

Unit 7 Educational multimedia

What is multimedia? Multimedia can mean many different things. Taken literally, the term multimedia really only means to communicate in more than one way. Jumping up and down while singing praise for the winning rugby team is providing onlookers around you a multimedia presentation (movement + sound). In education multimedia might be the presentation of line graphs with an overhead projector to support the oral delivery of an economics lesson. It could be using e-mail to supplement communication in a face-to-face group-work activity. Students downloading and revisiting audiotaped lessons on their iPods are using a form of multimedia to reinforce what they have been assigned to read in their course textbook.

According to Wikipedia, 'multimedia is the use of several different media (eg text, audio, graphics, animation, video, and interactivity) to convey information.' Educational multimedia is understood to be multimedia which provides learning resources by using a variety of media in an integrated way for the purpose of instruction. By doing so we provide resources to students in ways that best suit their learning needs and capture their interest.

This chapter will provide:

- An overview of the main types of educational multimedia
- A rationale for the use of multimedia in teaching including examples and
- Good practice guidelines.

1.0 Why use multimedia?

Incorporating multimedia into teaching requires extra time and effort – so, really, why even bother? The case for multimedia in education is quite simply an enhanced learner experience. If implemented thoughtfully multimedia can facilitate a richer learning experience and promote deeper understanding. Using multimedia also supports students with different preferences for how information is presented. In other words two formats for presentation are better than one (Mayer, 2009).

Pictures convey information more quickly than words. Virtual worlds enable learners to actively participate in authentic tasks, empowering them to do things in an environment that provides a level of complexity and information representative of the actual setting rather than be passive onlookers. Interactive animations can create more exciting and captivating learning experiences. Students can choose, start and stop simulations at their own pace. They can view and scrutinise images as often as they like, repeat practice quizzes or audiotaped lessons for clarification of topics. Presenting information by using more than one format

caters to the different ways in which students learn. In addition by providing more than one way for students to gain information we are improving accessibility.

Unfortunately, the past has seen many inappropriate uses of multimedia in teaching due to a preoccupation with the technology rather than with the learner. Technologically dazzling multimedia has rarely lived up to the expectations of its creators and has hardly influenced the learning process or transformed practice or effectiveness of teaching. When considering multimedia for teaching the aim must not be to showcase cutting-edge technology, but rather to adapt technology to enhance the student learning experience. A range of stunning animations created to deliver vast quantities of information can easily become distracting, whereas one semi-interactive tutorial has the potential of maintaining attention while helping consolidate knowledge and skills introduced to the learner elsewhere.

1.1 When to use multimedia

Some subject areas lend themselves seemingly naturally to the incorporation of multimedia. Contemporary lessons in art design have never been only text-based, of course. Chemistry students benefit hugely in their spatial understanding from building and manipulating 3D computer graphic models of molecules (eg Figure 19) and are better prepared for actual quantitative analysis by calculating appropriate concentrations of reactants in virtual lab experiments. The health field sees everything from heart sound tutorials to digestion video clips support understanding and provide opportunity to practice key skills. But how might English as a second language, history, law or business studies benefit? Let's explore just a few examples which might give you an idea or two of your own.

Case Study

Doris, a French studies tutor, is frustrated by the poor aural comprehension skills of her students. She feels limited in what she can do to support them better given the sheer number of students and a bare minimum of contact hours with them. After consulting the faculty's online learning adviser she feels encouraged to create weekly audio-introductions to lessons online in addition to uploading written lecture notes. Using freely available audio recording software she records weekly lesson outlines but soon adds announcements and 'phrases of the day' to the VLE for students to correctly translate in the following face-to-face lecture. Doris has not only incorporated multimedia meaningfully into her teaching but has managed to link online activity directly to the face-to-face lecture adding relevance and purpose to both. Her students are pleased about the additional and flexible opportunity to refine their listening skills.

Now is the time to reflect on your teaching and ask yourself:

- Is there a complex process you would like your students to see?
- Are there problem-solving skills your students need more opportunities to practice?

- Do your students need to become better prepared for labs or for workplace related assignments?
- Have you considered the benefits of engaging your students in an otherwise inaccessible authentic environment (such as on the moon, at the bottom of the ocean)?
- Would your students benefit from more interactive self-assessment opportunities?
- Have you been thinking about making your students feel more comfortable learning online?

If your answer to only one of the questions above was yes, then you may very well find that a form of multimedia could enhance your students' learning experience.

