

ACETS Exemplar 01

Online Microanatomy Tutorial on Skin

Philip Bradley

University of Newcastle upon Tyne

ACETS Exemplar 01: Baseline

1	Teacher/academics name	Phil Bradley
2	Teacher/academics position	MBBS Sub Dean for Teaching, Learning & Assessment
3	Teacher/academics institution	University of Newcastle upon Tyne
4	Range of subjects taught	Cell biology, anatomy, microanatomy, neuroanatomy
5	Contact information	p.m.bradley@ncl.ac.uk
6	Principal interest	anatomy
7	ACETS Officer	shardy
8	Date of survey	11/4/2003
9	Do you know how to make web pages?	a little
10	Have you used the web in your teaching?	a lot
11	Do you use anything that you would consider a 'learning object' in your teaching?	a lot
12	How would you rate your own computing skills against those of your colleagues?	good
13	How would you rate your own teaching skills against those of your colleagues?	expert
14	How would you rate your own use of CAL against those of your colleagues?	poor
15	How much relevant staff development and training is available?	a little
16	How much relevant staff development have you actually made use of?	a little
17	Do you have access to support in making electronic learning materials?	a lot
18	Is this available as a free service?	completely
19	Have you made use of this support service before?	a lot
20	Would you expect that you would need to use this service to use learning objects in your teaching?	a little
21	Do you have a VLE (or equivalent) available to support your work?	Yes
22	What is the system called (eg WebCT, or equivalent local system name)?	NLE (from TLTP3-86 Facilitated Network Learning in Medicine and Health Science)
23	Does it allow you to put teaching/learning materials online for your students	a lot
24	If so, do you do this or is it done centrally for you?	I do this
25	How easy is it for you to get teaching materials online?	very easy
26	Do you have your own computer at work	Yes
27	Do you use a computer at home for work	Yes
28	What level of computer access do you think your students have in the institution and at home	very good
29	How much of this is internet-enabled ?	a lot
30	How much teaching and learning materials are provided online for the students	a lot
31	To what degree do you expect the use of learning objects to enhance your teaching	a little
32	To what degree do you expect the use of learning objects to enhance your students learning	a little
33	To what degree do you expect the use of learning objects to make your work easier	none
34	Extra notes	

ACETS Exemplar 01: Reflective Diary

Stage one: resource discovery

The beginning of the process to design an object for this ACETS project is to define the object and the obstacles. It is my intention to design a teaching resource that can be used to reinforce some lecture-based teaching on the microanatomy of skin and on the development and treatment of acne. The need for this has arisen because as part of our internal reorganisation in Newcastle we have lost our microanatomy laboratory where previously I would have taught this material with paper based handouts, glass slides and microscopes. We have already identified and put in place an intranet version of an histology atlas -the 'Gartner and Hiatt Color atlas of Histology'. This contains some, but not all, of the images I would need to teach this material.

In Semester 1 for a teaching session on epithelia I tried the simple expedient of using the same paper handout that I had used in the practical class previously but with references changed to the images in the Gartner and Hiatt atlas. Students were then expected to complete this in a self-study exercise in the computer clusters. This was not a great success and I learnt that if you are going to expect students to follow directed learning materials and particularly where those learning materials may pose questions or set problems then you need a clear mechanism for delivering the answers in a way which will reinforce the teaching aims of the sessions. As a result of this I have decided to still try for a hybrid approach as I believe that active learning and the production of diagrams or notes are important parts of the process. However I will also develop some on line guidance which allows students to gain access to answers and allows more control over the process. I have identified and obtained permission to use some images of ACNE from the Wisconsin medlib site and I shall incorporate these into the resource. In the first instance I intend to use my original practical handouts as a starting point and to try to construct a PowerPoint based tutorial from this.

