

DeL II Project Report

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Subject Centre: Subject Centre for Geography, Earth and Environmental Sciences (GEES)

Project name/acronym: Informal Mobile Podcasting And Learning Adaptation 2 (IMPALA 2)

1. Project description

This section provides the background and context information of the IMPALA 2 project, reviews the literature on how podcasting has been used to support GEES subjects, outlines the aims and objectives of the project, and the methodology adopted for carrying out the research.

On the whole, the project has been completed successfully. The goals and objectives set up at the beginning of the project have been fulfilled.

1.1 Background and context

From 2005, podcasting started to capture the attention of academics in Higher Education (HE). At Duke University in the US, first year students were given iPods and academics were encouraged to develop applications (duke.edu/ddi). Early uses at Duke included course content, classroom recordings, field recordings, study support, file storage and transfer (Belanger, 2005). At Stanford University, students can subscribe to Stanford on iTunes U (itunes.stanford.edu), download courses, faculty lectures and interviews and listen to them from their iPods. Another early pilot was Georgia College and State University (ipod.gcsu.edu), which introduced the iPod to a range of courses in Liberal Arts from 2002. Since 2006, podcasting initiatives have spanned academic disciplines and student life in HE in many countries.

In Australia, a large project researching educational benefits of student-generated podcasts has been underway at Charles Stuart University since 2005. It began with a small pilot group of undergraduate on-campus students studying Information Technology, but it soon expanded to include a wide range of undergraduate and postgraduate subjects and to involve both on-campus and distance learning students. Publications based on this project revealed that its student-centred approach is beneficial for both student producers (McLoughlin, Lee and Chan, 2006) and listeners (McLoughlin, Lee and Chan, 2007).

In the UK, early in 2006, a research project called IMPALA (impala.ac.uk), funded by the UK Higher Education Academy (HEA) was carried out at the University of Leicester. The project set out to explore the subject-specific pedagogical benefits of podcasting to support students' learning. Around 20 university lecturers and 500 students across six topics, subjects and disciplines and different modes of learning were involved. The project showed that podcasting that can have a positive impact on student learning in a wide range of subjects (Salmon and Nie, forthcoming).

Interestingly, five out of ten case studies in IMPALA focused on the use of podcasting for supporting GEES subjects. The enthusiastic uptake of podcasting by GEES practitioners prompted the GEES Subject Centre to invite the IMPALA team to carry out another podcasting project – IMPALA 2, specifically to explore the potential of podcasting for supporting GEES disciplines.

1.2 Podcasting in the GEES subjects

Early studies have revealed that podcasting can support student learning in the GEES subjects in a number of ways.

Supporting fieldwork

The widespread availability and the falling cost of mobile technology have resulted in considerable interest in off-campus learning (Maskall et al, 2007). Podcasting can be used across learning spaces and can support knowledge continuity and transfer from the classroom to the field. There is a considerable interest in the work from the GEES disciplines, where lecturers use podcasting to provide instructions and information to support fieldwork, a crucial component of teaching and learning in these subjects. For example, Thomas (2006) reports on an experiment in providing audio instructions to support student field trips in an Earth Sciences course. Students listened to instructions provided as MP3 audio files and completed three field trips in their own time. In another study, field instructors delivered PowerPoint presentations, instructional DVDs and CD-ROMs to students on a bus while they were travelling to the field site, via a portable audio and video system (Elkins and Elkins, 2006). Downward et al (forthcoming) have documented a comprehensive discussion on how to use podcasts to support fieldwork, including fieldwork preparation, providing information and instruction in the field, demonstrating field techniques and equipment use, and using student-created video podcast as a means for assessment.

Two colleagues participated in IMPALA 2 developed a podcast library of geographical techniques. Another colleague produced a series of podcasts to provide field-based instructions. They wanted to help students do more independent learning in the field by empowering them with mobile devices and technology (Jarvis and Dickie, 2008).

Improving learner engagement and motivation

GEES subjects are inherently visual. Lim (2005) suggested that ‘the nature of the discipline lends itself far better to the use and/or authoring of video podcasts than audio ones.’

IMPALA 2 colleagues were enthusiastic to explore the effectiveness of video podcasts in promoting learner engagement and motivation. One technique engaged first year students in creating digital storytelling, giving them active, independent, collaborative and reflective learning experiences (Jenkins and Lonsdale, forthcoming). Another approach involved the practitioner producing supplementary material in video documentaries to engage students with the topic and motivate them to learn more about it. Other colleagues examined how video podcasts can engage students and help them learn geographical software more effectively (Mount and Chambers, forthcoming)

Fostering collaborative learning

GEES subjects often involve introducing students to controversial and debatable issues. Earlier studies have revealed the effectiveness of collaborative learning through perspective-taking offered by podcasting in contributing to students’ understanding the subject matter for other subjects, such as Information Technology (Lee, McLoughlin and Chan, 2007), and English Language and Communication (Edirisingha et al, 2007).

One practitioner working on the IMPALA 2 project developed podcasts that included interviews, conversations and debates with colleagues, local residents and site managers. He aimed to increase the breadth and depth of student learning by exposing learners to different viewpoints about a controversial issue through podcasts. Another colleague podcasted students' presentations and discussions. He wanted to examine the effectiveness of peer-discussion in developing students' in-depth understanding and critical thinking of the issue covered.

Offering flexibility and learner control

Winterbottom (2007) reported on a study of delivering lectures using podcasting technology for a second year Environmental Science module. Students' feedback showed that they enjoyed the flexibility that podcasting brought to their study, 'as they could then view the lectures at the time of the day most suited to their learning styles, rather than be constrained by lecture times' (p.8). This approach can also allow the lecturer to cover basic principles with a podcast and use the face to face session to explore the subject matter in more detail with the students.

Providing effective feedback

Podcasting has been used to provide assignment feedback to students studying GEES subjects (France and Wheeler, 2007). Their study suggested that podcasting offers an opportunity of providing students with more personalised and effective feedback than traditional written feedback.

Enhancing understanding of subject related threshold concepts and troublesome knowledge

Certain concepts and ideas in the GEES subjects can be difficult to understand. Meyer and Land (2005), quoted in Bradbeer (2005, p.3), defined a threshold concept as, "a conceptual gateway that leads to previously inaccessible understanding and links a known knowledge space to the unknown. They suggested that a threshold concept has two key characteristics: 'It is transformative, leading to a significant shift in perception or a new world view; and 'It is irreversible, unlikely to be forgotten and more or less impossible to unlearn'. Threshold concepts became one of the themes of the GEES annual conference taking place in June 2006. The conference participants generated a list of threshold concepts for the three subjects that can be accessed from (www.gees.ac.uk/planet/p17/tcideas.pdf).

Podcasted lectures were found useful in reinforcing student understanding of subject-related material through repeated listening (Winterbottom, 2007). It would be of interest to examine whether this approach is effective in enhancing student understanding of subject-specific threshold and difficult concepts.

The use of podcasts to enhance students' understanding of complex concepts is not unique to GEES. Other studies have found that podcasts based on discussions of difficult concepts were effective in addressing students' common misconceptions and enhancing their understanding of subject-related issues for other difficult subjects, such as Information Systems (Newnham and Miller, 2007), Information Technology (Chan and Lee, 2005), Physics (Aliotta et al., 2007), and Sports Science (Abt et al., 2007). However, these studies have not yielded sufficient evidence of how the improvement in students' conceptual understanding is related to improvement in their performance. A few studies reflected a slight but positive impact of podcasting on student learning (Aliotta et al., 2007; Abt et al., 2007).

1.3 Aims and objectives

IMPALA 2 aimed to answer three research questions:

1. How can podcasting help students and staff tackle 'troublesome knowledge' and 'threshold concepts' in GEES subjects?

2. How can podcasts help students' learning in 'multiple learning spaces' in GEES subjects?
3. What are the key issues and enablers for sharing, re-using and re-purposing podcasts and exemplars across GEES disciplines?

Five UK institutions (Leicester, Gloucestershire, Nottingham, Leeds and Sussex) were involved in IMPALA 2 project. Colleagues identified and developed eight pedagogical approaches through which to address the three research questions and evaluate the use of podcasts for supporting student learning in GEES subjects.

- Podcasted lectures
- Podcasted students' presentations and discussion
- Video podcasts to provide lecture summaries
- Video podcasts to support software teaching and learning
- Video podcasts on field techniques and equipment use
- Video podcasts to provide a field guide
- Podcasts to provide additional information about the subject
- Student-created digital storytelling

1.4 Methodology

The research was carried out across five UK universities, (Leicester, Gloucestershire, Nottingham, Leeds and Sussex) during the academic year of 2007-08.

The impact of podcasting on student learning was evaluated through quantitative and qualitative methods. Qualitative data were collected from focus group interviews with students. The interviews lasted 30-40 minutes and were conducted using a semi-structured interview schedule developed to explore how student learning is supported by podcasts and patterns of podcast use. Findings from the interviews were complemented by quantitative data gathered through an end-of-semester questionnaire. The questionnaire captured data on students' familiarity with technologies, especially Web 2.0 technologies, their typical usage of podcasts, and patterns of using podcasts.

Staff experience of developing podcasts was gathered through a personal interview with each lecturer who developed podcasts. Information was gathered about the pedagogical rationale for using podcasts, how podcasts were integrated with other learning activities and learning resources, the development process and issues encountered, and their visions about future development.

All interviews with both students and staff were recorded on a digital recorder and transcribed verbatim for analysis to identify key themes and issues.

Appendix 1 contains a summary of the institutions and courses involved in the study, and the number of participants included in the questionnaire survey and focus groups.

2. Project Outputs

This session will outline the main outputs of the IMPALA 2 project. There are four deliverables: workshops, user-exemplars, a model of podcasting for GEES subjects, and a rich digital repository of re-usable and shareable podcasts. All the resources are available through the project (www.impala.ac.uk) and GEES subject centre (www.gees.ac.uk) websites, and the project wiki (www2.le.ac.uk/projects/impala2).

2.1 Workshops

IMPALA 2 provided GEES practitioners with a platform for exchanging ideas, sharing experiences of using podcasts, and disseminating findings. They were supported through two workshops.

The first workshop was on 16th July 2007 at Leicester. This event was attended by 12 GEES colleagues from different universities across the UK. Delegates included university lectures and researchers from University of Leicester, Plymouth, Sussex, Stirling, Kingston, Gloucestershire, Wolverhampton, and Exeter. Most of them already had plenty of experience in developing podcasts. Seven colleagues presented their work and ideas about how to integrate podcasting into their specific discipline areas. Colleagues had used podcasting to:

- Provide lectures: e.g. podcasted lectures for students to revisit lectures or to replace face-to-face lectures
- Support fieldwork: e.g. providing location-based information (e.g. explanation and description of a particular site), and instruction-based information (e.g. guide for equipment use), and by recording student fieldwork (e.g. for field trip preparation)
- Assess students' work: e.g. student-created video documentaries based on field trip or student-produced video podcasts on an environmental topic impacting China
- Provide additional information: e.g. bringing topic issues in Development and Sustainability

Colleagues also discussed how the three research questions could be addressed through this project and their plan for developing and implementing podcasts in Semester 1.

The second workshop, on 5th December 2007 at Leicester, was attended by 14 university and college lecturers, researchers and learning technologists across the UK (Leicester, Staffordshire, Harper-Adams University College, Chester, West England, Birkbeck College, Nottingham, Keele, Worcester, and Derby). Most of the delegates had little experience of using podcasts. The purpose of this workshop was therefore to introduce them to podcasting in the GEES subjects and the technologies involved, and to demonstrate a variety of different kinds of podcast applications used by GEES colleagues.

The workshop began with presentations by three experienced GEES colleagues on how they had used podcasts to support teaching and learning. The workshop was then led by another experienced GEES colleague who demonstrated a variety of software tools and techniques for creating podcasts. Delegates were also given an opportunity to create their very first video podcast.

Resources generated from the two workshops including PowerPoint presentations by GEES colleagues and video podcasts created by participants are available through the project wiki (www2.le.ac.uk/projects/impala2).

2.2 User exemplars

Seven user-exemplars based on different approaches to using podcasts adopted by IMPALA 2 colleagues are included in Appendix 2. They were also made available through the project (www.impala.ac.uk) and GEES subject centre (www.gees.ac.uk) websites. The user-exemplars are:

- Podcasts for providing supplementary materials – a case study at School of Earth and Environment, University of Leeds
- Lecture and seminar podcasts – a case study at Department of Geography, University of Sussex

- Podcasts to support teaching and learning geographic software and theories – a case study at Department of Geography, University of Nottingham
- GeoPods: A podcast library for geographical techniques – a case study at Department of Geography, University of Leicester
- iWalk: A field guide – a case study at School of Earth Sciences and Geography, Kingston University
- Enhancing students' learning experiences through the use of digital storytelling – a case study at University of Gloucestershire
- Podcasts to introduce topical issues – a case study at Department of Geography and Development, University of Gloucestershire

2.3 Impala 2 model of podcasting

An IMPALA 2 model is adapted from the IMPALA model, which is a 10-factor design model presented by the IMPALA research team as a guide for developing podcasting for learning in HE. The model guides practitioners through the process of developing their own educational podcasts and offers them options for their own teaching and learning challenges and contexts. The design model is grounded in our research and emerged from in-depth data analysis in the IMPALA case studies. The Impala model was first made available through IMPALA's website (www.impala.ac.uk). It is now being published as a book chapter 'Developing pedagogical podcasts' (Edirisingha et al., forthcoming) within the book 'Podcasting for universities'.

The IMPALA model identified ten factors to be taken into consideration when developing podcasts to support teaching and learning in universities. Each factor offers multiple options and leads to an important design step. The ten factors are:

- The purpose or pedagogical rationale
- The medium used (audio only or audio and visual)
- The convergence (how much the podcasts are integrated with other e-learning)
- The authors and contributors of content
- The structure of podcasting (frequency and timing)
- The re-usability of content
- The length
- The style (presentation, interview, dialogue)
- The framework of content organization
- The access system (via VLE or Internet-based feeder service such as RSS).

The IMPALA 2 model is adapted from the IMPALA model, with particular focus on five of the ten factors: the purpose or pedagogical rationale, the medium used, the authors and contributors of content, the re-usability of content, and the style that are more important and make more sense to the design of podcasts for GEES subjects.

A piece of advice we give to GEES practitioners on how to use this model is to refer to the IMPALA model (Edirisingha et al., forthcoming) covered in the book chapter to get generic guidelines. An online interactive version of this model is available from the book's website (www.podcastingforlearning.com). They used the IMPALA 2 model and user-exemplars for subject-specific guidelines. A detailed description of how IMPALA 2 colleagues designed their podcasts, and what specific pedagogical

benefits were delivered through their applications were provided in the user-exemplars in Appendix 2.

The following sections deal with the five factors that are particularly relevant to the design of podcasts for GEES subjects and offer subject-specific guidelines.

The purpose and pedagogical rationale

It is essential for GEES practitioners to decide to use podcasts in their teaching based on a teaching and learning problem, challenge or issue that they have identified.

The table below provides a summary of the pedagogical rationales identified in IMPALA 2, the approaches adopted by GEES colleagues to using podcasts and how this particular approach to podcasting is linked to the curriculum.

Teaching and learning problem, challenge or issue	Approach in using podcasting	Link to the curriculum
Review and enhance understanding of subject-specific difficult concepts	Podcasted lectures	Cover the same content as in weekly lectures
Help students' learning and revision in their own time	Lecture summaries produced as video podcasts	Cover the essential parts of weekly lectures
Foster collaborative learning among students Help students to develop ideas for their essays	Podcasted audio recordings of students' seminars	Link to the assessment
Help students to learn to use geographical information systems (GIS) software	Visual instructions on how to use GIS software, produced in video podcasts	Valuable to students in weekly practical sessions, replacing text-based instructions
Help students to learn and review field techniques and equipment use	A series of video podcasts explaining how to use different types of field equipment and techniques	Essential for students on their field trip, as part of a second year 'Technique' module
Help students to receive and grasp instructions during their field trip	A series of video podcasts that provide students with location-specific information and instructions.	To be used by students on the field trip, as part of the course delivery
Increase the breadth and depth of teaching material	Podcasts providing students with extra material related to the subject	Supplement a specific lecture Provide additional information about a particular workshop or field trip, as part of the course delivery

		Link to the assessment
Engage students with an activity	Student-created digital storytelling	An induction week activity, as part of first-year student experience Link to a Level 1 ‘Skills’ module The digital story and the reflection are included in the student’s e-portfolio.

The medium used

The IMPALA model offers two choices of medium for developing podcasts: audio only or audio with visual material such as video, still images and graphical illustrations.

The IMPALA 2 experience shows that GEES colleagues prefer to incorporate visual material into the design of their podcasts because the nature of GEES subjects is inherently visual. IMPALA 2 research also shows that visual material is effective in engaging the learners and promoting their learning.

The table below provides a summary of the video podcast applications developed by the IMPALA 2 colleagues and the pedagogic benefits delivered through these applications. The benefits particularly relevant to GEES subjects are shown in bold.

Video podcast applications	Pedagogic benefits promoted and delivered
Lecture summaries produced as video podcasts	Independent and flexible learning Revision tool Learner engagement
Visual instructions on how to use GIS software, produced in video podcasts	Independent and flexible learning Learner engagement Students learning to use geographical software
A series of video podcasts explaining how to use different types of field equipment and techniques	Independent learning in the field Efficient delivery of field-based instructions
A series of video podcasts that provide information and instructions to students in the field	Independent learning in the field Efficient delivery of field-based instructions and information
Providing students with extra material related to the subject through video podcasts	Learner engagement Visuals appropriate to the teaching objective (e.g., identification of plants)
Student-created digital storytelling	Students’ engagement in independent, active, collaborative learning experiences

	<p>Students' reflection on their work</p> <p>Students' empowerment through new technology and mobile devices</p>
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The authors and contributors of the content

The IMPALA model includes three categories of podcast content:

- Solely university teacher-generated
- Solely student-generated
- A mixture of student- and teacher-generated

In IMPALA 2, applications were developed by GEES colleagues in all three categories. The podcasted lectures, video podcast lecture summaries and the video podcasts to support practical-based and field-based learning were all generated by lecturers. Podcasted seminars and digital stories were student-generated.

We also found that the third category, incorporating voices and perspectives from different stake holders, is preferred by GEES colleagues. This is perhaps because that their courses involve introducing students to topical but controversial issues in the subject. In one example, an IMPALA 2 colleague at Leeds developed video documentaries to introduce students to topical and controversial issues related to 'Climate Change' and 'Conservation' by incorporating interviews and discussions with colleagues, site managers and local residents. Another example was developed by a colleague at Gloucestershire. He included interviews, discussions and debates into the podcasts to help introducing the issue 'Sustainability'. Our evaluations showed that students like to listen to the voices, opinions and contributions of other people as well as teaching staff. In this way colleagues made their podcasts much more interesting and rather different from other formal teaching and learning material. They also helped students to get different perspectives from different parties regarding the issues.

The re-usability of content

Developing podcasts, although enjoyable and useful for supporting student learning, has implications. One implication is time-investment, especially for GEES colleagues who want to use more sophisticated tools to develop good quality video podcasts. There is a resource implication as well. Podcasts can be built and archived for a particular module or for sharing with others. Therefore, GEES practitioners need to think about re-usability at the very beginning of their podcast development.

The IMPALA 2 project provides many examples of re-usable podcasts. The GIS instructional podcasts and lecture summaries are re-usable podcasts. The disciplinary knowledge covered in these podcasts is fairly stable therefore the authors have been able to re-use them. In fact, one lecturer has already benefited from his re-usable podcasts. The podcasts that he first created for students in the academic year 2006-07 he re-used with a new student cohort in 2007-8.

The podcast library of geographical techniques and the 'iWalk' podcasts are also re-usable examples. At the planning stage, the resources that were allocated to developing these podcasts were considered to be a worthwhile investment, partly in the light of their re-usability.

Podcasts that introduce students to topical and controversial issues are re-usable to some extent. If the topics and viewpoints change, the authors can perhaps re-use or re-purpose part of the content.

The digital stories are very context- and student cohort-specific. They are usually produced afresh by students each year but in some instances the previous year's podcasts can be offered to new student cohorts with clear guidance on how they can be used.

The style

By style, we mean the degree of formality adopted and the genre (e.g., interviews, discussions) selected for podcasts. Podcasts' style is very important because they need to be interesting as well as informative to appeal students and hold their attention.

One approach to making podcasts interesting is to adopt an informal style. A friendly tone invites students to learn and helps to build intimacy with the speaker. Students can feel their lecturer's enthusiasm for the topic conveyed through his voice. This enthusiasm can encourage students to learn more about the topic. Another approach is to incorporate informal learning content such as people's experiences, opinions, and perspectives through interviews, discussions and other forms of dialogue.

GEES colleagues in IMPALA 2 produced good examples of an informal style designed to make the podcasts appealing to students. Two colleagues engaged their listeners by incorporating conversations, discussions and debates, plus music. Another GEES colleague podcasted student presentations and discussion in seminars to foster collaborative learning among peers.

2.4 Digital repository

A podcast repository containing podcast examples used by IMPALA 2 colleagues is available through the project (www.impala.ac.uk) and GEES subject centre (www.gees.ac.uk) websites for GEES practitioners to use. This digital repository contains 21 podcasts in six categories: Lectures, Lecture Summaries, Seminars, Practicals, Fieldwork, and Supplements. Each one is downloadable. A short description to each podcast is included in Appendix 3. An outline of the repository's structure and content is shown below.