2.0 Educational multimedia technology

Let's take a look at some of the most frequently used technologies and review key educational benefits of incorporating these into your teaching. Through examples you will see how each might be used to accomplish a specific learning outcome defined beforehand for that particular multimedia application.

The main elements of multimedia applications include graphics, video, audio, animations and interactive technologies, which are described below. Also find a short introduction to the emerging technologies of m-learning, wireless technologies, podcasting, augmented realities and educational gaming.



Figure 18: Map of Europe from pics4learning repository at <http://www.pics4learning.com/details.php?img=europe.jpg>

2.1 Graphics

Graphics are visual elements that include everything from still images, icons, graphs, diagrams, illustrations, photographs, artwork, to maps and more.

2.1.1 Benefits of graphics

Information presented in an alternative format enhances written text; aids visualisation and supports conceptual learning. Object analysis is enabled.

2.1.2 Teaching example

Writing composition students are sent to pick one painting of their choice by Paul Cezanne at <http://www.ibiblio.org/wm/paint/auth/cezanne/> and describe it in a written essay.

2.1.3 Web resources for graphics

- SCRAM at <http://www.scran.ac.uk/> (Edinburgh Napier subscription)
- JISC BIO Science Image Bank at <http://www.bioscience.heacademy.ac.uk/imagebank/>
- Flickr at <http://flickrcc.bluemountains.net/>

2.1.4 Implementation tips

- To save an image, right click on it with your mouse and click on 'save image as'
- Download Picasa from <http://picasa.google.com/> to find and organise all your pictures on your PC.
- Use Picnik at <http://www.picnik.com> for easy editing

2.2 Video

Video refers to the 'technology of capturing, recording, processing, transmitting, and reconstructing moving pictures' (definition in Wikipedia at http://en.wikipedia.org/wiki/Main_Page).

2.2.1 Benefits of video

Portrays authentic learning situations enhancing the authenticity of computer-based learning environment; presents scenarios otherwise inaccessible to traditional classroom (operating theatre, historic landmark etc).

2.2.2 Teaching example

Link a descriptive video clip to a written paragraph about the shortage of potable water in Lesotho (eg countries around the world video clips at <http://www.peacecorps.gov/wws/multimedia/videos/>

2.2.3 Web resources for video

- Visit the Moving Image Gateway (MIG) for educational video and audio resources at <http://www.bufvc.ac.uk/gateway/>

- HERMES is the British Universities Film & Video Council's (BUFVC) central database at http://www.jisc-collections.ac.uk/catalogue/coll_hermes
- EMOL (Education Media Online) database with over 300 hours of film related to every subject area at <http://bufvc.ac.uk/> (completion of licence agreement required)

2.2.4 Implementation tips

- Use Viddler (<http://www.viddler.com/>) or Vimeo (<http://vimeo.com/>) to create video presentations yourself.

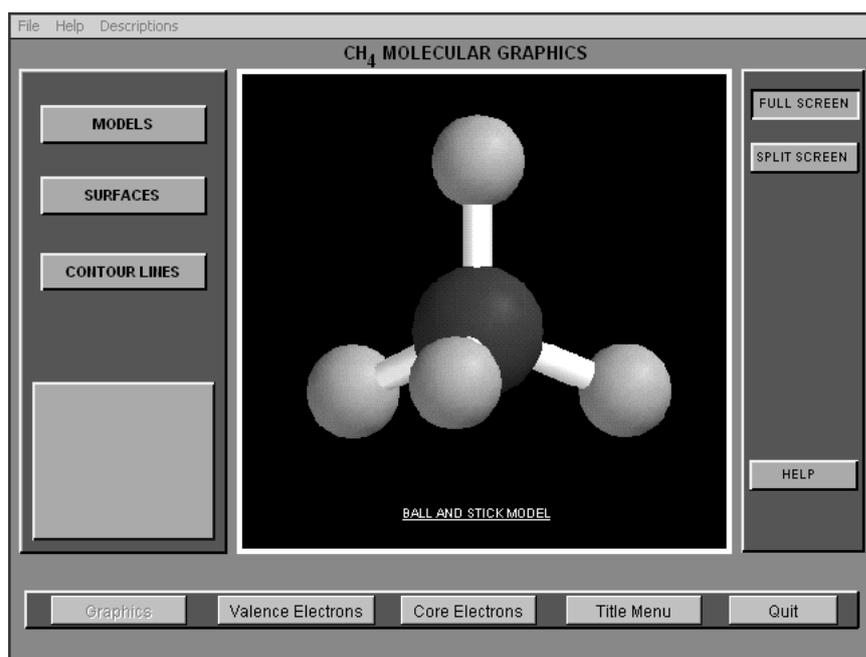


Figure 19: Ball and stick model of methane, CH₄. Image from <http://treefrog.fullerton.edu/chem/mog/ch4.htm>

2.3 Audio

Audio refers to sound recording and its reproduction where sound can mean voice, music and sound effects (see also section 4.2 below).

