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Chapter 15: Classics Online at the Open University: Teaching and Learning with Interactive Resources

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The Open University: on air and online

As a distance learning institution, the Open University (OU) has a long and proud tradition of using technology to support student learning. Not that the OU's enthusiastic use of modern media has always earned it admirers: in the early days, this 'University of the Air' (as Harold Wilson put it during a speech given in Glasgow on 8 September 1963) was commonly mocked as an institution whose students gained degrees by watching television. But while the late night broadcasts of OU lectures by the BBC may be a thing of the past, the university continues to find innovative ways to reach and teach not just its own students, but the public at large. Alongside traditional broadcast media, such as BBC television and radio, the university now uses channels such as YouTube and iTunesU as well as new ways of engaging learners, such as MOOCs (Massive Open Online Courses) and BOCs (Badged Open Courses). Particularly notable for its scope and reach is OpenLearn, the OU's online learning portal, which contains over 12,000 hours of free courses (including plenty of Classics content) and attracts over five million unique visitors a year. Further free learning materials to be found on OU websites include interactive, open-access resources designed both to provide informal learning opportunities to the general public and to prepare would-be students for academic study.

Classicists at the Open University have eagerly embraced opportunities to use new media and develop free online content, from vodcasts on *Latin Graffiti at Pompeii* and *Troy Story: Homer's Iliad and Odyssey*, a condensed narrative animation, to an iTunesU course on *The Birth of Comedy*, and interactive OpenLearn courses on topics as diverse as *The Ancient Olympics* and *Herodotus 'The Histories'*. In this chapter, the focus will be on just two sets of online resources, however. First, the suite of open-access websites which support the study of ancient languages at the OU, especially those designed for students taking their first steps in Latin. And secondly, two very different online resources developed in conjunction with an honours-level module on *The Roman Empire*: an interactive map intended to support the acquisition of geographical knowledge whilst providing scope for independent exploration of the empire, and an introductory game called *Hadrian: The Roamin' Emperor*. The discussion that follows is partly 'show and tell': an overview of the functionality and usefulness of these resources to students. But we will also explore the important topics of the design and underpinning pedagogy of these interactive offerings as well as considering student reactions, both positive and negative, and some of the potential benefits and pitfalls of using new technology in teaching.

Introducing Classical Latin

The launch of a new beginner's Latin module in 2015, *Classical Latin: The Language of Ancient Rome*, provided the opportunity to develop a whole array of interactive resources for students. A number of these are tied closely to the module's content: a vocabulary tester, interactive quizzes, and a 'principal parts' tester (relating to the identification of Latin verbs in their different tenses, voices and moods), as well as a 'Story Explorer' which provides an interactive way for students to read the simplified Latin texts which form the spine of the course (key here is the 'click and look up' feature, providing students with instant help on vocabulary and grammar). These resources support student

learning in what are fairly tried and tested ways (indeed, the Story Explorer uses the same technology as the Cambridge School Classics Project 'Explorer' tool and Latin vocabulary and drill testers have a particularly long pedigree). But as well as facilitating learning and consolidation throughout the module, the OU Latin team was also determined to make strides in the ways in which students are supported in the early stages of their language learning, even before their formal studies begin.

The main focus of these aspirations was a free-standing, open access resource called *Introducing Classical Latin*.¹ This site is intended to allow students to encounter some of the basics of Latin in as fun and unthreatening a way as possible, all underpinned by an uncluttered and user-friendly design.

[Figure 18.1]

Introducing Classical Latin is structured in the following way. In the 'Sounds' section, students learn to pronounce Latin with the aid of an alphabetic list of clickable words (Figure 18.1). In the 'Words' section, students get to master a total of twenty-four vocabulary items, broken down into four sections covering nouns ('people', 'animals'), verbs ('actions') and adjectives ('descriptions'). The 'Sentences' section draws on this vocabulary to introduce the basic concepts both of inflection (through simple sentences comprising subject-object-verb) and of the agreement of nouns and adjectives on the basis of gender. At each stage there are short, interactive exercises which allow students to practise their understanding. The 'Words' section is also enlivened by cartoon flashcards (Figure 18.2), while the 'Sentences' section includes both images and animation (the pedagogical justification here coming from Piagetian principles of allowing learners to experience concepts in a concrete form before moving on to the abstract; thus mirroring, too, the use of visuals in modern Latin school textbooks [Gay 2003: 83]).