Stage two: preparation

I began the process of designing the PowerPoint presentation that will guide the students through use of the RLO by setting up a very simple framework presentation with no details but with internal hyperlinks between question pages and answer pages. I then spent an hour on the University cluster machines working through the Gartner and Hiatt atlas and the section on skin. I identified all the images that I would use as the basis for the sessions and recorded into the PowerPoint presentation the key things that could be seen on each image. The next stage is to expand the text in the PowerPoint presentation and to include appropriate links to other web based resources where necessary. First though I will try and get my text right in terms of guiding the students through the images in the atlas before embellishing the presentation with additional background information and the section on acne which will rely on the Wisconsin images which I have downloaded and stored.

Stage three: creation

I spent about 2 hours yesterday working on the first part of the presentation. As I went through I realised that there were points where it was possible to add extra links and so have incorporated links to a webpage on embryology to illustrate the development of the neural crest and to some dermatological sites on psoriasis and melanoma. <http://sprojects.mmi.mcgill.ca/embryology/earlydev/default.html>
<http://matrix.ucdavis.edu/tumors/new/tutorial-intro.html>
<http://www.vh.org/adult/provider/dermatology/PietteDermatology/BlackTray/10Psoriasis.html> In general this is taking longer than I had first anticipated but I suspect it will be worth it to make a reasonable on-line guide to the use of RLO.

Yesterday I spent a further 4 hours finalising the presentation. I entered the material on dermis and dermal structures and some material on Acne and its treatment. In the course of this I put in one or two more links to websites on Acne and used some material from the BNF regarding treatment options. www.bnf.org I spent a lot of time working on action buttons so that navigation through the pages was foolproof (I think). This involved restricting the answer pages so they only led back to the question page and so that clicking on them directly did not lead to the next answer page. I believe that the on-line tutorial is now ready for action and the next phase is to produce a paper worksheet to go with it on which the students will make various drawings. It then needs to be uploaded and used in teaching during the first few weeks of the semester. In terms of evaluation I have for the moment put in a page asking students to e-mail me with comments. If time permits I may speak to our computer people and see whether we can rig up a brief on-line evaluation form that we could link to from the final page.

Stage four: use and evaluation

before the opportunity came along to use the presentation on skin that I had developed I realised that I was due to teach a practical class to Dental students on the microanatomy of blood vessels and that I had double booked myself to be in London at the time. I decided to avail myself of the opportunity to use the on-line histology atlas with a group of students whom I had previously taught in the traditional way using microscopes and slides. I did not have time to develop a full-blown on-line version and so I adapted the paper based handout that previous years had been given in the practical class to allow it to be used in conjunction with the on-line atlas.

Because the previous experience with trying to use the on-line atlas and existing paper guides had been a disaster I decided that this meant putting a little more work into the preparation of the paper guide by meant expanding the commentary in each section to cover the material that I would have demonstrated to the class over the TV system. I decided that I needed to evaluate this approach and so attached a simple questionnaire to the back of the handout and asked them to return these to the Dental School Office when they had completed the task.

There was no timetabled slot for completion of the task but I set a deadline of about a week for the completed handouts and forms to be handed in. I used a Likert scale questionnaire with 6 points ranging from 1 = Strongly Disagree to 6 = Strongly Agree. The questions asked are shown below. There were 61 responses out of 70 students and the mean score for each question is given next to it. (min =1 max= 6)

1. I found the online atlas easy to use 5.3
2. I would prefer to use a microscope to study histology specimens. 3.5
3. I found the images were clear 4.9
4. Having structures labelled on screen was helpful 5.9
5. The zoom facility in the atlas was useful 4.8
6. I enjoyed being able to work at my own pace 5.2
7. I felt I needed more guidance in the on-line tutorial 2.8
8. It would have been useful to have more members of staff available to answer questions 3.5
9. I feel confident that I would be able to recognize blood vessels in a practical exam 4.3
10. I feel confident that I understand the structure of blood vessel walls. 4.8

The one surprising feature was that they did not feel that they needed a member of staff available to answer questions. Maybe this is a reflection of the fact that they also felt that sufficient guidance was given in the study guide. It was also interesting as a group who had had previous experience with microscopes there was a significant proportion of the year who preferred to use the on-line atlas. This question had the largest variation in answers and tended to polarise the class.