2.3.1 Benefits of audio

Simple to create with freely available software. Audio introductions personalise online modules, audio recordings help students recognise sounds, improve listening (music) and pronunciation (foreign language studies) skills. Tutors can highlight course content in preparation for an exam.

2.3.2 Teaching example

Short (1 minute) audio introduction to weekly online lessons, staged audio debate as an introduction to a controversial current events topic, audio recordings of correct pronunciation of objects displayed in pictures in a foreign language course.

2.3.3 Web resources for audio

- Freeware odeo at <http://www.odeo.com/> and a headset lets you create your own audio files (stored as MP3 files) within minutes.
- Free desktop audio editing programmes also include Audacity (at <http://audacity.sourceforge.net/>) or Sound Recorder (<http://www.sound-recorder.info/>)
- Recorded documentaries freely available from Discovery Channel at <http://www.discovery.com/radio/podcasts.html> or find documentaries from pbs at <http://feeds.pbs.org/pbs/pov-audio>
- Go to SCOLA at <http://www.scola.org/scola/SampleWTO.aspx> to hear televised programmes from around the world in native languages
- Berklee College of Music offers free music resources at <http://www.berkleeshares.com/>

2.4 Animations

Animations are simulations of movement of graphic images.

2.4.1 Benefits of animations

Processes (over time) otherwise invisible to the human eye are made visible. Animations add impact to presentations, enliven a message, illustrate individual steps making complex information appear simple.

2.4.2 Teaching example

A biology professor links to a photosynthesis animation to assist students in their understanding of the complex chemical processes involved (eg photosynthesis animation at <http://www.johnkyrk.com/photosynthesis.html>)

2.4.3 Web resources for animations

- Try <http://www.miniclip.com/sketch-star/en/> or **GoAnimate** at <http://www.miniclip.com/sketch-star/en/> for free animations and instructions on how to create simple animations.

3.0 Interactive technologies

3.1 Courseware

Courseware here refers to educational applications within an online lesson (eg multiple choice quiz (MCQ), 'fill-in-the-blank' activity).

3.1.1 Benefits of courseware

Interactive demonstrations of the concepts under study; consolidate or test knowledge.

3.1.2 Teaching example

An economics professor makes a supply and demand interactive graph available to his students to reinforce market dynamics (eg <http://www.bized.co.uk/learn/economics/markets/mechanism/interactive/part1.htm>)

3.1.3 Web resources for courseware

- Create interactive puzzles for your students at <http://www.univie.ac.at/future.media/moe/testpuzzle/testpuzzle.html>
- Sensory processing case study at http://classes.kumc.edu/sah/resources/sensory_processing/learning_opportunities/case_studies/myagrace/case_intro_frameset.htm

3.1.4 Implementation tip

- Many book publishers make interactive courseware (and other web resources) available to support hard copy book content-be sure to ask and potentially save loads of time.

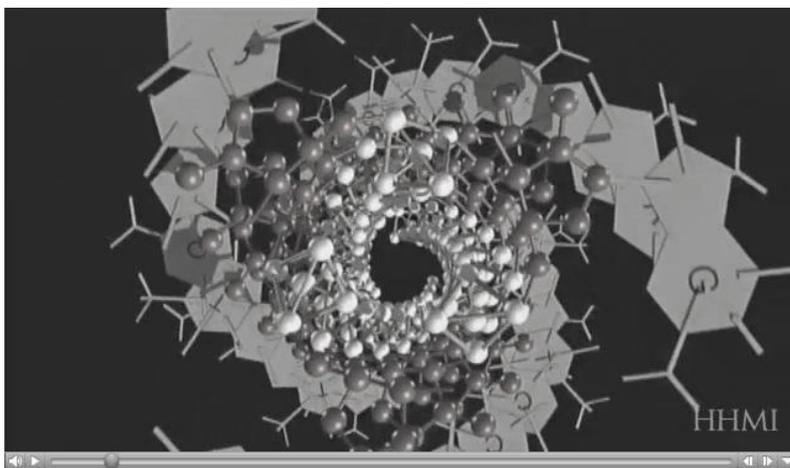


Figure 20: Example of a Flash animation from http://www.hhmi.org/biointeractive/dna/DNAi_pauling_triple_helix.html

3.2 Tutorials

Interactive tutorials mimic situations representative of the actual setting in which learners are able to apply problem-solving skills in accomplishing the tasks as if they had been in the actual environment.