[Figure 18.2]

Aims and Objectives: outreach, recruitment, retention

In the spirit of outreach and serving the wider Classics community, *Introducing Classical Latin* is designed to be of use to anyone starting out in Latin. The vocabulary items encountered are common words, for example, that will appear in most Latin courses that a student might go on to study. In terms of OU students, however, *Introducing Classical Latin* is intended to fulfil a number of different purposes. Open University Greek and Latin modules recruit less well than their non-language-testing equivalents, so recruitment is one function. More pressing, however, is retention. Historically, drop-out rates on language modules at the OU are high and this resource was designed to play an important part in the battle to reverse that trend. And so, the vocabulary and grammar learning that students undertake while working through *Introducing Classical Latin* gives a useful taster of what learning the language involves and can help students to decide whether Latin is for them. Moreover, for those who are keen to study further, the site provides a firm foundation to help students better negotiate the crucial early stages of language acquisition during the first weeks of the module itself. In its first year, an impressive 96% of students submitted the first assignment of *Classical Latin: The Language of Ancient Rome*, the vast majority of whom had worked through the *Introducing Classical Latin* site (instructively, this represents a 15% improvement on the beginners' Latin module it replaced). The pass rate for the module as a whole was also extremely healthy at 97%.

Design and Pedagogy

It is worth taking a moment to reflect on the design principles that underpin this and many of the other language websites developed at the OU. *Introducing Classical Latin* is designed as a site with

clear objectives and simple tasks, which is straightforward to navigate and which aims to provide feedback that is easy for students to digest. Important to the way we construct interactive language resources, too, is the 'one thing at a time' principle: that is, sites are structured in such a way as to focus on one key skill per section (e.g. 'Sounds', 'Words' and 'Sentences') or per resource (e.g. vocabulary learning in the case of our *Latin Vocabulary Tester*; grammatical forms in the case of our *Latin Grammar Tester*).

Of course, while a website that aspires to have limited text, repeatable activities, and simple feedback supports well the kind of 'surface learning' so important for early stages of language acquisition, 'deep learning' is arguably harder to achieve in this way. This said, the teaching of topics such as inflection and grammatical gender in the 'Sentences' section of *Introducing Classical Latin* does represent an attempt on our part to make users engage with linguistic *concepts* and not simply linguistic data (indeed, to draw on the work of Cousin, inflection and gender might even be considered as belonging to the category of 'threshold concepts': according to Cousin, these are potentially transformative for student learning, since they are capable of disrupting students' previous assumptions about a topic, i.e. in this case their understanding as English speakers about how language works [Cousin 2006: 4]). The desire to keep textual explanations to a minimum also prompted us to adopt an 'inductive' approach to grammar teaching on this site, with grammatical concepts explained upfront. Interestingly, this differs from the largely 'deductive' approach used in the module itself, where students encounter new grammatical concepts when reading synthetic Latin texts before these concepts are explained to them in detail in the passenger grammar. One benefit of this variation, perhaps, is that it helps to cater to different learning styles.