1. Lectures:

- Ethnobotany part 3: spirituality and the arts
- Structure of the earth
- Introduction to palaeoenvironmental proxies

2. Lecture Summaries:

3. Seminars:

4. Practicals:

- How to use GIS software
- Lab techniques

5. Fieldwork:

- iWalk – a field guide
- How to use a Schmidt hammer - field techniques

6. Supplements:

- Reflective learning and the Egan review
- Team-based learning and Fairtrade
- Impacts of Climate Change on UK

- Carbon confessions of an environment school
- Plant Detectives: using plant indicators species to uncover environmental history in Scotland
- Interview with Dr Gordon Noble about Neolithic spirituality and trees
- Sustainable Uplands case study special: ecological modeling
- Plant species profile 2: Dog Rose

3. Dissemination

IMPALA 2 dissemination was via websites, workshops, conferences and publications.

3.1 Websites

Main project outcomes and deliverables (see **Section 2 Project Outputs**), including the resources delivered through the two IMPALA 2 workshops, five user-exemplars, a model of podcasting for GEES subjects, and a digital repository of re-usable and sharable podcasts are available at the project (www.impala.ac.uk) and GEES subject centre (www.gees.ac.uk) websites, and the project wiki (www2.le.ac.uk/projects/impala2).

3.2 Workshops

Key project findings and results were delivered through IMPALA 2 workshops at Leicester for GEES colleagues, on 16 July and 6 December 2007 (see **Section 2.1 Workshops**).

We also ran two IMPALA workshops at two international conferences: Online Educa Berlin, November 28-30, 2007 and the Learning Futures Conference, Leicester, 8-9 January, 2008. Although these two workshops were not specifically designed for GEES practitioners, but for an audience from a wide range of disciplinary and institutional backgrounds, the approaches, case studies, and findings from IMPALA 2 were disseminated, and the resources and guidelines generated from the project were well-received by those attending.

3.3 Conference presentation

Presentations and posters given at international conferences by the leading and partner institutions based on IMPALA 2 work are listed below:

- Nie, M. and Edirisingha, P. (2007) Using podcasting to support student learning in GEES subjects. A presentation given at Online Educa 2007, November 28-30 Berlin. A short paper based on this presentation was available online (www2.le.ac.uk/departments/beyond-distance-research-alliance/event/previous_events/conferences/conferences2007/OnlineEduca2007/online-educa-short-papers/WIKI%20BUILDING%20DUMMY2.doc/view)
- Jarvis, C. and Dickie, J. (2008) Supporting experimental field-based learning: Interfaces and archives. Poster presented at Learning Futures Conference 2008, University of Leicester, 8-9 January.

3.4 Publications

Publications from the leading and partner institutions based on IMPALA 2 work are listed below:

- Downward, S., Livingstone, D., Lynch, K. and Mount, N. (forthcoming) Podcasts and locations, in G. Salmon and P. Edirisingha (eds), *Podcasting for learning in universities*. McGraw Hill.

- Jenkins, M. and Lonsdale, J. (forthcoming) Podcasts and students' storytelling, in G. Salmon and P. Edirisingha (eds), *Podcasting for learning in universities*. McGraw Hill.
- Mount, N. and Chambers, C. (forthcoming) Podcasts and practicals, in G. Salmon and P. Edirisingha (eds), *Podcasting for learning in universities*. McGraw Hill.
- Nie, M. (forthcoming) Podcasts to support students' learning GEES subjects. *Planet*

4. Project Outcomes

In this section, we report the key themes that emerged from the questionnaire survey and student focus group interviews.

4.1 Participants' profile

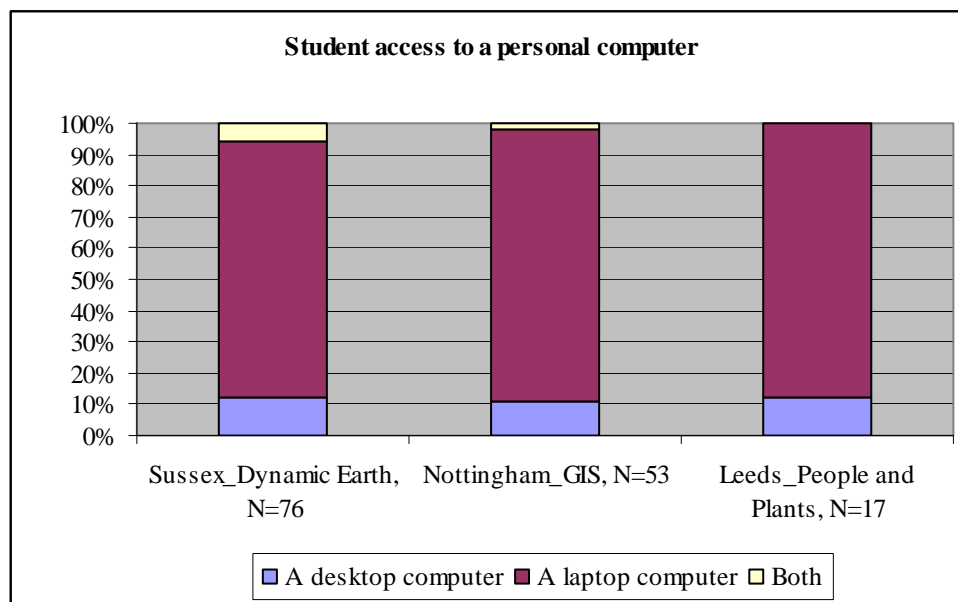
The table below shows the average age and gender distribution of students who participated in our questionnaire survey during the academic year 2007-08.

	Sussex_Dynamic Earth, N=42	Sussex_Palaeo N=11	Nottingham_GIS, N=53	Leeds_People and Plants, N=13
Average age	19	21	19	21
Male	54%	36%	51%	15%
Female	46%	64%	49%	85%

4.2 Student access to a personal computer

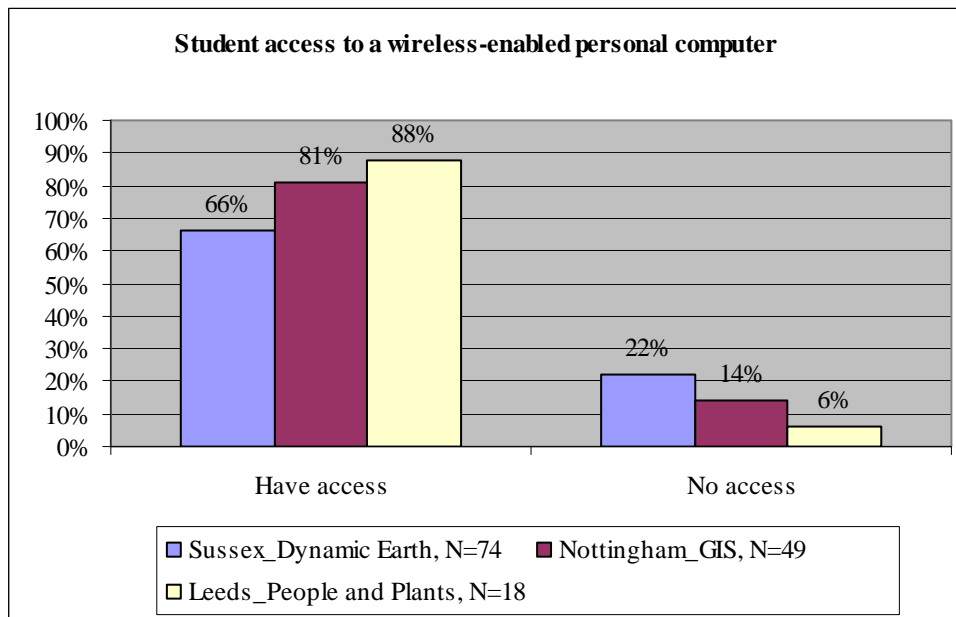
Student access to a laptop or desktop computer

Quantitative data show that all participants across three institutions had access to a personal computer. Most of the participants (82%, 87%, and 88% respectively) in the three institutions have laptop computers.



Student access to a wireless-enabled laptop or desktop computer

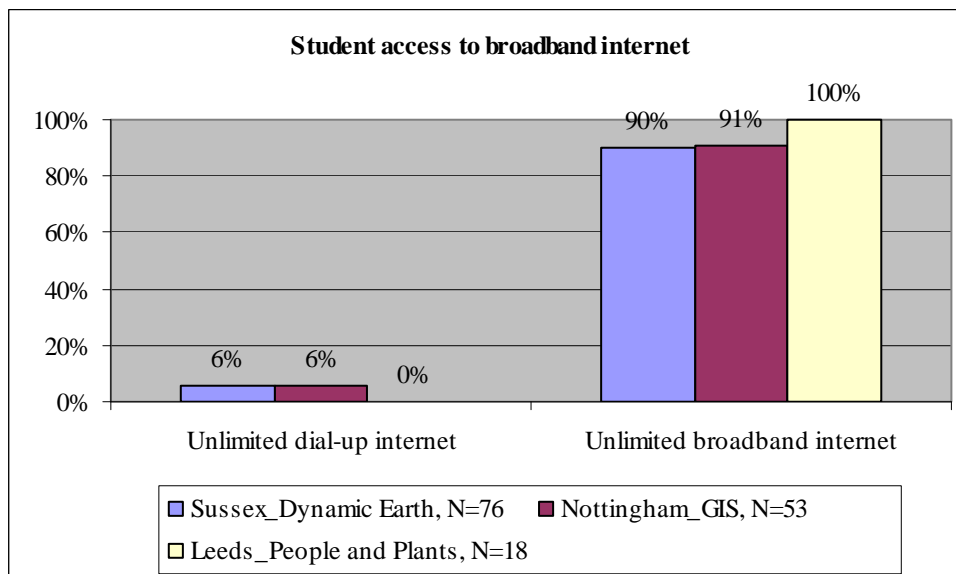
Questionnaire data show that a large percentage of participants in the three institutions (66%, 81%, and 88% respectively) have access to a wireless-enabled computer.



4.3 Student use of the internet

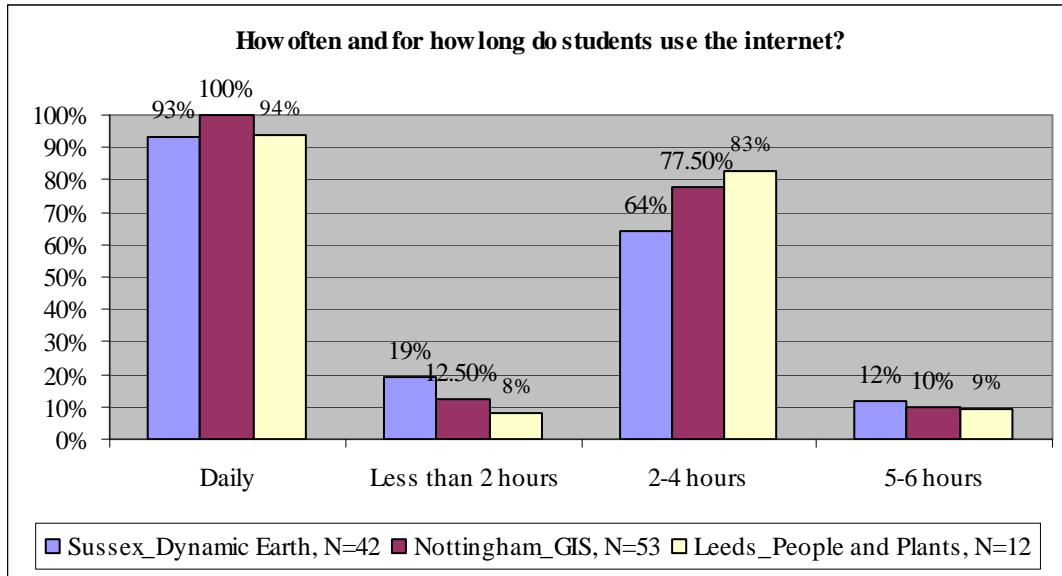
Student access to broadband internet

Questionnaire data show that the majority of participants in the three institutions (90%, 91%, and 100% respectively) have access to broadband internet at their term-time addresses.



How often and for how long do students use the internet?

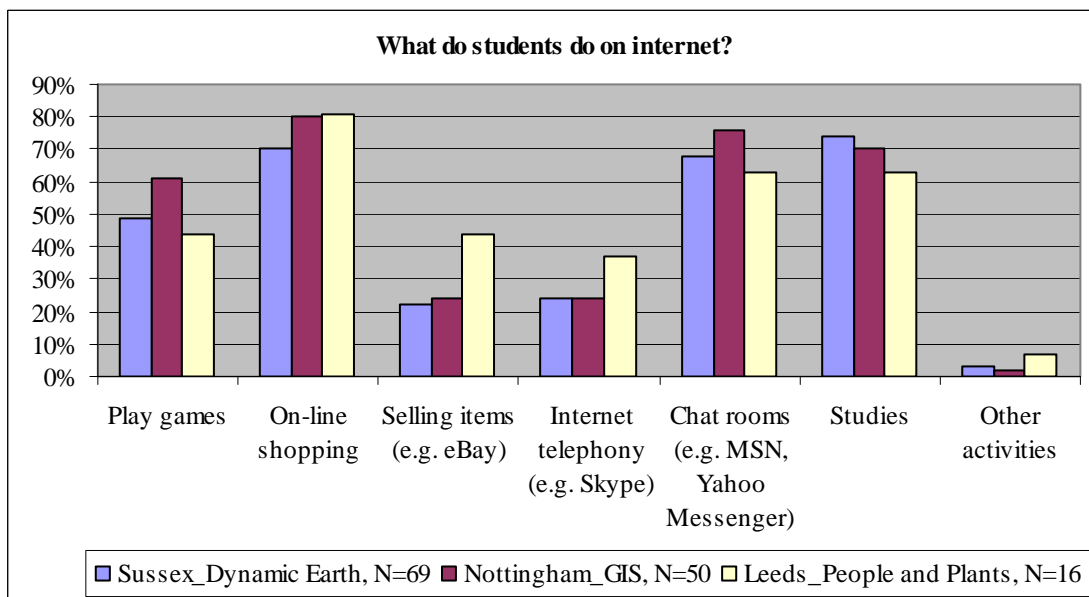
The majority of the participants in the three institutions (93%, 100%, 94% respectively) access the internet daily. Most (64%, 77.5%, 83% respectively), use the internet 2-4 hours a day.



What do students use the internet for?

The top five online activities that engaged the participants in the three institutions were:

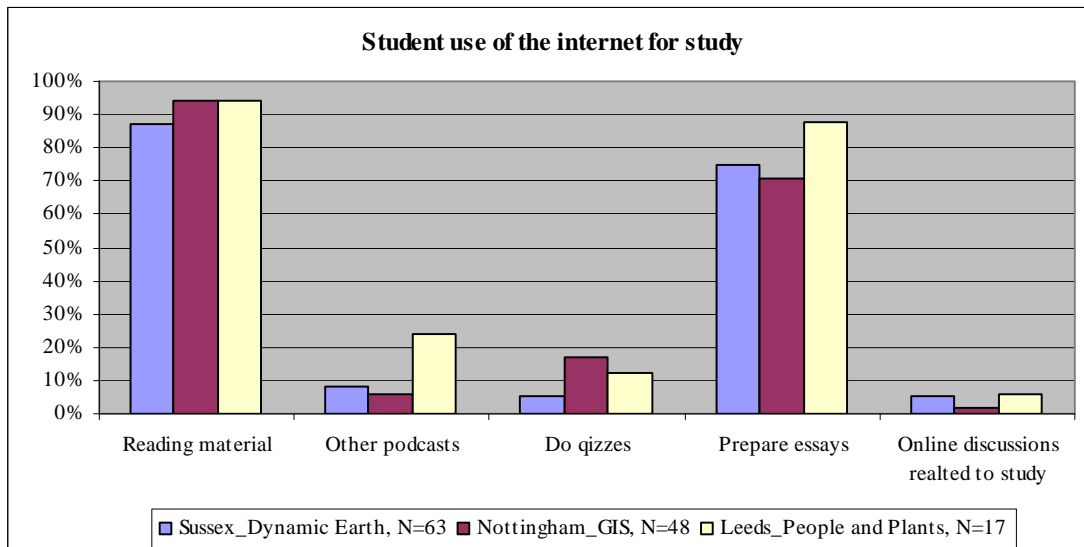
1. Online shopping: 70%, 80%, 81% respectively
2. Studies: 74%, 70%, 63% respectively
3. Chat rooms: 68%, 76%, 63% respectively
4. Play games: 49%, 61%, 44% respectively
5. Selling items: 22%, 24%, 44% respectively



Student use of the internet for study

When asked what they do on the internet for study or learning purposes, a large percentage of the participants in the three institutions reported two activities:

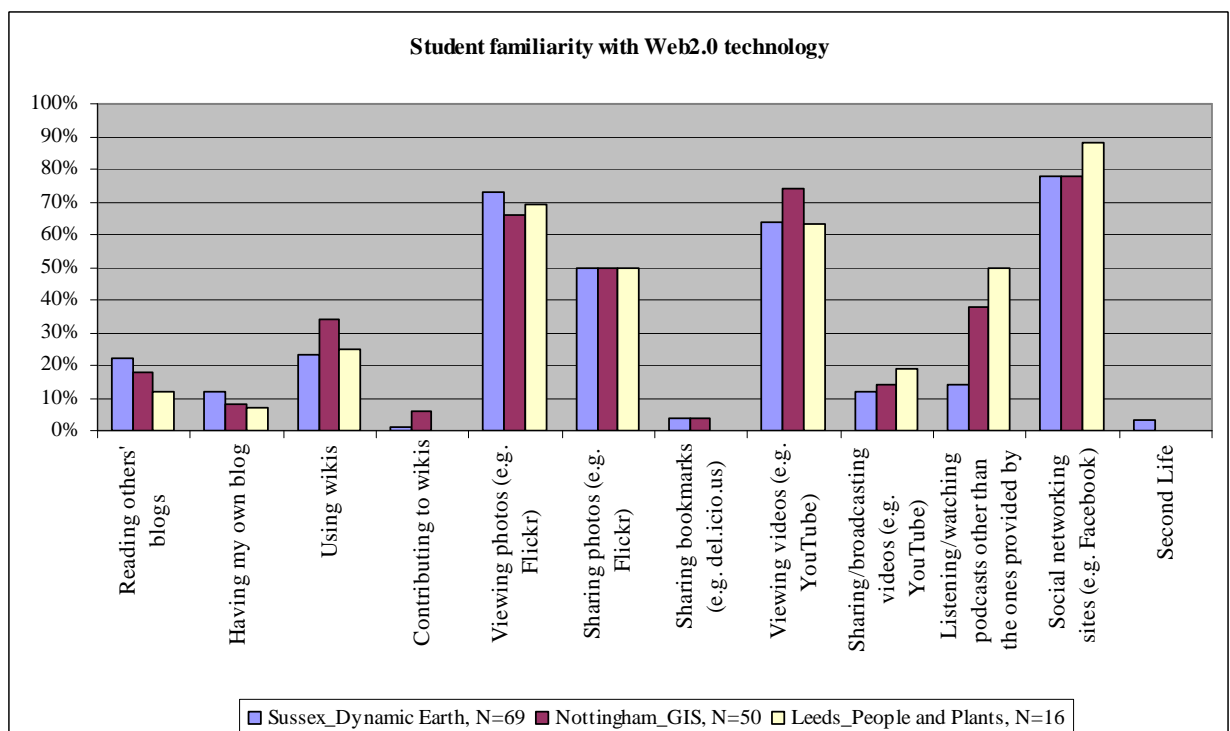
1. Accessing useful reading material: 87%, 94%, 94% respectively
2. Writing coursework, assignment or essay: 75%, 71%, 88% respectively



Student familiarity with Web2.0 technology

The top five Web2.0 technologies that the participants from the three institutions are familiar with are:

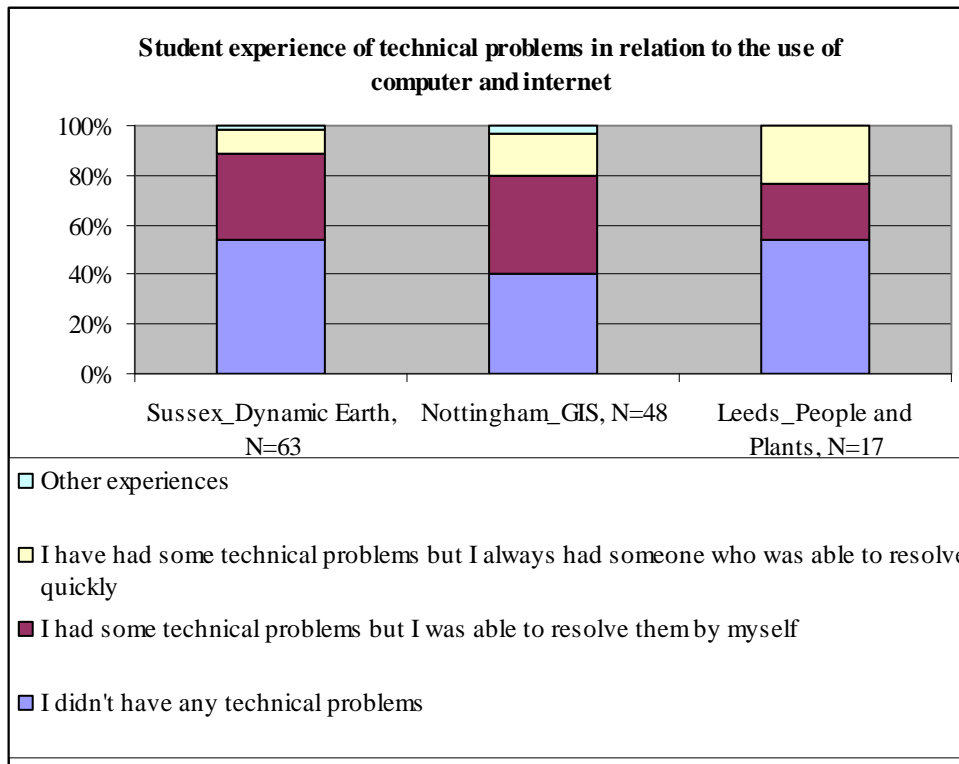
1. Social networking sites (e.g., Facebook): 78%, 78%, 88% respectively
2. Viewing photos (e.g., Flickr): 73%, 66%, 69% respectively
Sharing photos (e.g., Flickr): 50%, 50%, 50% respectively
3. Viewing videos (e.g., YouTube): 64%, 74%, 63% respectively
4. Listening/watching podcasts (other than the ones provided by the course): 14%, 38%, 50% respectively
5. Using wiki: 23%, 34%, 25% respectively



The data also show that most of these activities involve students using content contributed by other people (e.g., viewing photos, videos, listening/watching podcasts, using wiki) rather than making their own contributions (e.g., sharing photos, contributing to Facebook).