3.2.1 Benefits of tutorials

Interactive demonstrations of the concepts under study prepare students for real world learning activities; opportunity for refining skills improved; time on task in lectures improved.

3.2.2 Teaching example

In order to give students the added opportunity to practice monitoring heart sounds students are sent to the Heartsounds tutorial at <http://www.blaufuss.org/>

3.2.3 Web resources for tutorials

- Microscope
- Tutorial at <http://www.udel.edu/Biology/ketcham/microscope/> (requires Macromedia Flash available at <http://get.adobe.com/flashplayer/>)

3.3 Virtual worlds

Virtual worlds refer to interactive simulated 3D virtual spaces in which many users can participate (also referred to as 'digital worlds'). Currently the most popular virtual worlds in use in education are Second Life (SL) (<http://secondlife.com/>) and OpenSim (<http://opensimulator.org/wiki/>).

3.3.1 Benefits of virtual worlds

Students freed from the need to be situated within the real environment can learn and receive feedback while interacting within recreated 3D environments such as museums, historical events, crime scenes, hospital wards, chemistry labs.

3.3.2 Teaching example

In an arts lecture students are charged with visiting a virtual art museum and finding 10 works of art that best reflect a chosen theme (eg walk around the Van Gogh Exhibition at <http://www.nga.gov/exhibitions/vgwel.htm> requires RealPlayer at <http://uk.real.com/realplayer/>

3.3.3 Web resources for virtual worlds

- Review the many educational applications of Second Life at <http://education.secondlife.com/> including courses run entirely in SL
- Read the Anne Myers medical center in SL support blog at <http://ammc.wordpress.com/> for an authentic look at how virtual worlds are being used to support health science studies.

3.4 Virtual labs

A virtual lab is a virtual world within which students can engage specifically in science lab activities such as microscopy or compound synthesis.

3.4.1 Benefits of virtual labs

Aids student preparedness; time on task in real lab setting improved; encourages authentic inquiry (data gathering, synthesis); fosters critical thinking skills.

3.4.2 Teaching example

A chemistry teacher sends students to a virtual chemistry lab in order for them to learn lab equipment terminology and become aware of safety hazards (eg Virtual ChemLab Community at <http://chemlab.byu.edu/tour/Chemistry>)

3.4.3 Web resources for virtual labs

- Fluffy the Virtual Frog Dissection kit at <http://froggy.lbl.gov/virtual/>
- Free trial of virtual biology labs from <http://www.sciencecourseware.org/BLOL/>
- Carnegie Mellon's Virtual Lab Simulator at <http://www.chemcollective.org/vlab/vlab.php>.