Engaging Students with Interactive Resources

Introducing Classical Latin and its sister site, *Introducing Ancient Greek*, are just two of the open access sites hosted by the Open University. Various other resources support student study of the JACT textbook *Reading Greek*,² while OpenLearn courses providing opportunities for complete beginners to engage more deeply with Latin and Greek exist in the form of *Getting Started on Classical Latin* and *Discovering Ancient Greek and Latin* (whose more involved, explanation-rich approach aims to facilitate 'deep learning' about linguistic concepts).³

How can these sites improve or change student learning? One important advantage that they have over a classroom environment is that students can take as much time as they need to cover the material, repeating exercises or forging ahead as appropriate. And moving learning activities online can also facilitate a 'flipped classroom' approach, where tutorials are largely given over to practising new skills and dealing with students' questions, rather than 'chalk and talk' explanations of new grammar or going over homework (this is particularly valuable in an OU context, where instructors enjoy only limited contact time with their students). Another role that 'testing' or 'drilling' sites can provide is assessment practice: our *Principal Parts Tester*, for example, is set up to mirror a similar question on the examination paper. This 'constructive alignment' of the interactive resource with the assessment question is designed both to increase student use of this website and to strengthen student performance on a challenging area of language acquisition (on 'constructive alignment', see Biggs 2003: 25-31).

Student Feedback: the good, the bad and the surprising

Feedback on the interactive Latin resources has been largely positive. 89% of the 36 students surveyed in 2016 rated *Introducing Classical Latin* as either 'very helpful' or 'quite helpful' with 46% claiming to have spent at least three hours using the site and another 33% one to two hours. Responses to the site from Latin instructors have also been upbeat ('I **LOVE** the elephant',

‘Excellent!’, ‘A very good resource to point those who are just wanting a taste’). 50% of students also reported using the *Latin Vocabulary Tester* at least once a week and a pleasing 61% of students were either ‘extremely satisfied’ or ‘very satisfied’ with the interactive resources on the module as a whole. In terms of where we might have made improvements, perhaps the starkest lesson we learnt was in respect of the *Latin Vocabulary Tester*. A handful of glitches here led to some students losing their confidence – or worse their patience (‘I have used it a few times and found it hugely frustrating’).

Negative feedback is always disappointing, but an interesting development here was that a handful of students went on to develop interactive learning resources of their own in response to the *Latin Vocabulary Tester*’s perceived shortcomings, e.g. and especially using freeware such as Quizlet. The professional way in which they went about this certainly gives pause for thought. Students co-operatively producing and tailoring resources to their own needs does present issues, of course (e.g. student workload, possible absence of underpinning pedagogy and lack of technical support), but this is an inspiring model nonetheless and, importantly, gives students ownership of their own learning. Does producing high-quality interactive resources run the risk of encouraging too much of a spoon-feeding approach? Perhaps one question for the OU to consider in the future is whether the positive elements of this kind of self-sufficiency can be better harnessed, e.g. by providing students with appropriate tools to create their own resources.

The Roman Empire interactive map

Designing an entirely new 60-credit third-level module to introduce OU Classical Studies students to the Roman empire presented a number of different challenges. When would we begin and end? Would we cover all the territory associated with imperial Roman rule? Should we adopt a chronological, geographical or thematic approach? Opting for the latter, how could we help students to contextualise the individuals, communities, places, artefacts and texts that they are learning about and, significantly, understand why it is important to do so? Selecting a textbook with a chronological overview to accompany the bespoke module materials solved the issue of historical context, but geography was more problematic. Although the module provides an introduction to the Roman empire (a subject not otherwise covered by existing OU modules at Levels 1 and 2) students would still be expected to work at a level appropriate for Level 3 (honours level). This involves achieving learning outcomes associated with the independent identification, selection, critical evaluation and application of material from a diverse range of ancient sources and contexts to address defined issues, as well as understanding the contested nature of current knowledge concerning the empire. Students would therefore be required to think for themselves about where evidence comes from and why that matters. One option was to pair the chronologically-oriented set text with a traditional printed atlas, but concerns were raised about this hampering full engagement with the empire as a dynamic and complex entity and implicitly endorsing passive learning. Importantly, the module was to be underpinned by a strategy which fosters deep active learning, requiring students to ‘do meaningful learning activities and think about what they are doing’ (Prince 2004: 223) in a manner which takes account of the fact that ‘discovery-oriented and student-active teaching methods ensure higher student motivation, more learning at higher cognitive levels, and longer retention of the knowledge’ (Cherney 2008: 154). Consequently, the decision was made to develop a digital interactive map which could act in a dual capacity, hosting supported learning activities and providing a resource for independent discovery.