Overall therefore the student satisfaction scores were high and the free text comments were largely positive. Running the session this way freed up my time and did not appear to detract from the student experience. Since then I have used the atlas twice more for the BDS students once with an on line tutorial on respiratory system and once with a paper tutorial on the GI tract. The MBBS on line skin tutorial was also run this week.

For this the group were scheduled to attend at specific times in one of the clusters and I was on hand to answer questions as they worked through the on line tutorial. I ran a similar questionnaire to the one used with the dentals with the addition of a specific question on ease of use of the on-line tutorial. The questions and the scores are reproduced below.

1. I found the online atlas easy to use 5.3
2. I would prefer to use a microscope to study histology specimens. 2.4
3. I found the images were clear 5.0
4. Having structures labelled on screen was helpful 5.8
5. The zoom facility in the atlas was useful 4.9
6. I enjoyed being able to work at my own pace 5.7
7. I felt I needed more guidance in the on-line tutorial 2.3
8. The on-line tutorial was easy to navigate 5.0
9. It would have been useful to have more members of staff available to answer questions 3.0

10. I feel confident that I would be able to recognize structures of the skin in a practical exam 4.5

11. I feel confident that I understand the development and treatment of acne 4.8

The scores are remarkably similar to those produced as a result of the BDS paper based session but the free comments revealed that there were two aspects of the on-line version that the students had particularly appreciated. These were the opportunities for self assessment that the on-line version provided - the ability to set a question and then provide the answer and more information on the click of a mouse was seen as valuable as was the ability to link to other websites. The students felt that the additional resources were useful and during the class I certainly saw most students visit most of the web-based resources. There were some problems with navigation through the tutorial - particularly when leaping out to websites and this is something I shall talk to our NLE people about.

All in all this has shown me that we can teach histology in a microscope independent way and I shall be working on the paper based tutorials I used with the dentists to convert them all into on-line versions and shall try to persuade my colleagues to do likewise.