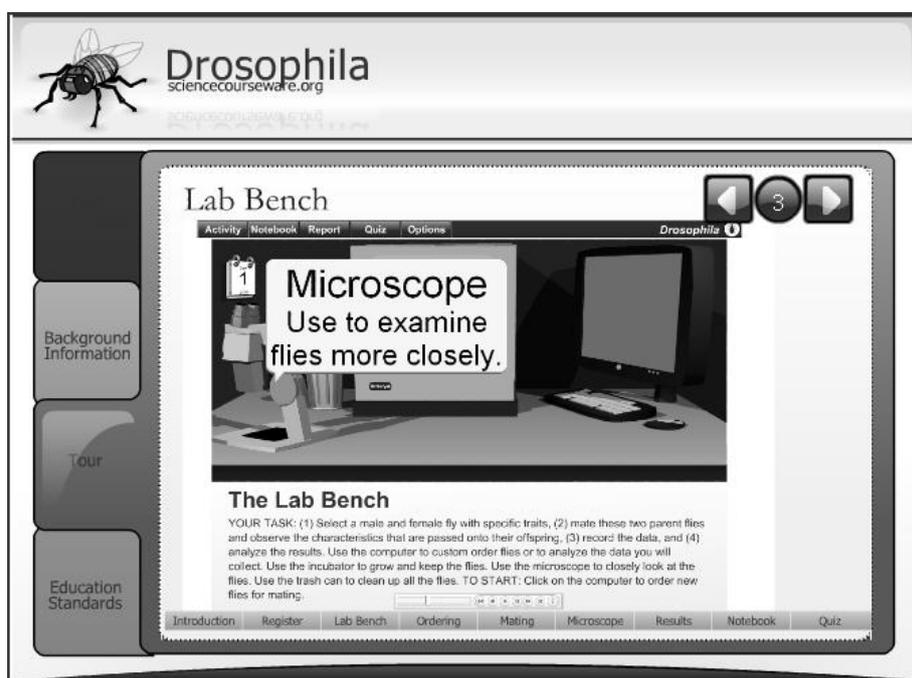


Figure 21: A virtual biology lab from <http://www.sciencecourseware.org/vcise/>

3.5 Virtual field trips

A virtual field trip is a virtual world within which the student takes part in an exploration or expedition such as of a volcano, Stonehenge or a dairy farm.

3.5.1 Benefits of virtual field trips

Active, student-centred learning facilitated. Virtual field trips provide project-based learning environments that support exploration and discovery, foster curiosity and raise awareness for issues students are often detached from.

3.5.2 Teaching example

Biology students join the virtual explorers to study the river dolphins in Peru at <http://www.virtualexplorers.org/ARD/index.htm>.

3.5.3 Web resources for virtual field trips

- Discover the Galapagos Islands at <http://www.geo.cornell.edu/geology/GalapagosWWW/GalapagosMap.html>
- Have students explore the Aral Sea at http://visearth.ucsd.edu:16080/VisE_Int/aralsea/aral_map.html
- For a harrowing tour of the concentration camps Auschwitz and Birkenau see <http://remember.org/educate/intro.html>

3.6 Simulations

Simulations refer to safe virtual environments that provide users with real-life situations to practice skills.

3.6.1 Benefits of simulations

Simulations support exploration otherwise inaccessible because of risk or cost (eg flight simulator, combat zone, earthquake).

3.6.2 Teaching example

A civil engineering lesson about mechanical stress and strain on elements of construction is accompanied by a simulation of the application of varying degrees of stress and strain on a steel support beam (eg the pbs site, 'Why the towers fell' at <http://www.pbs.org/wgbh/nova/wtc/metal.html>).

3.6.3 Web resources for simulations

- Virtual developing country at <http://www.bized.co.uk/virtual/dc/>
- Rice Virtual Statistics Lab at <http://onlinestatbook.com/rvls.html>

► See [Unit 10](#) for guidance on third party material and copyright issues.

4.0 Emerging technologies

In a period of rapid developments in wireless local area networks (WLANs), increasing networking speeds, refined screen technology and software trends, it is difficult to accurately choose and expand upon those new technologies that may one day prove most influential in education. Of the five emerging technologies below, wireless, m-learning and podcasting have been chosen as emergent technologies of not yet widespread applications but for which pilot studies promise more accessible, flexible and active learning experiences. Educational gaming and augmented realities are at earlier stages still in their educational applications and hence only introduced briefly.

4.1 Wireless and m-learning

Wireless and m-learning (short for mobile learning) refer to internet technologies that support online teaching and learning applications with access via mobile

devices or wireless networks rather than cable-based networks. Wireless and m-learning are not yet established as mainstream practice in higher and further education, but increasingly mobile devices used together with wireless networks will break down further barriers to deliver educational content, enabling multimedia experiences from anywhere and at anytime.

There is some dispute over what exactly constitutes a mobile device. Most commonly mobile devices include mobile phones, the hand held devices, personal digital assistants (PDAs) and personal media players (eg Apple iPods, iPad, MP3 Players). Mobile devices themselves are increasingly diverging into hybrid devices which integrate multiple functions (eg 'smartphones' which include video capture functions).

4.1.1 Teaching examples for wireless and m-learning

At City College in Southampton camera phones are used together with a web-based multi media message board in an activity that requires international students to build a photo story that introduces the campus to newly enrolled students in pictures, text and sound. At Thomas Danby College interactive 'drill for skill' tutorials have been developed for the PDA giving students the added opportunity to practice basic skills.

4.1.2 Benefits of the use of mobile technologies

- Portable access to activities and learning resources
- Support active learning approaches such as work-based learning and field work
- Enable richer learning experiences (data, sound, image capture)
- Students take ownership of their learning
- Facilitate information sharing and discussion
- Learning situated in a wide variety of locations in support of lifelong learning.