Mapping the empire

The interactive map was produced by combining freely available geospatial data for ancient sites and monuments (e.g. theatres), boundary polygons for provinces and shapefiles for road networks

and rivers. It drew especially on data available via the *Digital Atlas of the Roman Empire* and the Pleiades project, as well as map tiles sourced from the Ancient World Mapping Center.⁴ These were enhanced with 'info boxes' featuring customised text, images, audio recordings and films to meet the needs of specific learning activities.

Technical limitations were imposed on the map: it had to be hosted within the digital storage constraints of the OU Virtual Learning Environment (VLE) and remain compatible with ordinary computing and download capacities. Ultimately, this led to the development of a series of maps with the same design and functionality, presented to students as snapshots or versions of 'the interactive map'. In total, ten versions of the map were produced, each designed to support specific directed and independent learning activities:

- *General view*: all sites within the empire grouped into 'heat clusters' at lower zoom levels (Figure 18.3)
- *Searchable map*: search for any province/location (by ancient or modern name) (Figure 18.4)
- *Province map*: the location and status of all provinces, with sliding timeline allowing learners to explore the chronology of imperial territorial control
- *Hadrian's Wall*: sites on the Wall, supporting a discovery-led activity (see below and Figure 18.5)
- *Rome*: multiple period-specific on/off layers displaying key public buildings
- *Volubilis*: city plan populated with 'info boxes' to support a discovery-led urbanization activity
- *Baths, Cemeteries, Theatres and amphitheatres, Barbarian incursions* – four empire-wide maps populated with a restricted number of bespoke 'info boxes'.

[Figure 18.3]

In addition to a search function, each empire-wide map offers the learner the option of switching additional layers on/off: rivers, roads, an East/West line (to provide basic contextual information at a glance), and three period-specific provincial configurations (117 CE, 200 CE, 303 CE). These enable the learner to engage actively with the data and to manipulate it in order to address questions or develop independent enquiries, thereby promoting 'experiential learning, [and] learning by doing' in which students 'process content themselves' (Carr, Palmer and Hagel 2015: 174).

[Figure 18.4]

Specific activities introduce the map early in the module as part of the general chronological and geographical scene-setting, urging students to explore its capabilities through a series of basic information gathering and navigation activities. For all compulsory activities, links are provided to 'sub-versions' of the relevant map, where students find collapsible sidebars containing full instructions and a link back to a follow-up discussion.⁵ Each version is also available as a standalone resource which students are encouraged to make use of to 'find out more' (i.e. during their independent study time) and when they encounter unknown places in the course of their reading.

Exploring the Wall

Hadrian's Wall features early in the module and provides a good example of how the map facilitates an active enquiry-based learning experience. As advocates of this style of learning have articulated, active learning 'calls forth images of active, student-centered, participatory learning' (O'Loughlin, 1992: 792), and importantly it requires students to 'process content themselves in order to learn' (Carr, Palmer and Hagel 2015: 174). In line with this approach, our students are required to explore

Hadrian's Wall using the information provided within the map, thinking especially about the strengths and limitations of the available evidence. This begins the process of thinking critically about how the nature of sources impact upon our knowledge. Students are directed to watch a series of short bespoke films embedded within the map at appropriate locations (e.g. milecastle, turret, fort, the ditch and bank system known as the *vallum*) before exploring an extensive series of 'info boxes' associated with other features. These contain text, images and links to external websites, including the online *Roman Inscriptions of Britain (RIB)* database.⁶ Embedding the films, images and written information within the map reinforces the importance of examining evidence within its appropriate geographical and topographical context. It is suggested to students that they watch the films in a recommended order but they are free to explore the various resources in a way that enables them to think for themselves about how to address the questions they have been asked to consider: they become 'the authors of their own learning' (Cherney 2008: 155).

