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# Games technologies for learning

More than just toys



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**More than just toys**

Rebecca Douch, Jill Attewell  
and Di Dawson

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# Executive summary

## Introduction

It is possible to play computer games on many technology platforms including PCs, Sony PlayStation and Xbox games consoles and mobile phones. The focus of this publication is the use of games technologies for teaching and learning and in particular handheld games technologies including the Nintendo DS/DS Lite/DSi, and the Sony PSP (PlayStation Portable). Educational use of the Nintendo Wii games console is also addressed. The case studies and snapshots in this publication provide an insight into the innovative ways in which these gaming platforms have been used by the MoLeNET projects and the significant impact this has had on the learners, staff and institutions.

The Mobile Learning Network (MoLeNET, [www.molenet.org.uk](http://www.molenet.org.uk)) is a unique collaborative approach to encouraging, supporting, expanding and promoting mobile learning, primarily in the English further education (FE) sector (but also including some schools), via supported, shared-cost mobile learning projects. Collaboration at national level involves participating institutions and the Learning and Skills Council (LSC, [www.lsc.gov.uk](http://www.lsc.gov.uk)) sharing the cost of projects introducing or expanding mobile learning. LSC contributes capital funding and LSN ([www.lsnlearning.org.uk](http://www.lsnlearning.org.uk)) provides the support and evaluation programme. The LSC and participating institutions have invested over £16 million to date in three phases of MoLeNET – 2007/08, 2008/09 and 2009/10. The MoLeNET support and evaluation programme includes technical and pedagogic advice and support, materials development, continuing professional development (CPD), mentoring, facilitation of peer-to-peer support, networking and resource-sharing, research and evaluation.

The MoLeNET programme uses a broad definition of mobile learning, i.e.:  
**‘The exploitation of ubiquitous handheld technologies, together with wireless and mobile phone networks, to facilitate, support, enhance and extend the reach of teaching and learning.’**

Mobile learning can take place in any location, at any time, including traditional learning environments such as classrooms – but also workplaces, at home, community locations and in transit.

Mobile technologies can include mobile phones, Smartphones, PDAs, MP3/ MP4 players (e.g. iPods), handheld games devices (e.g. Sony PSP, Nintendo DS), Ultra Mobile PCs (UMPCs), mini notebooks or netbooks, handheld GPS, voting devices and specialist handheld technologies used in science labs, engineering workshops or for environmental or agricultural study. Mobile learning involves connectivity for downloading, uploading and/or online working via wireless networks, mobile phone networks or both, and linking to institutional systems, e.g. virtual learning environments (VLEs) and management information systems (MIS).

In the first phase of MoLeNET just over 300 handheld games devices were purchased by the 32 projects involved, representing 3% of all of the handheld devices procured. In phase two, however, games devices were 22% of the handheld devices purchased. This trend may have been influenced by guidance from LSN that phase two project proposals focusing solely or mostly on the use of 7” to 9” screen UMPCs/mini notebooks/netbooks were less likely to be successful than those wishing to take a more innovative approach when exploring the use of handheld technologies to support learning. However, it is also likely that some purchases of games technologies were influenced by the positive experiences of phase one projects.

## Overview

This publication explores the ways in which computer games/digital games/digital learning games and the extra functionality and affordances of handheld games technologies can be used to enhance and support teaching and learning.

The research literature sources discussed suggest that digital games (defined as any game that can be played via a digital device, but particularly more complex games) can be a great asset in supporting teaching and learning for the following reasons:

- Digital games require, and therefore support, the development of a range of skills such as decision-making, reflection, teamwork, communication, learning of rules, mental manipulation of images and problem-solving.
- The way digital games are designed is consistent with the design of many teaching and learning processes, such as learning being tailored to the individual; learning being scaffolded by the game itself or by other players; learning through active involvement; assessing learning and obtaining feedback.
- Digital games have a motivational impact, particularly where the goals are meaningful to the learner; feedback supports attainment of these goals; and the design of the game is aimed at, and adapts to, the player’s skill level.
- Digital learning games can support the development of specific subject knowledge and skills.

Examples from a range of disciplines, including education, health and the military, demonstrate the powerful influence that digital games can have on learning and subsequent behaviour. Nevertheless, it can be difficult to embed complex digital games into the curriculum as this requires additional funds, training and time, and currently such games are generally not designed to provide curriculum coverage, nor to fit in with lesson timetabling (although there are several examples of complex digital games being used as stimuli for cross-curricular projects).

Digital learning games (defined as games played via a digital device that have the dual aims of entertaining and educating) are a more acceptable alternative for use as teaching and learning tools, and with puzzle, problem-solving, language, numeracy and literacy games now designed to be much more engaging and available on handheld devices, they can become very effective and flexible teaching and learning tools.

Additional functionality and affordances of handheld games technologies include image, video and audio recording; global positioning (GPS) technology; text, chat and pictorial messaging; and internet access.

The Sony PSP and Nintendo DS, and also the Nintendo Wii have the added advantage of being familiar to many younger learners. They are, perhaps, also intrinsically motivating for young people because of their links to the gaming world and the perceived social status they may convey.

Interviews and focus groups with MoLeNET learners are reported and these reveal learners' thinking about possible learning opportunities of digital games and compare these with their own recreational games and digital learning games available on the Nintendo DS. They identify skills learnt from playing their recreational games and in general their views support the literature. Learners agree that digital learning games on the DS support their learning, help to motivate them and focus them on their learning, however they are not yet comparable to recreational games. So it seems there is some way to go in improving digital learning games but there has been good progress in recent years. Digital learning games available on the Nintendo DS are generally seen as an enjoyable and useful way to learn, alongside other tools and techniques.

The largest section of this publication includes 35 case studies and teaching and learning snapshots provided by MoLeNET projects from phase one (2007/08) and phase two (2008/09). These offer useful examples of how games technologies have been used successfully for teaching and learning via both games and their additional functionality. Examples range across a variety of subjects and learners, and many learning contexts including the classroom, workplace, home, workshop, and salon.

## Key messages from the case studies

The MoLeNET case studies provide a number of key messages relating to the benefits of games technologies for teaching and learning as well as advice for those who wish to use these technologies in their own organisations. Games technologies appear to be particularly valuable for supporting and motivating disengaged learners; learners with learning difficulties and/or disabilities; and learners with numeracy or literacy development needs. They provide an enjoyable and engaging experience that can help to create an environment which is conducive to learning, with fewer behaviour management issues and improved group dynamics. The technologies themselves are generally easy to use and provide flexible and varied opportunities for accessing, delivering, recording and assessing teaching and learning. Key messages are summarised below.

## The benefits of using handheld games technologies for teaching and learning

### Assessment

Handheld games technologies can:

- Provide teachers and learners with a non-threatening assessment tool
- Enable learners to collect evidence of their skills/progress
- Encourage self and peer assessment
- Improve feedback mechanisms, and immediacy of feedback



### **Flexibility**

Handheld games technologies can:

- Encourage learning at different times
- Support learners in various locations
- Give access to college resources for those learning outside the college
- Be used as a stimulus for further learning or cross-curricular work

### **Learner performance and skills development**

Handheld games technologies can:

- Improve achievement
- Improve attendance
- Help learners develop transferable skills
- Help learners develop skills more quickly
- Enable learners to reflect on and learn from their own and other students' work by watching recordings of themselves and each other
- Enable capture of photo, audio and video resources to use to stimulate further learning



### **Motivation and engagement**

Handheld games technologies can:

- Motivate learners to progress and achieve
- Engage young people with learning
- Improve and maintain learner focus and attention
- Improve learner behaviour
- Make learning fun
- Foster enthusiasm for learning in both learners and teachers
- Give learners ownership of their learning
- Provide multisensory, interactive learning opportunities

### **Social and emotional well-being**

Handheld games technologies can:

- Increase learner confidence and self-esteem
- Encourage collaboration and communication
- Give learners a sense of pride in their work
- Encourage autonomy
- Improve peer group dynamics

### **Supporting learners' individual needs**

Handheld games technologies can:

- Support learners with low levels of literacy and/or numeracy
- Help teachers to support learners at different levels
- Help to overcome language barriers
- Support learners with learning difficulties and/or disabilities (LLDD)
- Help teachers to support many learners at one time
- Enable provision of recorded tutorials to support learners in the completion of a task
- Enable teachers to more easily support learners with different learning preferences and paces
- Enable provision of recorded materials for learning and revision purposes
- Enable teachers to provide additional resources for learners



## Advice for using games technologies for teaching and learning

The following advice is taken from the MoLeNET case studies provided by practitioners and based on their experiences.

### Setting up and training

- Be aware of any prior knowledge or extra teaching required to make the most of the game.
- Initial set-up of the devices may be time-consuming but once this is achieved, training should be minimal in comparison to other handheld technologies.
- Ensure that learners understand the aim of using the device and that ground rules are set out.
- Ensure you have considered memory, charging and storage implications.
- Where assessors are involved, ensure adequate training.

### Planning

- Bear in mind the extra time and support that may be required to repurpose learning resources for handheld devices.
- Make the best possible use of shared resources.
- Listen to your learners as they may have ideas as to how a device can be used.
- Try to develop structured plans for embedding digital gaming in schemes of work to realise the potential of this teaching and learning strategy.
- Make the most of competitive gaming opportunities to promote engagement.
- Although the primary function of the handheld games device may be to provide a gaming platform, do not ignore their many extra functions.
- Check games to make sure they are appropriate to a learner's level or learning difficulty or disability.
- Learners enjoy seeing their tutor getting involved in the game play.

---

# 1 Introduction

## This publication

The focus of this publication is on the use of games technologies for teaching and learning; specifically, handheld games devices, such as the Nintendo DS/DS Lite/DSi, the Sony PSP (PlayStation Portable) and also the Nintendo Wii. Clearly it is also possible to play games on other technology platforms such as PCs, Sony PlayStation and Xbox games consoles, and mobile phones.

The case studies and snapshots in section 6, provide an insight into the innovative ways in which these gaming platforms have been used by the MoLeNET projects and the significant impact this has had on the learners, staff and institutions. Key messages from the case studies are included on pages 3–5.

## MoLeNET

The information in this publication reflects the findings and experiences of MoLeNET phases one and two projects.

The Mobile Learning Network (MoLeNET, [www.molenet.org.uk](http://www.molenet.org.uk)) is a unique collaborative approach to encouraging, supporting, expanding and promoting mobile learning, primarily in the English further education (FE) sector, via supported, shared-cost mobile learning projects. Collaboration at national level involves participating institutions and the Learning and Skills Council (LSC, [www.lsc.gov.uk](http://www.lsc.gov.uk)) sharing the cost of projects introducing or expanding mobile learning and LSN ([www.lsnlearning.org.uk](http://www.lsnlearning.org.uk)) providing a support and evaluation programme. The LSC and participating institutions have invested over £16 million to date in three phases of MoLeNET – 2007/08, 2008/09 and 2009/10. The MoLeNET support and evaluation programme includes technical and pedagogic advice and support, materials development, continuing professional development (CPD), mentoring, facilitation of peer-to-peer support, networking and resource-sharing, research and evaluation.

## Mobile learning

The MoLeNET programme uses a broad definition of mobile learning, i.e.: **‘The exploitation of ubiquitous handheld technologies, together with wireless and mobile phone networks, to facilitate, support, enhance and extend the reach of teaching and learning.’**

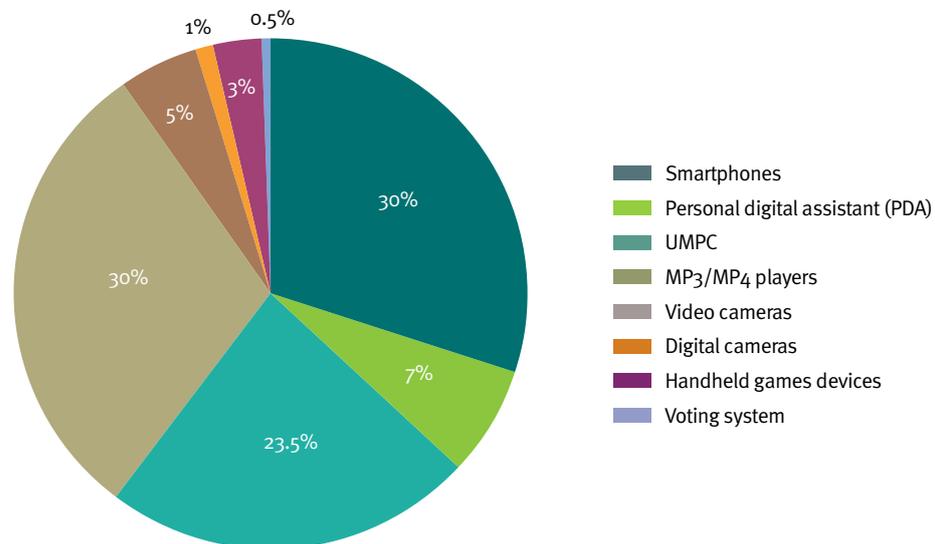
Mobile learning can take place in any location, at any time, including traditional learning environments such as classrooms – but also workplaces, at home, community locations and in transit.

Mobile technologies can include mobile phones, smartphones, PDAs, MP3/MP4 players (e.g. iPods), handheld games devices (e.g. Sony PSP, Nintendo DS), Ultra Mobile PCs (UMPCs), mini notebooks or netbooks, handheld GPS, voting devices and specialist handheld technologies used in science labs, engineering workshops or for environmental or agricultural study. Mobile learning involves connectivity for downloading, uploading and/or online working via wireless networks, mobile phone networks or both, and linking to institutional systems, e.g. virtual learning environments (VLEs) and management information systems (MIS).