ACETS Exemplar 01: Interview

<i>Exemplifier</i>	Philip Bradley, Subdean for Teaching, Learning and Assessment, Medical School, University of Newcastle
<i>Exemplar description</i>	An Online Microanatomy Tutorial on Skin using a commercial online anatomy atlas as its resource. Developed to replace microscopes which had previously been used for microanatomy teaching; they refurbished the labs and took all the microscopes away. Used principally by MBBS stage 1 medical students and BDS dental students in stage 1 (both first year).
<i>Interviewer</i>	Rachel Ellaway
<i>Date and location of interview</i>	Newcastle, 21 May 2004
<i>Context of use</i>	Early years undergraduate medicine and undergraduate dentistry, at the University of Newcastle, UK
<i>How did you go about putting this together? Was it hard to design/conceptualise your exemplar?</i>	I had previously done an online tutorial before I started this, for one microanatomy class that didn't work very well. The reasons were that I tried to just adapt an existing class-based paper study guide that I had used as the basis of a tutorial at which I had been present. It was to use the paper guides looking at images in an online anatomical atlas and answer paper-based questions. When the students were using they couldn't answer the questions without further input from me so I found either they hadn't bothered with the questions or I spent a lot of time wandering around answering questions individually for everybody. So when I started to design the ACETS exemplar, taking that into account, the two things I wanted to do were to ensure that the tutorial was comprehensive and that if I asked any questions that the answers were available in the tutorial so they could go and find them out themselves and I didn't need to be present.
<i>How did you approach this? How quickly were you able to come up with the activity design?</i>	That was fairly quick because I did have a practical class that was the basis of this so I had an outline of the kinds of things I wanted to do. So taking that gave me the outline of the content, which I then set about adapting into a PowerPoint presentation/tutorial.
<i>Is this something the students were familiar with?</i>	Yes, they receive PowerPoint for all their lectures and lots of their lectures are already loaded onto the web so they can work through them themselves. But this was aimed to be more interactive.
<i>How did you find/identify your third-party materials?</i>	Two sorts of materials: one was the online atlas – we had previously evaluated this set of images which was available to be networked and we were quite keen to try and use it – so we had that lined up. The other materials I used were additional websites (listed in the reflective diary) which I got through net searching. "Atlas of Histology" published by Lippincott, Williams & Wilkins cost ~£1000 for indefinite use.
<i>Did you use ACETS listed links and sources?</i>	We went through some of those. Most of them I found rather limited, lots of the images were not relevant and some of the sites were subscription only. So there was some not very good free material and the rest was by subscription only. What I tended to do was to find websites that offered additional tutorials. For example I found one which on recognition of melanoma, this was a practical on skin and this was a particularly useful tutorial and I just put a link in to that at the appropriate point into the tutorial, using them not as integrated parts of the tutorial but external sources – 'if you want to know more about melanoma, go here'
<i>Did you have to get clearance/permission to use the third party materials?</i>	I didn't for the ones that were offered online as tutorials as I wasn't importing them, I was just directing people to look at them on the web. We did get permission for a couple of images on acne that were on somebody's website on dermatology. I emailed the author and got permission to bring those images into the tutorial.
<i>Everyone agreed to you using this material? You had full rights to use the CD-ROM in this way?</i>	Yes.
<i>Was the exemplar easy to put together?</i>	It was easy to get the outline but it took a lot longer than I thought to finalise it. There was a lot of work on making it neat and looking at slide transitions, the presentation part of it. Assembling the materials was quite straightforward but then getting it to work and hang together with all the links working to answers took time.
<i>What tools did you</i>	It was just PowerPoint – not Photoshop or anything other than PPT.

<i>use?</i>	
<i>Did you get any help?</i>	All just myself
<i>Were you pushing your skills in doing this?</i>	I found some new stuff in PowerPoint that I hadn't used before. Some of the internal links and ways of doing returns and action buttons and I did this by trial and error.
<i>Did you engage with colleagues in your own working context?</i>	Not to any great extent.
<i>Would that be the normal way you work?</i>	Yes, pretty autonomously.
<i>Did you engage with the ACETS project or X4L programme?</i>	No
<i>Did you engage with other external bodies?</i>	No
<i>Was the exemplar easy to deliver/use?</i>	Yes, we talk about evaluation later on but most of them found it easy because with our networked learning environment [Newcastle's VLE for medicine] it was just a matter of uploading it. Then I gave them a paper handout because I wanted to do some work from the screen onto paper and then back again so they were engaging with the material and not just flicking through slides. The handout said 'you will find the presentation here on the NLE'. They just go to it, open it and start it. They do this on a regular basis and it was just a straightforward thing to do.
<i>Did it give pedagogical benefit?</i>	Yes, I think there were a couple of things that were important. One was previously when we've taught microanatomy we've used microscopes. I've always had a suspicion that students don't see what they say they see when they look down a microscope and that they all see something slightly different. In fact when we go round a class and some of them claim they're looking at something and they've got the wrong slide in. This enables me to ensure they're all looking at the same thing, so that I know the image they see is standard so it standardises their experience. It also makes the delivery more flexible in that they can access it when they want although it did have a scheduled time slot because I wanted to make sure everyone did it and completed the questionnaire at the end. However it stays available so they can work on it at any point. In the future we can make that more flexible.
<i>Did it give economies of scale and efficiency?</i>	Initially it was less efficient because previously I would just run the microscope classes in two groups of 110. Because of the size of the cluster [computer lab] that we were working in we had to do it four times, with 50 odd a time. But again, in future, because I won't particularly need to be there, now I'm confident that the thing works, then it will be more efficient in future.
<i>Did it give diversity of approach and experiment</i>	[pauses] I think what it did was to allow me to use more question and answer material into the practical. Previously when I put questions in the students tended not to do them or they would ask you to give them the answers. In this new form I have been able to put in more explanation and feedback around the answers so I knew that all of them were getting the same explanation rather than me going round answering questions in an ad hoc way. The information and explanations to students were more controlled. It has also been a benefit in that, having done this one, I have now been able to do this for a number of other sessions which I previously ran in a different way.
<i>Have you evaluated it?</i>	Yes
<i>What was the form of the evaluation?</i>	Questionnaire students of about 10 questions about ease of use and whether they preferred this to microscopes, questions about whether they needed more help with it, whether they wanted more staff members there or not, and mostly the comments were positive. Using a 6-point Likert most of the answers were in the '5' range.
<i>What was the result of the evaluation?</i>	Two things that surprised me about the evaluation were that the students felt that they didn't need more help. I had expected them to say that yes, we want more staff around, and mostly they said no we don't, we're quite happy. I also tried this out with the dental students who had actually already used microscopes (the medical students hadn't but we had already run some classes with the dentists). Their evaluation was dichotomous but the majority preferred using it to using microscopes for the reasons I have said before that they could see what they should do, the images were clear