Student experience of technical problems in relation to the use of computer and internet

Quantitative data show that about half of the participants (54%, 40%, 54% in the three institutions respectively) do not experience any technical problems in relation to the use of their computers and the internet. The other participants can either resolve the problems by themselves or have someone else to resolve the problems for them.

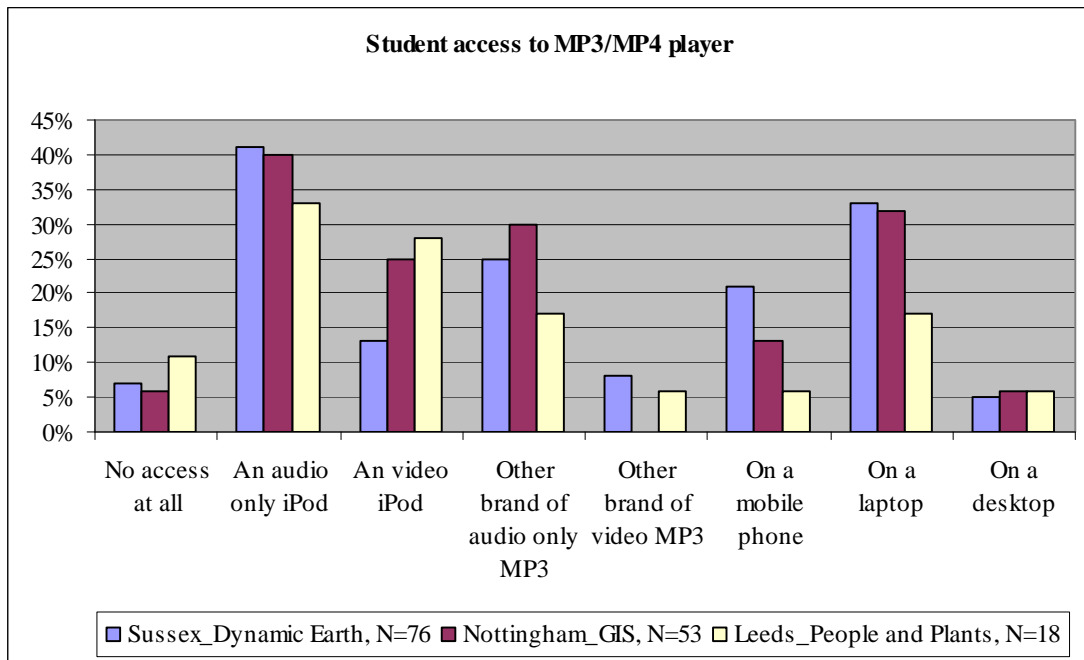


4.4 Student use of MP3/MP4 player

Student access to MP3/MP4 player

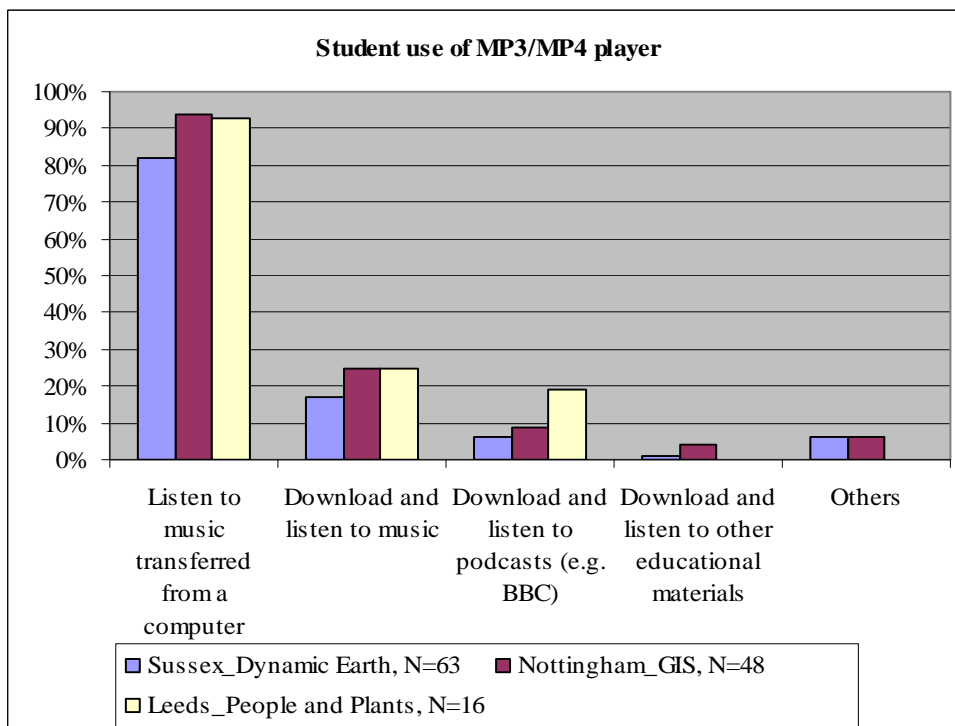
About 90% of the participants from the three institutions have access to a MP3/MP4 player of some kind. Only 7%, 6%, and 11% from the three institutions respectively reported no access to any kind of MP3/MP4 player. The most popular types of MP3/MP4 player owned by students are:

1. An audio iPod: 41%, 40%, 33% respectively
2. A video iPod: 13%, 25%, 28% respectively
3. Another brand of MP3: 25%, 30%, 17% respectively



Student use of MP3/MP4 player

The majority of the participants from the three institutions prefer to use their MP3/MP4 player for listening to music either transferred from a computer (82%, 94%, 93% respectively) or downloaded from the internet (17%, 25%, 25% respectively). Only a small number of the participants (6%, 9%, 19% respectively) used their MP3/MP4 players for listening/watching other podcasts such as from the BBC.

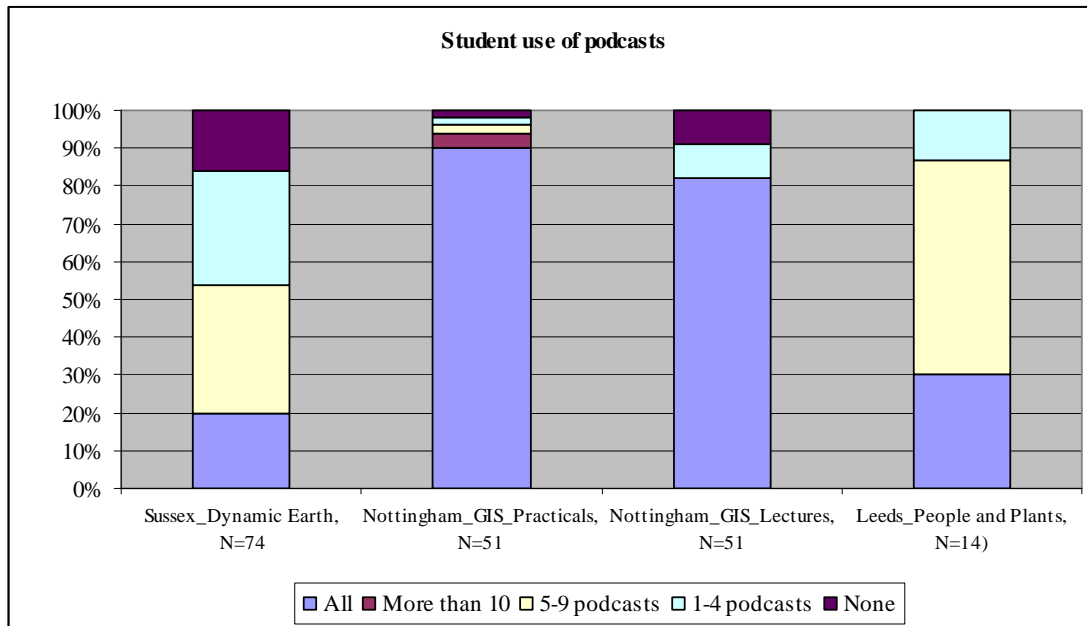


4.5 Student patterns of using podcasts

Listening percentage

Quantitative data show that student listening percentages across four modules and three institutions are very high. Over 80% of the participants listened or watched at

least one podcast. The practical and lecture summary podcasts provided with a GIS module at Nottingham achieved the highest listening percentages: 90% and 82% of the students watched all the practical and lecture podcasts respectively.



Feedback from students regarding the use of podcasting as a learning tool is overwhelmingly positive:

'Very useful for revision and added bonus even if you did go to the lectures.' (Sussex)

'Really good idea- having the back up of the podcast would make very confusing lectures much easier to understand - should be adopted by more subjects.' (Sussex)

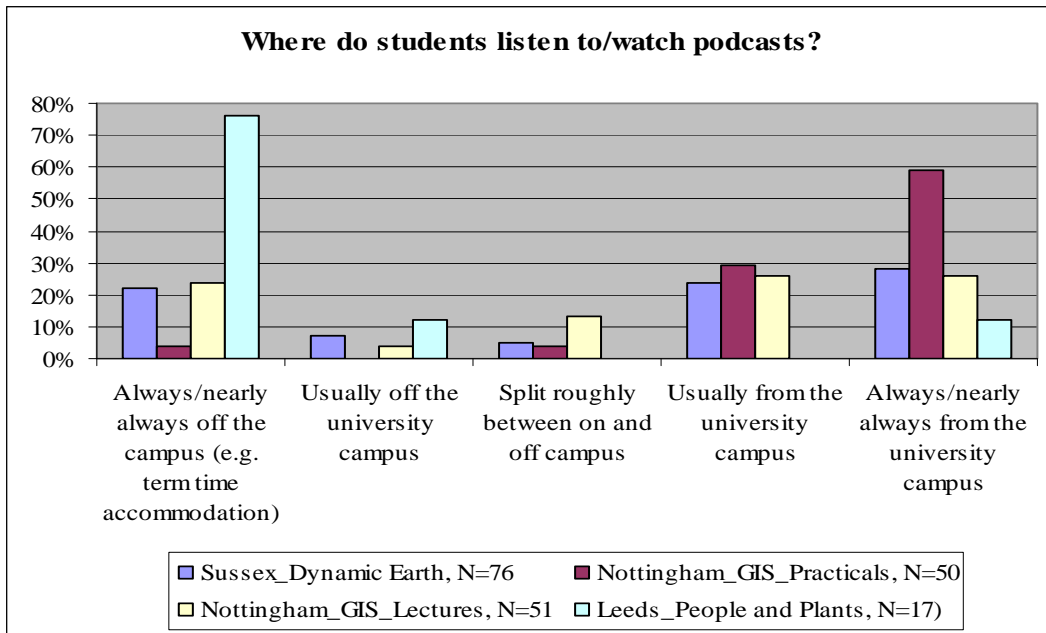
'A fantastic and unique way to structure practical sessions and backup lectures - continue to use them!' (Nottingham)

'Podcast would be great for all the modules, not just GIS. They are far more easily accessible than any other learning tools. More revision podcasts that added in the run up to exams would be useful. Also making them easier to download would mean you could integrate the podcasts with your MP3 player more easily.' (Nottingham)

'I think they are a very good service of learning as you can revise the lecture again at home to help you remember and learn it!' (Leeds)

Where do students listen to/watch podcasts?

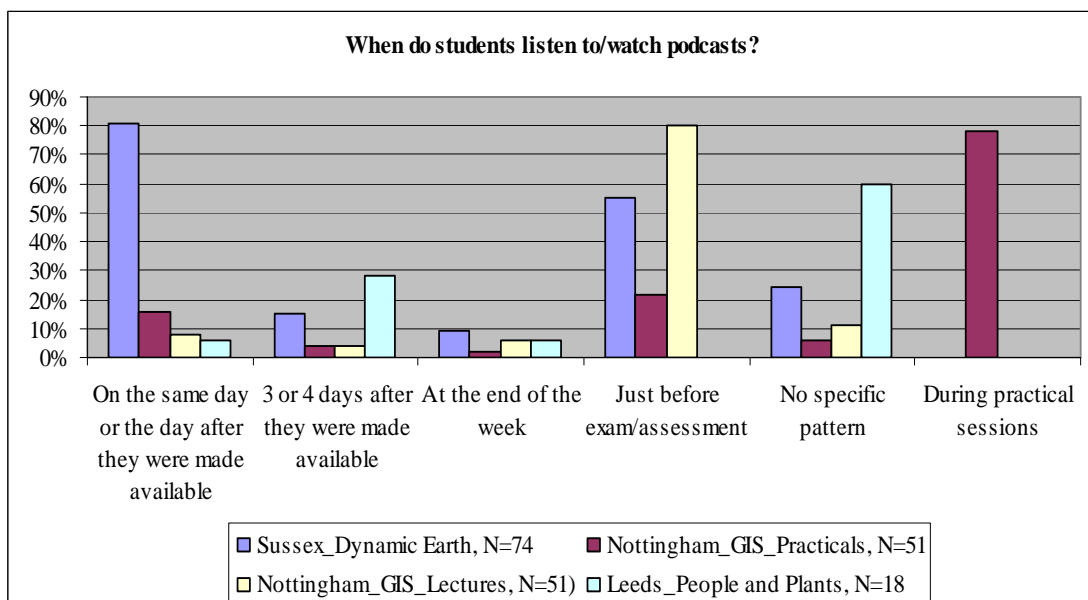
Locations in which students prefer to listen to or watch podcasts are different from one case to another. For the practical podcasts developed within a GIS module at Nottingham, the majority of students (88%) used them on the university campus. This is because these podcasts were purposely developed for students to use in their weekly practical sessions. For the two lecture podcasts developed within a Dynamic Earth module at Sussex and a GIS module at Nottingham, about half of the students (52%, 52% respectively) accessed them on campus; a quarter (22%, 24% respectively) chose to access them off campus. For the podcasts developed to provide extra and supplementary learning material within a People and Plants module at Leeds, most students (76%) reported that they accessed them off campus.



These results indicate that the less the content in the podcast is to do with the lecture, the more likely it is that students will use them ‘anywhere’ off campus.

When do students listen to/watch podcasts?

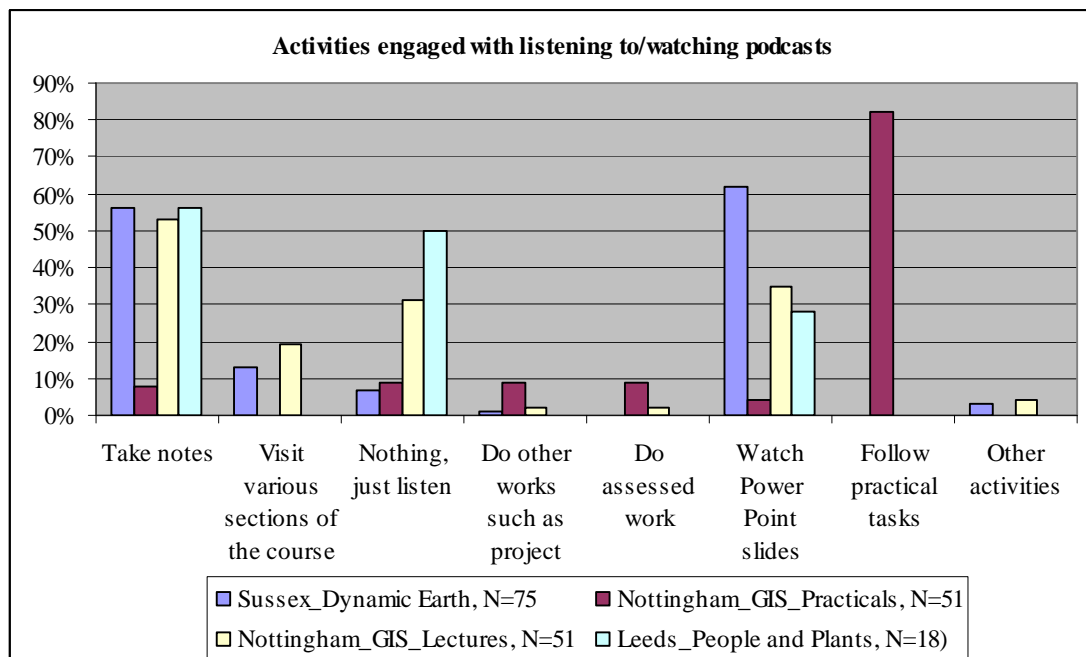
For the practical podcasts developed within a GIS module at Nottingham, most students (78%) used them during the practical sessions. For the two lecture podcasts developed within a Dynamic Earth module at Sussex and a GIS module at Nottingham, many students (55%, 80% respectively) use them just before the exam and assessment, indicating the potential of podcast lectures to help students’ revision . For the podcasts developed to provide extra and supplementary learning material within a People and Plants module at Leeds, many students (60%) reported using them with no specific pattern.



This finding also indicates that the less the content in the podcast is to do with the lecture, the more likely it is that students will use them ‘anytime’.

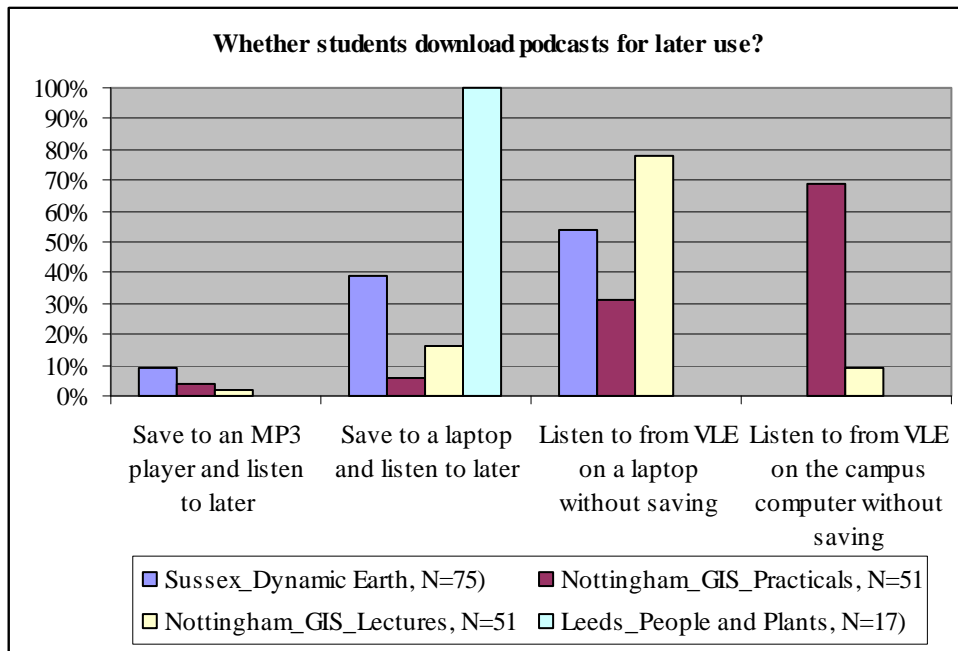
Activities engaged with listening to/watching podcasts

For the practical podcasts developed within a GIS module at Nottingham, most students (82%) watched them by just following practical tasks during the practical session. For the other three applications: the lecture podcasts developed within a Dynamic Earth module at Sussex, the lecture podcasts developed within a GIS module at Nottingham, and the podcasts developed to provide extra and supplementary learning material within a People and Plants module at Leeds, many students reported taking notes and watching PowerPoint slides of the lecture when they listened to/watched the podcasts. Doing nothing, just listening or watching was also reported by some students in the three institutions.



Whether students download podcasts for later use?