[Figure 18.5]

Early feedback and ongoing challenges

The map was frequently singled out when students were asked what aspects of the teaching materials, learning activities or assessment they found particularly helpful to their learning, noting that it was an engaging and useful resource (e.g. 'I enjoyed using the interactive map found it very helpful in understanding locations'; 'I thought it was really innovative and helpful'; and 'The interactive map series was particularly helpful for getting things in perspective generally, and for detailed study in the films and individual notes'). The most encouraging comments suggest that it successfully achieves its primary objective: 'it gave a geographical perspective, and it pinpointed places in relation to each other. This brought to life much of the development of the empire through time and placed provinces and cities in relation to each other'. Indeed, some students evidently wanted it to do more than it was designed to do, noting that it 'was useful but could have been better ... [it] should have allowed for multiple searches in one go so that you can see *[sic]* places relative to each other,' and 'It is such a useful resource that it would be brilliant to see it developed further'. Although these comments were sometimes expressed as frustration with its limitations, they can also be interpreted as evidence that this type of multi-purpose interactive resource has genuine potential for supporting deep active learning and independent discovery, reinforcing the observations above about the power of student self-sufficiency and creativity. Some of the requested modifications have already been implemented, including more detailed scale information and the ability to hold a number of sites in a search history as well as pinned to the map itself.

Not all students were so enamoured, citing slow loading times, an inability to download it to portable media storage and a general sense of irritation about having to switch back and forth between online activities and printed books. As a result, the map neatly spotlights current tensions within blended forms of distance learning which combine print and online resources (although such experiential and practical issues tend to be overlooked by scholarship focused on the challenges of technology within distance education, e.g. Conole 2014). These issues will undoubtedly become more acute as open access digital resources and publications increasingly represent the conventional products of academic research, creating both exciting opportunities and new difficulties. For example, in order to provide students with an expansive resource which they can manipulate, the sheer scale of the data embedded within the map prevents the creation of the downloadable, portable resource that some students would have appreciated. On the other hand, continuing to host the map on the OU server does allow for ongoing development, more responsive updates and greater connectivity with new external websites. Future iterations of the model, currently being adapted for other OU Arts and Humanities modules, should enable greater compression and a

smoother user experience (e.g. a version incorporating information about the Greek Mediterranean will feature in a new module available from October 2018: A229 *Exploring the Classical World*; the model has also been adopted and adapted by Art History and History modules). There are nevertheless other challenges too. In accordance with standard OU practice, accessibility issues were addressed in the course of development, including the use of screen-readable text-transcripts and compatibility with adaptation software used, for instance, by learners with visual impairments. Unfortunately, however, the online nature of the map renders it inaccessible to the OU's community of Students in Secure Environments (formerly known as Offender Learners or Learners in Prison). For these accessibility-related reasons, students are encouraged to use the interactive map to support their assignment preparation but no compulsory elements of assessment are directly dependent upon accessing the map.

Hadrian: The Roamin' Emperor

At the other end of the spectrum, but still with an intention to develop understandings of the relationship between history, geography and primary sources, *Hadrian: The Roamin' Emperor* is a standalone educational game developed for OpenLearn, in conjunction with the OU's Open Media Unit and Make Sense Design.⁷ Again, learning is presented as explorative, but this time in a light-hearted manner appropriate for the informal to formal learning process promoted by OpenLearn.

[Figure 18.6]

Players build Hadrian's passport (discovering certain facets of his character) before accompanying him on his travels around the empire, doing some myth-busting along the way. They answer questions designed to introduce bigger issues surrounding what it meant to be emperor and how the empire was secured and maintained. At the end of each 'scene' the player who has answered at least one question correctly can choose a 'souvenir' from a selection of real artefacts, texts or monuments to take back to Tivoli, requiring them to think carefully about which item will provide the best evidence for what they have learned. The game is designed to be entertaining, hence the tongue-in-cheek animations, but by the end the user will understand something about the nature of imperial rule and Hadrian himself.