4.2 Podcasting

Podcasting is the 'method of distributing multimedia files, such as audio programs or music videos, over the Internet for playback on mobile devices and personal computers.' (Definition in Wikipedia at <http://en.wikipedia.org/wiki/Podcast>). Podcasting supports mobile learning – students can listen to a lesson outside the classroom, on a bus on their way home from classes. Edinburgh Napier's latest podcasting initiative at <http://edinburghnapier.podbean.com>, for example, was developed to offer additional and timely support to its first year students who have responded very positively to the useful study tips and hints 'on the go'.

Podcasting (from iPod and broadcasting) does not require an iPod! The iPod has simply become established as the most popular portable digital audio player. Podcasts (nothing more than an MP3 audio file) can be produced with a standard computer, microphone, and free software in order to upload the audio file to your VLE, webpage or portable digital audio player, for example. To create a podcast all you (or your students) need is a headset, computer connected to the Internet

and (freely available) software (eg Audacity at <http://audacity.sourceforge.net/>) to record, save and play standard MP3 audio files (see section 2.3.3).

Video podcasting is referred to as vodcasting. Ohio University offers weekly informative vodcasts ('Ask the Techies') on issues covering a wide range of technology topics, available to anyone at <http://cscwww.cats.ohiou.edu/aac/lab/techies/>. A wide range of educational podcasts such as documentaries, recorded speeches, interviews, but also city walking tours (listen for example to a guided walk through a major UK city at <http://www.walktalktour.com/>) are available on the internet to support your teaching but may incur a fee (always be mindful of copyright, see [Unit 10](#)).

4.3 Augmented realities

An augmented reality is created by merging virtual images with the real view. In other words graphics, audio, or text is superimposed on a real world environment—such as every night on the news meteorologist's weather map. Augmented realities have been piloted to assist surgeons during operations and soldiers train for war. In education the PDA has been identified as a cost-effective platform for augmented realities.

4.3.1 Teaching example

See <http://education.mit.edu/drupal/ar> for an example of using handhelds to engage students in simulated realities in order to uncover the source of a toxic spill that has caused serious environmental damage. Students walk right into the environmental investigation led by a GPS (global positioning system) enabled handheld to interview virtual witnesses and measure and analyse simulated data.

4.4 Educational gaming

Educational games can provide a safe, fun environment for students to learn. Online games immerse students in the material within a competitive or challenging context motivating them more to learn, (often the 'hook' to engage at-risk students), and encouraging students to learn from their mistakes. Despite these benefits educational gaming has only recently gained recognition by academics as a potentially effective means of facilitating comprehension and knowledge retention.

4.4.1 Teaching examples

- Games can include real world simulations (medical applications, conflict resolution, ecosystems) and player interaction. 'Live Long and Prosper' is a game developed at MIT for use on a PDA in which students are challenged to breed genetic traits that will result in longest life (available at <http://education.mit.edu/pda/igenetics.htm>).

- In the Virtual Oil Well game developed at the University of Texas (available at <http://www.beg.utexas.edu/vow/index.html>) players are prospectors with a limited budget who must interpret seismic data to search for oil traps. Students learn about the geological and managerial issues involved with oil exploration.

5.0 Incorporating multimedia

5.1 Using third party material

As you may have noticed in some of the examples above, incorporating multimedia into teaching does not necessarily require specialised software or programming expertise. You can upload images and link to freely available multimedia applications by using software you will most likely already have, your institution's VLE provides or which it is freely available on the web (subject to permissions). In fact the range of and ease with which web-based media is made available at no cost to the user can easily become too tempting, which is why it is worth reminding that incorporating technology must always serve a purpose toward the students' learning experience.

Collections of learning objects have made it easier to search for freely available multimedia resources. Digital repositories such as MERLOT (Multimedia educational resource for learning and online teaching, <http://www.merlot.org/>) and JORUM (<http://www.jorum.ac.uk/>) allow you to search for civil engineering simulations, interactive tutorials for creative writing courses, or animations for a thermodynamics lesson. The UK national electronic repositories EMOL (<http://www.filmandsound.ac.uk/>) and Edina (at <http://edina.ac.uk/>) are also searchable sources of multimedia applications for your teaching.

Note: Multimedia you did not create that is derived from web sources is subject to copyright provisions. Be sure to check! Generally, educational, not-for-profit use of content is endorsed by the author subject to attribution.

► See [Unit 10 sections 1 and 2](#) for more examples of web resources and for guidance on third party material and copyright issues.