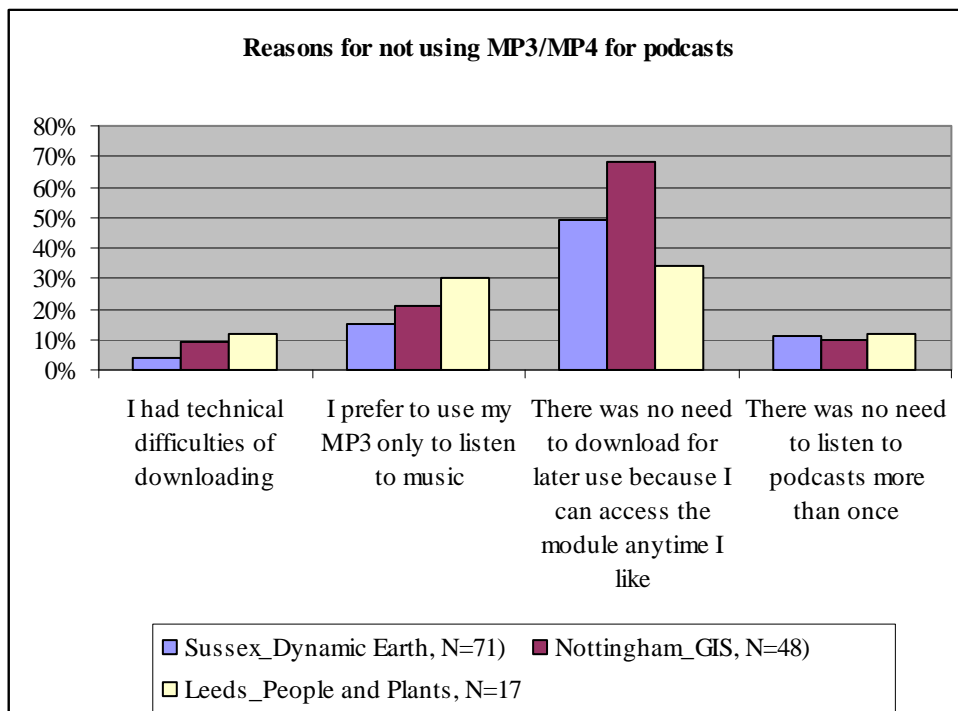
The percentage of students downloading podcasts varies from one case to another. For the practical and lecture podcasts developed within a GIS module at Nottingham, most students watched the podcasts from WebCT, the university's VLE, directly without saving. For lecture podcasts developed within a Dynamic Earth module at Sussex, the download percentage increased. 38% of the students saved podcasts onto their laptop; another 9% saved podcasts onto their MP3 for later use. Interestingly, for the podcasts developed to provide extra and supplementary learning material within a People and Plants module at Leeds, 100% students reported saving podcasts onto their laptop for later use.



The finding also indicates that a small percentage of students listened to/watched academic podcasts from their own MP3/MP4 player.

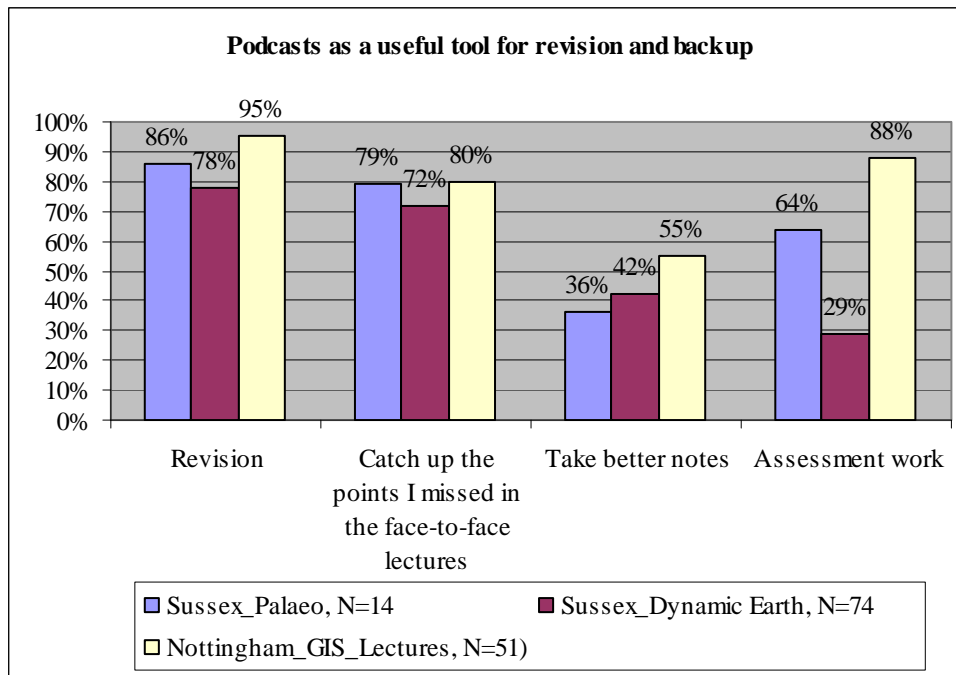
Reasons for not using MP3/MP4 for podcasts

Students reported their reasons for not using their own MP3/MP4 player for listening to/watching podcasts. The most common reason reported by the participants from the three institutions is 'There was no need to download for later use because I can access the module anytime I like'. The second reason is 'I prefer to use my MP3 only to listen to music'. Some students reported another two reasons: 'There was no need to listen to podcasts more than once', and 'I had technical difficulties in downloading'.



4.6 Student perceived benefits of using podcasts

A revision and backup tool



For the lecture podcasts provided for three different modules: Palaeoenvironments and Dynamic Earth at Sussex, and GIS at Nottingham, a large percentage of the participants from the three modules perceived podcasts as very useful for revision (86%, 78%, 95% respectively) and assessment tasks (64%, 29%, 88% respectively). In the students' own words,

'Before exams (podcasts) are a great summary.' (Sussex_Palaeo)

'(They are) very useful for exams' (Sussex_Dynamic)

'In revision for the test, podcasts were more useful than reading long chapters from the GIS textbook.' (Nottingham)

'(They) allow me to revise key points efficiently.' (Nottingham)

'Regarding revision, they played a vital role in my exam preparation.' (Nottingham)

A considerable percentage of the participants from the three modules also viewed the podcasts as a very useful tool for catching up the points they had missed in the face-to-face lecture (79%, 72%, 80% respectively), therefore helpful for making better notes (36%, 42%, 55% respectively).

'Sometimes can be hard to keep up in lectures but podcasts (allow you) to pause and rewind sections.' (Sussex_Palaeo)

'(They are useful for) revision and note taking after lectures' (Sussex_Palaeo)

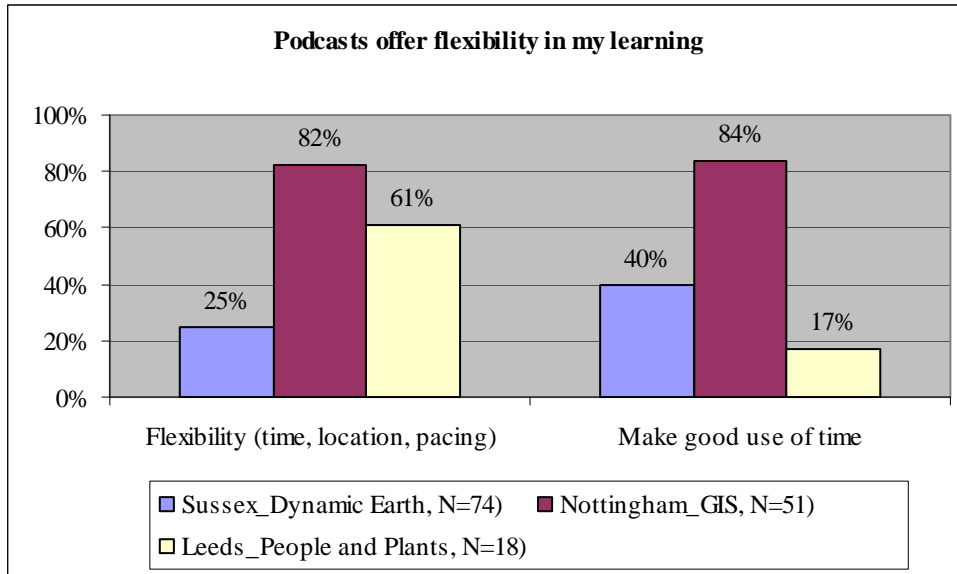
'Any missed in a lecture can be listened too again' (Sussex_Dynamic)

'(You can) repeat it to help take additional notes' (Sussex_Dynamic)

'I could rewind the podcast whereas in lectures sometimes the information went too fast!' (Nottingham)

'The future use of podcasts should definitely continue. Notes taken in a lecture are more thorough and the ability to make further notes at home is good idea.' (Nottingham)

Offering flexibility and learner control



Many students, especially those who took the GIS module at Nottingham (over 80%) perceived that podcasts offered flexibility and learner control for their learning with regard to time, location and pacing, therefore offering them an opportunity for making good use of time (over 80%).

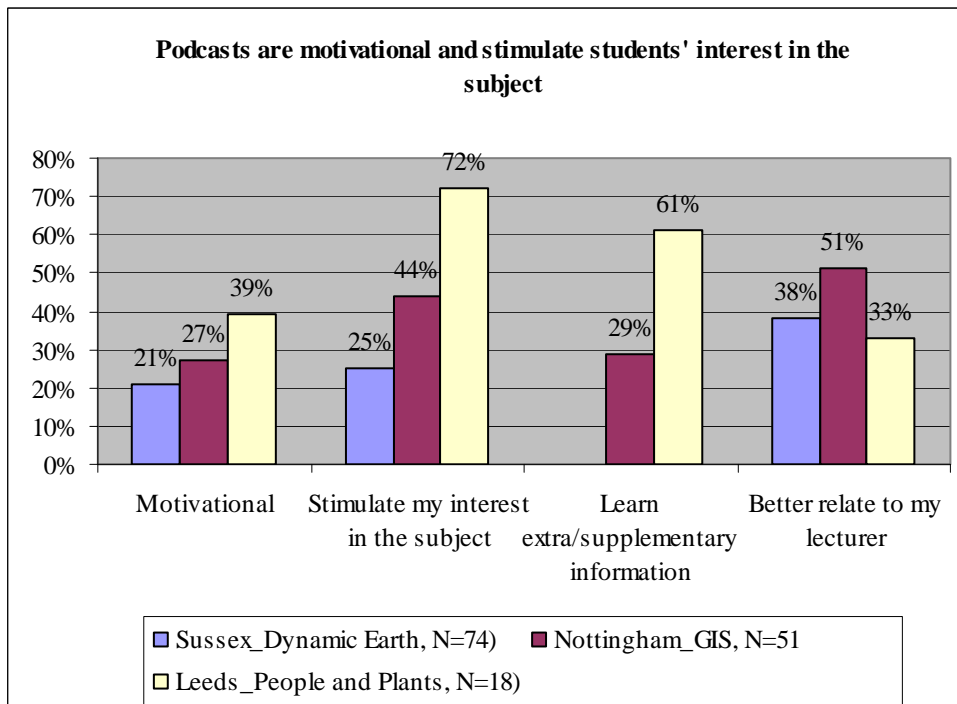
(I can) learn at my own pace. (Sussex_Dynamic)

'I can listen/watch in my own time'. (Leeds)

You could watch the podcasts anywhere on campus at anytime through WebCT which was great. (Nottingham)

'(Podcasts are) very useful in the future as it caters for all needs and learning abilities.' (Nottingham)

Improving learner engagement and motivation for learning



Many students from Nottingham and Leeds perceived that podcasts helped to engage them and promote their motivation (27%, 39% respectively) and interest in learning the subject (44%, 72% respectively) in several ways.

Podcasting offers a new way of learning, which can potentially stimulate students' interest for learning.

'(It's) more interesting to have more one form of learning.' (Nottingham)

'I would definitely advocate the future use of podcasts as an alternative way of learning. They are very effective, and as they provide a novel way of learning, they are stimulating and engaging the users' interest.' (Nottingham)

'Good because they offer a different kind of learning.' (Leeds)

Visuals are effective in engaging learners. For the practical podcasts developed within a GIS module at Nottingham, students commented on how visual instructions engaged them better in learning how to use GIS software.

'I think, definitely, if you're kind of doing something interactive, you're engaging with the software and the podcast most of the hour... Generally, like everything went smoothly, you're fine, engaged, don't get bored really. You just kind of follow the process.' (Nottingham)

'Yeah (it's engaging), because lots of them you have some forms of output on the screen, you can see something you've produced...' (Nottingham)

For the podcasts developed to provide extra and supplementary learning material within a People and Plants module at Leeds, students commented on how being able to see their lecturer demonstrating things from a video rather than from an image engaged them the subject.

'Some of the visually simulation...more interesting...especially when you're doing conservations like plants and how to use them in different circumstances, be able to see it rather than just a picture of it.' (Leeds)

Listening to podcasts that offer extra learning material other than what is covered in the lecture can be motivational. In the case study at Leeds, students also found podcasts very interesting and engaging because they introduced lots of extra information (61%) related to the subject matter through a real scenario or situation.

'It's fun because you can see a scenario of a real situation...' (Leeds)

'I found it really interesting when he was talking to a farmer in Scotland about how their job changes over years due to climate change.' (Leeds)

Some students in the three institutions also perceived that podcasts offer them an opportunity to relate to their lecturer better (38%, 51%, 33% respectively) because they can see and listen to their lecturer not only in the face-to-face lectures but also through the podcasts. Interestingly, in the case study at Leeds, students were motivated to listen to the podcasts and learn more about the subject by their lecturer, who is perceived by his students as an enthusiastic teacher who made the module and teaching very interesting. Therefore, students were keen to know what he was going to produce in the podcasts.

'[the lecturer's name]'s lecture is quite interactive. He's quite interactive himself, so when he does make the podcast, it's quite interesting to see what he has to say.' (Leeds)

'Because the module is so interesting, it's a good module, you want to know more about it, it's not necessarily for the assessment, because you want to know it.' (Leeds)

Enhancing understanding of subject-specific difficult concepts

The discussion in this section will address research question 1:

How can podcasting help students and staff tackle 'troublesome knowledge' and 'threshold concepts' in GEES subjects?

Some GEES subjects introduce students to difficult and complex concepts and theories. The questionnaire survey and student interviews revealed some concepts and theories from four modules that were identified by students as difficult and complex.

Dynamic Earth:

- Tectonic plates and processes
- Partial melting/ fractional crystallisation
- Rock deformation mechanisms (creep etc)

Palaeoenvironments:

- Thermohaline circulation/ bi-polar see-saw
- Challenging paradigms using evidence-based argument, e.g., megafaunal extinction, patterns and timings different on different continents
- Biogeographical and refugial concepts

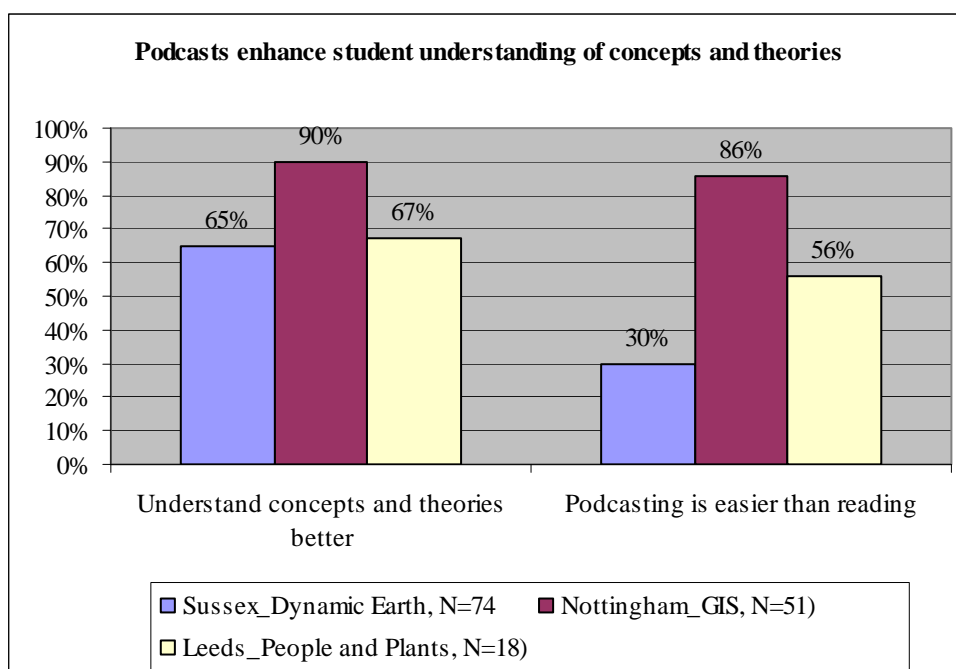
GIS:

- GPS

People and Plants:

- Ecological modelling

Many students from the three institutions (65%, 90%, 67% respectively) perceived that podcasts helped them to have a better understanding of these subject-specific difficult concepts and theories, in several ways.



Podcast lectures allow students to go back to the lecture material as many times as they like. This repeatability offered students an opportunity to gain a better understanding of the subject-specific difficult concepts and theories.

'Really good idea, having the backup of the podcast would make very confusing lectures much easier to understand.' (Sussex)

'I think particular topics sometimes you need to listen to a few more times before you understand it. Some of them might be just a bit technical. You try to understand the word they're using. By the end of the lecture, you come to understand the vocabulary a bit more...so you listen to it again, you get to understand it.' (Sussex)

'Often I struggle to understand a concept the first time I hear about it. But podcast let you listen multiple times.' (Nottingham)

'(It's) easier to understand theory if able to recap after lectures.' (Nottingham)

Being able to go back to a lecture at a later time also allowed students the time and space to conduct more readings and research around the subject, therefore offering them an opportunity to relate knowledge and enabling them to make more sense of what they have learnt.

'And you can go away and read other things, journals or something, and come back to it (lecture podcast) again...It seems a lot better if you got away and come back to it.' (Sussex)

'I think you can help bring everything together...like if you're reading an article and did not understand the subject, listen to the podcast again, and you realise, 'oh, yeah, that's how they interlinked', it's quite useful to draw together.' (Sussex)

A considerable percentage of students from the three institutions (30%, 86%, 56% respectively) perceived 'listening is easier than reading'. They commented:

'(Through podcasts) greater information was gained, and retained in longer.' (Nottingham)

'I can't help but take in information' (Nottingham)

'(Podcasts offer) extra reading in watchable format.' (Leeds)

'(Podcasts are) easier to concentrate and more entertaining.' (Leeds)

Listening or watching podcasts may offer students a more effective way to take in information and gain a better understanding of the subject-specific difficult concepts and theories.

Podcasting offers an opportunity to capture different voices and enables students to share others' perspectives. In the case study at Leeds, the lecturer talked through some difficult concepts such as 'conservation strategies' through interviews with local people and field experts.

'There is one about plants for medicines...about what's going on, whether local shops really know what's going on, whether they actually use for medical reasons, and that's quite interesting, because they're both talking about from different angles.' (Leeds)

'Quite a lot of the [podcast about] Peak District is related to conservation issues, make you to think about people have different interests, to get people involved.' (Leeds)

The opportunity to gain different perspectives by listening to a podcast may help students to develop a better understanding of subject-specific difficult concepts.

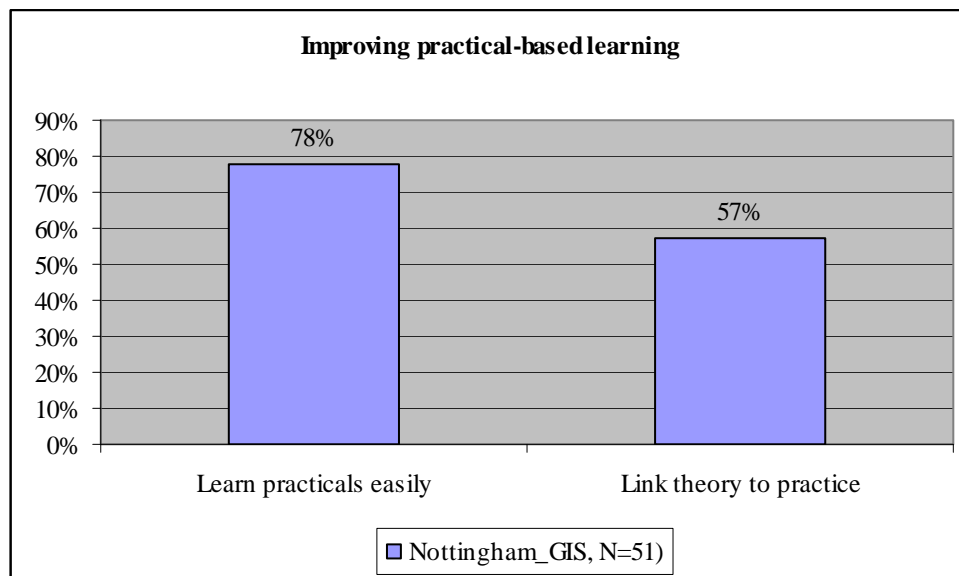
4.7 Results in relation to research question 2

How can podcasts help students' learning in 'multiple learning spaces' in GEES subjects?

GEES subjects involve student learning in multiple learning spaces: factual and conceptual learning in classrooms, practical learning in laboratories, and guided field exploration. GEES practitioners want flexible mobile technologies like podcasting that can be used across learning spaces.

Visual information can help students to understand software and how to use it, more than do conventional text-based instructions and screen shots. In the case study at Nottingham where the lecturer provided visual instructions on how to use GIS

software, students' feedback showed that video podcasting dramatically improves students' practical-based learning with regard to helping them learn software easily (78%) and link theory they learnt in the lecture to practice (57%).



Students commented:

'Podcasts show practically how to do things in real time which was easier than printed out ...'

'I found GIS a lot easier interpreting geography data (than if) you pick up on a sheet with instructions on it...'

'Practical sessions are easy to follow along or refer back.'

'Sometimes in the practicals, it's easy just follow the steps as he's [the lecturer] showing that on the screen. Or if you're not really taking in, so sometimes if you go back and follow practicals which instruct you what you've learnt previously you haven't actually taken in previously, you just go back....'

One of the students commented, 'They (practical podcasts) should also be available in other modules interpreting geographical data and with the SPSS software.'

A podcast library of geographical techniques and the iWalk podcasts were developed in particular to support student learning in the field. Appendix 2 contains two user-exemplars: GeoPods: A podcast library for geographical techniques – a case study at Department of Geography, University of Leicester, and iWalk: A field guide – a case study at School of Earth Sciences and Geography, Kingston University. The two user-exemplars introduce GEES practitioners to the challenges students and staff face in the field, the rationale of using podcasts to deliver field-based information and instruction, and the technologies involved in the development of more sophisticated podcasts.