Since it went live in August 2014, *Roamin' Hadrian* has attracted over 22,000 unique users (as of 31 July 2017), each of whom spends around twice as long engaging with the site as the average visitor to other OpenLearn resources (8.63 minutes compared with a site average of 4.40 minutes). The success of the game as a means for potentially converting informal learning into formal learning is indicated by the fact that 14% of users subsequently click through from *Roamin' Hadrian* to a course site on the main OU webpage, compared with a current OpenLearn site average of 8.58%. Users also click through to additional Classical Studies resources available through OpenLearn.

Informal learning with Hadrian

Game-based learning such as this offers immersive learning in context and the 'development of soft skills' appropriate to an informal learning context (Conole 2014: 223; see also Gros 2010). *Roamin' Hadrian* is designed not only to allow learners with little or no prior knowledge to find out about Hadrian, but to *understand* something about the Roman world and its study. Students studying *The Roman Empire* are encouraged to play the game at the start of the module as a way of engaging with some of the issues surrounding their study of the empire. Although designed primarily as an adult-oriented educational resource, the interactive nature of the game, cheerful graphics, low-stakes questions and gradual discovery of historical information means that it also has relevance for school groups. Additionally, it has attracted and challenged those with an existing interest in the subject (comments received from established academics suggest that they have also enjoyed playing, often

finding it a genuine challenge to achieve a score close to 100%!). The appearance of *Roamin' Hadrian* is radically different from the more sober interactive map of the Roman empire, but the underpinning pedagogical principles are the same: that explorative, discovery-led learning where 'facts are learned in the context of meaning' (Nicholls 2002: 31) contribute to the development of a deeper understanding of a subject and promote an attitude towards learning which emphasises understanding over memorisation.

Interactive online resources: looking ahead

As the Open University and other Higher Education institutions increasingly seek to make use of digital learning materials, including, for example, the opportunities offered by augmented and virtual reality (e.g. a beating heart model used in an OU Level 1 Science module on *Hominid Developments*),⁸ it is crucial that Classics continues to assert its place within this emerging use of interactive technology for pedagogic purposes. Indeed, as shown by the growth and success of research based within the Digital Humanities more broadly, Classics-based interactive resources such as *Pelagios Commons* continue to lead the way in the development of open data methodologies and tools designed to support research projects, fundamentally changing the ways in which we are able to approach the study of the ancient world.⁹ If these digital advancements, new methodologies and ways of questioning classical texts, objects and voices are to continue to shape the future of the discipline it is imperative that they also become embedded in the ways in which students learn about – and, more significantly, *learn how to learn* about – the ancient world. Incorporating online interactive resources into the teaching of Classics is a first step towards this, building on tried and tested forms of teaching as well as existing pedagogical methods and theory to enhance what we already offer and to reach a wider range of students, and potential students, with varying learning needs and styles. Indeed, the examples cited in this chapter suggest that interactive resources not only serve the more traditional ends of Classics teaching within Higher Education – that is, to enable students to find out about the Greek and Roman worlds and acquire a set of discipline-specific skills – but also open new doors to those students in terms of the ways in which they learn, as well as the more widely applicable skills that they develop and put into practice. Interactive resources such as the map of the Roman empire encourage the formal learner to actively explore and question the knowledge and information available to them, whilst *Roamin' Hadrian* provides a reminder to the informal student, and those who might never have considered studying Classics, that learning about the past is something that is both accessible to everyone and can be (perhaps should always be) an enjoyable experience. Moreover, as the case of Latin students creating their own vocabulary testing resources demonstrates, online interactive tools might even offer opportunities for students with a range of existing skills to get creative themselves and to find ways to work innovatively and collaboratively to support their fellow learners. Most excitingly, open access online platforms such as OpenLearn mean that these opportunities can be opened up to a community beyond the formal student, reaching the informal learner, even the merely curious.

Bibliography

Biggs, J. B. (2003), *Teaching for Quality Learning at University*, 2nd edn, Buckingham: Society for Research into Higher Education/Open University Press.