## The technologies

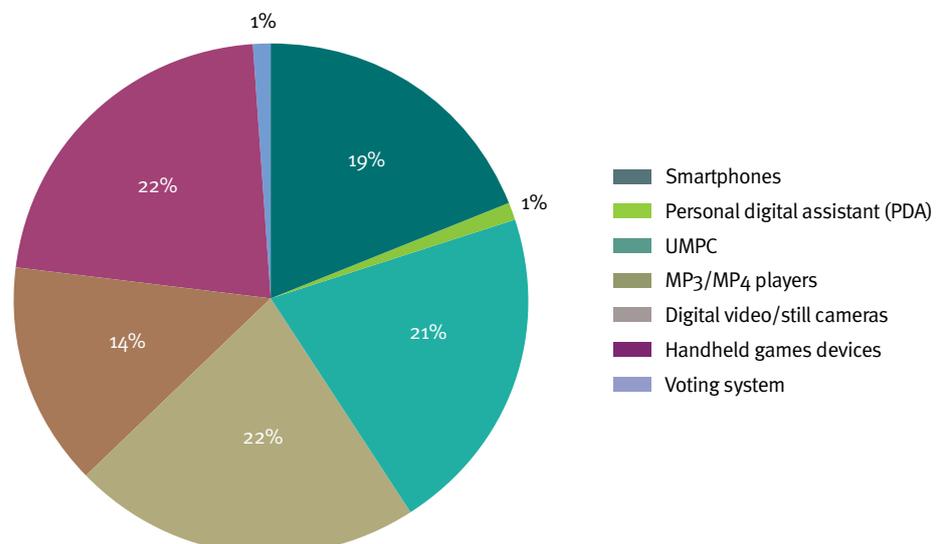
In the first phase of MoLeNET just over 300 handheld games devices were purchased by the 32 projects involved, representing 3% of all the handheld devices procured. See figure 1.

**Figure 1 MoLeNET Phase one purchases of handheld technologies**



In phase two, however, the percentage of handheld games devices purchased rose to 22% representing over 2000 devices. see figure 2.

**Figure 2 MoLeNET Phase two purchases of handheld technologies**



This trend may have been influenced by guidance from LSN that phase two project proposals focusing solely or mostly on the use of 7" to 9" screen UMPCs/mini notebooks/netbooks were less likely to be successful than those wishing to take a more innovative approach when exploring the use of handheld technologies to support learning. However, it is also likely that some purchases of games technologies were influenced by the positive experiences of phase one projects.

### **The Nintendo DS**

The Nintendo DS ([www.nintendo.co.uk](http://www.nintendo.co.uk)) family of handheld games machines (including the original DS, the DS Lite and the DSi) are unusual because they have two screens (DS is an abbreviation of dual screen). These are touch screens and the pre-installed 'PictoChat' software enables users to communicate with each other by text or pictorially. Many games are available for the DS, including educational, strategy, puzzle, action, simulation, adventure, sport and music games. Multiplayer modes are available in many of the games, using the built-in wireless connection, enabling players to play together and even talk to each other. The microphone also enables users to interact with their games.



Extra accessories such as a web-browsing application and the Nintendo MP3 player, which slots into the DS, make this a very versatile tool. The DSi has an integrated camera enabling users to take, view and edit photographs. A sound system enables both recording and playing of sounds, music and podcasts. It also has an activity meter, which measures movement patterns and a Wi-Fi USB hub, which enables online game play.

### **The MoLeNET experience of the Nintendo DS**

MoLeNET projects have used Nintendo's 'Dr Kawashima's Brain Training' and other educational games. They have reported improvements in learners' achievement, engagement and behaviour. 'PictoChat' communication has been used to encourage teamwork and enable teachers to check learners' progress.

### The Sony PSP

The most important feature of the PSP (PlayStation Portable, [www.uk.playstation.com](http://www.uk.playstation.com)) is the relatively large, very high-quality screen, which is excellent for viewing photographs and videos. The addition of the Sony Go!Cam means users can record video and stills and replay them instantly. Users of the Sony PSP can access a wide variety of games from many genres including multiplayer games. The PSP supports internet browsing and email. Other possible functions from add-ons or newer editions of the device include GPS, Skype, Go!VIEW for easy downloading of videos onto the PSP, and Media Go for downloading content and media to the PSP from a PC.



### The MoLeNET experience of the Sony PSP

MoLeNET projects have used PSP games to provide a break, reward or motivation to encourage improved engagement and classroom behaviour. However, the most common use of the PSP has been to record the activities and outputs of learners, especially those in the workplace, providing evidence of achievement and materials for subsequent reflection. They have also been used to record demonstrations and lessons for learners to access at an alternative, convenient time and place, and to play back as tutorials.

### The Nintendo Wii



The primary unique feature of the Nintendo Wii ([www.nintendo.co.uk](http://www.nintendo.co.uk)) is that the player controls game play through whole body movements, rather than by just pressing buttons or touching the screen. Many different games are available for the Wii: the controller can be inserted into a variety of gaming objects resembling, for example, golf clubs, racquets and guitars, to give players a relatively realistic experience of a wide range of activities. The Wii can connect wirelessly to the internet, and has a range of channels embedded into the system, enabling users to access news and weather reports, view photos and videos, leave messages and play Nintendo 'GameCube' games. The Wii Speak accessory also allows voice interaction with the Wii.

### The MoLeNET experience of the Nintendo Wii

Although the Nintendo Wii is not strictly a handheld technology it has been used by several MoLeNET projects and has proven to be a particularly valuable learning tool for learners with learning difficulties or disabilities. The movement involved in playing the Wii games makes physiotherapy fun and engaging, and provides an enjoyable opportunity for learners to work collaboratively.

## 2 Using handheld games technologies to support teaching and learning

### Nintendo DS games

#### Nintendo DS and DSi

There are over 1500 games available for the Nintendo DS devices and many of them can be used to engage, motivate and teach learners new skills. ‘Dr Kawashima’s Brain Training’ is by far the most popular but other games can be used to develop different skills.

The Nintendo DSi now offers players many activities, including the opportunity to play games. DSi games can be purchased or downloaded, and games on other people’s devices can be shared. Conventional DS games can be used too, although the slot to accommodate old GameBoy games has been removed from the DSi. A newly purchased DSi comes with 1000 DSi points so that games can be downloaded from the online DSiWare shop.

The DSi XL will be launched in 2010 with larger 4.2 inch dual screens and pre-loaded items such as ‘Dr Kawashima’s: Little Bit of Brain Training: Arts Edition’, ‘Dictionary 6 in 1 with Camera Function’, ‘Flip Studio’ and the Nintendo Browser.

**Table 1** Examples of Nintendo games and how they can work as teaching and learning tools

Game title	Brief description	Teaching and learning opportunities
‘Mixed Messages’	A multiplayer activity similar to ‘Chinese Whispers’. The first player writes down a short statement or sentence then passes the DSi to another player. The second player tries to draw a picture based on the statement or sentence. Player three then receives the device and writes down a statement or sentence describing the drawing.	This game could be used as a warm-up activity at the start of a session or specifically to focus on keywords that players must include in the sentence.
‘Flipnote Studio’ (‘Moving Memo’)	A fun and creative game asking players to create animations building on the sequence of a movement. Player 1 creates an object, player 2 creates the next move and they continue until an animated sequence has been created.	Any basic action or sequence of events could be explained or explored using this animation tool. Although this can also be done with computer-based software such as Flash this game provides a very simple interface, which is easy to understand and quick to use.

Game title	Brief description	Teaching and learning opportunities
'Personal Trainer: Walking'	One of many in the 'Personal Trainer' series, this game records steps the player takes. It comes with an Activity Meter™ and translates the data collected into an interactive graph. This game can import and integrate Mii characters created on the Wii device. You can even create a Mii character for your dog!	This can be used to encourage young (or older) learners to take exercise or to take note of their personal activity to keep healthy. This game could be used in conjunction with 'Personal Trainer: Cooking'.
'Personal Trainer: Cooking'	This game offers over 240 recipes including ones from worldwide cuisine. It's an interactive cookbook so you can see demonstrations of different techniques and it takes you step by step through each recipe. This can help learners read and understand instructions and see where food comes from. There is also advice about healthy eating.	This can be used to encourage learners to take an interest in developing basic cooking skills and gain an awareness of where food comes from. The range of worldwide recipes could be used in classes for English for speakers of other languages (ESOL) learners to generate interest in others' culinary backgrounds.
'My Healthy Cooking Coach'	There are many cookery-related games for the DS devices but 'My Healthy Cooking Coach' offers a basic approach to cooking for adults and young people and includes a virtual recipe finder and a shopping list that can help learners create a basic list of ingredients. Learners can take the device and the ingredient list when they go shopping.	This game is ideal for young learners or learners with learning difficulties who are learning basic cooking and independent living skills as the ingredients list can help them when they visit supermarkets.
'Scrabble 2009'	Nintendo offers various word games including 'Scrabble', which is a popular example for two players.	This game could be used as a short warm-up before a literacy or English class.
'Imagine: Makeup Artist'	Two players can simultaneously play this game, which allows the players to be makeup artists. You train in different makeup techniques, experiment with various looks and, as you work with the 'client', you build your 'reputation as a professional makeup artist'.	This game is ideal for level 1 hairdressing and beauty learners or those studying for Diplomas, but it could also motivate learners with learning difficulties because it is a fun activity developing not only personal skills but also communication skills in pairs.

Game title	Brief description	Teaching and learning opportunities
'Nintendogs' and 'Petz'	<p>The 'Petz' series and 'Nintendogs' are games offering the player the chance to become an animal owner who can play with, train, pet, walk, brush, and wash their virtual dog.</p> <p>As both DS and DSi have microphones this game allows you to create voice commands that the dog will respond to. The dogs can be 'walked' and play at the park or attend a dog agility centre.</p> <p>The actions require basic numeracy – being able to count the number of strokes to give to the dog or count the number of drops of liquid. The on-screen instructions require a level of literacy to ensure the actions are carried out correctly.</p>	<p>This game could help develop literacy, numeracy and verbal skills. The player also takes on the responsibility of 'caring' for the animal in a similar way to the Tamagotchi handheld digital pets that became popular in the 1990s.</p>
'Rhythm Paradise'	<p>This is a fun game about rhythm, listening for the on and off beat in the music provided. You can play with your finger or the stylus and tap, flick or slide the screen to match the rhythm.</p>	<p>This game is ideal for learners who need to develop and improve their speech or for basic numeracy listening and counting to the number of the beats. Hand-eye co-ordination and fine motor skills are essential.</p>

## Sony PSP UMD (Universal Media Disc) games and creating games for the PSP\*

**Table 2** Examples of PSP games which can be used for teaching and learning

Game title	Brief description
'Talkman'	<p>This is a game that acts as an interactive translator and language tutor. Max, the animated blue bird, helps you communicate, with the use of the microphone, as a basic translator between English, French, Spanish, German, Italian, and Japanese. The game includes over 3000 phrases in various contexts such as restaurants, the beach, etc. The game also includes a currency converter and a world clock.</p>
'Mercury'	<p>This game asks the player to guide a mercury blob around mazes, platforms and tubes avoiding obstacles and carrying out logic solutions to questions.</p>
'Practical Intelligence Quotient'	<p>This is a quiz type game where a player has to deal with logic puzzles to work out the quickest way to move through the level and out of the exit. They have to move blocks around, avoid lasers, throw colour-coded switches to open doors, navigate mazes, construct steps out of 3-D jigsaw pieces or memorise a route as if blindfolded.</p>
'Mind Quiz' and 'Buzz! Brain Bender'	<p>The 'MyBuzz' website (<a href="http://www.mybuzzquiz.com/en_GB/actions/Home.do">www.mybuzzquiz.com/en_GB/actions/Home.do</a>) offers free games and the opportunity to create your own.</p>

\* Not Sony PSPGo as this does not include UMD capability

### **Creating games for a Sony PSP**

The 'AdventureMaker' (<http://www.adventuremaker.com/games.htm>) website allows a player to create point-and-click games for Sony PSPs, iPhones and iPod touch devices.

## **Extra functions of games technologies**

### **Nintendo DS and DSi**

#### **Camera mode**

The Nintendo DSi has a great deal to offer as well as the game play. The learner can be very creative with the 11 lenses (normal, distortion, graffiti, colour, colourpad, mirror, mischief, emoter, merge, resemblance and frame). The DSi cameras have integrated facial recognition, so in some modes the photo cannot be captured unless there is a human face in the picture. 'Resemblance' looks at two faces and identifies the relationship between them. 'Colourpad' takes a black and white image and then, when part of the image is tapped on the lower display, everything with that colour appears in that colour while the rest of the image remains black and white. For example, if you tap the blue sky then everything that is blue turns that colour while everything else remains black and white.

Learners can use the cameras creatively or can capture evidence of their progress and using the 'Graffiti' mode annotate the picture immediately.

#### **Internet mode**

The wireless capability on the DSi can be used to connect to the internet. The device fully supports WPA and WPA2 encrypted networks and the less secure WEP method of Wi-Fi networks. To access the internet through the Nintendo DSi, you must first download the Nintendo DSi browser from the Nintendo DSi Shop. Learners can access most internet sites using the DSi browser, but they can't play Flash video.



#### **Sound recording/playing**

The inbuilt microphone on the DS and DSi allows the player to speak directly into any game that requires speech activation or commands. The DSi also has a recording and editing mode that allows any recording to be altered. For example, a short recording can be slowed down or speeded up or adjusted to sound like a budgie or a trumpet. Learners could use this tool creatively, or capture voice reflections on what they have experienced or achieved. They could also record and practise verbal presentations.

### **Additional sources of information**

Ban Ryan has been a primary school teacher and a principal. She is passionate about the role technology can play in teaching and learning. She now works with children with special educational needs and as a tutor/facilitator to teachers interested in integrating information and communications technology (ICT) into their practice. Ban suggests several possible teaching and learning opportunities using the 'PictoChat' function on the Nintendo DS including brainstorming, developing strategies to improve one's score, writing a short piece of dialogue between two characters, predicting the end of a sentence, and spotting an error. See [www.cesi.ie/digiteach-dsandwii](http://www.cesi.ie/digiteach-dsandwii) for the article in full.

Mark Warner is a primary school teacher who has a website ([www.ideastoinspire.co.uk/nintendodsdsi.htm](http://www.ideastoinspire.co.uk/nintendodsdsi.htm)) inspired by the work of another teacher in Nottinghamshire Tom Barrett. This includes many useful ideas for incorporating the Nintendo DS's functionality into teaching and learning.

### **Sony PSP**

#### **E-books**

E-books are easy to read on a Sony PSP because of the large screen size (480 x 272). Users can download free Manga comics for the Sony PSP. The 'Gomanga' website ([www.gomanga.com](http://www.gomanga.com)) offers free 'Seven Seas Manga' content, which is downloaded as a series of jpg images. Each 'page' can be viewed using the zoom and scroll functions on the device and the right R1 button navigates the reader through the comic.



#### **GPS**

Some games have been created using the GPS functionality, including 'Metal Gear Solid Portable Ops' and a golf game based on a Japanese golf course. Just as the PSP camera has the 'Go!Edit' software the GPS receiver has 'Go!Explore' software to convert the games device into a satellite navigation device including car and pedestrian positional data and maps covering UK and Ireland. With internet connection players can take part in geocaching activities using positional data to move around a trail. The Sony PSP 3000 is particularly helpful for outdoor activities as it has an anti-reflective screen.