5.2 User generated multimedia

Multimedia applications, such as video or audio recordings, animations and narrated presentations require less specialist knowledge than ever before, thanks to emergent web 2.0 technologies and tools that are often free, accessible and easy to use. You don't always need a graphics artist, computer programmer or media production personnel to create multimedia. Have a go at creating graphics, video or audio applications, a simple game or even an educational puzzle using software that is opensource and easy to learn. See section 6.0 below for further advice on this issue.

For the creation of high quality graphics, Flash simulations or interactive animations, however, a skilled multi media developer is indispensable.

5.2.1 The design pitfalls

While principles of multimedia design extend beyond the scope of this chapter, it does pay to be aware of the fundamental design pitfalls – whether you are reusing an application from the web or creating one from scratch:

- The use of multimedia, interactive elements and graphics needs to be considered as early as possible in case there is no appropriate web resource available and these elements need to be produced.
- Be aware that multimedia files are usually very big and will take longer to download. Narrow use of multimedia down to those elements that will clearly add benefit for your students.
- Multimedia will often require students to install software-try staying a version or two behind the most current as users are usually slow to upgrade.
- Let the student know what the learning outcome for the application is
- Indicate clearly the time requirement for the video, audio or interactive application.
- Ensure simple navigation and avoid automatic playing which can be distracting. Include start/stop/rewind functions.
- Ensure that the multimedia application is working and that the student has been informed of any additional software/hardware requirements
- Provide a help facility in case of technical questions.
- Be sure to consult the excellent accessibility guidelines for e-learning from JISC's Tech Dis at <http://www.techdis.ac.uk/> in order to make the application as accessible as possible for all users.

5.2.2 Accessibility considerations for multimedia

Very briefly, things to be concerned about are:

Graphics

- always provide a text alternative
- ensure colour contrast
- avoid visual effects that flicker (can cause seizures!).

Audio/video

- provide transcripts
- provide captions and video descriptions.

Animations/simulations

Provide an alternative accessible format to Flash applications (for those giving it a go see <http://www.adobe.com/accessibility/products/flash/tutorial/> for guidelines).

Proprietary software

Be sure to be aware of accessibility functions/limitations of any software packages you may use to develop multimedia.

5.3 Multimedia created by the student

Instead of asking your students to write a report the next time, might there be scope for them to use their mobile phones to videotape each other's oral presentation and upload to a video sharing site? Language students could be assigned to audiotape a staged conversation or interview to demonstrate pronunciation skills. You or your students can create simple interactive exercises and games with Hot Potatoes software available for free at <http://hotpot.uvic.ca/> to reinforce the week's lesson. Assign students to create a digitised photo gallery of native plants under study in a collaborative (social) working space.

Students equipped with handhelds (PDAs) can go out into the field and record and collect data, which is uploaded to the VLE or wiki for further analysis and study. Interviews with classmates can be recorded and saved as MP3 files to iTunes. A collection of digital photos could be captured over time and presented in a blog to document the progress of a project or an exploratory field trip. Have students host weekly podcasts in the foreign language under study – the possibilities are endless for the students to create their own learning experience!

6.0 Selection of multimedia development tools

6.1 Graphics and slideshows

Development: requires beginner technological/developer skills.

Use Adobe Photoshop at <http://tryit.adobe.com/uk/cs5/photoshop/> or Macromedia Fireworks (<http://www.adobe.com/products/fireworks/>) to create simple graphics. Other commonly used packages include Adobe Illustrator and Macromedia Freehand. Opensourceware includes Flickrcc at <http://flickrcc.bluemountains.net/> for a growing collection of photographs that can be incorporated, for example, into a slideshow presentation using Splashr at <http://splashr.com/>

Save digital photographs and works of art as JPEG files. Save flat colour graphics or line images as GIF files.

6.2 Video

Development: requires beginner multimedia developmental skills

Hardware/software requirements; mobile phone, basic camcorder, microphone and tripod; Microsoft[®] Producer (free at <http://www.microsoft.com/windows/windowsmedia/technologies/producer.msp>); commercial software Elluminate[®] at <http://www.illuminate.com/> (Edinburgh Napier has a licence) and video editing software such as:

- iMovie (<http://www.apple.com/ilife/imovie/>)
- Viddler at <http://www.viddler.com/>; Vimeo at <http://vimeo.com/>.
- Adobe Premiere (<http://www.adobe.com/products/premiere/index.html>)

6.3 Audio

Development: requires beginner multimedia developmental skills

Hardware/software requirements: microphone and speakers or headset.