Carr, R., Palmer, S. and Hagel, P. (2015), 'Active Learning: The Importance of Developing a Comprehensive Measure', *Active Learning in Higher Education*, 16(3): 173–86.

Cherney, I.D. (2008), 'The Effects of Active Learning on Students' Memories for Course Content', *Active Learning in Higher Education*, 9(2): 152–71

- Conole, G. (2014), 'The Use of Technology in Distance Education' in O. Zawacki-Richter and T. Anderson (eds) *Online Distance Education: Towards a Research Agenda*, 219–36, Athabasca: Athabasca University Press.
- Cousin, G. (2006), 'An Introduction to Threshold Concepts', *Planet*, 17 (December 2006): 4–5.
- Gay, B. (2003), 'The Theoretical Underpinning of the Main Latin Courses' in J. Morwood (ed.), *The Teaching of Classics*, 73–84, Cambridge: Cambridge University Press.
- Gros, B. (2010), 'Game-Based Learning: A Strategy to Integrate Digital Games in Schools' in J. Yamamoto, J. C. Kush, R. Lombard, and C. J. Hertzog (eds), *Technology Implementation and Teacher Education: Reflective Models*, 365–79, Hershey, PA: Information Science Reference.
- Jones, B. and Mattingly, D. (1990), *An Atlas of Roman Britain*, Oxford: Oxbow Books.
- Nicholls, G. (2002), *Developing Teaching and Learning in Higher Education*, London: Routledge.
- O'Loughlin, M. (1992), 'Rethinking Science Education: Beyond Piagetian Constructivism Toward a Sociocultural Model of Teaching and Learning', *Journal of Research in Science Teaching*, 29(8): 791–820.
- Prince, M. (2004), 'Does Active Learning Work? A Review of the Research', *Journal of Engineering Education*, 93(3): 223–31.

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Figure 18.1. The 'Sounds' section of *Introducing Classical Latin*. Image copyright The Open University.

Figure 18.2. The 'Using Nouns' section of *Introducing Classical Latin* (featuring the very popular elephant). Image copyright The Open University.

Figure 18.3. General view version of the Roman empire map featuring heat clusters. Image copyright The Open University.

Figure 18.4. Searchable version of the Roman empire map, showing the results of a search, as well as the application of the roads and province layers. Image copyright The Open University.

Figure 18.5. Hadrian's Wall version of the Roman empire map, showing clickable sites along the wall (after Jones and Mattingly, 1990) and the 'info box' containing the instructions for the accompanying activity and links to multimedia resources. Image copyright The Open University.

Figure 18.6. A screenshot from *Hadrian: The Roamin' Emperor*, showing Hadrian and Antinous in Egypt. Image copyright The Open University.

¹ *Introducing Classical Latin* can be found at www.open.ac.uk/Arts/introducing-classical-latin/.

² These resources are usefully collected together at www.open.ac.uk/Arts/reading-classical-greek/.

³ See the many resources available at www.open.edu/openlearn/.

⁴ These resources are available at <http://imperium.ahlfeldt.se>, <http://pleiades.stoa.org> and <http://awmc.unc.edu/wordpress/>.

⁵ For a fully interactive demo of the map of Hadrianic Rome see the section of a free short course available at http://students.open.ac.uk/arts/openlearn/rome.html?activity_id=activity_3.

⁶ Available at <http://romaninscriptionsofbritain.org/>.

⁷ *Hadrian: The Roamin' Emperor* can be found at <http://www.open.edu/openlearn/history-the-arts/history/classical-studies/hadrian-the-roamin-emperor>. See also the Make Sense Design website at <http://makesensedesign.com/hadrian>.

⁸ More details, including a video demo and a link to download the relevant human heart app can be found at <https://arvr.kmi.open.ac.uk/>.

⁹ Pelagios Commons is available at <http://commons.pelagios.org/>. See also the *Hestia Project* <http://hestia.open.ac.uk/> and *Google Ancient Places* (GAP) <http://gap.alexandriaarchive.org/gapvis/index.html#index>.