#### **Flash Cards**

Revision activities can be easily produced using Powerpoint presentation slides. A slide contains the question, the next contains an answer or a prompt and each slide could be colour co-ordinated for navigation. The entire set of questions and answer slides are saved as jpg images and transferred to the Sony PSP. The right R1 button navigates from question to answer.

## 3 Background and context

This short summary gives some background information that provides a context for the MoLeNET case studies that follow.

### Digital game-based learning

The idea that play can support and encourage learning through experimentation and exploration of ideas in a meaningful context is not new (Piaget 1973; Vygotsky 1978). Some writers believe that digital game-based learning (DGBL) can be effective in teaching and learning. Recently, more educational institutions have started to investigate how DGBL can support their learners. Van Eck (2006) explains that because of extensive research into the effectiveness of DGBL, learner disengagement with traditional instruction and the increased popularity of digital games, the message that games are an effective tool for learning is being heard. However, he argues, the focus should now be on:

- why DGBL is an effective teaching and learning strategy
- ‘practical guidance for how (when, with whom and under what conditions) games can be integrated into the learning process to maximise their learning potential’

This publication addresses these two areas with reference to handheld games technologies and to the Nintendo Wii, which requires users to be much more mobile than other computer games devices. Much of the literature refers particularly to younger learners but MoLeNET projects have also reported a positive response from many mature learners.

### What does the term ‘digital game’ mean?

The word ‘game’ is defined by the Compact Oxford Dictionary ([www.askoxford.com](http://www.askoxford.com)) as follows:

1. *An activity engaged in for amusement*
2. *A form of activity or sport played according to rules*
3. *A complete episode or period of play, ending in a final result*
4. *A single portion of play, forming a scoring unit within a game*

Prensky (2001) has further proposed that computer games have six key elements:

1. *Rules*
2. *Goals and Objectives*
3. *Outcomes and Feedback*
4. *Conflict, Competition, Challenge and Opposition*
5. *Interaction*
6. *Representation or Story*

A digital game may be played on a desktop computer, a laptop, a games console or a handheld device such as a mobile phone or PDA. There are many types of digital games available across a range of platforms, and these are categorised by the Herz system (Herz 1997, cited in Kirriemuir and McFarlane 2004) as follows: action, adventure, fighting, puzzle, role-playing, simulation, sports and strategy. Prensky (2006) contends that there are really two main types of digital games: the ‘mini’ game and the ‘complex’ game.

Complex games generally take longer to master, call on a wider skills set, require numerous strategies, often require the player to assume alternate identities, frequently present players with difficult decisions and dilemmas, and tend to engage the player more intensely. Complex games therefore provide more effective and engaging opportunities for skills development.

In this section, the terms ‘digital game’ and ‘complex digital game’ refer to games not specifically designed for educational purposes, these fall into another category discussed later.

### What makes digital games effective for teaching and learning?

The answer to this question can be broken down into two parts based on the game’s design:

1. games map very well onto the basic components that support and encourage learning
2. games engage the player extremely effectively

Oblinger (2004) highlights eight learning principles, the application of which can clearly be seen in games. They are active learning, assessment, feedback, individualisation, motivation, scaffolding, social and transfer. Based on Oblinger’s (2004) work, a description of the principles and a summary of how they relate to game-playing follow below:

- **Active learning** (the learner actively discovers and constructs knowledge): Games require the player to interact in order to progress. Often the rules of a game are built into the game for mastery as the player proceeds, and the skills and knowledge base is developed through participation in the game’s tasks.
- **Assessment** (a learner can assess their progress and make comparisons with their peers): Gamers can assess their progress within a game and reflect on what skills they need to develop to achieve certain goals. They are able to compare their achievements with other players’ achievements and also with their own past achievements.
- **Feedback** (instant and relevant feedback is provided to support learning): Feedback provided by games is usually immediate, relevant and clear in terms of conveying the consequences of correct and incorrect choices, enabling players to learn from their successes and mistakes.
- **Individualisation** (learning meets the needs of the individual learner): Games are tailored to the individual through content and pre-set levels; in some complex games the game-play can adapt to the individual’s skills and knowledge by making tasks easier/more difficult or by providing/withdrawing support.
- **Motivation** (when the task is meaningful and rewarding, the learner becomes motivated): A player becomes involved in a game for large amounts of time with an aim to achieve goals that are both meaningful and achievable. (See next section on engagement for further discussion of this aspect of using digital games for teaching and learning.)

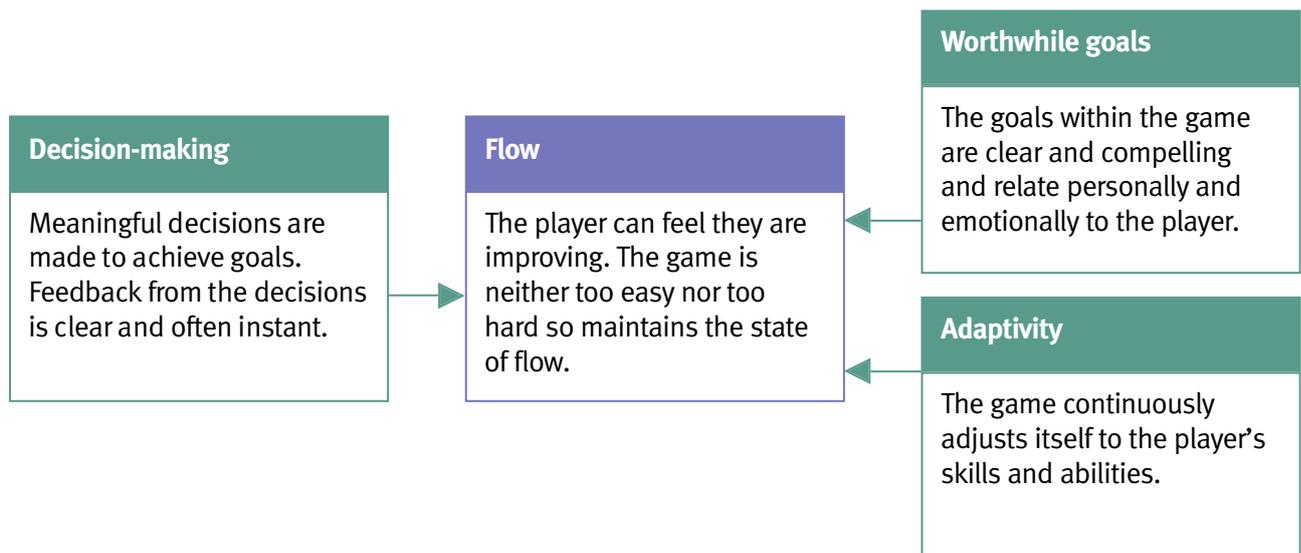
- **Scaffolding** (learning becomes gradually more challenging as the learner progresses, allowing for development): Games are usually designed to include a number of levels through which a player moves as their knowledge and skills improve. There are often characters present within games that are designed to support players, enabling them to learn more quickly. When working in collaboration, players will share knowledge and skills to support the development of their peers.
- **Social** (learning involves others): Games can be played in multiplayer mode, whether individuals are using the same device or involved online. Some online games rely on large communities of players who work together to achieve goals within the game.
- **Transfer** (skills and knowledge acquired are not restricted to a single context): Gamers use knowledge and skills learnt through playing a game in other games and in real world contexts: 'Learning through performance requires active discovery, analysis, interpretation, problem solving, memory and physical activity which results in the sort of extensive cognitive processing that deeply roots learning in a well-developed neural network' (Foreman 2003, cited in Oblinger 2004, p7).

### Engagement

'Today's students are no longer the people our education system was designed to teach.' (Prensky 2006, p30)

Prensky suggests that when seeking to engage children and teenagers in learning it is important to understand how they may differ from previous generations. Using descriptions such as 'digital natives' (Prensky), 'the Millennials', etc, many researchers and commentators have claimed that learners born into the world with digital technologies have different experiences, develop different skills and have different expectations of learning. Prensky (2001) claims that the approaches to and expectations of learning of today's young people are very different to those of previous generations. It is important to note, however, that the assumption that all children and young people are 'digital natives' who do not require any training in the use of digital technologies is a generalisation. According to findings from MoLeNET phase one (Attewell et al 2009) a number of projects found that students did not realise the full capabilities of the devices they owned and did require a significant amount of training to make the best use of them. Palfrey and Gasser (2008) claim that not all of the younger generation are digital natives, whether by choice or otherwise, and not all people who do have the characteristics of digital natives are young.

Beyond the powerful graphics, complex digital games in particular tap into the preferences and expectations of learners, which is why so many young people spend so much time voluntarily engaging with complex games on their own, with their friends and with other players around the world in so-called massively multiplayer virtual online worlds. Prensky (2006) explains that what really keeps players playing is the notion of 'flow' (Csikszentmihalyi, 1990); 'flow' being a state where there is a balance between the skills of the individual and the challenges of the situation so that the individual becomes highly involved and focused on the activity. He describes three main factors afforded by digital games that contribute to this state of flow – worthwhile goals, decision-making and adaptivity. See figure 3 for descriptions of these, based on Prensky (2006, p60-61).

**Figure 3** Flow factors in complex digital games

Additionally,

*... the recognition and respect that comes from successful game-play 'fuels' participation and invests the player in the experience because it transforms knowledge into social capital. Not only do players 'own' their learning (because they participated in the construction), but ownership is worth something in a social context where one's status derives from peer acknowledgement (an incentive that is often more powerful than grade point average or teacher approval).*

(Herz 2001, cited in Oblinger 2004, p8)

Section 5 'MoLeNET learner voice' highlights the importance of these motivational factors for the players.

### What can complex digital games teach?

Complex digital games provide a learning tool that people engage with voluntarily and through which they learn a range of cognitive skills. Prensky (2006) explains that because of the nature of complex games, players learn through experimentation and they learn to manipulate and control highly complex environments and systems. They have to devise strategies to overcome obstacles and pull together information from a variety of sources (sometimes beyond the game itself) to fully understand the challenges they encounter.

Prensky (2006) also suggests gamers learn to understand the correlation between cause and effect and weigh up the benefits of long-term success compared to short-term gains. They learn not only about the direct consequences of their actions but also about second order consequences. Additionally, players are not usually told the rules of the game in advance so they have to develop deduction skills to advance through the game. Gamers make comparisons between rules in games and the rules they understand of everyday life and expect game rules to be fair and comparative. When a player breaks the rules it is very clear to them and punishment is generally instant and severe. Players also learn about behavioural norms and values, and although these may not reflect real life they do differ from one game to another and so it might be argued that they teach the player something about cultural diversity. They can learn about management, morality and emotion, particularly from simulation games where, for example, a player may make a decision for the good of the business they are designing but at a cost to another individual involved.

Complex and often crucial decisions have to be made, usually under time pressures, meaning that players must be aware of the situation they are in at all times. Many games require the player to multitask and process several thoughts, decisions and actions simultaneously. Circumstances may change very quickly within a game and players need to learn to be able to respond quickly but accurately. Some games require collaboration and therefore communication skills between players who may not even be in the same country. Games exist in virtual worlds that the players become immersed in, but as they are not physical worlds, the players become skilled at understanding visual images, making mental maps and manipulating 2D images in their minds. Green and Bavelier (2003) add that playing action, video and computer games positively affects players' 'visual selective attention', i.e. how they identify and concentrate on the most important things in busy situations and filter out the rest. Simulation games are also useful in supporting the development of some career-specific knowledge and understanding, as they are able to simulate real life contexts. Such games include 'RollerCoaster Tycoon' (Atari) and 'Baseball Mogul 2003' (Softtek International), which require a range of business and organisational skills and decision making processes, and even flight simulator games such as 'Flight Simulator X' (Microsoft).

Game-playing not only helps players to learn, it also provides opportunities for reflection on strategies for learning (Facer et al 2004). Essentially players have the opportunity to learn how to learn; a transferable skill that educational establishments recognise as important.

### Issues in, and barriers to, using and embedding complex digital games

Despite evidence suggesting that complex digital games can be effective teaching and learning tools, their use in education is still relatively uncommon. Findings from the Becta (2002, cited in Kirriemuir and McFarlane 2003) schools survey suggested that where digital games were being used in the schools, it was usually as part of an experimental research project rather than a structured pilot or something more. Clearly there are issues and barriers, some of which are identified below.

**Skills development and engagement vs. curriculum coverage:** There are currently very few complex games that map directly to the curriculum (Prensky 2006). Teachers have restrictive timetables and it is difficult for them to reap the rewards of complex games by incorporating them into their schemes of work, without missing out a number of learning objectives.

**Structure and timetabling:** Many complex games take many hours to complete, which may not sit well with timetabling (Clark 2003). Veen (2006, cited in De Freitas 2006) proposes that future lesson structure and timetabling will need to be very different from how it is now if it is to enable complex game-based learning.

**Inappropriate content:** There are concerns over the inappropriate content of some games (Becta 2002, cited in Kirriemuir and McFarlane, 2003).

**Gender:** Some games may appeal more to one gender than the other (Clark 2003).

**Level:** Games may not be pitched at the correct level for all learners (Becta 2006). On the other hand, the fact that players progress through levels and that many complex games are being designed with more and more capabilities in terms of adaptivity, may help to overcome this barrier.

**Training:** Becta's 2002 schools survey (cited in Kirriemuir and McFarlane 2003) found that staff were concerned about the training implications of introducing games devices and games software into their schemes of work. Prensky (2006) suggests that this may be addressed by allowing the learners, as this is their area of expertise, to provide the training in a show-and-tell manner, and to explain what various parts of the game they are demonstrating help them to learn and how this relates to the subjects they are studying.

**Funds:** The cost of the necessary devices and software may be a disincentive for some institutions. The time and monetary costs associated with designing and creating games and accompanying resources can be prohibitively high for many institutions (De Freitas 2006). The array of technologies and games available and the pace of change may also mitigate against the development of sustainable teaching and learning strategies. One solution may be to encourage learners to use their own games devices and to encourage institutions to share games developed. Evidence from MoLeNET research indicates a growing consensus amongst colleges who have introduced mobile learning that the sustainability of technology enhanced learning strategies is improved by planning to facilitate the use of learners own technologies.