Freely available audio recording software to record, save and play standard MP3 audio files:

- ODEO at <http://www.odeo.com>
- Audacity at <http://audacity.sourceforge.net> (also available to staff at Edinburgh Napier on the server. See guidelines at)
- Apple iTunes (<http://www.apple.com/itunes/>) to play and organise podcasts, audio files.

6.3.1 Narrated screencasts

A screencast is a recording of activity on your computer screen and is often created for more illustrative guidance or training. Examples of narrated screencasts at Edinburgh Napier include the WebCT staff help resources at <http://www2.napier.ac.uk/webct/staff/resources1.html>. Screencasts can be created using commercial software such as Camtasia (free trial available at <http://www.techsmith.com/camtasia.asp>) and PowerPoint® (<http://office.microsoft.com/en-us/powerpoint-help/>), but many easy to use opensourceware tools are available as well (Jing at <http://www.jingproject.com/> and Screenr at <http://screenr.com/>) including helpful instructions and guidance.

6.3.2 Extras

Software to convert text to audio:

- TextAloud at <http://www.nextup.com/> (free trial)

Software to create podcasts of blogs:

- Talkr at <http://new.talkr.com/>

Software to capture podcasts to create custom online audio

- Juice at <http://juicereceiver.sourceforge.net/>

Note: Audio clips are saved in one of the following formats.

- AU: larger file than MP3 and RA, compatible with most web browsers
- MP3 (MPEG Audio): like RA a smaller file and common format (best for uploading into WebCT)
- WAV: format for Windows®, large file
- Real Audio (RA or RM): compressed file, requires the Real Player plugin.

6.4 Animations, interactive courseware, tutorials, simulations

Development: requires intermediate/advanced technology developer skills

Usually developed in applications such as:

- Macromedia Flash (<http://www.macromedia.com/software/flash/>). See also Macromedia Director and Authorware as alternative development environments. Free 30 day trial Macromedia Flashdownload at https://www.adobe.com/cfusion/tdrc/index.cfm?product=flash&promo_id=FDTFP.
- Java (<http://java.sun.com/>) for mathematical and scientific animations
- Mathsonline Puzzlemaker makes creating simple games and puzzles easy <http://www.univie.ac.at/future.media/moe/testpuzzle/testpuzzle.html>
- Hot Potatoes at <http://hotpot.uvic.ca/> for creating a wide range interactive exercises (free of charge for educational purposes).
- The commercial software Sitepal (<http://www.sitepal.com/>) allows the creation of speaking avatars using your voice and photographic or cartoon facial features. Free 15-day trial available.

7.0 Further reading

Aldrich, C. (2009) *Learning online with games, simulations, and virtual worlds: strategies for online instruction*. San Francisco, California: Jossey-Bass.

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Accessibility issues resources

TechDis Creation of Learning Materials at http://www.techdis.ac.uk/index.php?p=9_7

WebAim Creating accessible images at <http://www.webaim.org/techniques/images/>

Further multimedia resources (in addition to resources listed in Unit 7 and Unit 10)

Video web resources

Search for educational video clips at the pbs teachers' resource site, <http://www.pbs.org/wgbh/nova/teachers/video.html>

TedTalks for recorded speeches by famous figures in science, media and politics. <http://www.ted.com/>

BUND British Universities Newsreel Database at <http://bufvc.ac.uk/newsonscreen>

The University of Washington offers a library of educational videos in nearly every subject area at <http://www.uwv.org/>

Images collections

Pics4Learning for free images at <http://www.pics4learning.com/>

Flickrcc Creative Commons photo collection at <http://flickrcc.bluemountains.net/>

Audio multimedia web resource collections

Find recordings of politically significant speeches at History out loud at <http://www.hpol.org/>

For freely available podcasts for your teaching visit PodcastCom at <http://podcast.com> or Podcast Alley at <http://www.podcastalley.com/>

EPN: The Education Podcast Network at http://epnweb.org/index.php?view_mode=about

The Digital media archive offers video, movies, radio shows, concerts, podcasts
<http://www.archive.org/index.php>

Miscellaneous

BBC multimedia learning gallery:
<http://www.bbc.co.uk/learning/>

University of South Carolina's multimedia stratigraphy web page at
<http://sepmsstrata.org/index.html>

See the whole world virtually at <http://www.virtualtourist.com>

See the whole world with Google Earth available at <http://earth.google.com/>