The colleague who produced iWalk plans to use it for fieldwork in the academic year 2008/09. Student evaluations will be carried out following its use. With regard to the GeoPods, the IMPALA 2 research team did not have access to the research context.

4.8 Issues in relation to sharing and re-using podcasts

The discussion in this section will address research question 3:

What are the key issues and enablers for sharing, re-using and re-purposing podcasts and exemplars across GEES disciplines?

Personal interviews with the lecturers who developed podcasts showed that IMPALA 2 colleagues were keen on the idea of building a digital repository of re-usable and shareable podcasts for other GEES practitioners to share. Some have already started building a podcast library or archive for their own module, by adding new podcasts and replacing old ones. Some have already started sharing their podcasts with colleagues who work in other institutions within and outside the UK through their personal links or research projects. Examples of these initiatives include:

- Sharing generic podcasts (e.g. field and lab techniques, research methodologies, interview techniques) across departments and institutions.
- Sharing subject-specific podcasts with colleagues who teach the same subject or have the same research interest.
- Re-using the same podcasts with a different group of students, for example, students who study a different subject. The podcasts may offer the benefit of adding a dimension to their learning the subject.
- Re-using the podcasts with students in developing countries, though the technology can be a challenge.
- Re-purposing the podcasts as a marketing tool to appeal to potential students.

Interviews with staff also revealed issues involved in sharing and re-using podcasts. One is the need to build re-usability into the design of podcasts. Guidelines and examples on how to achieve this are included in **Section 2.3** above.

Another issue is to do with the platform through which podcasts can be published for others to share. iTunes seems to be a simple way of making podcasts accessible to a wider audience. JORUM (www.jorum.ac.uk/), a **free** online repository service for teaching and support staff in UK Further and Higher Education Institutions, is the platform for sharing and contributing digital teaching and learning material.

The biggest issues so far, are to do with Intellectual Property Rights (IPR). IPR issues raised by IMPALA 2 colleagues include:

- Copyrights in any graphic, photographic or video image or music is owned by the creator.
- Integrating within a single podcast different types of material, or material from different contributors and collaborators, may mean that many intellectual property rights will be attached.
- Original contributors should be aware of how the podcasts will be used, and their permission must be sought.

IMPALA 2 is a small scale project, and initiatives to share, re-use and re-purpose the podcasts are only beginning. It would be worth exploring key issues and enablers for sharing and re-using podcasts across GEES disciplines.

5. Remaining Project Activity

All tasks or work packages have been completed.

6. Budget

Of £16,481 allocated to this project, £9,411 supported the project Research Associate (at 0.5 FTE for 9 months), £2,220 contributed to the salary of the Project Coordinator (at 0.1 FTE for 9 months). £3,700 was allocated to support the dissemination activities such as organising workshops and attending conferences, conducted by the leading and partner institutions. £1,150 was spent on travel and subsistence related to research work.

7. Future Work

Certain concepts and ideas in the GEES subjects can be difficult to understand. This was why IMPALA 2 colleagues were keen to explore whether podcasting could be an effective tool in addressing subject-specific threshold concepts or troublesome knowledge. Our IMPALA 2 research showed that podcasting can be used in several ways to enhance students' understanding of these concepts. However, this small scale study has not revealed sufficient evidence of how improvement of students' conceptual understanding related to improvement in their performance. It would be valuable if GEES practitioners could further examine this approach of using podcasting and measure its impact on student learning outcomes.

GEES subjects are inherently visual. Impala results showed that video podcasts were effective particularly in relation to engaging students and promoting their learning motivation, and improving practical-based learning.

Fieldwork is a crucial component of teaching and learning in GEES subjects. There is considerable interest among IMPALA 2 colleagues regarding podcasting to support fieldwork. Interviews revealed that they are all keen to integrate podcasting one way or another into the support of fieldwork. A comprehensive discussion on how podcasts can support fieldwork is included in Downward et al (forthcoming): this includes using podcasts for fieldwork preparation, providing information and instruction in the field, demonstrating field techniques and equipment use, and using student-created video podcasts as a means of assessment. Two IMPALA 2 case studies, a podcast library of field techniques and a series of iWalk podcasts as a field guide, are examples of podcasting to support fieldwork. However, we were unable to collect research evidence from students in the two case studies. It would be valuable if GEES practitioners could collect evidence on how students actually use the podcasts in the field and how the podcasts support their field-based learning.

Interviews with the IMPALA 2 colleagues showed that they are keen on the idea of building a digital repository of re-usable and shareable podcasts for other GEES practitioners to share. Some have already taken action on a small scale, mainly through personal contacts. Interviews also revealed issues involved in sharing and re-using podcasts, such as the need to re-usability issues in the design of the podcast, choice of platform, and intellectual property issues. As a start to foster this sharing practice among GEES practitioners, we have built a digital repository of podcasts contributed by IMPALA 2 colleagues. We hope that GEES practitioners can use these resources, and contribute ideas on how to expand it and use it in a more effective way. It would also be valuable to further explore the key issues and enablers for sharing and re-using podcasts across GEES disciplines.

On the whole, as IMPALA 2 is a small scale project, we focused on the positive aspects of podcasting for student learning and the evidence was collected from small groups of students. To investigate the negative aspects a larger study will be necessary.

8. Key messages

Evaluation demonstrated that podcasting can have positive impacts on student learning in GEES subjects. These impacts include: enhancing understanding of threshold concepts and troublesome knowledge, improving learner engagement and motivation, fostering collaborative learning, offering flexibility and control over many aspects of learning, providing effective feedback and supporting fieldwork. These findings should be disseminated across the GEES HE sector to inform practitioners who want to consider using podcasts to support learning.

IMPALA 2 showed that GEES practitioners and learning technologists are willing to experiment with different podcasting applications to improve student learning. HE

policy makers responsible for GEES subjects should provide continued support for these academics and learning technologists to move from small scale experiments to faculty or departmental use of podcasting for learning.

The 10-factor podcast development model developed though IMPALA served as a useful tool in developing pedagogical podcasts within GEES subjects. The GEES HE community can further develop it to suit their own teaching and learning.

The digital repository, one of IMPALA 2's deliverables is a useful collection of resources for GEES practitioners. It contains 21 exemplar podcasts under 6 six categories. GEES practitioners can review how these podcasts can be used to guide their own podcast development and can add further exemplars, with useful descriptions, to expand the repository.

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Appendix 1: Data Collected from Partner Institutions

Institution	Module	No. of Student	Application	No. of Podcast	No. of Questionnaire	Student Interview	Staff Interview
Leicester	2 nd year: Fieldwork Techniques	30	Fieldwork techniques & equipment	35	-	-	2
Gloucestershire	1 st year: Skills4Sustainability	129	Skills development and topical issues (Partly re-used)	Weekly	10	A focus group with 4 students	1
	1 st year : Digital Story Telling	80-90	Student-created digital storytelling	1	13	-	1
Leeds	2 nd year: People & Plants	50	Combination of video, audio, images, lectures, interviews, etc.	Weekly	18	2 Focus Group with 8 students	1
	2 nd year: Climate Change: Social Issues	120-150	Lectures & additions	Weekly	-	A focus group with 4 students	
Nottingham	1 st year: Introduction to GIS	200	Lectures & practicals (re-used)	Weekly	53	2 focus groups with 10 students	-
Sussex	1 st year: Dynamic Earth	86	Podcasting lectures + seminars + a video podcast for practicals	Weekly	76	A focus group with 3 students	1
	3 rd year: Palaeoenvironments & Human Impact	26		Weekly	14	A focus group with 3 students	
Kingston	School of Geography	-	Thames iWalk	9	-	-	-

Appendix 2: User-exemplars

Informal Mobile Podcasting and Learning Adaptation 2 (IMPALA 2)

**Funded by The Higher Education Academy, Subject Centre for
Geography, Earth and Environmental Sciences (GEES)**

Podcasts for providing supplementary material - “People and Plants” and “Climate Change” Podcasts (School of Earth and Environment, University of Leeds)

Introduction

This case study is based on an example of using podcasts to provide students with supplementary material to the subject matter. The podcasts were developed by a lecturer who teaches two second year modules at School of Earth and Environment, University of Leeds. The case study will introduce audience to the modules' information, rationale of using podcasts, a description of the podcast application, and most importantly, students' perceived benefits of listening to such podcasts and the lecturer's plan on future development.

Module context

The podcasts have been developed and used to support and enhance teaching and learning for two second year modules: 'People and Plants' and 'Climate Change'.

'People and Plants' is a second year semester one core module for BSc and BA Environment programmes that is open to students from across the University. About 50 students enroll in this module each year. The module is taught through a combination of interactive seminars consisting of lectures, case studies, discussions, role play exercises, and field trips. The module is assessed through three pieces of work: tree identification, an ethnobotany mini-website, and designing a conservation strategy for a selected area.

'Climate Change' is a second year semester two module for BSc and BA Environment programmes that is open to students from across the University. About 100-160 students enroll in this module each year. The module is taught through three 1-hour face-to-face lectures each week due to the large size of the class, and is assessed through a research report (50%) and an exam (50%).

Most students who take the 'People and Plants' module in semester one will go on to take the 'Climate Change' module in semester two.

Purpose of using podcasts

The purpose of developing podcasts to support these two modules is twofold. First, the lecturer aims to increase the breadth and depth of student learning by providing them with extra material related to the subject through podcasts. Second, the podcasts are designed to be motivational. By introducing sufficiently interesting and inspiring

material, it is believed that students will be motivated to do more related reading and research.

The podcasts were linked to the modules in various ways. Some were linked to specific teaching themes and lectures. Some provided additional background material to contextualise a field trip or workshop. Others were designed to prepare students for the assessed work.

Application

The 'People and Plants' and 'Climate Change' podcasts consist of a variety of audio and video podcasts, and cover a wide range of topics. They mainly fall into two categories: interviews and documentaries. They were developed to provide supplementary material for the two modules and were delivered on a weekly basis.

An example of the content and topics covered in the 'People and Plants' podcasts was given below:

- Interviews with key experts about research relevant to the module
 - Dr Joyce Reed, Senior House Officer at St James University Hospital, talks about her undercover investigation into the use of herbal remedies to treat mild to moderate depression
 - Dr Dan Chapman talks about his work on the Sustainable Uplands research project, modelling upland habitats
 - Dr Fred Worrall and Gareth Clay from University of Durham talk about their research on the carbon dynamics of upland habitats, and how these might change in future, with important implications for climate change and biodiversity
- A tour around a Sites of Special Scientific Interest with the Leeds City Council site manager, including an interview with the site manager about career opportunities in conservation and footage of the class managing the site during a field trip
- Plant species profiles covering identification features and uses, history and folklore surrounding each species
 - Dog Rose
 - Rose Bay Willowherb
- A documentary about the power of plant indicator species to uncover complex stories about environmental change over time. Mark pieces together the environmental history of a remote Scottish agricultural landscape from a handful of indicator species, and then investigates how accurate this picture is, interviewing old farmers and uncovering a hand-painted map from the 1830
- A documentary about the Sustainable Uplands project with interviews from social and natural scientists about their work to understand how our uplands might change in future, and how those who live, work and play in uplands might be able to cope with the challenges this will entail. Includes footage from study sites, working with land managers and scientific equipment to understand the hidden complexities of this unique and important environment

Technology

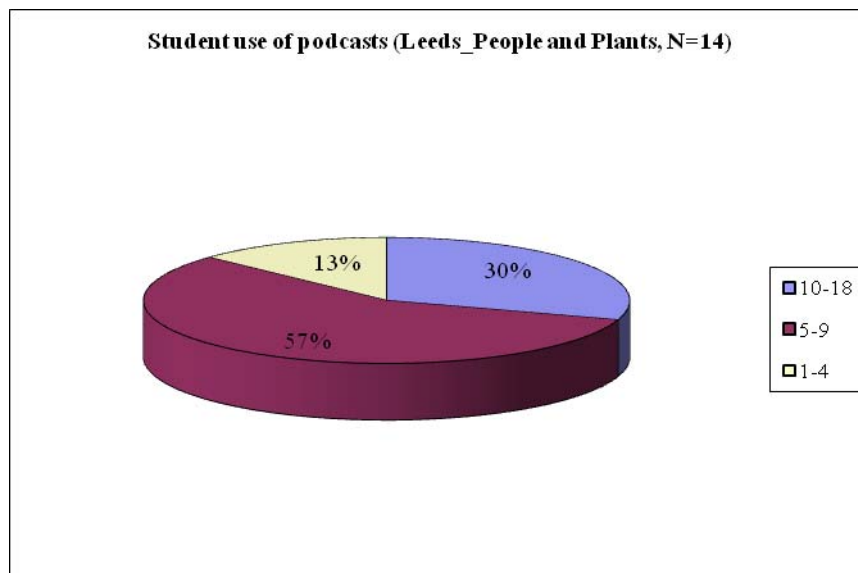
The podcasts can be delivered through any podcast aggregator, but the most popular choice was iTunes. Audio podcasts were created by Audacity and made available as MP3 files. Video podcasts were created in Windows Movie Maker and made available as MP4 files. The audio interviews and documentaries were recorded from the internal microphone on a laptop. After editing, audio and video files were uploaded to University webspace added to the podcast RSS feed manually using Microsoft Notepad.

Evaluation method

The evaluation of students' learning experience through podcasts was collected through two focus group interviews with 9 students and a questionnaire survey with 18 students who studied 'People and Plants' module, and a focus group interview with 4 students who studied 'Climate Change' module, during December 2007.

Students' perceived benefits of using podcasts

The podcasts have achieved a very high listening percentage – 100 listened/watched 'People and Plants' podcasts; 30% listened/watched more than 10 podcasts (See the pie chart below).



Students' feedback collected from a questionnaire survey and focus group interviews regarding their use of practical and lecture podcasts as learning tools are overwhelmingly positive (See the bar chart below). A number of themes emerged and discussed below.

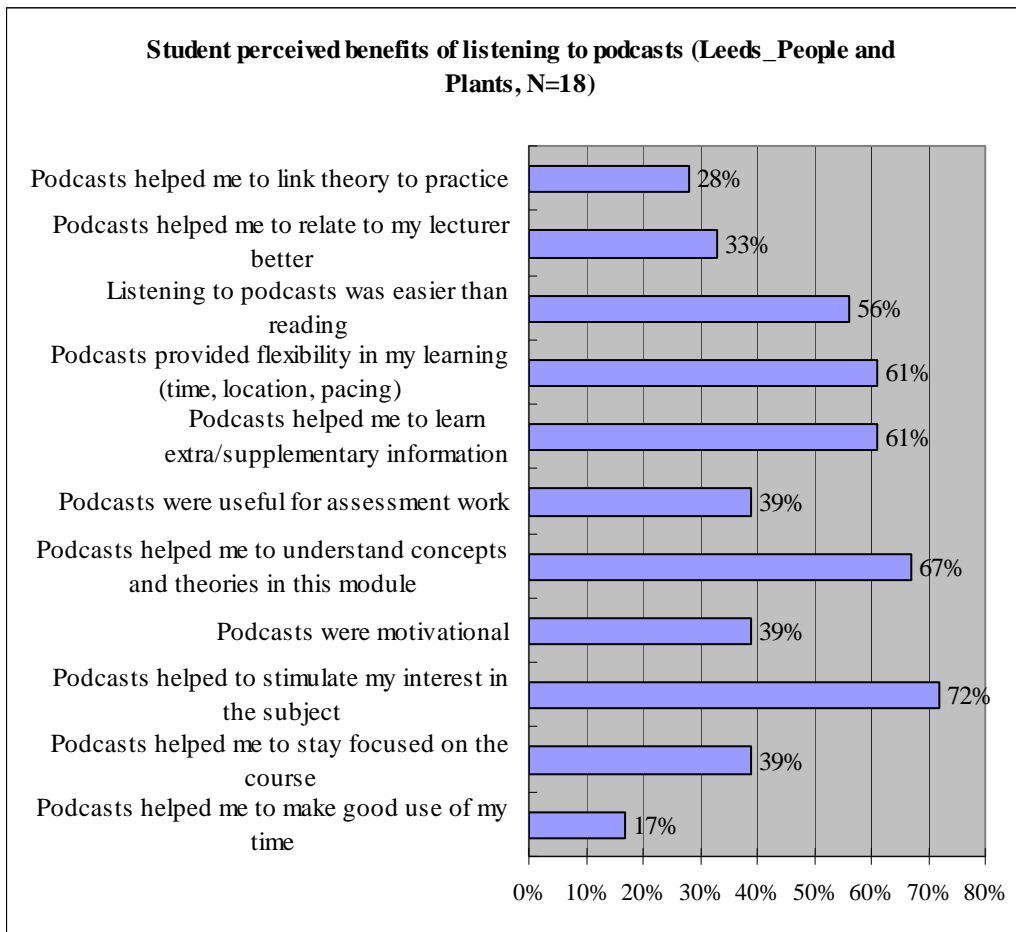
- **Stimulating interest in the subject and promoting learner engagement**

A large percentage of students found the podcasts were effective in stimulating their interest in the subject (72%) because the podcasts introduced them to extra and supplementary information related to the subject (61%) through a real scenario or situation.

"It's fun because you can see a scenario of a real situation..."

"I found it really interesting when he was talking to a farmer in Scotland about how their job changes over years due to climate change".

"The documentary that [the lecturer's name] made is quite funny, the interview with ground manager guy, it was quite interesting".



Some students found that visuals helped engage them.

“For some other modules, you just go to the lectures, while this one, you get videos, a little bit more, engaging”.

“I actually like watching the video, because you can see the little images rather than just listen to”.

“Some of the visually simulation...more interesting...especially when you’re doing conservations like plants and how to use them in different circumstances, be able to see it rather than just a picture of it”.

About one-third of students (33%) also perceived that podcasts offer them an opportunity to relate to their lecturer better because they can see and listen to their lecturer not only in the face-to-face lectures but also through the podcasts. This improvement in relationship may in return stimulate students learn more about the subject. Some students mentioned that they were motivated to listen to the podcasts by their lecturer because he is an enthusiastic lecturer who made the modules and his teaching very interesting.

“[the lecturer’s name]’s lecture is quite interactive. He’s quite interactive himself, so when he does make the podcast, it’s quite interesting to see what he has to say”.

“Because the module is so interesting, it’s a good module, you want to know more about it, it’s not necessarily for the assessment, because you want to know it”.

“He’s [the lecturer] enthusiastic, and he’s making us enthusiastic, he’s actually interested...”

One of the aspects that the lecturer wanted to explore was to examine whether the podcasts can motivate students to learn more if he can introduce the topic in an

engaging enough manner. Based on student comments, it was clear that students had engaged with this aim; that podcasts could be used as a tool to promote learner engagement and motivation for learning.

- **Offering cognitive benefits**

Many students talked about how listening to podcasts can improve their cognitive aspect of learning in a number of ways.

Enhancing understanding of difficult concepts and theories

In addition to the podcasts developed to provide extra learning material, the lecturer also made his weekly lectures available as lecture podcasts. Many (67%) perceived both types of podcasts: lectures and supplements gave them an opportunity for going back and helping them to develop a better understanding of the difficult concepts and theories covered in the course:

“The conservation strategy...is worth getting back, if it wasn't clear, get back and listen to it”.

“If you don't realize the importance at the time, and if you go back...”

Gaining extra information

One student said how listening to podcasts that provide extra information helped her to gain more in-depth knowledge about the topic.

“What covers in the lectures are what's covered in the surface, so there is a lot more in depth you can go into, which could potentially help...”

Some others mentioned how podcasts were helpful for providing more background knowledge about a particular topic.

“It's always gives you the background knowledge”.

“But it's good to get some extra information that you can't get out from the lecture...it does make it easy to learn.”

“Yeah, maybe stuff they don't have the time to put in the lecture or just things you might not normally have access to that, interview to people in the research he's doing that's relevant. It's really good to have an insight into it”.

The supplementary podcasts were also perceived as a useful tool for disseminating timely and updated information about the subject.

“It's really update as well, it's not a book, out of date in a certain period of time”.

“So you know, he's just made the podcast, this information is new”.

Enabling deep learning

Another student talked about how listening to the supplement podcasts can promote students to do further reading and research on a particular topic.

“I think it must engaging learning because if you hear something interesting or information about a piece of research, you might then go and read a paper around that research. So not necessarily I did, but I can see how that would engage with certain learning...”

Others talked about how listening to the supplement podcasts helped them to relate knowledge.

“When I read around it, and I know what he was talking about...”

“I listen to them while I was revising, just in case something jogged my mind, and give me an example...”

“It might be a subject or something fascinating that across another lecture or module, that might be helpful for that.”

Offering perspective-taking

Some of the students emphasized the value of gaining different perspectives about the topic covered offered by supplement podcasts.

“Quite a lot of the [podcast about] Peak District is related to conservation issues, make you to think about people have different interests, to get people involved”.

“There is one about plants for medicines...about what’s going on, whether local shops really know what’s going on, whether they actually use for medical reasons, and that’s quite interesting, because they’re both talking about from different angles”.

Another student believed that visuals helped to develop cognitive learning.

“Because you get more background information, and a lot of them are visuals, things like identification plants, you can actually see what they look like, to be able to see how rather than just pictures. It always helps better, so you get it stuck in your mind”.

- **Offering flexibility and learner control**

Many students (61%) perceived that podcasts offered flexibility and learner control for their learning with regard to time, location and pacing.

“I can listen/watch in my own time.”

- **Listening is easier than reading**

Many (56%) perceived ‘listening is easier than reading’. Watching podcast may offer students a more effective way of taking in information and gaining a better understanding of the course-related difficult concepts and theories.

Future work

The podcasts were well-received by students, and were perceived to be re-usable in the future by both the students who retain copies and lecturer who is adding material to a library for each podcast over the years.