**Overcoming the idea that games are only for fun and entertainment:** Becta (2002, cited in Kirriemuir and McFarlane 2003) found that most of the games used in the schools in their survey were PC rather than device based. This seemed to be because the perception was that games devices are for entertainment only. For this reason devices were used mainly for recreation and/or reward rather than being integrated into the teaching and learning. However, the introduction of large numbers of games devices into colleges, and some schools, via MoLeNET projects is changing this perception.

### Digital learning games

In addition to the distinction between 'mini' and 'complex' games, Prensky (2006) examines the differences between complex games and what he refers to as 'edutainment'. The term edutainment is often used to describe a game, programme or activity that has the dual aims of entertaining and educating, for example a television documentary. Some writers, including Prensky, have also used edutainment to describe games created specifically for educational purposes. In this publication the term digital learning games is used to avoid confusion.

Games designed to teach specific learning objectives are closely tied to curriculum requirements and often have easily measurable outcomes. However, these games tend not to have the same motivational value as complex games, usually because they are merely 'drill and skill' style teaching enhanced with graphics, or simplistic mini games or mini simulations. These games, though they may provide excellent curriculum coverage, are not particularly entertaining or engaging in their own right. Leddo (1996, p24) suggested that although educational games were preferred to standard classroom instruction, students 'would never voluntarily play such a game outside of class'. These games do not encourage a state of 'flow' because they tend to lack the factors required to do so, as discussed above.

Nevertheless, games on handheld technologies seem to be starting to change the nature of learning games; their design is becoming more engaging, incorporating the factors that lead to a state of flow as described earlier, thus potentially making them a more effective teaching and learning tool. Facer *et al* (2004) note that handheld technologies enable the user to interact with the digital media and the physical world simultaneously, and with increasingly improving graphical interfaces, speakers, opportunities to connect with other users, touch screen technology, GPS, and motion-sensitive accelerometer technology, handheld devices are becoming highly capable gaming devices.

### **The use of digital learning games on handheld games technologies**

Digital learning games have greatly improved in the last few years and some now incorporate the features that make recreational digital games enjoyable and engaging. Some newer digital learning games, such as ‘Dr Kawashima’s Brain Training’, ‘Professor Kageyama’s Maths Training’, and ‘Professor Layton and the Curious Village’ on the Nintendo DS, provide opportunities for the player to work through levels competing against the game and other players. (See [www.nintendo.com/games/guide](http://www.nintendo.com/games/guide) for more information on the games available on the Nintendo DS.)

They encourage the player to strive to do better, which creates a much more engaging and motivating gaming experience. Importantly some of the content on these games covers specific parts of the curriculum, and the puzzle games require the use of skills such as problem-solving, decision-making, reflection and recall. Furthermore, the mobile nature of the device facilitates flexible, instant learning opportunities, previously unavailable with PC-based games.

### **Additional functions of handheld games technologies for learners and teachers**

The primary function of handheld games technologies such as the Sony PSP and the Nintendo DS is clearly game playing but they do have other functionality, either built in or through accessories, which can be used to support teaching and learning. They can, for example, be used for recording and viewing/playing pictures, videos and sounds, accessing the internet, communicating and collaborating with other users via voice, text or pictorial chat, and Skype. Some devices also offer GPS navigation. This type of functionality can be provided by other non-gaming technologies, but children and young adults may be more motivated to use games technologies that they find more familiar and more attractive.

## 4 Non-MoLeNET examples of good practice

The following examples are intended to give a flavour of some other projects that have used handheld and non-handheld digital games, and the additional functions of handheld games technologies, for teaching and learning across a range of sectors.

### Digital games to support teaching and learning

**Becta Computer Games in Education Project:** Part of Becta's 2006 Curriculum Software Initiative, the project was designed to explore ways in which aspects of computer games may support teaching and learning in schools. Teachers were able to achieve specific learning objectives and the general benefits included support for ICT skills; increased motivation; encouragement of collaborative working; encouragement of discussion of citizenship issues; increased library use; increased self-esteem and engagement with content. The report provides detail on the various games used and issues encountered.

**Beth Israel Hospital, New York City:** Dr James Rosser, who was in charge of laparoscopic surgery, discovered that doctors who had spent their early years playing computer games made nearly 40% fewer mistakes in surgery; he now encourages his staff to complete a 30-minute video game playing warm-up before surgery. (Prensky 2006)

**Bristol Secondary School, Year 7 Savannah Game Project:** A PDA-based game was designed to create a virtual savannah that learners could navigate as if they were lions, then reflect on their experiences on their return to the den. The game incorporates GPS to enable the players to use the outside space as if it were the savannah. It enabled the students to learn about the savannah and lion behaviour, make decisions and reflect on their choices, weigh up costs and benefits, collaborate with others, navigate maps and really engage with learning. (Facer et al 2004)

**Chew Magna Primary School, Tim Rylands, Supporting literacy with 'Myst':** Tim Rylands used the PC game 'Myst' with his 9–11 year-old students to help support the development of their literacy skills. He found the fantasy environments in the game inspired creative writing, reflection, music and more. His learners were fully engaged during lessons and showed marked improvements in levels of achievement.

For more details see <http://www.timrylands.com>.

**Improving behavioural outcomes for cancer patients:** Kato et al (2008) found that adolescents and young adults playing a video game addressing cancer treatment and care showed greater adherence to self-administered medication than the control group who did not play this game over the period of the intervention.

**Click Health (2001):** Click Health created action adventure games to help children develop the skills required to self-manage asthma and diabetes. They found that children who played these games at home showed a measureable increase in diabetes-related knowledge, self-efficacy, and communication about their disease and self-care behaviours. Furthermore, they report a decrease of 77% in urgent care required for this group, compared to no decrease in the group who did not play the games. (Prensky 2006)

**Learning and Teaching Scotland, Consolarium Guitar Hero project:** The Sony PS2 game 'Guitar Hero' was used to engage learners in the last term of school in thematic cross-curricular learning. Learners were motivated and completed writing, music, drama, science, art and design tasks all inspired by the game. Learners also showed improvements in hand-eye coordination and class relationships grew stronger.

For more details see  
[www.ltscotland.org.uk/ictineducation/gamesbasedlearning/index.asp](http://www.ltscotland.org.uk/ictineducation/gamesbasedlearning/index.asp).

**Lightspan (2000):** Lightspan carried out studies across 400 individual school districts which revealed a 25% increase in vocabulary and language skills and almost 50% increase in maths problem-solving skills by children who played computer games compared with those who did not. (Prensky 2006)

**US Military: Roger Smith (2008):** The chief technology officer for the US army programme executive office for simulation, training and instrumentation explains that both off-the-shelf and bespoke digital games are used to teach recruits necessary skills such as military strategies, communication and team-work.

The following are just two examples of many from the New Scientist website at [www.newscientist.com](http://www.newscientist.com)

**New Scientist: Action computer games can sharpen eyesight (New Scientist Tech and Reuters, 2007):** A study by US researchers at the University of Rochester has found that playing action video games that push the human visual system can improve eye test (the visual crowding test) results by 20% on average. The researchers believe this data could prove useful in supporting patients with visual defects such as amblyopia (lazy eye).

**New Scientist: Physios recommend a healthy dose of gaming (Giles 2009):**

A case study is described in which an individual suffering from Parkinson's disease has been playing games on the Nintendo Wii for three hours a week, and has seen improvements in his movement, walking and coordination. In a study of approximately 20 participants, Ben Hertz (an occupational therapist) demonstrated that playing the bowling, tennis and baseball games improved patients' ability to stand and walk short distances, and in many cases there were also improvements in mental health.

**Bournemouth University (2008):** As part of a Higher Education Assistive Technology project health and social care students used games on the Nintendo DS to improve their numeracy skills. They felt the games improved their confidence with numeracy and their recall, and resulted in noticeable differences in the calculations carried out in their daily activities. (Pulman 2008)

**Nintendo DS in Japan:** Ten elementary and junior high schools in the Osaka region of Japan have been issued with rented Nintendo DSs for every student and each student is required to use a range of educational software during lessons. (Charlton, 2009)

The following examples are documented by The Consolarium ('the Scottish Centre for Games and Learning, established by Learning and Teaching Scotland to explore the world of computer games and how they can impact on teaching and learning in Scottish schools') at Learning and Teaching Scotland [www.ltscotland.org.uk](http://www.ltscotland.org.uk) and through their blog.

**Dundee schools, Nintendo DS 'Dr Kawashima's Brain Training':** Three primary schools in Dundee compared 'Brain Gym' (a set of exercises/movements/activities performed to help stimulate positive focus, memory, organisation, and other learning skills, [www.braingym.org](http://www.braingym.org)) with 'Dr Kawashima's Brain Training' games. The findings revealed that a 15–20-minute morning warm-up using 'Dr Kawashima's Brain Training' proved particularly effective in improving learners' mental maths skills, accuracy and speed, and also their confidence and classroom behaviour.

**Aberdeenshire primary schools, Nintendo DS 'Nintendogs':** An article uploaded to the blog in 2008 describes how two primary schools in Aberdeenshire have been using 'Nintendogs' on the Nintendo DS as a starting point for a variety of cross-curricular work – story-writing, painting, numeracy, role-playing, reading and dog care. Learners have shown improvements in confidence, self-esteem, numeracy skills and enthusiasm for learning.

**Musselburgh, Sony PSP project:** Children have been given a Sony PSP to use at the beginning of the day to play 'Hot Brain', focusing on their numeracy, literacy and puzzle-solving skills. The teacher explains that the children are more focused and settled than usual at the start of the day and the children themselves are very enthusiastic about it.

Learners have also used the Go!Cam to record videos for later editing as part of their project work, and have been able to access the internet from their desks to research a topic and download relevant images.

**Lairdsland Primary School, 'Cooking Mama: World Kitchen':** This game was used as a stimulus for a range of teaching and learning activities including writing biographies, menus and instructions, developing geographical knowledge, involving parents in collecting recipes, money-handling, internet browsing, word-processing, acting and developing food knowledge, as well as developing teamwork skills.

**Lairdsland Primary School, 'Endless Ocean' on the Nintendo Wii:** This game has inspired a variety of creative writing activities including tourist guides, diaries and newspaper reports as well as leading to art and design activities. The children are really keen and very motivated to learn.

**Gavinburn Primary School, Mario Kart on the Wii:** This computer game provided inspiration for numerous activities including writing, maths, art and design, drama, and science, with science teachers from the secondary school also getting involved.

### Extra functions of handheld games devices to support teaching and learning

The following are examples of PSP in Education projects that have used the extra functions of handheld games technologies to support teaching and learning. PSP in Education is 'an initiative by Sony Computer Entertainment UK to enhance mobile learning'. For more information and more detailed case studies please refer to ConnectEd's website at [www.connectededucation.com](http://www.connectededucation.com). ConnectEd is Sony Computer Entertainment's accredited educational and training sales and marketing channel.

**Building Schools for the Future, Leeds schools:** Pupils have used PSPs to create multi-media induction materials for newcomers, to record their work and achievements, to record activities for later review and evaluation, and to view onscreen materials for reflection. The machines have also been used to open up channels of communication between staff, parents, carers and learners. Staff report that the PSPs have provided opportunities for interaction and collaboration contributing to increases in self-esteem, independence, confidence and communication skills.

**City Learning Centres and Birmingham schools:** Learners have used PSPs to record school trips for reflection and sharing with others on return to the classroom. The camera on the PSPs has also been used to 'read' printed 'bar coding' which triggers the playing of selected audio and video files to provide additional learning media. Staff commented that the PSPs have assisted with differentiation, revision and visual literacy, and have helped to keep learners on task.

**Longwill School for Deaf Children:** Learners have used the PSPs to record signing vocabulary lessons for revision and practise outside lesson time and outside school. They have also been creating videos of their own signed stories, which are used in creative writing lessons. Family events and trips are recorded for sharing with others. The PSP has also been useful in improving communication between home and school and developing the signing skills of other family members.

**Holyhead Secondary School, Year 8 geography:** PSPs were used as a research tool, enabling learners to create a glossary of images, and PowerPoint slides accessed via the PSP supported extended writing. PSPs were successfully used to support vertical tutoring, and were also used during assemblies. Staff report long-term (over a year) improvements in engagement and enthusiasm and stronger feelings of ownership. The PSPs also helped learners to recall information more effectively because of the 'kinaesthetic nature of the learning'.

**Harefield Specialist Sports Academy, sport and A-Level ICT:** The PSP enabled learners to review sports practice frame by frame to evaluate performance. A-level ICT students used their PSPs with an online assessment programme that they have found dynamic and engaging.

**HMS Collingwood Armed Forces:** This specialist Royal Navy training centre used PSPs for nine months to train new recruits in basic numeracy skills. They captured all the lessons on video, made them accessible via the PSP and combined this with Flash-based tests and games delivered through the PSP. The learners have been using the PSPs on board ships and submarines and are reported to have found the resources enjoyable.

## 5 MoLeNET learner voice

What do learners think of digital games for learning? To find out what they think, both in and outside college, focus groups and interviews were carried out with a sample of 20 learners. They were studying a range of courses at various levels, and some were learners with learning difficulties and/or disabilities. This research examined learners' perceptions of their own computer games (referred to as recreational games because this is the main purpose for the player) and those available on the Nintendo DS Lite supplied by the college (referred to as digital learning games as this is the main purpose) and asked them to compare these.

### 5.1 Recreational games

Most (16 of the 20) learners owned a games device and commented on a range of computer games they enjoyed playing. These were generally played on games consoles or PCs rather than handheld games devices. The games included action games (such as 'Grand Theft Auto'), strategy games (such as 'Tom Clancy's Endwar'), puzzle games (such as 'Crash Bash'), simulation games (such as 'The Sims'), shooting games (such as 'Call of Duty' and 'Manhunt 2') and sports games (such as 'Fifa' and the 'Wii Fit' collection).

#### Why young people enjoy recreational computer games

The learners not only talked about the games they enjoy playing but also the reasons why. Their responses are summarised in the following table.

**Table 3** Reasons why young people enjoy recreational computer games

Reasons	Explanations
<b>Genre</b>	It seems that each learner enjoys one specific genre of game more than any other, with some preferring realistic games and others fantasy. When talking about the merits of different consoles, one learner explained 'It's the games that you buy that make the difference ... some people like shooters, some like war games...' For many of the learners their favourite games were those where the subject matter interested them in their own lives, such as animals, sport or exercise, or had characters that they could relate to.
<b>Challenge</b>	Learners repeatedly mentioned the increasing difficulty of the games they play and how they want to progress through the levels and attain high scores or record times. They enjoy the challenge of the game and share their successes with their friends.
<b>Competition</b>	Learners talked about competing against one another either on the same device or online, and the achievement they feel when they win. Learners who are competitive in other aspects of their lives particularly felt this way, although they also appreciated the option on some games to play in a 'friendly' way where you can lose 'without shame' or recognition.