	and so on. Some students could microscopes well, although a relatively small proportion. The atlas allows annotations to be turned on and off which is popular. In the tutorial guidance the annotations helped to ensure students did see what was required. The labelling got high recommendations.
<i>Has this enhanced your teaching? In what way?</i>	No but it will enhance the students' learning.
<i>Has this enhanced your students learning? In what way?</i>	Yes, I put in a confidence question and a lot of them felt confident that they had seen and would recognise these features again if they saw them. In the microscope classes, although I hadn't evaluated them, my feeling is that when you give them exams with microscopes in, the majority don't recognise what they need to. We'll know more about that when they do an exam next week where this material will be assessed.
<i>Can you report back on the success of this assessment?</i>	There's a question on the melanoma that I can compare with last years material.
<i>Has the use of learning objects made your work easier?</i>	Yes I think so. I knocked together another 2 or 3 after that and I did so fairly easily and I think a few others are also using this approach now.
<i>Would you do it again?</i>	I'm going to continue to do it and develop more things. Probably also as a result of this we're going to be developing an online anatomy tutorial over the summer with 2 students working on that using some online resources and using the same approach of online tutorial with paper workbooks.
<i>How important was it that you were able to get hold of third party materials to use in your teaching?</i>	Very. Yes. We could have created everything ourselves but it would have required substantial money and time. It's hardly worth doing unless you have something that is very individual you want to do or demonstrate.
<i>Was it hard to adapt materials or teaching practices to do this?</i>	No, all of the images were matched with microscope slides we used to have. Its sort of fairly fixed material without a time or space anchor. A kidney is a kidney; it doesn't matter where it came from England, Australia or the moon!
<i>Has this changed your practice?</i>	Yes, most certainly.
<i>Any other points or comments?</i>	No, I think we've covered everything.

ACETS Exemplar 01: Semi-structured Learning Design Statement

<i>Learning Design Name:</i>	Microanatomy of Skin Practical
<i>Learning Designer(s):</i>	Dr Philip Bradley
<i>Institution(s):</i>	University of Newcastle upon Tyne
<i>Course Context(s):</i>	MBBS Stage 1 (early years undergraduate medicine)
<i>ACETS exemplar ID:</i>	01
<i>LD period:</i>	December 2003 – February 2004
<i>LD duration:</i>	Three months