There are future plans to share the podcasts beyond the University. The ‘People and Plants’ podcast will be used for providing supplementary material to a module taught by a colleague at University of Sheffield, who is developing a module about sociology of environment. The lecturer is also involved in a capacity building project funded by DFID in Ghana that is investigating the potential to make podcasts available for students in Cape Coast University. There are also plans to launch the “People and Plants” podcast through media publicity to interested members of the public, as a marketing tool for Environmental degree programmes in the school. The effect of this will be monitored through regular market research with students who enrol on the programmes.

Informal Mobile Podcasting and Learning Adaptation 2 (IMPALA 2)

**Funded by Higher Education Academy, Subject Centre for
Geography, Earth and Environmental Sciences (GEES)**

Lectures and Seminars Podcasts

(Department of Geography, University of Sussex)

Introduction

This case study is based on an example of using podcasting technology to provide lecture and seminar recordings. The podcasts were developed by a lecturer who teaches two modules: a level one compulsory module 'Dynamic Earth' and a level three module called 'Palaeoenvironments and Human Impact', at the Department of Geography, University of Sussex. The case study will introduce audience to the modules' information, rationale of using podcasts, and most importantly, students' perceived benefits of listening to such podcasts and the lecturer's plan on future development.

Module context

'Dynamic Earth' is a level one compulsory module. Around 80-90 students enrolled in this module each year. The module is taught through two one-hour lectures per week and is assessed by a 30-minute mid-term test and a 30-minute end-of-term test.

'Palaeoenvironments and Human Impact' is a level three module. About 20-30 students enrolled in this module each year. The module is taught through a one-hour lecture, a one-hour seminar, and a two-hour practical session per week, and is assessed by a 2000-word essay, a 15-minute seminar presentation, a 1500-word practical write up, and a two-hour end-of-year exam. The one-hour weekly seminar is led by students. They are divided into small groups of 3, given a topic for their presentation and general readings around that topic. They will be asked to conduct their own research and present their in-depth understanding of the topic at the seminar, and led the discussion among peers followed by their presentation.

Purpose of using podcasts

The purpose for podcasting lectures for the two modules is twofold: students can use them as a revision tool and revisit them to develop a better understanding of the subject-specific difficult or complex concepts.

Students who studied the two modules are introduced with some quite difficult and complex concepts, especially in the level three module 'Palaeoenvironment'. About half of the students who enrolled in this module were BA geography students who do not have a strict mathematical and scientific background, therefore, might struggle even more with the difficult concepts introduced in this module. Podcasting lectures gave students the opportunity to revisit the lectures if they had any difficulties with any of the difficult concepts.

The lecturer of these two modules produced a list of threshold or difficult concepts that students might have struggled with.

Threshold or difficult concepts for ‘Dynamic Earth’ module:

- Time: deep/geological time, absolute time, rates of activity
- Seismic processes (P-waves, S-waves, surface waves, etc)
- Mantle state: solid but convects
- Viscosity (of lavas, of the asthenosphere)
- Earth structure: lithosphere/asthenosphere (but no change in composition)
- **Tectonic plates and processes**
- **Partial melting/ fractional crystallisation**
- **Rock deformation mechanisms (creep etc)**

Threshold or difficult concepts for ‘Palaeoenvironments’ module:

- Critical interpretation of practical data
- **Thermohaline circulation/ bi-polar see-saw**
- **Challenging paradigms using evidence-based argument, e.g. megafaunal extinction, patterns and timings different on different continents (so-same mechanisms?)**
- **Biogeographical and refugial concepts**
- Human impact – contribution to global warming on long timescales?

Two focus group interviews with a small group of students from each course revealed that the concepts highlighted were identified by students as threshold or difficult concepts for the two modules respectively.

The purpose of making seminars available through podcasting is to promote collaborative learning among peers. Being able to go back to students’ presentation as well as discussion about a particular topic can be useful for them to develop ideas for their essays. It was also expected to be useful for developing students’ in-depth understanding and critical thinking about the topic covered through interaction and questioning.

Application

For ‘Dynamic Earth’ module, two lecture recordings, one hour each in duration were made available on a weekly basis. For ‘Palaeoenvironments and Human Impact’ module, a one-hour lecture recording and a one-hour student seminar recording were made available on a weekly basis. All the podcasts were delivered through Moodle VLE at Sussex.

Technology

Both the lectures and student seminars were recorded by an Olympus digital recorder in MP3 or WMA format, and transferred to the course site at Moodle VLE soon after the lecture or seminar.

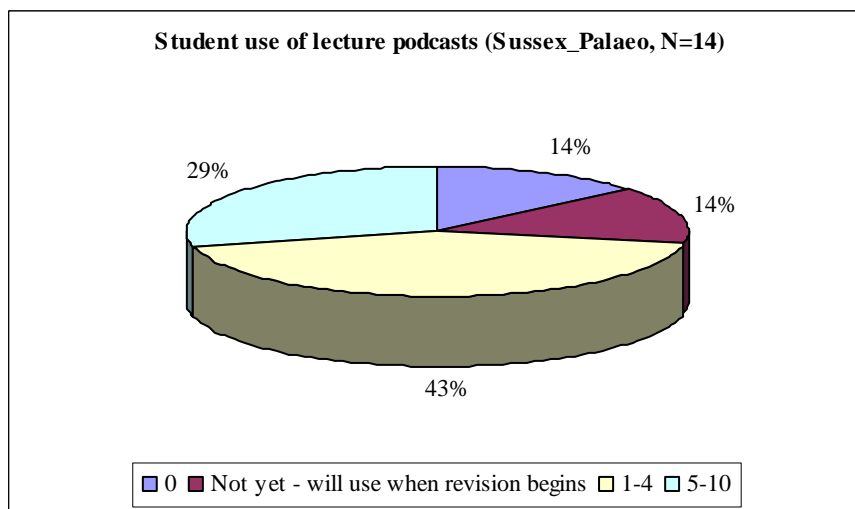
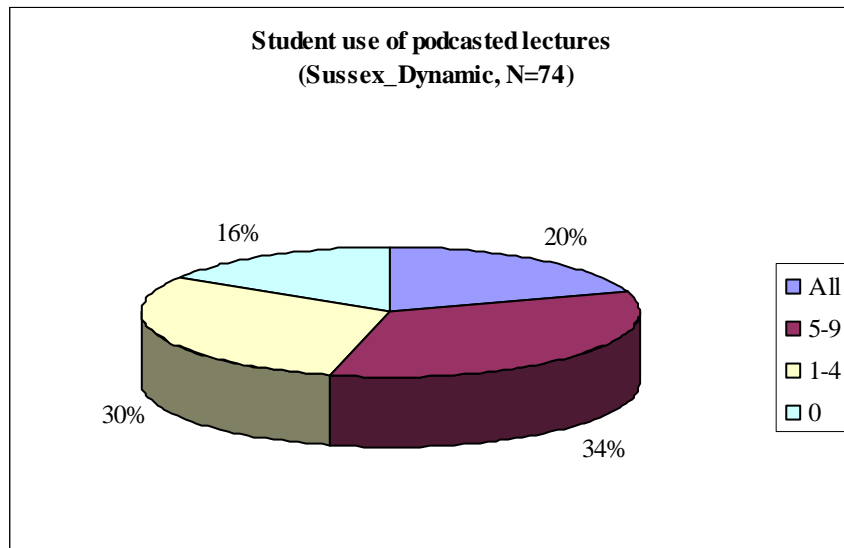
Evaluation

The evaluation of student learning experience through podcasting was gathered through a focus group interview with 3 students and a questionnaire survey with 76 students who studied the ‘Dynamic Earth’ module; a focus group interview with 3

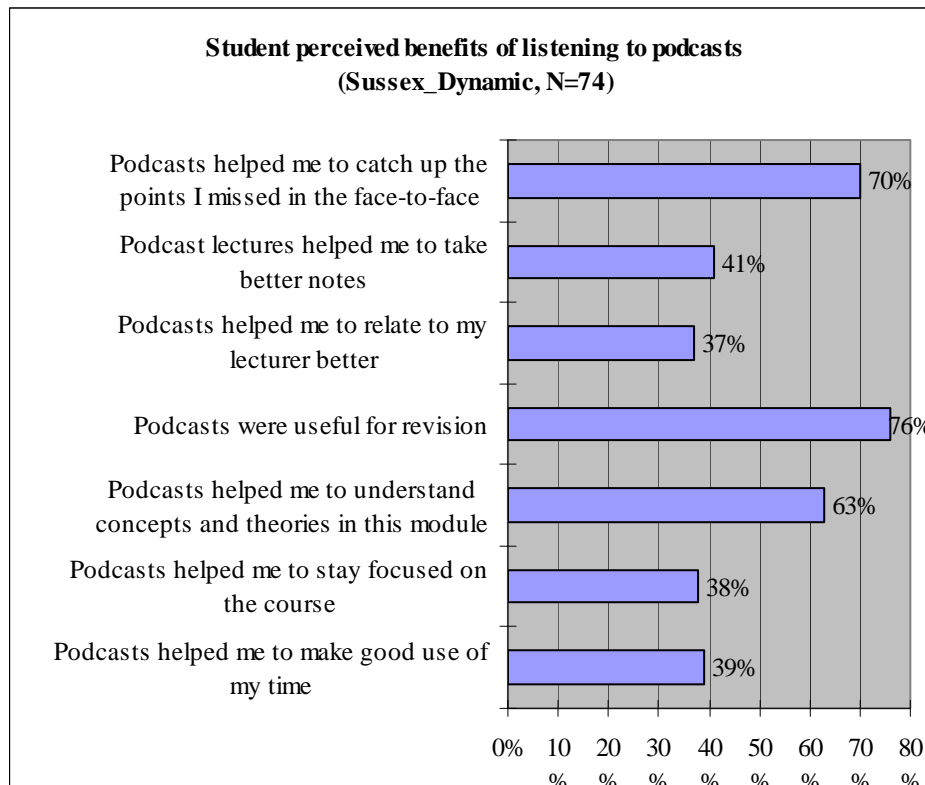
students and a questionnaire survey with 14 students who studied the 'Palaeoenvironments and Human Impact' module.

Students' perceived benefits of using podcasts

The lecture podcasts provided for two modules have achieved very successful listening percentage (See two pie charts below). For the Dynamic Earth module, 84% students listened to podcasted lectures; 20% listened to all. For the Palaeoenvironments module, 70% listened to podcasted lectures; another 15% indicate that they will listen to them when the revision begins in summer 2008.



Feedback from students on their use of podcasts as a learning tool is overwhelmingly positive (See bar chart below). A number of themes emerged and discussed below.



- **A revision/backup tool**

A large percentage of students perceived podcasts as very useful for revision (76%). Part of the reason is they helped students to stay focused on the course (38%), therefore helping them to make good use of time (39%). In students' own words,

"Before exams (podcasts) are a great summary."

"(They are) very useful for exams."

A large percentage of students also viewed the podcasted lectures as a very useful tool for catching up the points they missed in the face-to-face lecture (70%).

"Sometimes it can be hard to keep up in lectures but podcasts (allow you) to pause and rewind sections."

Many perceived the modules they studied quite hard. It was easier for them to concentrate on what the lecturer was talking about in the face-to-face lectures, and listened back to the lecture recordings to make better notes (41%).

"I listened to almost all of them because I found quite difficult to make notes, very complicated, so I did that at home from the podcasts."

"I found it difficult to write notes and understand what they're saying, then your notes didn't make a lot more sense. I think it's much better, just sit and listen, and contributed to discussion and then come back to it later to make notes."

- **Cognitive benefits**

Enhancing understanding of difficult concepts

As many students perceived the course they were taking as quite difficult, they believed that it was a good mechanism to provide lecture recordings which allowed them to go back to the lecture materials and improve understanding of the difficult concepts and theories (63%)

"It's a good mechanism to be able to come back to a difficult and complicated course like this. "I can't...how I...Mick's course because it's a quite difficult course, hard course."

Many of them reported how they used the lecture recordings, by listening to the hard parts of the lectures to gain a better understanding.

"I listened to the hard session I thought was difficult to revising, just to get back over it."

"Yeah, I did the same thing as I just picked up the lectures that I thought the hard material that I wasn't quite sure about, then I listen to the podcast and going over and make notes as well."

Some of the students on the course were from a BA geography background. They were the ones who struggled in particular with the scientific concepts and terminologies.

I think it's partly because of my background is not scientific background...It just takes a little while for some people to understand, how you talk about these things, how different ways to speaking these things you're not used to hearing...so it took me a little while to understand it."

"Well, I'm an English major actually, so all the science stuff doesn't really come easily for me...if you got more technical, the more difficult."

"I found particularly the 'Tectonic plates and processes' is really useful to go back over, and definitely the 'Partial melting/fractional crystallisation', because it's really scientific."

For these students, the podcasting lectures gave them the opportunity to repeat the lectures at their own pace to get over these difficult concepts.

"I think for me is, if you got a lot more scientific term, the style is quite, you got a lot more in details and scientific, if I was getting lost, switching off for a moment in a lecture could be miss something crucial...so go back and listen to the podcast..."

"Things that are quite complex, because I do Human Geography, so the science side is quite difficult to me. So that (podcasting lecture) helps quite a lot."

"I think particular topics sometimes you need to listen to a few more times before you understand it. Some of them might be just a bit technical. You try to understand the word they're using. By the end of the lecture, you come to understand the vocabulary a bit more...so you listen to it again, you get to understand it."

Some of the concepts were perceived particularly difficult to understand because they were completely new to the students. For example, one student identified three concepts were difficult to understand: 'Seismic processes (P-waves, S-waves, surface waves, etc), 'Partial melting/fractional crystallisation' and 'Rock deformation mechanisms (creep etc)'. And the reason was they were new concepts and completely unfamiliar to her.

"I've taken some geography before in first year and in high school, but those three things definitely were new comers, so definitely they're unfamiliar to me....They are new terms, new concepts to me."

The second student identified 'Megafaunal extinction' and 'Biogeographical and refugial were difficult for the same reason.

"I think it's because I've never heard before...I had no idea what 'refugial' is all about, so it was like first time to hear about it, so just go back once I knew a bit more about it."

Both students believed that going back to the lecture recordings helped them to gain a better idea of these new concepts.

Some of the concepts were not necessarily difficult, but rather complex. For example, one student identified 'partial melting/fractional crystallisation' and 'rock deformation

mechanisms (creep etc)' were complex. Being able to go back to the podcasting lectures helped her develop a better understanding of these complex processes.

"It was just kind of more complex, it wasn't so difficult, I feel it's quite complex. When you were in a lecture, it's not like too quickly, but if you switch off, then you lost, I just found it easy to sit back and go through it at my own time."

Allowing deep and independent learning

Students tend to study more on the module with the podcasting lectures available. They reported that podcasting lectures allowed students more opportunities to conduct further study on the subject, by doing more independent readings and research.

"I think I do more readings for the courses where I had got the podcasts...I think it makes more sense if I got the lecture [recordings]..."

"When you got a backup like podcast, you don't really have to do the sort of basic reading, just to get the understanding going, whereas, you got the podcasts, you just read around the subjects, and you do more complex reading..."

"I think it makes the lecturers to do more what they're supposed to do, giving you an introduction or something....You could have been spending time doing more complex more interesting reading."

By conducting more readings and research around the topics, students made more sense of what they had learnt from the lectures.

"And you can go away and read other things, journals or something, and come back to it again...It seems a lot better if you got away and come back to it."

"Sometimes, he's talking about specific papers that we never had time to read, so it didn't make the whole sense in the seminar, then read it, and listen to the seminar again, and it will more sense."

"I think you can help bring everything together...like if you're reading an article and did not understand the subject, listen to the podcast again, and you realise, 'oh, yeah, that's how they interlinked', it's quite useful to draw together."

Listening to students' presentations and discussion was also perceived offering deep learning opportunities, by sharing insights and developing in-depth understanding of the topic covered. It was found particularly useful for developing ideas for essays.

"(Listening to seminar podcasts) I think it's good for essay questions and exams and general essays because after discussed the questions, and everyone discussed it, you've got a recording of it, you can listen back and you can see what the key points that people brought up, some of the more obscured ones may be you thought more on your own."

"There was a podcast that was sort around my area what I was writing up, just a few things I thought the same way, so you can add more in-depth discussion. So yeah, definitely I'll be listening to that."

Learning from perspective-taking

Many students identified that listening to students' presentation and discussion offered benefits for learning, by sharing different viewpoints and learning from perspective-taking.

"I think it's just useful because you could get people's perspectives they taking from readings, so it's nice to be able to have the discussion recorded."

"I think that's...particularly the seminars... then you get everyone's different opinions where in the lectures you just get the lecturer's opinions. I think particular the seminars are really useful...adding more depth..."

“I think like what they were saying, it’s so much better you got all different views. People do different readings as well....It’s a lot more useful to hear what they perceived to be, what they’re taking...”

- **Relate to my lecturer better**

Some students (37%) also perceived that podcasts offer them an opportunity to relate to their lecturer better because they can see and listen to their lecturer not only in the face-to-face lectures but also through the podcasts. This improvement in relationship may in return stimulate students learn more about the subject.

Future work

As the lecture and seminar podcasts developed for these two modules were well-received by students, more and more colleagues within the department started podcasting their lectures and seminars. Sussex is now installing microphones in many lecture theatres, and this practice is rolling out to seminar spaces. Lecturers can record their sessions from the PC set up in the lecture theatre and by simply pressing the button, the recordings will automatically upload onto the Moodle site.

Due to the success of this practice, the lecturer is now planning to expand his experience on using podcasts for field trip preparation. The idea is to use the video footage taken from the students doing their fieldwork for preparing the students next round for their field trips. Both general videos that provide students with more background information about the environment they are going to work and more targeting videos that show them the specific work to be done in each field trip will be made available.

Another development is to build an archive of podcasts based on lab techniques, to demonstrate techniques not covered in students’ normal practical sessions and encourage them to conduct more independent learning on how to use equipment.

**Informal Mobile Podcasting and Learning Adaptation 2
(IMPALA 2)**
**Funded by Higher Education Academy, Subject Centre for
Geography, Earth and Environmental Sciences (GEES)**

Podcasts to support practicals and lectures
(Department of Geography, University of Nottingham)

Summary

The case study introduces an example of the use of video podcasting to support the teaching of geographical software and theories. The lecturer first developed and used the video podcasts to the students who studied his course in 2006. He was able to reuse the podcasts to a new student cohort in 2007. Two user-exemplars developed based on the feedback and experience of the students in 2006 were made available from (<http://www.impala.ac.uk/outputs/exemplars/index.html>). A comprehensive discussion about the use of podcasting to support practical-based learning was included in a book chapter written by Mount and Chambers (forthcoming). This user-exemplar was developed to reveal the experience and feedback from the new student cohort in 2007. We strongly recommend you to read this document in combination with the book chapter and the two user-exemplars developed from last year.

Module information

The practical and lecture podcasts were developed within a Level 1 compulsory module called Introduction to GIS (Geographic Information Systems). About 200 undergraduate students took this module during the academic year 2007-08. The module was taught through a weekly lecture (about 1 hour) to introduce the theories, and a weekly practical (about 2 hours) that links and embeds theory through using GIS software. The module was assessed through two computer-based multiple-choice tests, an individual project to produce a map of the student's hometown, and a group project.

Rationale

The module was generally perceived by students as being particularly technical and difficult for a number of reasons. First, many theories and concepts covered in the module are completely new to most geography students. Second, the GIS software package is new to most geography students as well, to which they have little knowledge and experience of processing data within it. Additionally, GIS software is dynamic. Successful software manipulation is dependent on students accessing the correct functionality, in the correct order and at the right time. Traditionally, teaching students how to use GIS software tools has been largely dependant on the use of paper-based manuals, illustrated with screen shots, a method perceived by students as difficult to follow in doing the practical exercises and therefore present a barrier for students to meet practical learning outcomes. As a result, few students were motivated to progress to higher level GISc modules.

In response to these concerns, the lecturer and his colleague developed a strategy to improve student cognition and motivation for the subject through the use of contemporary and flexible media technologies, centred on video podcasts for all practical classes to replace all paper-based manuals with narrated screen capture videos, and video podcasts to cover the theories introduced in the weekly lecture.

Application

The lecturer produced 24 practical podcasts with narrated screen capture videos to demonstrate students how to use GIS software. The practical podcasts were produced in CamStudio, a freely available package, that allowed the lecturer to undertake each practical exercise in turn, capturing the on-screen manipulation of the software and a synchronous audio commentary explaining the detail and functionality of the software manipulation.

Additionally, video podcasts giving lecture summaries were produced on a weekly basis. Each one is about 15-20 minutes in duration.