Reasons	Explanations
<b>Realism</b>	Some learners mentioned the high-quality sound and graphics on their games consoles and how this helps to make the games feel more real. They talked about feeling immersed in the game, particularly when using a large screen and high volume.
<b>Interactivity</b>	Several of the learners explained that computer games keep their brains and their minds busy because they are interactive. One learner commented ‘I don’t watch TV ... I like to do things with my hands instead ... it keeps me busy.’
<b>Motivational</b>	The learners find their games fun, relaxing, relevant and challenging and are therefore highly motivated to keep playing them. They also identified motivating features within the games such as messages congratulating them when they had done well and motivating them to improve further.

### Do young people believe they can learn from their recreational computer games?

Most of the learners had never been asked to think about this before. At first they found it difficult to comment beyond the entertainment value but once ideas started being discussed in the focus groups it became clear that the answer for most of them was definitely yes, they could learn from games, but this had mostly happened without them realising learning was occurring.

**Communication:** Some learners explained how they enjoy playing multiplayer games online either against, or in teams with, people from all over the world. Two learners reported that this is useful for improving communication skills as you need to be able to explain things clearly and ensure that your language is appropriate: ‘When you have your friends round and play competitively ... you learn quite a lot about communication, it teaches you how to say things.’ One learner also commented that other players can report you for inappropriate language and that this encourages appropriate language.

**Teamwork:** Learners often reported that they enjoy the competitive aspect of playing against each other but many also enjoy playing in teams, working towards the same goal. One learner commented on how when playing in a team you need to make sure your actions do not affect other members of your team badly as this would decrease your team’s chances of winning. This involves quite complex teamwork skills.

**Problem-solving and reflection:** Learners talked about puzzle and task-based games they enjoy and explained how they have to solve problems and make the correct choices to progress to the next task or level. A couple of learners explained how they devise strategies based on what they have learnt from previous attempts.

**Memory and quick thinking:** Learners identified the importance of memorising particular aspects of the game to be able to progress further, e.g. memorising which combinations of actions result in particular outcomes and what to do for certain missions. Some puzzle games also rely on the learners memorising and recalling patterns or sequences to move onto the next level or achieve a higher score. Many of the learners suggested that computer games keep their minds active because decisions often have to be made quickly.

**Rules, morality and respect:** Some of the high action, possibly violent, games mentioned by learners are often perceived in a fairly negative light but although the learners admitted that within the game it is fun to behave in ways they would never consider in their real lives, they also were keen to explain that without respecting the rules of the games it is not possible to achieve the goals, and these rules seem to be built on ideas of right and wrong and showing respect to other people within the game. One learner said ‘it’s all about loyalty and respect ... it’s about doing the right thing ... and about people’s personal opinions’; they suggested that the rules can be similar to real life and you lose if you behave in the wrong way.

**Looking after animals:** One learner explained that a game she particularly enjoys involves looking after a virtual pet hamster. She feels that the game has taught her the various aspects of pet care and when she has a hamster of her own this will be very useful. When asked how the experience compares to reading about hamster care in a book she explained ‘it looks more real and you’re doing something with your hands ... at the end of the day at least you actually get to look after the animal whereas in the book you can’t’.

**Reading:** One learner mentioned that the onscreen messages displayed during the games help to improve their reading skills.

**Fitness and sports skills:** Two learners talked about the sports and fitness games they enjoy and explained how they can learn skills and techniques from the games, which they then go out and practise. The games inspire them to exercise or play the particular sport and teach them about their level of fitness.

## The Nintendo DS Lite

All the learners involved in the focus groups/interviews were able to use a Nintendo DS Lite as part of the MoLeNET project. Some were able to take the device home and others only used it within the college. Games accessed on the device included ‘Dr Kawashima’s Brain Training’, ‘Dr Kawashima’s More Brain Training’, ‘Professor Kageyama’s Maths Training’ and ‘Professor Layton’s Curious Village’. One learner declined the offer of a DS Lite because, having the use of only one hand, he found it too difficult to operate.

## The perceived benefits of using the DS Lite

Most of the responses regarding the use of games on the Nintendo DS Lite to support teaching and learning were positive. Learners comments are provided in table 4 categorised by whether they relate to improving skills or knowledge or improving the learning experience.

Table 4 The perceived benefits of using a DS Lite

Improving skills/knowledge	Improved learning experience
<ul style="list-style-type: none"> <li>● <i>It helps you a bit more...to get further into your maths ... more than paper.</i></li> <li>● A learner who had previously commented that she did not like computer games says: <i>It's good... makes me think more because I got 'Brain Training'.</i></li> <li>● <i>'Brain Training' helps you with your maths and gives you a bit <b>more confidence</b>.</i></li> <li>● <i>I'm not very good with my times and it helped me.</i></li> <li>● <i>'Brain Training' <b>helped me with my maths</b> more... because I'm not very good at maths.</i></li> <li>● <i>It <b>increased my focus</b>.</i></li> <li>● One learner reported <b>improvements in speed reading</b>, which was something he was not too good at before; the fact that he could see his progress on a graph made it more <b>motivating</b>.</li> <li>● <i>'Brain Training' and 'More Brain Training' help me to get <b>more confident</b> in the games.</i></li> <li>● Another learner explained that the 'Dr Kawashima's Brain Training' game helped him to feel <b>more confident</b> in his abilities.</li> <li>● <i>With the 'Brain Training' one I felt that <b>my maths was improving and so was my English</b>.</i></li> <li>● <i>With the 'Curious Village' one <b>it's helping me with problems and understanding different problems and how to solve them</b> so it's making me try to think more and think outside the box.</i></li> <li>● <i>It's helped me to <b>improve my times tables</b>.</i></li> <li>● <i>It's improved my times tables, <b>I'm getting faster</b>.</i></li> <li>● <i>'Brain Training' <b>helped me an immense amount with maths</b> because I do find it really hard...it's helped me come on loads and it's <b>helped problem-solving</b> as well...I had to take a test to get into university and actually my maths was higher than my English!</i></li> <li>● <i>It's helped me get past the stage of thinking I don't want to do it or I can't do it and now I sit there and say well actually <b>I can do it</b> if I do it that way or whichever way I can get to the answer.</i></li> <li>● <i>My <b>mental arithmetic has improved</b> a lot, which was my weakest point.</i></li> </ul>	<ul style="list-style-type: none"> <li>● <i>Easier than paper because it's just a screen and if you make mistakes you can easily clear it and it doesn't hurt your hand from too much writing.</i></li> <li>● <i>The games were <b>fun</b> as they had levels to complete that got harder and you need to get more points.</i></li> <li>● <i>It's something <b>different</b> to do.</i></li> <li>● Learners felt that the games on the DS Lite <b>gave them a break</b> from the more intense types of learning such as lectures. One learner commented <i>...came down one Friday and we started playing on the DS together...it was quite a nice surprise really!</i></li> <li>● <i>I thought it was really good because not only are you playing a game you might <b>enjoy</b> but you're actually learning.</i></li> <li>● Learners found they were <b>engaged</b> in learning <i>I was quiet as a mouse for a solid hour...I was occupied for the whole time...I was really impressed.</i></li> <li>● <i>It played music which helped because I don't like doing things in silence.</i></li> <li>● Several learners commented on the <b>flexibility</b> of being able to carry the DS around with them, enabling them to play the games on the train or in the car, or anywhere inside or outside college or home. The fact that the DS Lite is easy and <b>quick to set up</b> also made it ideal for short bursts of learning activity.</li> <li>● <i>It's been quite a <b>good laugh</b>.</i></li> <li>● The DS Lites enable learners to play together, which <b>creates competition</b> that some learners have enjoyed.</li> <li>● <i>I've got a Chinese friend and I'm teaching him English and we were playing on it and <b>multiculturally...it breaks down the barrier</b>.</i></li> <li>● The DS games are <b>more interactive it makes you carry on doing the work...trying to answer the questions</b></li> <li>● A few of the learners mentioned that their siblings or parents had used the DS and that they <b>liked the fact that their parents in particular were getting involved and taking an interest</b>: <i>My mum plays it as well, which is always a plus.</i></li> </ul>

### **Disadvantages of the Nintendo DS Lite**

A few learners with learning difficulties and/or disabilities expressed slightly more reservations about the Nintendo DS Lite, which were not shared by the other learners in the focus groups/interviews. This was partly because the DSs did not always correctly recognise what they were saying or writing (often due to speech problems or poor handwriting skills), which meant their answers were wrongly marked as incorrect.

One learner declined the offer of a DS because he only has the use of one arm and so the device was difficult to use; another learner with reduced grip explained that holding onto and controlling the device was tricky. Thus some of the learners' physical disabilities were a barrier to using the DS Lites to their full potential.

A few learners simply weren't particularly interested: one learner who already had his own DS exclaimed 'Oh no, not another one', when he was given it by the college. Some learners felt that they would rather play their own games when at home and leave college work behind. Some said the games on the Nintendo DS did not really interest them compared to their own games because they were not the right genre or they could not relate to them.

Tutors and staff involved felt that some learners would reach a point in some of the games that they would never be able to pass due to their specific learning difficulty or cognitive level and this could cause frustration. Similarly, research carried out by the Cornwall Consortium in phase one of MoLeNET indicated that the DS games may not be appropriate for some learners.

For this sample of learners it appeared that learners who were particularly keen on shooting and fighting recreational games were less enthusiastic about DS games than learners who preferred more real-life or puzzle-based recreational games.

### **Comparing the DS Lite games with recreational computer games**

Those learners who did not have a particularly positive experience with the Nintendo DS showed a strong preference for their own recreational games, explaining that they have better graphics and that the games are more enjoyable, relaxing and engaging. These learners rarely used their DS at home. This cluster of learners represented approximately one quarter of the group, with the rest of the group making some interesting comparisons between the Nintendo DS and their own recreational games and highlighting the key characteristics of digital games that make them enjoyable and engaging.

**Table 5 Comparing DS Lite games with recreational computer games**

<b>Comparison</b>	<b>Learners' views</b>
<b>Educational value</b>	All learners believed that the Nintendo DS Lite games used have greater educational value than the recreational games they play at home. Although they recognise the skills they learn from their own games, learners agreed that the knowledge and skills gained from playing the DS games provided by the project are much more relevant to those required at college.
<b>Type of use</b>	There was a mixed response when asked how often they played on the college DS at home compared to their own devices; answers ranged from mostly their own device to about half and half. Learners appreciated the flexibility of the DS Lite, commenting that it was small and easy to set up compared with their full-sized games consoles, so could be used anywhere, whenever they wanted. They preferred shorter bursts of activity than when playing their own recreational games because the games provided by the college could be repetitive but when returned to they became fun again. One learner explained that it was good to be able to mix it up a bit so she would play with her games first, then college-provided games on the DS to 'test her brain'. Learners who did not own a games device reported enjoying using the DS at home.
<b>Motivational impact</b>	When talking about their own recreational games it was obvious that the learners found them very entertaining and engaging and were highly motivated to use them. Nevertheless, this was also true to a certain degree with the college-provided Nintendo DSs. Learners who recognised that their skills and knowledge were improving were motivated to continue to use the devices to try to improve further. Of clear importance was the fact that the games were designed with levels of increasing difficulty or opportunities to beat your own or someone else's time or score. Many of the learners mentioned this as an important aspect of the game design, with the ability to play competitively being enjoyable.
<b>Games genre</b>	<p>A recurring point was that learners are very sure what types of game they enjoy and usually choose to play games where the subject matter or characters are relevant to them. This may relate to a hobby of theirs or to a particular fantasy situation they find fascinating (such as a castle environment or leading a large army). It was felt that this was something that the digital learning games lacked so that although the digital learning games were mainly seen as fun and effective learning tools, they were not comparable to their own games.</p> <p>One learner commented: 'The DS was alright but...mainly all the games I play are shooting and war games'. Another member of the group who enjoys war games agreed with this sentiment.</p> <p>Some of the learners made comparisons between the DS games provided by the college and other digital learning games available on the PC, including online and multimedia CD games. One learner thought that the DS games are a more effective learning tool because players interact with the game rather than simply choosing from multiple-choice answers. Another learner felt that the DS games more successfully disguised their educational content, making them more engaging and more motivational: 'I like the fact that it's not saying you're learning GCSE maths because when I used to open up a disk for a PC or something and it said GCSE maths I was like oh my god I'm not going to do this and it constantly drills stuff into you. At least this is like slowly easing it into you and you're subconsciously learning stuff... it's cheeky.' This learner also felt that the games he played on the DS treated him like an adult and this was really important to him, a view echoed by other members of the group.</p>

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Comparison	Learners' views
<b>The console</b>	Some learners mentioned that the graphics and sound on full-sized consoles are better than those on the DS Lite and the controls are a little easier to use. However, apart from some learners with a physical difficulty who found using the DS more challenging, they did not think this was an important issue compared with the content and design of the games.

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## Learners' views on the possible use of recreational games at college

All the learners agreed that it would be fun to use their own computer games in college but thought it would probably have a bad effect on their behaviour, i.e. 'I wouldn't play the Xbox in college cos I'm not here to play games, I'm here to work'. Most learners did, however, greatly appreciate the Nintendo DS Lite as providing an enjoyable, engaging and interactive way of learning. Many of them recognised improvements in their skills and knowledge as a result and many enjoyed using the DS in combination with other tools and techniques.

## Conclusion

Feedback from young adult learners suggests that the Nintendo DS Lite games represent a step forward for digital learning games. However, learners still perceive a very clear distinction between recreational and digital learning games so there is considerable room for improvement.

Learners did not support bringing recreational computer games into the classroom as teaching tools on a wider scale, despite their perceived educational value, because they thought they would be more distracting than helpful. However, these views were based on assumptions about how the games might be used rather than on experience of their introduction.

The majority of the learners' responses suggest that digital learning games that build on learners' interests and genre preferences and provide opportunities for competitive gaming can be an engaging and beneficial teaching and learning tool.

# 6

## **MoLeNET case studies and teaching and learning snapshots**

The following case studies and teaching and learning snapshots illustrate how MoLeNET projects have used games technologies and the benefits realised. In some cases the games or games technologies are central to the teaching or learning. In others they are a supporting tool or are used as an incentive, reward, or study break. In all cases it is clear that the potential of games technologies has caught the attention and imagination of learners and staff.