<i>In order to attain the following learning objective(s):</i>	<i>Specific learning objectives</i>	Students will be able to describe: <ul style="list-style-type: none"> the microscopic appearance of normal skin structure and function of sweat glands the structure of the dermis the structure and function of hair and sebaceous glands the process by which acne may develop the clinical features of acne and the basis for common acne therapies 		
	<i>General learning outcomes</i>	Students will be able to demonstrate knowledge and understanding of: <ul style="list-style-type: none"> Normal structure and function of the major organ systems and how they interrelate Causes of disease and the ways in which diseases affect the body Pharmacological principles of treatment using drugs & efficacy of therapeutic measures in management and symptomatic relief of diseases 		
<i>With prerequisite(s):</i>	Having completed Semester 1 of Year 1 of Newcastle MBBS			
<i>Trigger(s):</i>	START: The session is triggered as a learning outcome within a series of teaching sessions associated with a case of a teenager with acne. The specific trigger is the appearance in the timetable of the scheduled session and the attendance of students to that session. END: end of teaching session although students will continue to have access to the materials thereafter for the duration of their studies.			
<i>The following persons/roles:</i>	<i>Name</i>	<i>Type (staff, student)</i>	<i>Description</i>	
	Student learner (SL)	student	Active participation in on-line tutorial session	
	Subject expert (SE)	staff	Provides support during and after tutorial session	
<i>Perform:</i>	<i>Which roles?</i>	<i>Do what?</i>	<i>How?</i>	
<i>Learning activity(s):</i>	SL	Work through on-line tutorial on microanatomy of skin and development of acne (LO)	Log on to cluster machine and follow instructions Complete on-screen or worksheet based tasks Complete self-assessment tasks Examine microscopic images of skin within on-line atlas (LO) Discuss work with peers and tutor	
<i>Support activity(s):</i>	SE	Gives initial lecture as preparation for practical	Didactic presentation to introduce the topic of skin microanatomy	
<i>Using environment(s) or scenario(s):</i>	All	NLE	Hosts LO . Uploaded into relevant session from developer's desktop	

<i>Using:</i>	<i>Which roles?</i>	<i>Use what?</i>	<i>To do what?</i>
<i>Tool object(s):</i>	All	Cluster computers University servers	Access NLE Host networked on-line atlas (LO)
<i>Knowledge object(s):</i>	All	LO	Undertake practical
<i>Test object(s):</i>	SL	LO's self-assessment resource	Formative assessment
	SL	EMI: An EMI is an extended matching item question and the questions used in the summative exam are the same as those used formatively in the LO .	Summative assessment
	SL	OSCPE: 1 station on skin - relates to a tutorial on melanoma that is linked out of the practical. OSCPE stands for practical 'objective structured clinical & practical examination'	Summative assessment
<i>Search service(s):</i>	N/a		
<i>Communicate service(s):</i>	"they discuss this in class groups of a quarter of a year in a scheduled session and certainly my observation was that they discussed it with each other"		
<i>Announce service(s):</i>	They are told about the resource through their study guides - where the session is timetabled. They were also told about it in a lecture when they were handed the worksheets. It is available in the NLE so they can revisit it if required.		
<i>Other elements or notes:</i>	Images acquired from: Gartner and Hiatt Colour Atlas of Histology, published: Lippincott Williams and Wilkins http://sprojects.mmi.mcgill.ca/embryology/earlydev/default.html http://matrix.ucdavis.edu/tumors/new/tutorial-intro.html http://human.physiol.arizona.edu/SCHED/Respiration/MorganCysFib/CysFibSmGrp.html http://www.about-acne.com/html/types-of-acne.php3 http://www.vh.org/adult/provider/dermatology/PietteDermatology/BlackTray/10Psoriasis.html n.b. all sources were used for image resources only.		

Completion Survey

Recorder:	Rachel Ellaway
Date:	21 May 2004
Other meta-metadata:	Assisted by Suzanne Hardy. Interview took place in Newcastle, LTSN-01 premises.