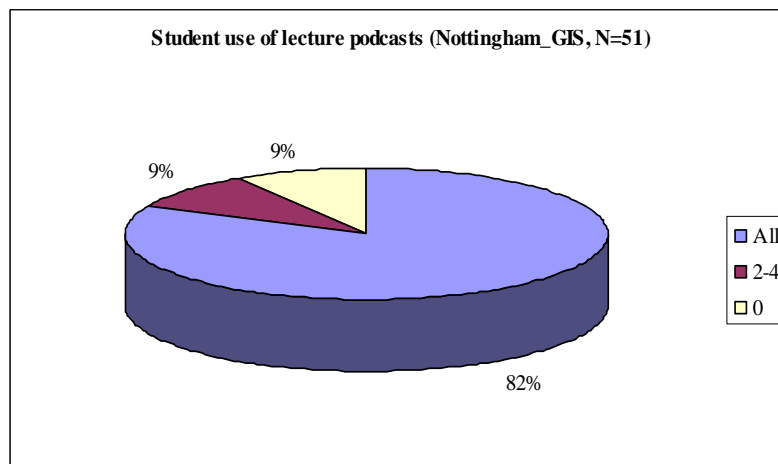
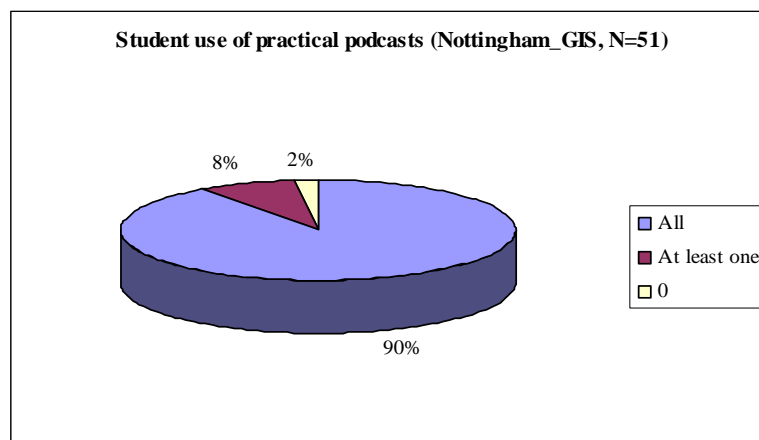
Both the practical and lecture podcasts were delivered as MP4 files, and available either as streamed video via the university's WebCT VLE, or as downloadable video podcasts.

Evaluation

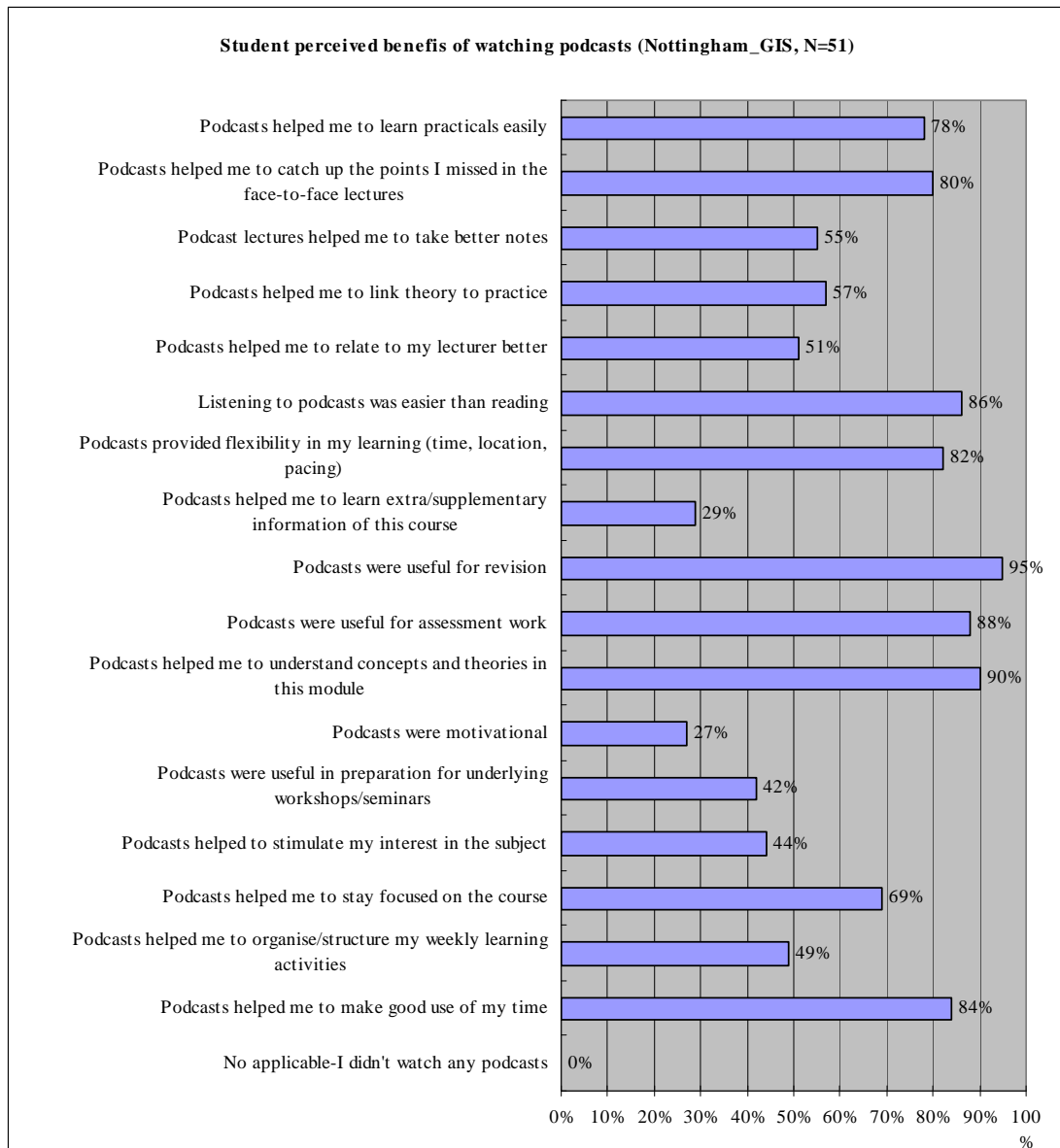
The impact of podcasting on students' learning captured through an end-of-semester questionnaire survey with 53 students and two focus groups with 10 students. Student interviews, lasted about 40 minutes, were conducted using a semi-structured interview schedule developed to explore how student learning is supported by podcasts.

Students' perceived benefits

Both the practical and lecture podcasts have achieved very high listening percentage – 90% watched all practical podcasts and 82% watched all lecture podcasts (See two pie charts below).



Students' feedback collected from a questionnaire survey and focus group interviews regarding their use of practical and lecture podcasts as learning tools are overwhelmingly positive (See the bar chart below).



Two general comments from students show:

"A fantastic and unique way to structure practical sessions and backup lectures - continue to use them!"

"Podcast would be great for all the modules, not just GIS. They are far more easily accessible than any other learning tools. More revision podcasts that added in the run up to exams would be useful. Also making them easier to download would mean you could integrate the podcasts with your MP3 palyer more easily."

A number of themes emerged and discussed below.

- **Improving efficiency in learning software**

Visual information can help students to understand software and how to use it, more than do conventional text-based instructions and screen shots. Students' quantitative feedback showed that practical podcasts dramatically helped their learning GIS

software easily (78%) and link theory they've learnt in the lecture to practice (57%). Several general comments from students show:

"I think GIS software we couldn't really have done it in another way...having the practical podcasts it's much easier..."

"They (practical podcasts) should also be available in other modules interpreting geographical data and with the SPSS software."

"I learnt really new things, it helped in the practical sessions - all the practical sessions!"

Interviews with students further elaborate that practical podcasts helped students learn GIS software more easily and efficiently through three ways: visual instructions are easy to follow than text-based instructions; students can complete practical tasks by following podcasts at their own pace; practical podcasts can be referred back easily.

"Podcasts show practically how to do things in real time which was easier than printed out ..."

"I found GIS a lot easier interpreting geography data (than if) you pick up on a sheet with instructions on it..."

"You don't just watch podcasts, you can actually pause the podcast and do what he's telling you".

"Practical sessions are easy to follow along or refer back."

"Sometimes in the practicals, it's easy just follow the steps as he's [the lecturer] showing that on the screen. Or if you're not really taking in, so sometimes if you go back and follow practicals which instruct you what you've learnt previously you haven't actually taken in previously, you just go back...."

- **A revision and backup tool**

The lecture summaries were perceived by a large percentage of students as very useful for revision (95%) and assessment tasks (88%), because they helped students to stay focused on the course (69%). In students' own words,

"(They) allow me to revise key points efficiently."

"Regarding revision, they played a vital role in my exam preparation."

"In revision for the test, podcasts were more useful than reading long chapters from the GIS textbook."

Many students also viewed the lecture podcasts as a very useful tool for catching up the points they missed in the face-to-face lecture (80%), therefore, helping them take better notes (55%).

"I could rewind the podcast whereas in lectures sometimes the information went too fast!"

"The future use of podcasts should definitely continue. Notes taken in a lecture are more thorough and the ability to make further notes at home is good idea."

"I missed (the lecture) because I was ill, so I was able to go back to the podcast, otherwise I wouldn't be able to make notes".

"It was, because a few things when you're listening to the lecture, you might tune off for a few minutes, you wouldn't take it in, with the podcast, you'd be able to hear it again".

"Not specific one, basically just adding to the lecture...backup your learning".

- **Enhancing understanding of subject-specific concepts and theories**

Many students (90%) perceived that the lecture podcasts helped them to have a better understanding of the subject-specific difficult concepts and theories through two ways: repeatability and 'listening is easier than reading'.

In this course, many students perceived 'GPS' as a difficult concept to understand. Lecture podcasts allow students to go back to the lecture material as many times as they like. This repeatability offers them an opportunity to gain a better understanding of the subject-specific difficult concepts and theories.

"Often I struggle to understand a concept the first time I hear about it. But podcast let you listen multiple times."

"(It's) easier to understand theory if able to recap after lectures."

"It's the GPS stuff that I've never done before, so I went back".

"You can stop and rewind something you don't really understand, if you're reading through your lecture notes, you can pick up the topic you possibly highlighted in the lecture to understand, just...to do it again. If you just had the lecture, you wouldn't be able to get back and find something".

"I found it good because GIS is something I've never studied before....a lot of concepts in the lectures are completely new concepts that we've never come across, never you know, never learnt before, so I found a lot of times, some of things in the lecture go to my head or I wouldn't be able to make to learn the details as I would like to, so in that case, it's really useful going back after the lecture, stay in my own room on my own laptop...just take the time to write the notes because you can pause the podcast when you go along, and also refer to the reading list if you want to, find the bits in the textbook, so definitely further kind of learning new concepts in this completely, most valuable way of learning really because you can do at your own pace to pick up what you needed".

A considerable percentage of students (86%) perceived 'listening is easier than reading'. Watching podcast may offer students a more effective way of taking in information and gaining a better understanding of the subject-specific difficult concepts and theories. They commented:

"(Through podcasts) greater information was gained, and retained in longer."

"I can't help but take in information."

- **Offering flexibility and learner control**

Many students (82%) perceived that podcasts, especially the lecture podcasts offered flexibility and learner control for their learning with regard to time, location and pacing, therefore offering them a benefit for making good use of time (84%), and helping to organise and structure their weekly learning activities (49%).

"(Podcasts allow me to) go over topics that I was unsure of at any time."

"You could watch the podcasts anywhere on campus at anytime through WebCT which was great."

"(Podcasts are) very useful in the future as it caters for all needs and learning abilities."

The flexibility offered by practical podcasts also helped to promote student independent learning. In practical sessions, students can follow the visual instructions and get on with the tasks by themselves. They can rewind if something goes wrong instead of asking help from a staff member.

"You have the practical podcast you don't have to wait for (instructions)...in GIS you just work in silence and do it."

"If something goes wrong in GIS, I go back what I've done and sort it out..."

“Also being able to go back to the podcasts, you can do that session again, you can see if you got it right”. “I normally try self-corrected, then after a couple of times, I haven’t got it right, then ask someone else”. “You can just rewind it”.

- **Improving learner engagement**

Many students perceived that podcasts helped to engage them and promote their motivation (27%) and interest for learning the subject (44%) through a number of ways.

Podcasting offers a new way of learning, which can potentially stimulate students’ interest for learning, and improve their learning motivation.

“(It’s) more interesting to have more one form of learning.”

Visuals are effective in engaging learners. For the practical podcasts, students commented how visual instructions engaged them better in learning how to use GIS software.

“I think, definitely, if you’re kind of doing something interactive, you’re engaging with the software and the podcast most of the hour... Generally, like everything went smoothly, you’re fine, engaged, don’t get bored really. You just kind of following the process.”

“Yeah (it’s engaging), because lots of them you have some forms of output on the screen, you can see something you’ve produced...”

Many students (51%) also perceived that podcasts offer them an opportunity to relate to their lecturer better because they can see and listen to their lecturer not only in the face-to-face lectures but also through the podcasts. This improvement in relationship may in return stimulate students learn more about the subject.

Reference

Mount, N. and Chambers, C. (forthcoming) Podcasts and practicals, in G.Salmon and P.Edirisingha (eds), *Podcasting for learning in universities*. McGraw Hill.

**Informal Mobile Podcasting and Learning Adaptation 2
(IMPALA 2)**
**Funded by Higher Education Academy, Subject Centre for
Geography, Earth and Environmental Sciences (GEES)**

GeoPods – A Podcast Library for Geographical Techniques

(Department of Geography, University of Leicester)

Summary

The podcast library was created by two colleagues at Department of Geography, University of Leicester. The library is consisted of a series of audio-visual clips demonstrating and explaining how to use a variety of field equipment and techniques. It is principally designed to support student independent learning in the field. This case study will introduce audience to the rationale of the development, a description of the application, technology involved and more interestingly, recommendations and guidelines on good practice and future development of the library.

Rationale

Fieldwork is a crucial component of teaching and learning in Geography. It often involves using equipment and techniques. In the field trip, students work in independent groups and they are often challenged by using equipment or techniques that they have not used before. Student on-site support is crucial! However, traditionally and historically, on-site support has been insufficient for several reasons. One of the challenges is the limited resources in terms of staff availability and manuals. Only a limited number of staff (one or two) will accompany students to the field site. Sometimes staff members have to travel a couple of kilometres in a day to provide the support to different groups of students located at different places. There are limited copies of manuals as well, and they are too heavy to carry when travelling. Only the staff members will have the access to these manuals. Another challenge is, students are not trained or prepared enough before they go out to the field trip. There are some lectures that cover some of the techniques, but not all students will take the course. On the whole, students are not trained formally and systematically, so they have to learn on the site. Staff members are not trained to use every technique either.

Actions have been taken by colleagues at Department of Geography to better support students working in the field. One of the changes is, students are now formally and systematically taught and demonstrated with a series of equipment and techniques in a second year module called *Techniques in Environmental Analysis* before they go out to the field trip. A podcast library of geographical techniques was developed to complement to the technique module. Students will be shown the techniques that have not been covered in the technique module in the podcasts.

Students are expected to use the podcast library in several ways. First, the library is made available through the university's Blackboard VLE, and all the students studying at Department of Geography are given the access to the library. Students have the opportunity to have a look of the equipment library and get some pre-training, and get some ideas what they might be doing in the field. They are encouraged and highly recommended to watch the podcasts and prepared themselves before they go out to the field trip.

The podcast library is also pre-loaded onto different mobile devices including laptops, Tablet PCs, and iPods so that students can take them out to the field and use these instructional podcasts as a review or reminder of the techniques. In this way, students will be working independently in the field instead of heavily relying on the staff member to show them how to do things. It will also help to save time for both the students and staff members, so that the teacher can spend more time with the students on the more challenging tasks, and students can spend more time on reading and data collection and focusing on how to improve the quality of the work they are going to produce.

Application

A discussion with academic and technical staff at the Geography Department was conducted before the development of library in order to generate a list of topics that need to be covered in the podcasts. Thirty-five podcasts in five categories were created and included in the library. Each podcast is about 7-10 minutes in duration. An outline of categories or topics covered in the library was shown below:

Surveys and surveying techniques

Sampling strategies

Field techniques:

Soil

Water

Atmosphere

Mobile technology

Data loggers

The podcast library covers very generic techniques that students from all levels: undergraduate, postgraduate, and dissertation students can benefit. They are also generic across a range of disciplines such as Geography, Geology and Archaeology, in which the field work is an essential component.

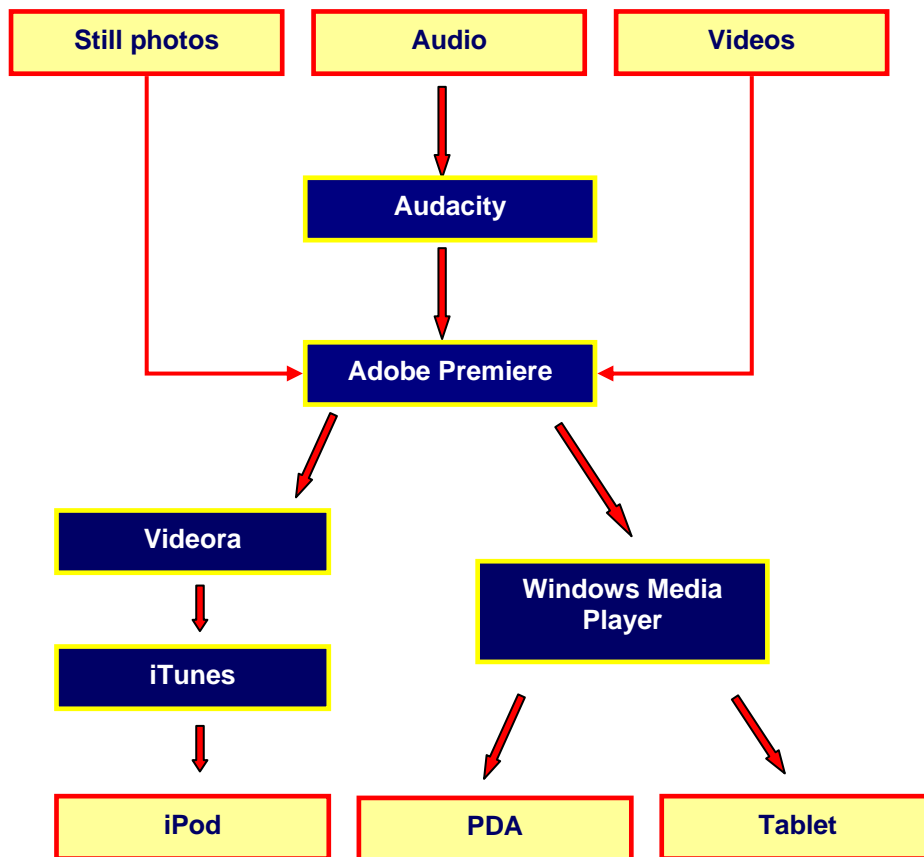
Technology

The podcast files are made downloaded in a variety of formats: WMV, AVI and MP4.

The development involves of using a range of software applications:

- Audacity: Audio narrations are recorded in Audacity.
- PowerPoint: Photos are imported in PowerPoint to prepare for slides
- SnagIt: is used to capture actions in PowerPoint
- Adobe Premium Pro: is used as the video editing software that puts audio, images and videos together.
- Videoauro: is used to convert WMV into MP4.

A diagram (Jarvis and Dickie, 2008) of the technology and method used was shown below:



Recommendations

- **Scripts are very important**

Prepare scripts for all podcasts before creating them is crucial. They are especially useful if you want to re-use them for other purposes in somewhere else.

- **Breaking down**

Breaking down big audio files into small clips is practical advice as dealing with a small session is much easier than with a big speech where you are likely to make mistakes. It is also good for reusable purposes. For example, “At Leicester”, is treated as a separate audio file, if other people from another institution wants to use the library, they can simply replace it by “At xxxx”.

- **Batch work**

When developing a library of this size, the most productive way is to do everything in batches. For example, preparing the scripts for all the podcasts, recording them all in Audacity, taking all the photos, filming all the equipments and procedures, and finally, putting every thing together in Adobe.

- **Separate video from audio**

Another practical advice is to record videos and audios separately, and label them as: audio0, audio1, audio2, video0, video1, video2...so the video and audio footage match.

Future Work

The colleagues at Leicester are planning to experiment the use of the library with a small pilot group of students who studying the technique module and will use the

library in their field trip. Once the pilot is done, the next step will be to test the library with other field-based disciplines within the University of Leicester. Another step will be to take the library to other universities.

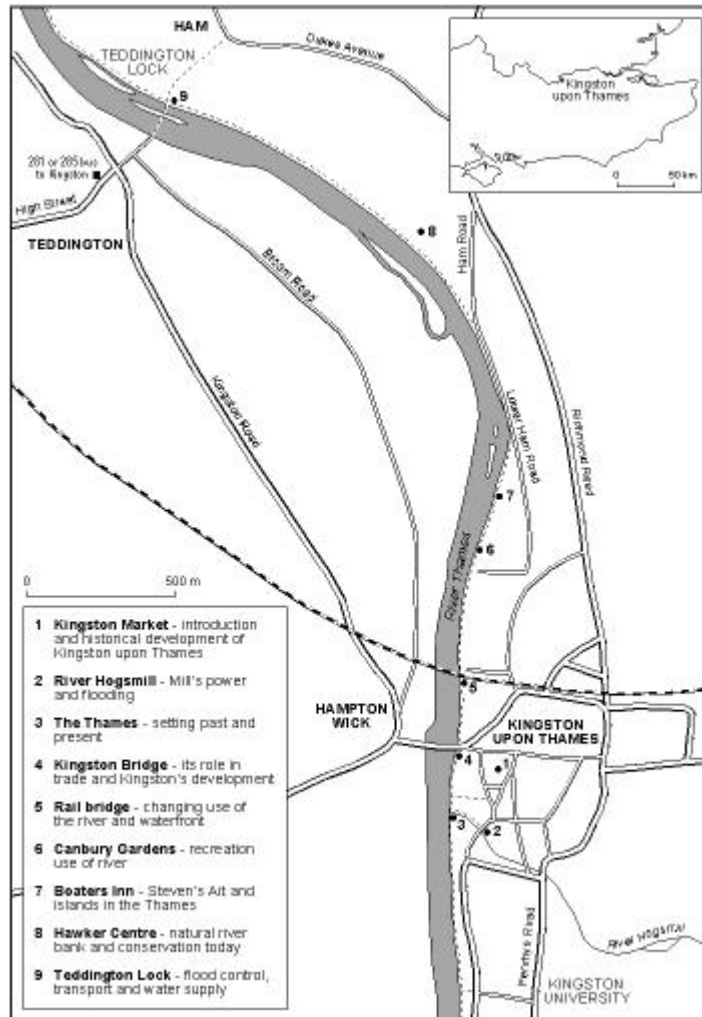
Another development is to have other institutions contribute to and expand the library. With the numbers of podcasts growing, the podcasts will be getting from generic to more and more specific.