Further mobile learning case studies and useful resources can be found via the MoLeShare service and videos are shared, and converted for download to a variety of mobile technologies, via MoLeTV. Both of these services can be accessed from the MoLeNET website at [www.molenet.org.uk](http://www.molenet.org.uk).

# Engaging the disengaged, enhancing the learner experience and improving behaviour

## Benefits of the Nintendo DS

### Bolton College teaching and learning snapshot: Academic year 2007/08

The use of Nintendo DSs proved very engaging for learners who did not regard the learning activities they completed as 'learning' and were therefore eager to continue to use the technologies and 'play'. Games devices were made part of the coursework, which encouraged collaborative activities among the games development cohort and developed learner confidence. All the tutors also indicated that they had developed the way they use technologies with learners, with one tutor saying: 'I have become personally more aware of the effectiveness of other games technologies.'

## Play to learn

### Stoke on Trent College: Academic year 2008/09

#### Introduction

This project was delivered to four vocationally relevant literacy and numeracy groups consisting of forty 14–19 year-old disengaged learners who are taught for two 2.5 hour sessions per week. Many have had poor educational experiences and have social issues that affect their learning, achievement and self-esteem to varying degrees. The Nintendo DS and 'Dr Kawashima's Brain Training' games were chosen for three main reasons:

- the interactivity with the touch screen and the range of game play available
- students identify the DSs as games devices so do not think of them as learning tools, unlike laptops, etc
- the ability to network the devices allows players to interact with each other

#### Aims

The aim of the project was to use the Nintendo DSs in normal classroom activities to aid knowledge attainment and to link to prior understanding. It was hoped that the project would achieve:

- increased student attendance
- increased student interaction and development in educational, personal and social contexts
- learning through implicit and intrinsic methods via discovery and problem-solving
- opportunities for students to 'tap into' prior knowledge and understanding
- demonstrating to learners that learning can be fun

### Addressing the challenge

The initial idea was to use 'Dr Kawashima's Brain Training' games to help students realise that they all have prior knowledge they can access. The games also allowed them to use new skills to solve the problems. Giving them a numbered game card enabled them to measure their progress against other students who used the same game card. (This moved beyond the classroom when students talked about how they achieved the records on a specific game.) The games were also used as a reward to motivate students and this had a positive impact on group dynamics.

### Outcomes and reactions

Benefits from the project include:

- improved attendance and punctuality
- positive change in group dynamics and interaction
- a decrease in disruptive behaviour and swearing
- students using taught knowledge more naturally without knowingly doing so
- students staying until the end of the sessions without complaining
- the DSs provided a tool to help identify and observe hidden issues relating to student ability
- students with learning difficulties developed strategies to overcome these issues
- increased student self-esteem
- students being able to unwind and take frustration out in a positive way
- ideas and topics identified for next academic year's teaching schemes
- a spirit of fun spread throughout other groups and staff when observing the positivity from using the DSs



Examples:

- One student with cerebral palsy, who is left-handed, has been able to tune the DS to his requirements. This has made issues with his writing more evident so that ways have been identified to help him improve.
- Another student has problems doing subtraction; using subtraction-by-adding via 'Dr Kawashima's Brain Training' games has increased his motivation and subject confidence and he is now an excellent attendee.

- Using the game has helped to transfer the aggression of some of the students into game play instead of them causing problems in the class.
- Several students who were more reserved and quieter, and were considered irrelevant by other group members have shown an aptitude for some of the games which has subsequently increased their group status and their self-esteem.

### Learners' reactions

Initial enthusiasm was deflated when they realised they were going to be using maths games. However, after the initial lesson the students' ideas changed, with comments such as

*Are we using the DSs today as I want to beat my score?*

### Teachers' reactions

*I have used one for many years, but my learning support assistants commented that it made the 'students behave', 'talk to each other and not shout at each other' and 'I have never seen students here ask to stay for an extra few minutes into lunch!'.*

### Managers' reactions

The direct manager was very open and supportive from the start, and some of the other managers who had been less taken by the idea soon changed their minds when the students began to talk about their positive experiences.



### Lessons learned

- Make sure that the equipment has British chargers and devices are set to English.
- Plan how to charge the number of devices and work out how long the battery will last for.
- Make sure that items are labelled.
- Keep a live journal about positives and negatives in each lesson.
- Even if the students say they know how to use the devices, explain it anyway as they may not.
- Keep a dynamic outlook in using them, ideas pop up when you least expect them.
- Be firm with students who wander in late and expect to just use the games.
- Be open to the individual students' ideas, as some know a lot about the technology.

### Next steps

Organise staff CPD sessions in setting up and using the Nintendo DS.

Look into methods of creating programmes for the DS and investigate other educational games that would benefit the students. Possibly use the facilities such as 'PictoChat' in a lesson other than in the case study.

### Links

How to network the Nintendo DS: [www.moletv.org.uk/watch.aspx?v=25WDU](http://www.moletv.org.uk/watch.aspx?v=25WDU)

For a document on how to set up a Nintendo DS when the language default is Chinese go to MoLeShare and search using keyword 'chinese'.

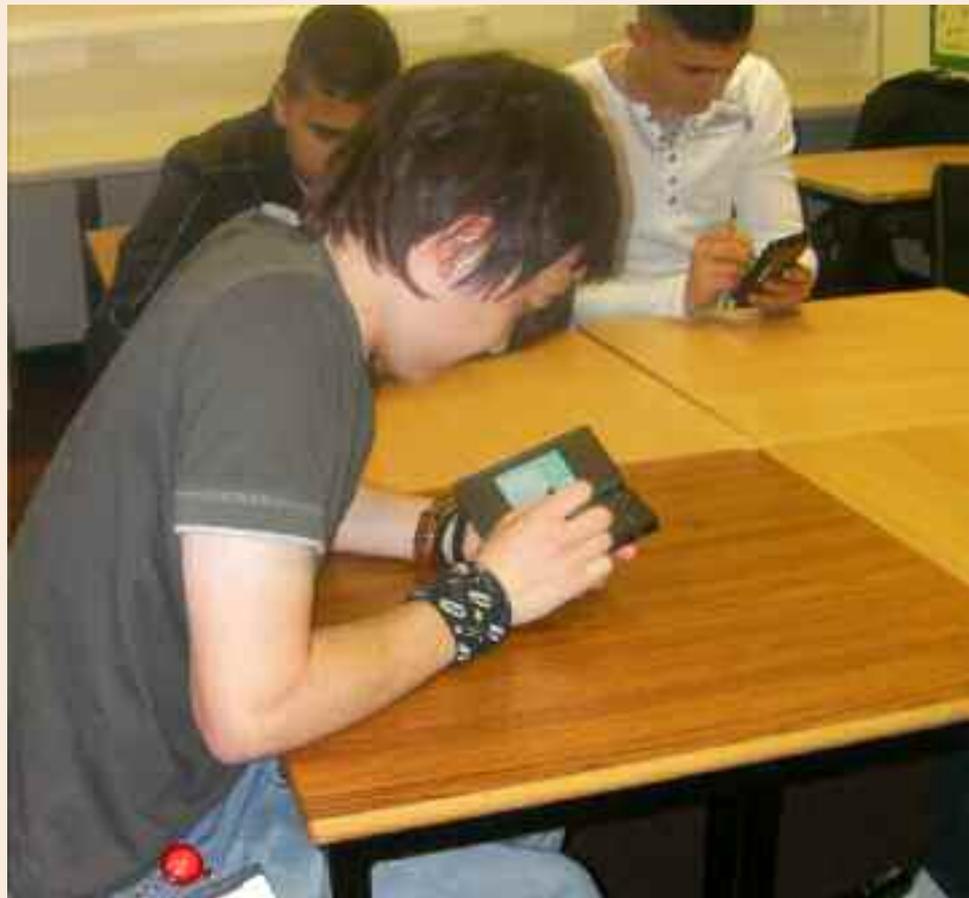
## Using the Nintendo DS Lite to engage young people not in education, employment or training and to improve literacy and numeracy

**Walsall College: Academic year 2008/09**

### Introduction

Walsall College recognises that e-learning and m-learning have introduced new opportunities and pedagogical advances for both teaching and learning. M-learning can enhance the learning experience and promote an active, flexible and enriched learning environment with the chance for the learners to become more involved and engaged in their own learning.

Walsall College is a vocational college situated in the heart of a diverse community; there are areas in Walsall identified as being within the 10% most deprived areas in England. This brings many challenges for the college in engaging and inspiring its learning community. This year the college took the opportunity to participate in the national MoLeNET initiative.



### Aims

The college led the Walsall project in collaboration with local schools. It focused on improving literacy and numeracy and involved a range of over 300 learners, many disengaged to middle ability, working towards obtaining their GCSE. The college chose to use Nintendo DS handheld devices in literacy and numeracy lessons to engage young learners who were not in education, employment or training (NEET).

### Addressing the challenge

The project has distributed over 300 Nintendo DS Lite devices across the cohort of learners, and they use them in lessons regularly. The initial set-up, including charging, tracking and distribution, was logistically challenging, requiring a significant amount of technician time, but once the devices were distributed, both staff and students quickly started to use them. In fact, the expected staff development provision was not needed, because most staff had a Nintendo DS already and were keen to share their knowledge with learners. The Nintendo DS Lite is a popular handheld device, which means it is easy to get started. The devices have been used as a starter, as a warm-up activity and to conclude a lesson in at least two lessons each week.



### Outcomes and reactions

Feedback from staff and students indicates improvement in learner behaviour, alertness and focus. There has been a noticeable reduction in learners having 'time out' because of classroom disruption. Tracey Humphries, head of mathematics at Alumwell School, says

*Using the 'Dr Kawashima's Brain Training' regularly has improved pupils' mental ability to think quicker and has also allowed them to develop strategies to improve short and long-term memory, which will assist in their GCSEs.*

Feedback from learners has been captured through video, blogs and verbally. A learner from Pool Hayes School commented on 'Professor Kageyama's Maths Training' games:

*Lessons are better now, it's not like work.*

And another learner, also from Pool Hayes, said

*It helps me to build my confidence in maths, it's better than worksheets, because you have to be quick.*

Most learners agreed that ‘Professor Kageyama’s Maths Training’ was improving their mental arithmetic, and believed it would improve their GCSE results.

### **Lessons learned**

The main issue when implementing a high volume of handheld devices such as the DS Lite is the tracking, power charging, recording and distribution. Once the initial set-up and distribution are completed, using them is very straightforward and the battery lasts quite a long time.

### **Next steps**

The Walsall College MoLeNET project propelled the college forward into m-learning and was enthusiastically received by both staff and learners. The Nintendo DSs were demonstrated to curriculum staff at a college ‘teaching and learning fayre’ and this resulted in great interest from other areas. As a result the college has started to widen the distribution of the Nintendo DS to include skills for life and key skills. There are also plans for devices to be made available in learning resource centres for home loans to all learners.

## **Improving engagement and focus with the Nintendo DS and Wii**

### **Regent Consortium teaching and learning snapshot: Academic year 2007/08**

There are many learners in Leicester who have particular difficulties with literacy and numeracy skills. Gateway and Regent College both have teams of teachers providing support lessons in these areas. By looking at previous research, we thought the best approach would be to use existing devices such as the Nintendo DS and Nintendo Wii and their associated ‘Brain Games’. The literacy/numeracy levels of these games and motivational/ competitive aspects captured the students’ imaginations and re-focused their energies. The games were often used as a study break (e.g. in IT lessons) or as a reward to take home for a night.

The college timetable is structured so that most lessons are 55 minutes or one hour long, so a double is one hour fifty or two hours. In the latter, in particular, it was decided to use the gadgets to provide students with an effective study break, i.e. if the students had worked well, teachers would use the Nintendo to reward them. It was felt that this had a positive impact on engagement and focus during lessons and also on attendance and retention.

## Using the Nintendo DS and Wii with construction and motor vehicle learners to enhance learning and promote positive behaviour

**The Manchester College: Academic year 2008/09**

### Introduction

The Nintendo DS and Nintendo Wii were chosen because learners are familiar with these devices and use them at home with friends and family. Games technologies like the Wii and DS have the required credibility among learners to encourage them to become immediately engaged with specific learning tasks.

The case study involved 16 learners working towards a level 1 qualification in construction and motor vehicle. The games devices were used in level 1 application of number key skill sessions.



### Aims

Key skills sessions are taught in addition to the learner's main programme, in a classroom environment. Although learners appreciate the value of the key skill qualification, some learners find it challenging working in a non-vocational environment.

The purpose of using the games devices was to enhance the learner experience in these sessions and promote positive behaviour.

### Addressing the challenge

The tutor set up a group session using the wireless facility on the DS and the learners played a series of games developing skills in problem-solving, quick calculation and strategic thinking. 'Dr Kawashima's Brain Training' games were used for 15–20 minutes at the start of the session and once the games devices were put away learners were focused and ready to carry out the remaining tasks of the session.

The Nintendo Wii and Wii Fit were used as the focal point of an application of number session on introducing Excel spreadsheets. The Wii device was used to generate data for an assignment: learners had to use the Wii Fit board to carry out a series of ski jumps and their results were recorded and used to generate graphs and calculations.

### Outcomes and reactions

In addition to developing cognitive skills the DS helped to promote positive behaviour within the group. It acted as a fantastic equaliser, with all learners and tutors experiencing equal amounts of success or despair depending on the game. Learners asked for their colleagues' scores and congratulated each other on their results. The 'Big Brain Academy' game is particularly inclusive and effectively removes certain barriers to learning: it uses imagery and sound as opposed to high levels of text and this enables less confident readers to take a full part. Any learners who appeared to experience difficulties logging on to the devices or accessing the games were supported by the tutors.

Using the Wii to generate data encouraged learners to take greater control of their learning. They were not only required to make sense of data, they actually had to create it. Learners were engaged throughout the activity and were responsible for ensuring the data was recorded correctly and everyone had a go at ski jumping. This meant they had greater control of the session and were determined to complete the assignment accurately and on time. The ski jumping task meant the tutor was able to take on the role of facilitator and the learners took on a more 'hands-on' role.

### Learners' reactions

At the close of the session learners were asked to evaluate whether the Wii had enhanced their learning experience and many learners suggested that it had. They enjoyed generating the facts and preferred this method to reading data off a piece of paper.

Using the Nintendo DS and Wii has had a very positive impact on the learner experience. The games device enabled learners to take control of their learning; they engaged and stimulated them, and improved concentration, which in turn had a direct impact on the promotion of positive behaviour within the group.

