guiding students to consciously justify their selection. In the Greek Mythology module, the activity assists students in the identification of figures involved in mythological depictions. By clicking on the figures students can see not only the correct answer but also a series of questions that guide them to justify their answer by referring to the specific features on which they based their identification.

These interactive activities can be used at the students' own pace and provide immediate and constructive feedback. At the same time, they allow reflection before the correct answers, given in small successive steps, are revealed. The activities are linked to learning outcomes and prepare students for future summative assessment. They are a pedagogically sound computer-mediated tool to encourage active, deep and reflective learning.