Reference

Jarvis, C. and Dickie, J. (2008) Supporting experimental field-based learning: Interfaces and archives. Poster presented at Learning Futures Conference 2008, University of Leicester, 8-9 January.

**Informal Mobile Podcasting and Learning Adaptation 2
(IMPALA 2)**
**Funded by Higher Education Academy, Subject Centre for
Geography, Earth and Environmental Sciences (GEES)**

**Thames iWalk – Podcast to support fieldwork
(Earth Sciences and Geography, Kingston University)**



Thames iWalk (Downward et al, forthcoming)

Summary

The case study introduces an example of using podcasts to deliver location specific information and instruction in the field. The Thames iWalk podcast is developed by colleagues at School of Earth Sciences and Geography, Kingston University. A comprehensive discussion about this application and other approaches of using podcast to support fieldwork are included in a book chapter written by Downward et al (forthcoming). We strongly recommend you to read this short-version user-exemplar in combination with the book chapter.

Rationale

The concept of iWalk to support student learning in the field is simple: students are provided with a map, they follow a prescribed route with specified stops, they walk

between the sites, stop where indicated to listen to and /or watch a description of the location.

A podcast-based iWalk has an advantage over the fieldwork guide because students can observe and listen to an audio narration simultaneously.

Application

Colleagues at Kingston University developed the River Thames iWalk for their incoming geography students during induction week to orientate them to the Kingston-upon-Thames environment. This iWalk guides students to nine sites located adjacent to the River Thames in Kingston upon Thames (see the Figure).

A podcast was produced in relation to each site that introduces students to a particular geographical theme. Each podcast is five minutes in duration. The podcasts were recorded in an interview style with the experts introducing and explaining the themes in the field. Background noises such as the sound of running water, crowds or bird songs were included to create atmosphere that enhances the listeners' imagination of the river environment (this is particularly valuable where the iWalk is not used in the field).

In addition to location-specific information, the iWalk podcasts can also deliver field instructions. For example, the lecturer can direct students to undertake a particular activity, such as to record particular phenomena at a given stop in the iWalk podcasts.

Reference

Downard, S., Livingstone, D., Lynch, K. and Mount, N. (forthcoming) Podcasts and locations, in G.Salmon and P.Edirisingha (eds), *Podcasting for learning in universities*. McGraw Hill.

**Informal Mobile Podcasting and Learning Adaptation 2
(IMPALA 2)
Funded by Higher Education Academy, Subject Centre for
Geography, Earth and Environmental Sciences (GEES)**

**Enhancing Students' Learning Experiences Through the Use of
Digital Storytelling**
(Centre for Active Learning (CeAL), University of Gloucestershire)

Summary

The case study introduces an example of using digital storytelling as a means of promoting students' reflection and engagement with active, independent and collaborative learning experiences.

Context

The University of Gloucestershire started piloting the use of student-generated digital stories in 2006. Since then its use has been adopted in several disciplines and contexts. An example of how digital storytelling has been used is illustrated in Jenkins and Lonsdale (forthcoming).

Digital storytelling was first integrated into a field-based induction week activity to engage new first-year university students in 2006. The induction week event was promoted by the University's Department of Natural and Social Sciences in conjunction with the Centre for Active Learning (CeAL) (www.glos.ac.uk/ceal/index.cfm). Its aims were to: provide an enjoyable and relaxed learning experience that introduces students to active learning; offer the opportunity to meet staff and fellow students; help students develop social networks; introduce new skills; develop students' independence. The induction week event is linked to a compulsory Semester 1 skills module that seeks to develop and embed core skills; this module also introduces the students to Personal Development Planning (PDP).

In 2007, a total of 80-90 students from Criminology, Sociology, Community Development and Landscape Design were involved in creating digital stories.

Rationale

The purpose was to use digital storytelling as a mechanism to engage new first-year university students with active, independent, and collaborative learning experiences; and to encourage their reflections on the learning activity with which they were engaged.

Application

The structure for the activities during the 2007 induction was as follows:

- Day 1: students were organised into groups of 5-6 and given briefing sessions introducing them to the activity, their role and an introduction to digital storytelling, including a presentation of examples created by students as part of the 2006 induction event.
- Day 2: students went into the field to gather data and capture physical evidence for the digital stories.

- Day 3: students spent the day putting their stories together, using the evidence they collected in the field on Day 2 and supplemented by information gathered from research in the Learning Centres and/or from websites.
- Day 4: the digital stories were shown to the group at an open event, providing an opportunity for students to view each others work and receive feedback on their stories.

Two different scenario-based activities were used in 2007:

1. The sociology-based students (Criminology, Sociology and Community Development) acted as social researchers to investigate the impact of the July 2007 floods in Gloucestershire on local communities. Working in groups the students were taken to the affected locations to investigate local people's experiences of flood, and obtain evidence through interviewing local residents, personal observation, capturing of images and using local information sources such as public libraries.
2. The Landscape Design students were tasked with making a design proposal for a site in the Stroud Valleys, using the story to explain their design approach and ideas.

Fifteen stories were generated, each about 2-3 minutes in duration. Example digital stories, from these induction activities and other uses within the University of Gloucestershire, will be made available on the University's Higher Education Academy (HEA) funded Pathfinder project, *Enhancing Students' Learning Experiences Through the Use of Digital Storytelling*, website: www.glos.ac.uk/tli/lets/projects/pathfinder/index.cfm. The stories are also useful as learning resources and can be integrated into students' skills development (for example as part of an evidence-based PDP portfolio).

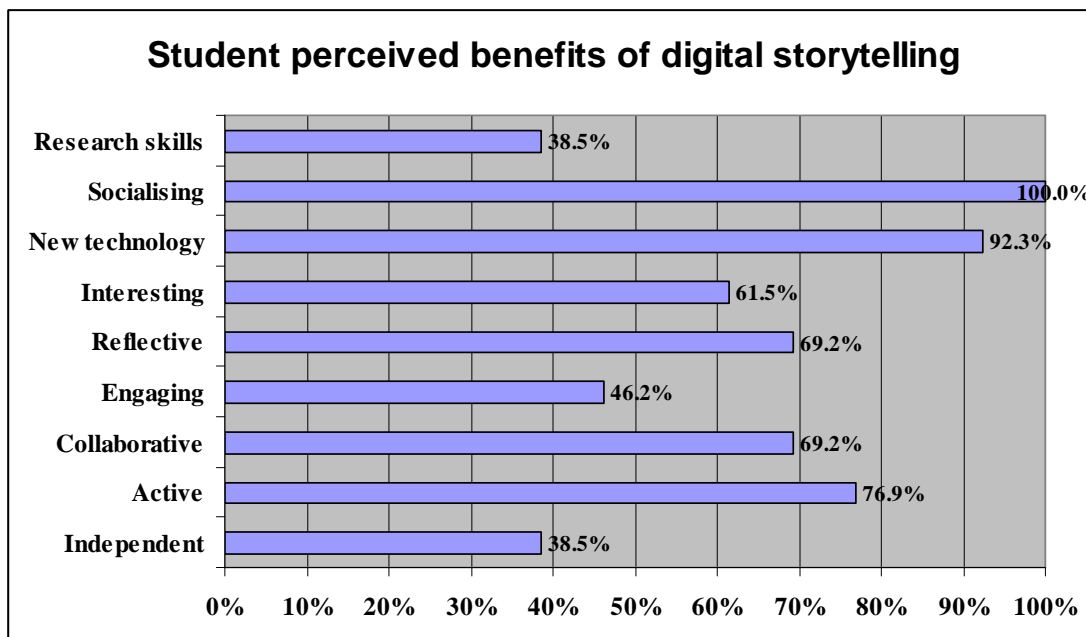
Technology

A range of equipment including voice recorders, iPods, digital cameras, laptops was made available to students. However, it was found that most students arrived with equipment that could be used to support this activity, for example the camera and audio recording functions within mobile phones. The stories were compiled using free downloadable software: Photo Story 3 or Windows Movie Maker. Further information can be found on the Centre for Active Learning website: www.glos.ac.uk/ceal/pedagogictoolsguides/digitalstorytelling.cfm.

Evaluation

Students' experiences and perceptions on digital storytelling as a learning tool were captured through a short questionnaire survey with a small group of 13 students who participated in the 2007 induction activity. Staff views on the use of digital storytelling were gathered through a personal interview with the Academic Manager of CeAL.

Results



The results show that students have been engaged with the aim of the project, that they found the activity engaging (46%) and interesting (61%), because of the opportunity of ‘go out, research and meet people’ and ‘creating something visual’; they have been engaged with active learning (77%) and independent learning experiences (38%); they had an opportunity to develop collaborative learning and communication skills (70%) through ‘working as a group’, and promote reflections on what they had learned (70%); they had an opportunity to develop research skills (38%), such as ‘how to collect research evidence’, interview skills on how to ‘ask questions and get answers’, and ‘talk to a subject’. Most importantly, they valued the opportunity of learning a new technology (92%), such as Photo Story 3 or Windows Movie Maker, and the opportunity of learning through socialising with others (100%), in students’ own word, an opportunity to ‘meet new people’, ‘we got to learn from each other’.

Recommendations

Evaluations from these case studies and other uses of digital storytelling within the University of Gloucestershire indicate that this technique presents a different way for students to present their work. The use of simple technologies mean that it is accessible to all students; although it is recommended that support sessions are provided to ensure that students are comfortable using the technology.

When introducing the use of digital storytelling students should be provided with clear guidance. Where possible this should be backed up by showing the students a good quality example, perhaps even an exemplar created for this purpose.

Lessons learned

The use of digital stories is a new approach for staff as well as students. The evaluation and assessment of the stories can require support. To address this, the University of Gloucestershire has developed a framework that can be used to identify factors to be considered when evaluating and assessing digital stories, which can also be used as criteria for students to help them in the development of their stories. This framework is available at University’s Higher Education Academy (HEA) funded

Pathfinder project, *Enhancing Students' Learning Experiences Through the Use of Digital Storytelling*, website: www.glos.ac.uk/tli/lets/projects/pathfinder/index.cfm.

Future work

The University of Gloucestershire is continuing to develop the use of digital storytelling in different contexts and to determine how it impacts on staff and student creativity.

Reference

Jenkins, M. and Lonsdale, J. (forthcoming) Podcasts and students' storytelling, in G.Salmon and P.Edirisingha (eds), *Podcasting for learning in universities*. McGraw Hill.

**Informal Mobile Podcasting and Learning Adaptation 2
(IMPALA 2)
Funded by Higher Education Academy, Subject Centre for
Geography, Earth and Environmental Sciences (GEES)**

Supplementary Podcasts to Introduce Topical Issues

(Geography and Development, University of Gloucestershire)

Summary

The case study was derived from a podcast application developed to introduce students to topical issues in sustainability and development. The podcasts were developed by a lecturer at University of Gloucestershire. He first produced the podcasts for a module called *Skills 4 Sustainability* in the academic year 2006-7. He was then able to re-use most of the content that he generated for the previous year. The case study will introduce audience to the module's information, rationale of using podcasts, a description of the podcast application, students' perceived benefits of listening to podcasts and most importantly, recommendations given by the lecturer on how to make sustainable podcasts and future development. We recommend you to read this document in combination with the user-exemplar developed based on the feedback and experience of the students from last year, which was made available from (<http://www.impala.ac.uk/outputs/exemplars/index.html>).

Module Context

The podcast application was developed for a level one module *Skills 4 Sustainability* within Geography and Development, University of Gloucestershire. The module was an inquiry-based and skills-focused core module for a hundred and twenty-nine students studying a wide range of programmes within the Department of Natural and Social Sciences during the academic year of 2007-8.

Students were divided into eight tutorial groups and taught through a 1.5-hour face-to-face tutorial session each week. The module was assessed through three pieces of work: a short essay (20%) on the use of references and citations, a team presentation (30%) based on an idea of how to make the university more sustainable, and an e-portfolio in PebblePad (50%).

Rationale

The module is an inquiry-based module and focus on student's development in PDP. Podcasts were developed to support and supplement to the learning activities and direct students to additional learning resources.

Application

The podcasts produced in 2007 adopted the same format: weekly podcast, 10 minutes each in duration, and contained similar information as the podcasts produced in 2006. Each one consisted of three themes: a skill theme, a content theme and a review of resource. In the skill theme, the lecturer introduced students to a range of academic skills including reflective, portfolio development and teamwork skills. In the content theme, the lecturer introduced students to a range of main issues related to sustainable development. In the resource session, the lecturer provided students with additional learning resources to introduce students to current debates on environment,

sustainability and development from global, national, regional and local perspectives. The content for this session was derived from interviews or discussion with colleagues, practitioners and experts in the field, and representatives from the local resident and business community.

The lecturer reused the content from interviews, debates and discussions taken from last year and re-recorded the content to do with skills based on students' feedback last year.

What is new about the podcasts is that music was included at the beginning and the end for the purpose that specific music might help students to listen.

Technology

The podcasts produced in 2006-7 were developed in Audacity and made available as MP3 files. The new podcasts were produced in GarageBand and the made available in M4A (enhanced podcast format).

The method for delivery also changed. In 2006, the podcasts were delivered through the lecturer's personal blog in PebblePad. In 2007, they were delivered through iTunes. One of the purposes to use iTunes was to improve the listening percentage because once students subscribe to the iTunes, new podcasts will automatically download onto students' device. Another purpose was that the lecturer wanted to make the podcasts available for other colleagues to share.

Evaluation

The impact of podcasting on students' learning was captured through a small focus group interview with four students and a questionnaire survey with a small group of 10 students. Staff experience of developing podcasts was gathered through a personal interview with the lecturer who developed the podcasts.

Students perceived benefits

Enhancing understanding of subject-related material

Some student identified the value of reinforcing and enhancing understanding of subject-related material through repeated listening.

"I think it's good. If you didn't understand the bit, you can rewind and listen to again, you can go back lots of times. If it's in a lecture, you can't go back".

"I suppose one of them is about Fair Trade... the last one he posted is Fair Trade and sustainability, so that one I rewind...(to have a better understanding of 'Sustainability')."

"Definitely the PebblePad, if you continue using PebblePad, you forget how to use it, you can go to podcast because how to use PebblePad, so that would be useful".

Flexibility and learner control

Some identified the feature of flexibility and learner control that podcasting offered to student learning

"What's good about it is you can listen when you're in leisure, so whenever is good for you".

"I think whenever you want, when you have the opportunity, you just like, take out your iPod and do it. You don't have to be at university to listen to it, it's good".

Recommendations

- **Always think about reusability**

The lecturer is able to re-use most of the content that he created from the previous year, and that saves a massive amount of time. One of the recommendations he gave for practitioners is always think about the reusability of the podcast content. When conducting interviews, for instance, make sure that it is not just used one-off, but can be reused again.

The lecturer is planning to do more interviews each year. In this way, he can be recycling by putting new ones in to replace the old ones.

- **Make transcription available**

The lecturer transcribed the audio content in podcasts and posted them on his personal blog through Pebblepad, so that students having hearing difficulties will not be disadvantaged. This practice also helps him to re-use and update the content. It works much faster when you have the transcript than writing it from scratch.

- **Email reminder**

By taking into account of students' recommendations last year, an email is being sent on a weekly basis to remind students what's coming up (the content) in the next podcast.

Future Work

In the future, the colleague plans to engage staff more in producing the podcasts by conducting more interviews with personal tutors, particularly the new tutors from Sociology and Criminology and more interviews with social and human researchers.

The lecturer is also keen to share his podcasts on research methodology with a colleague in Australia, and use the podcasts created by this colleagues for his students at Gloucestershire through iTunes.

Appendix 3: Introduction to example podcasts

Lectures:

1. Ethnobotany part 3: spirituality and the arts

This audio lecture is produced by Dr Mark Reed, at School of Earth and Environment, University of Leeds, as part of the level 2 *People and Plants* course, and discusses the historic and current role of plants in human spirituality and the arts.

2. Structure of the earth

This level 1 lecture (delivered early in the course) is produced by Dr Mick Frogley, at Department of Geography, University of Sussex as part of the *Dynamic Earth* course, and explores the evidence for the concentric-shelled structure of the Earth and (about 1/3 the way through) includes students taking part in a live demonstration of different earthquake wave types.

3. Introduction to palaeoenvironmental proxies

This level three lecture (delivered very early in the course) is produced by Dr Mick Frogley, at Department of Geography, University of Sussex as part of the *Palaeoenvironments and Human Impact* course, and reminds students about some of the topics covered in a previous (level 2) course and introduces them to several new case studies that use different proxies to reconstruct past environments.

Lecture Summaries:

1. GPS

2. Spatial Referencing

The two video podcasts are produced by Dr Nick Mount and Claire Chambers, at Department of Geography, University of Nottingham as part of the *Introduction to GIS* course, and provide students with summaries of the lecture.

Seminars:

These are two student-led seminars are produced by Dr Mick Frogley, at Department of Geography, University of Sussex as part of the level 3 *Palaeoenvironments and Human Impact* course. Students are required to present short small-group (2-3 students) seminar presentations on selected topics and invite discussion at the end of each presentation. Student PowerPoint presentations are made available on the course eLearning site, along with the podcast, after each session. These two seminar presentations are derived from a two hour session examining the topic of megafaunal extinctions – four student presentations were given in all.

Practicals:

1. How to use GIS software

These are two video podcasts are produced by Dr Nick Mount and Claire Chambers, at Department of Geography, University of Nottingham as part of the *Introduction to GIS* course, and provide step-by-step guide to carry out various operations with GIS software. These video podcasts were closely linked to Geography undergraduate students' learning activities with computers in practical classes.

2. Lab techniques

These are two short videos are produced by Dr Mick Frogley, at Department of Geography, University of Sussex, and made available to students on the level 3 *Palaeoenvironments & Human Impact* course. The practical aspect of the course requires students to carry out a series of analyses on sedimentary core material – the size of the group and the constraints of the core site mean that it is impractical to take students into the field. As a result, staff carry out the coring procedure, film the proceedings and then make each individual part of the technique available as short downloadable video clips.

Fieldwork:

1. iWalk – a field guide

This iWalk podcast is produced by Dr Stuart Downward and his colleagues, at School of Earth Sciences and Geography, Kingston University to support the Geography students learning activities in the field.

2. How to use a schmidt hammer - field techniques

This video podcast is produced by Dr Claire Jarvis and Dr Jen Dickie, at the Department of Geography, University of Leicester, as part of the GeoPods podcast library - a mobile learning library for geographical techniques consisted of a number of podcasts explaining how to use different types of field equipment. This particular podcast introduces students to how to use a Schmidt hammer in the field.

Supplementary material:

1. Reflective learning and the Egan review

This podcast is produced by Dr Kenny Lynch, at Department of Geography and Development, University of Gloucestershire as part of the level 1 *Skills4Sustainability* course, and discusses how to reflect on your learning and the Egan Review of Skills for Sustainable Communities.

2. Team-based learning and Fairtrade

This podcast is produced by Dr Kenny Lynch, at Department of Geography and Development, University of Gloucestershire as part of the level 1 *Skills4Sustainability* course. Kenny talks about team-based learning, while Barbara Crowther of the Fairtrade Foundation and Jonathan Horrell of Kraft Foods talk about fair trade and sustainable development.

3.Impacts of Climate Change on UK

This audio documentary is produced by Dr Mark Reed, at School of Earth and Environment, University of Leeds, as part of the level 2 *Climate Change* course that brings together interviews with Scottish farmers to investigate the changes they are already experiencing due to climate change.

4. Carbon confessions of an environment school

This podcast is produced by Dr Mark Reed, at School of Earth and Environment, University of Leeds, as part of the level 2 *Climate Change* course. This 15 minute documentary obtains carbon confessions from two prominent Environment staff, Mark's wife spills the beans on his environmental behaviour, and we hear how each of them is attempting to reduce their carbon footprint.

5. Plant Detectives: using plant indicators species to uncover environmental history in Scotland

This video podcast documentary is produced by Dr Mark Reed, at School of Earth and Environment, University of Leeds, as part of the level 2 *People and Plants* course that shows the power of plant indicator species to uncover complex stories about environmental change over time. Mark puts together the environmental history of a remote Scottish agricultural landscape from a handful of indicator species, and then investigates how accurate this picture is, interviewing old farmers and uncovering a hand-painted map from the 1830s.

6. Interview with Dr Gordon Noble about Neolithic spirituality and trees

This podcast is produced by Dr Mark Reed, at School of Earth and Environment, University of Leeds, as part of the level 2 *People and Plants* course. In this audio interview Dr Gordon Noble, British Academy Postdoctoral Fellow at the University of Glasgow, talks about his research into our Neolithic ancestors' relationship with trees.

7. Sustainable Uplands case study special: ecological modeling

This podcast is produced by Dr Mark Reed, at School of Earth and Environment, University of Leeds, as part of the level 2 *People and Plants* course. This video podcast interviews Dr Dan Chapman about his work on the Sustainable Uplands research project, modeling upland habitats.

8. Plant Species Profile 2: Dog Rose

This podcast is produced by Dr Mark Reed, at School of Earth and Environment, University of Leeds, as part of the level 2 *People and Plants* course. In this video podcast Mark showcases some of the uses, history and folklore surrounding this species.