### Teachers' reactions

The tutors involved in the case study were impressed with the positive impact of the games devices on the learners' learning and are keen to use them in future sessions.

### Lessons learned

- Using the Wii to create data is an innovative way to introduce learners to interpreting and recording data.
- The DS games not only improve concentration skills but can create a really positive 'buzz' in the classroom and have a positive impact on behaviour.
- Before using the DS or Wii inform learners of their responsibilities to ensure they are used safely and appropriately.
- Tutors need to get involved in the games. Learners enjoy seeing the tutor succeed or fail and being involved in the games means you can manage the use of the devices effectively.

### Next steps

We plan to continue using the 'Dr Kawashima's Brain Training' games and we may set up a class scoreboard to track progress throughout the term. We will continue to use the Wii to generate data and we hope that other tutors will use the Wii in their assignments. We would like to explore the possibility of using games that promote situated learning, such as 'Trauma Centre' or 'Attorney'.

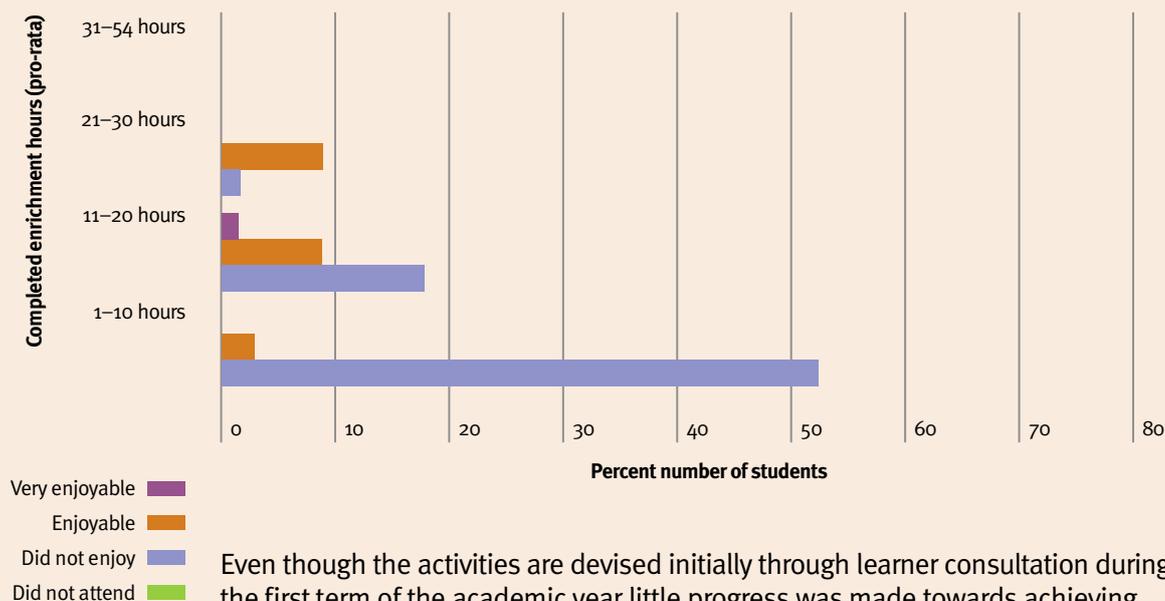
## Can handheld technology improve participation in enrichment activities?

**St Helens College: Academic year 2008/09**

### Introduction

In animal care, some learners' perceptions of enrichment are poor, and it can be difficult to engage them in enrichment activities.

### Pre-implementation results showing level of student engagement in enrichment



Even though the activities are devised initially through learner consultation during the first term of the academic year little progress was made towards achieving the required hours. Tutorial sessions, pre-project questionnaires, text walls\* and focus groups were all used to find out the reasons for the lack of participation.

Learners' comments and views suggested that the sessions should be longer and more enjoyable and interesting; they would prefer to learn about or do proper activities that are life skills; they would like access to more resources and to sessions where they could see where they were improving, what was happening and what they were working towards. Although learners accepted that enrichment was an integral part of their programme, it was low on their list of priorities, the highest priority being their vocational work, followed by key skills.

### Aims

- Improve attendance and retention.
- Increase learner engagement.
- Produce audio-visual aids for use on students' own website.
- Generate additional evidence towards key skills communication and ICT.
- Create a bank of resources for use in course work.

### Addressing the challenge

To overcome the issues identified it was agreed to link the enrichment programme with vocational work and key skills and increase the time allocated to enrichment,

\*Note: 'A text wall is a webpage that (your) learners can text to. This allows learners to send texts to a password-protected website which can be shown to the class as part of a lesson, or used for administrative or pastoral purposes.' [www.xlearn.co.uk/sms](http://www.xlearn.co.uk/sms)

and to ensure all learners had access to IT facilities within the enrichment sessions. PSPs were distributed to two cohorts of learners on level 3 programmes (70 learners in total). Everyone agreed that this was the fairest way to distribute the devices as all learners could aspire to progress to the higher level and everyone would then have the opportunity to use the devices.

In order to introduce handheld technology, learners were asked to evaluate the impact of three types of information on the same topic – animal welfare. There was unanimous agreement that the greatest impact was that of audio visual information through the use of the handheld device. Photostory 3 was then demonstrated as a means of collating the information into a learning resource. Learners were asked to consider how they could develop their own resources to develop a learning package for use on their own website, and each learner was given the opportunity to use their device to capture footage for use in their learning resource by taking the devices on a field trip.

Before the field trips two members of staff visited the zoo to capture footage using handheld devices. The staff used this footage to prepare instructional videos that could be downloaded onto the PSPs and used by learners during their visits. These resources would then be used for future visits with other groups.

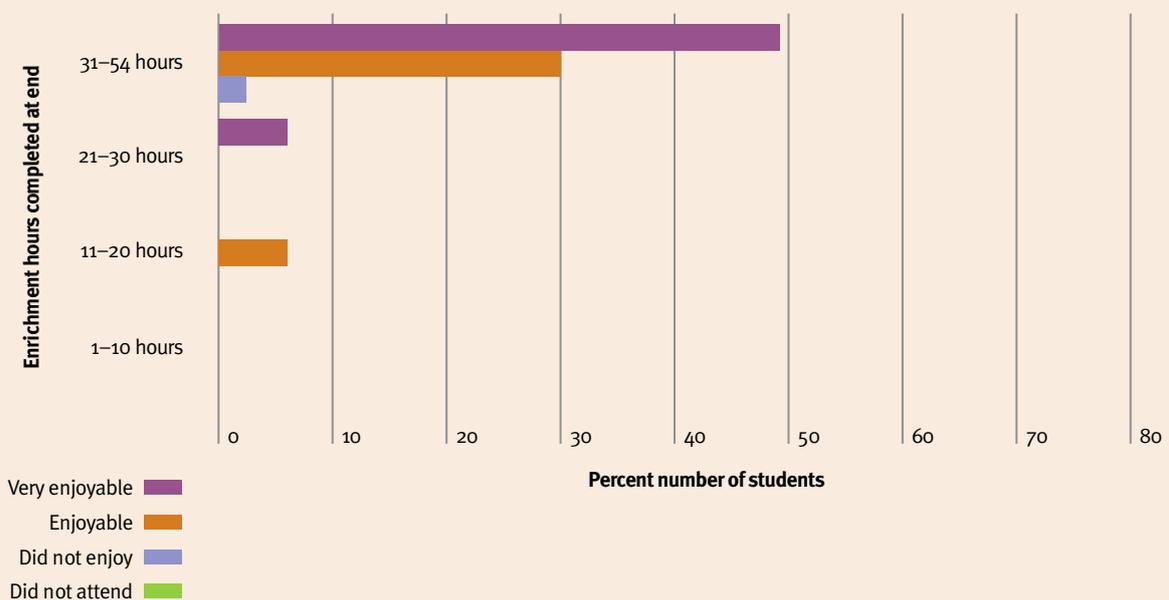
All footage obtained on the field trips was stored electronically on the college VLE and made collectively available for learners to develop their own resources. The completed projects were then to be uploaded onto the learners' own website.

### Outcomes and reactions

As well as an improvement in attendance patterns and retention, the post-project questionnaire clearly demonstrates a total shift in attitude towards enrichment.

Throughout the project learners enjoyed the activities, and although they felt there was a lot to do, they remained focused. Learners were actively engaged in discussions, comparing their work and taking pride in their achievements. They were eager to try out new, unfamiliar software including 'Picasa' and 'Movie Maker'. Overall they became quite adventurous in trying out and developing their skills with the use of the new technology.

### Post implementation results showing students engaging in more learning hours with more satisfaction



### Learners' reactions

There was consensus that the whole enrichment project was good fun and interesting:

*It was much more fun than just sitting at a computer, 'cause you're getting involved.*

*The PSPs helped make it more fun.*

*Give me a PSP next year please.*



### Teachers' reactions

The use of PSPs in enrichment activities had great benefits for the students. They were able to use them to document pictures and videos witnessed at the zoo. They were more motivated about the tasks that they were given as they were able to record what they had seen and were focused on looking for certain animal traits.

PSPs were also very useful for the staff, who were trained on how to use them and how they could be used to help with teaching. Related software was also added to their computers and they were shown how this could complement the devices and other software they were already using.

### Managers' reactions

The groups were exceptionally well behaved and were very enthusiastic while participating in all the activities. Learners appeared to be more task focused, particularly during the visits, and very eager to show off their acquisitions. They frequently asked questions about the types of animals and animal behaviours they had observed, the various types of accommodation and the variety of animal enrichment they had encountered on the field trip. The learners obtained a huge amount of footage, which will be useful for a variety of purposes including assignment work and key skills, as well as the enrichment project on the student website.

All members of staff enjoyed the activities. One member of staff, in particular, who had no previous experience of using a PSP and could be considered technophobic, became very proficient in its use by the end of the field trip and was identifying several ways in which m-learning could be incorporated into other sessions.

The project has enabled development of a much more coherent enrichment programme, which meets the needs and expectations of the learners.

### Lessons learned

Although learners were delighted to have the opportunity to use the devices, they did have some concerns about responsibility for such expensive devices, and showed some reluctance to use them for fear of damage, loss or theft. Some learners were also concerned about being targeted if they used such expensive devices in public places or on public transport. They suggested that some form of cheap insurance scheme be set up, which they could buy into.

### Next steps

- Continue to increase the resource base on the college VLE.
- Continue to develop the student website as a resource.
- Use handheld devices as an aid to introduce internationalisation into enrichment through global networks/partnerships.
- Incorporate handheld technologies into lesson-planning and schemes of work.

## PSP potential

### Accrington and Rossendale College teaching and learning snapshot: Academic year 2008/09

Entry level learners enjoyed using PSPs for videoing because they found them big enough to be held with two hands for steadiness. When they were given digital cameras they struggled and many quickly lost interest, but the PSPs were very popular and there appeared to be a certain kudos associated with their use.

Connection to the internet meant that the PSPs could be used to access the VLE but this was only done in a limited way. Staff have looked at developing the use of the PSP next year, using the Skype function so that learners can communicate with each other. There is huge potential for engaging and motivating learners by using the PSP in this way, and again the process was thought to be much easier for this level of learner than with other devices such as the Nokia and Arcos tablets.

Skype could be used on and off site with learners who are on courses outside college. For example, the learners who come to the college through the traveller community could be encouraged to use PSPs with Skype to develop links with learners at the college which might encourage them to consider moving into courses on the main site.

# Supporting English as a second or other language (ESOL) learners

## Handheld technology in an ESOL classroom – using the Nintendo DS Lite

**The Sheffield College: Academic year 2008/09**

### Introduction

The Sheffield College is an FE college offering a range of specialist vocational courses, plus a programme of general education including skills for life and ESOL.

Modern technology is imposing itself in classroom teaching and learning, which offers a constructive opportunity to stimulate learning pace and to work towards more learner autonomy. This will help the practitioner to move towards the role of facilitator.

### Aims

The aim was to explore whether using handheld games devices would be useful to:

- improve literacy skills
- assess literacy skills
- engage ESOL learners, especially those in the 14–19 year-old age group
- improve learner confidence and autonomy

It was hoped that introducing technology to learners who were already technologically minded would stimulate and engage them, and help develop and reinforce their language skills.

### Addressing the challenge

Nintendo DS Lites were used with different learners at different levels at different times. There were seven groups, and each group tried the consoles for three sessions. The sessions were planned to focus on developing learners' accuracy in reading aloud, punctuation, spelling, capitalisation, abbreviations and use of tenses.

The first stage was to give learners time to become comfortable with the equipment. This was done by using the 'Dr Kawashima's Brain Training' games (to check their 'brain age') and numeracy games.

The next step was to explore how to use the 'PictoChat' function to develop literacy skills. 'PictoChat' is a program built into the Nintendo DS, which allows users to text chat with up to 16 other users via the system-to-system Wi-Fi built into the handheld device. The 'PictoChat' tool was used as follows:

- crazy dictation: a short piece was dictated or read to the learners – usually just a sentence – and the person who could accurately text the sentence to the tutor was the winner
- crosswords: the learners were asked to complete crosswords on the BBC Skillswise website but not allowed to verbally ask any questions of the tutor. The tutor only responded to questions that were posed via 'PictoChat', and he responded via 'PictoChat', thus providing an opportunity for learners to practise both their writing and reading skills.



*I think using this sort of technology promotes learning because my brain gets a bit lazy sometimes.*



*I like using this technology since it improves my memory.*

## Outcomes and reactions

### Learners' reactions

Learners engaged with the activities enthusiastically and did not need too much support with them. The Nintendos were therefore useful in encouraging autonomous learning and providing learners with a different kind of learning experience. Overall all the learners enjoyed the initiative. They appreciated the fact that the tutor wanted to explore new avenues for learning. Younger students were generally more positive than adult learners as the older learners would have preferred to use specific literacy games on the DS, had they been available.

### Teacher's reaction

The tutor felt that the Nintendo DS was a very good resource provided that there was a choice of games. He felt that with a range of games it would be possible to incorporate Nintendo use in a variety of lessons, for example providing the opportunity for skills practise and reinforcement. The tutor felt that the DSs really enabled the learners to become the centre of their own learning experience and that the 'PictoChat' function made sometimes fairly dry literacy exercises fun and interactive:

*Learners loved it to the point of rejecting their 15-minute break!*

The tutor also pointed out that the language market was a large one, and so hoped that more games would be developed to teach, for example, the different types of writing, such as layouts for report-writing, formal and informal writing.

The tutor also felt that using Nintendos made good economic sense, and may also contribute to protecting the environment since the amount of paper-based learner activities could be decreased. This would also decrease the amount of printer ink used.

### Manager's reaction

Nintendos as a teaching aid have proven very successful across a range of curriculum areas including ESOL, literacy, numeracy, childcare, health and social care, and animal care. The success of the project has been in driving forward a mobile learning strategy that is embedded into the college ILT strategy. We can now advise curriculum teams as to best usage, software and how to introduce technology into their teaching.

### Lessons learned

Games consoles can:

- help to embed literacy, numeracy and ICT skills into the subject you teach
- introduce learners to interactive content
- encourage kinaesthetic learning
- encourage visual learning
- create awareness about ways to engage learners
- give instant feedback
- encourage autonomy
- help with varying pace of learning
- provide differentiation



*By doing similar activities, learners can turn this opportunity to their advantage – to learn better, and I recommend it to all learners.*



*Using brain training is going to sustain my progress and hopefully improve my learning pace.*

**Tips from the tutor:**

- Purchase a good range of software. When the tutor was using the games, there were no games available specifically for literacy development, so using 'PictoChat' creatively was a partial solution to this.
- Introduce the devices in a positive way, and you will get a good response from learners.
- The tutor tried to connect the Nintendos to the interactive white board, but could not get it to work. It would have been great to see the display of answers on the board instead of just on the device.



*Using games is an exciting way to learn while having fun.*

**Next steps**

With more choice of games next year it will be possible to embed a device activity or two for each curriculum point.

**Links**

PictoChat: <http://en.wikipedia.org/wiki/PictoChat>

BBC Skillswise: <http://www.bbc.co.uk/skillswise>

## Trips and excursions with the PSPs

### Tower Hamlets College teaching and learning snapshot: Academic year 2007/08

All the devices were used in a variety of Skills for Life ESOL areas: on site, off-site, in the classroom, in ICT classrooms and on visits and trips. The PSPs provided learners with an extra resource to use during trips and excursions and to record and reflect on their experiences. They particularly enjoyed the arcade quality resolution of the images and widescreen format of the PSP screen. This had a positive impact on students actually examining, discussing and evaluating pictures, etc, while on their trip, which is often not done due to poor quality of playback screens.

*I used the photos and video clips to discuss the trip afterwards in class. We practised the past simple tense and got students to write down their own experience using the visual stimuli. The students were more enthusiastic in doing the task as a result.*

Tower Hamlets is developing links with several museums and hopes to build on the existing good practice in this area. The National Maritime Museum approached the college to establish more direct links between the two organisations.

*We are developing links with the Petrie museum and I can't wait to show them what the students have done with the PSP photos.*

# Supporting literacy, numeracy and mathematics learning

## How does the use of a handheld games device with maths software affect learner understanding of multiplication tables?

**Ealing, Hammersmith and West London College – Foundation & Pre-Entry Division: Academic year 2008/09**

### Introduction

Nintendo DS Lites and 'Professor Kageyama's Maths Training – The Hundred Cell Calculation Method' were used with four classes of learners as follows:

- BTEC Introductory Diploma in IT@Work level 1 (ESOL group) – 19 learners
- BTEC Introductory Diploma in IT@Work level 1 – 7 learners
- BTEC Introductory Diploma in science level 1 – 8 learners
- BTEC Introductory Diploma in health & social care (ESOL) – 16 learners



### Aims

It was hoped that the Nintendo DS games would provide a tool for learners to assess their own multiplication knowledge and motivate them to continue to practise and assess this skill regularly.

### Addressing the challenge

Led by their key skills application of number (AoN) lecturer, all groups followed a six-week programme.

**Week 1:** An initial assessment established where the individuals were with their multiplication tables. Learners were given a CD-ROM or MP3 player onto which the multiplication tables were recorded to a rhythmic tune. They were required to listen and memorise no more than one multiplication table over two days.

**Week 2:** The games devices and ‘Professor Kageyama’s Maths Training’ were introduced to the learners in their AoN lessons. The learners had the opportunity to play with the device in the lesson. They were also told the aims and objectives of the project, which were to continue listening to the CD-ROM and then self-assess for at least 10 minutes every day using the DS.

**Weeks 3–6:** Over this period the learners were encouraged to use the device outside the classroom. Groups 1–3 were tested before and afterwards. Group 4 were tested by their lecturer at weeks 3, 6 and even on to week 9. The learners were tested using a paper-based method. All lecturers incorporated the device in some of their AoN lessons alongside the delivery of the key skills syllabus.

### Outcomes and reactions

The CD-ROM provided the teaching tool and the learners used the Nintendo DS game to test themselves using repetitive practice and out-of-sequence testing. The DS provided learners with a more enjoyable way to assess their learning, which in turn could help motivate them to check their progress and practise their times tables more often. It was hoped that with this self-assessment mechanism, learners would be able to recognise where they needed to use the CD-ROM more to learn their times tables and thus make greater improvements. In many cases the use of the device seemed to improve test results, but it was crucial that it was used in conjunction with the rote-learning CD-ROM as learners who failed to keep this up showed little or no progress.



For group 1, following their key skills exam, it was decided that only learners who had not passed the exam would continue to use the DS. In hindsight this was not a good idea because it reduced the learners’ self esteem in front of their peers. This may also have been why some learners showed little enthusiasm about taking the device home for use outside the classroom.

In the other groups, however, lecturers reported a noticeable improvement in learner response times for learners who had previously struggled with mental arithmetic or paper-based multiplication tests. For group 4, where the Nintendo DS was given to the whole group at the beginning of their course, three months before they sat their AoN exam, results were very positive. The group consisted mainly of females; they were all from an ESOL background and studying health and social care. Over the nine weeks of the project the lecturer commented on the huge difference in overall motivation and confidence. He found that students’ performance improved overall and all learners spoke of increased enjoyment of maths lessons. The learners took ownership of the pace of their independent learning and there was positive peer pressure in the form of the group comparing scores when self-testing using the software.

*I use it every time I’m bored and in my free time.*

*It helped me with my course and how to use it to multiply.*

*It helped me with my course and how to do different kinds of maths.*

All the learners who completed the online questionnaire felt that the Nintendo DS had been a useful addition to their college education, although about half felt that they still needed further help with using it.

The three lecturers involved fully embraced the concept of the project as they saw the opportunity for their learners to practise their multiplication tables outside their timetabled maths lesson. They were happy to keep a record of their learners' progress and incorporate the use of the device into their lesson plans. There has also been sharing of good practice as other AoN lecturers have looked at incorporating the use of the devices into their lessons.

### Lessons learned

- Playing the same game over a number of weeks can become repetitive and learners may lose interest.
- Give learners the opportunity to rote learn their times table before giving them the games console.
- Succinct testing before and after can help to determine the impact of the DS games on the learners' knowledge.
- Collect feedback from the learners to check how they are progressing and to reinforce the use of the device.
- Be aware of any limitations the software may have. For example, 'Professor Kageyama's Maths Training – The Hundred Cell Calculation Method', uses quick-fire questions for assessment purposes but does not actually teach the learner how to learn their multiplication tables.

### Links

Teacher feedback: <http://www.moletv.org.uk/watch.aspx?v=80PWJ>

Learner feedback: <http://www.moletv.org.uk/watch.aspx?v=PCV3Y>

## Supporting numeracy and literacy with the Nintendo DS

### Cornwall Consortium: Academic year 2007/08

#### Introduction and aims

'Dr Kawashima's Brain Training' games on the Nintendo DS were used with classes of students with moderate or significant numeracy and literacy development needs. The aim was to support them to develop their numeracy and literacy skills in an engaging way.

#### Addressing the challenge

The Nintendo DS devices were used as rewards, in study breaks and also as an activity for a lunchtime club.

#### Outcomes and reactions

Benefits for the teachers and learners included the following:

- Learners felt that the handheld devices made learning more fun.
- The handheld devices allowed learners to work in privacy.

- Teachers believed that, when doing well, learners were more engaged, and low-level learners in particular experienced a boost in confidence when completing ‘Dr Kawashima’s Brain Training’ tasks.
- The use of the Nintendo DS, including as a reward, improved learner motivation to complete set tasks.
- Learner performance in literacy and numeracy improved.
- The device supported assessment.
- A Nintendo DS club set up at lunchtime provided extra learning opportunities for students and was so popular that the students were queuing to get in.



### Teachers' reactions

*The use of the Nintendo DS with ‘Dr Kawashima’s Brain Training’ removed the stigma of a maths lesson with generally disengaged learners. It improved the learners’ performance and memory of basic mental arithmetic. It also allowed basic arithmetic to (be) practised and improved without them becoming disengaged after a short period of time due to boredom...*

Sam Rookes, Cornwall College

*Learners did not realise they were being assessed and so felt no pressure...*

Vicky Cox, Cornwall College

*Students have given feedback to the teacher that they feel it has helped with their maths and motivation. They recognised that their maths was improving and they were focusing more easily. Some pupils recognised that their handwriting was improving.*

Fowey Community College

*The students are very enthusiastic to use the devices. Motivation and engagement was evidently improved – one particular student that was notoriously difficult to get homework out of improved considerably with the introduction of the devices.*

Fowey Community College

### Lessons learned

Although learners with significant development needs experienced boosts in confidence when they were progressing well with the ‘Brain Training’ games, they quickly lost that new-found confidence when they did not progress as well as they had hoped. According to tutors, problems for these learners included the fact that the device did not always recognise their spoken or written answer, even when correct, because of their speech impediment or poor handwriting. This often led to frustration and disengagement, and feedback indicated that they did not enjoy the experience as a result.

## The impact of the Nintendo DS on students studying functional and GCSE maths

### The Sheffield College: Academic year 2008/09

#### Introduction and aims

Following an email from a colleague, Estelle Edwardson, teacher of mathematics and functional skills, read a very encouraging article about the use of the Nintendo DS with learners in Scotland. This article convinced her that the Nintendo DS could help her learners improve their mental maths skills and boost their confidence, which in turn may make a real difference in terms of achievement.

*I really wanted this group to achieve level 2 functional skills and they're an IT group so they like technology and I thought they were an ideal group to use it with.*



#### Addressing the challenge

The Nintendo DSs with ‘Professor Kageyama’s Maths Training’ were used as a fun activity to improve learners’ mental recall and basic maths skills. They were lent to students on a long-term loan so that the students were able to use them while they were on the move and also at home as a kind of extended form of homework.

*They didn't really feel it was homework because it was a game.*

### Outcomes and reactions

One particular learner explained that ‘Professor Kageyama’s Maths Training’ on the Nintendo DS had improved his maths skills and the speed at which he can complete maths tasks. In particular, he had struggled with his times tables in the past but feels that the Nintendo DS really helped him with this. He explained that he felt more confident going into his exam and that if he had received the Nintendo DS at the beginning of the year this would have increased his confidence even further. He likes the flexibility of playing on the Nintendo DS anywhere he chooses and says it’s particularly motivating for short bursts of challenging game play. He likes the fact that it is more interactive than other teaching styles and online educational games, and says

*It makes you carry on doing the work...trying to answer the questions.*

### Next steps

Estelle believes that the Nintendo DS will have a major and measurable impact on maths teaching and learning in the next academic year as it will be used from the beginning of the year and can be integrated into schemes of work. She hopes to get some ideas from others about the different games available and ways in which the DS can be used to encourage innovative teaching and learning. Estelle feels that the great thing about the Nintendo DS is its power to engage:

*If you gave the students worksheets or even games like dominoes to take home to practise their maths, they wouldn’t do it. But the Nintendo DS is just addictive so really motivates them to learn.*

## The impact of the Nintendo DS with maths training games on the teaching and learning of maths

### Wirral Metropolitan College: Academic year 2008/09

#### Introduction and aims

In the quest for resources that can engage and motivate a group of 11 learners with a range of disabilities, Nintendo DSs with ‘Professor Kageyama’s Maths Training’ games have been used in the maths class. These games have activities that not only engage and motivate learners but also enable them to aspire to excellence.

#### Addressing the challenge

The learners are enrolled on the Wirral Jobs Project, which is an employment preparation programme for adults with disabilities. The Nintendo DSs were used in the maths class in several ways to include every learner: as a starter activity to get learners focused and ready to learn, and as an extension activity to keep them captivated because they all enjoyed using it. The activities in the games are differentiated so every learner is included, each working at his or her level.

#### Outcomes and reactions

The learners found it easy to use the Nintendo DS because most of them have already played on one at home. They stayed focused and engaged until the end of each activity because the answer to each question had to be written within a specified amount of time, with no time for any distraction. They have learned and consolidated very good mathematical skills, such as column addition and

subtraction, mental maths, multiplication of two-digit number by two-digit number, etc. The instant feedback at completion of each task meant they all were all motivated to get 100% and move on to the next level. This has both enhanced their mathematical skills and built their confidence and self-esteem.

The learners are continuing to explore other mathematical skills using the Nintendo DS with the 'Professor Kageyama's Maths Training' games.

### Lessons learned

- The Nintendo DS with 'Professor Kageyama's Maths Training' games is a useful device that engages learners and makes learning maths enjoyable.
- It builds up learners' confidence and self-esteem.
- It provides a range of teaching and learning strategies that can be used to meet individual learners' needs.
- It should be used by maths tutors to captivate learners who are struggling with maths, especially at entry level and level 1.



## Using DS Lites to support key skills

### The Oldham College: Academic year 2008/09

#### Introduction

As part of the implementing Personalised Accessible Learning (iPAL) Project, The Oldham College and Bolton Community College aimed to create a more sustainable mobile learning culture to enhance participation, collaboration and success. The objective was to make learning more fun and engaging by using the DS Lite and related software to support functional skills learners.

#### Aims

To improve key skills and improve usage of handheld technology across the college.

#### Addressing the challenge

During the project there was a 'Dr Kawashima's Brain Training' competition for the media groups, with a 'leader chart' put up at the end of the sessions. All groups used the DS Lites with practice tests and they were also used as an incentive for learning, especially for construction learners, to bring a fun element to 'stale' sessions.

#### Outcomes and reactions

- Tutorial sessions became more fun for the students.
- The impact on key skills was difficult to assess, but learners generally felt the DS Lite training boosted their confidence.
- Tutors noted that learners became focused more quickly.
- While the 'Dr Kawashima's Brain Training' competition was in progress, involvement and achievement were promoted and attendance improved substantially.

#### Learners' reactions

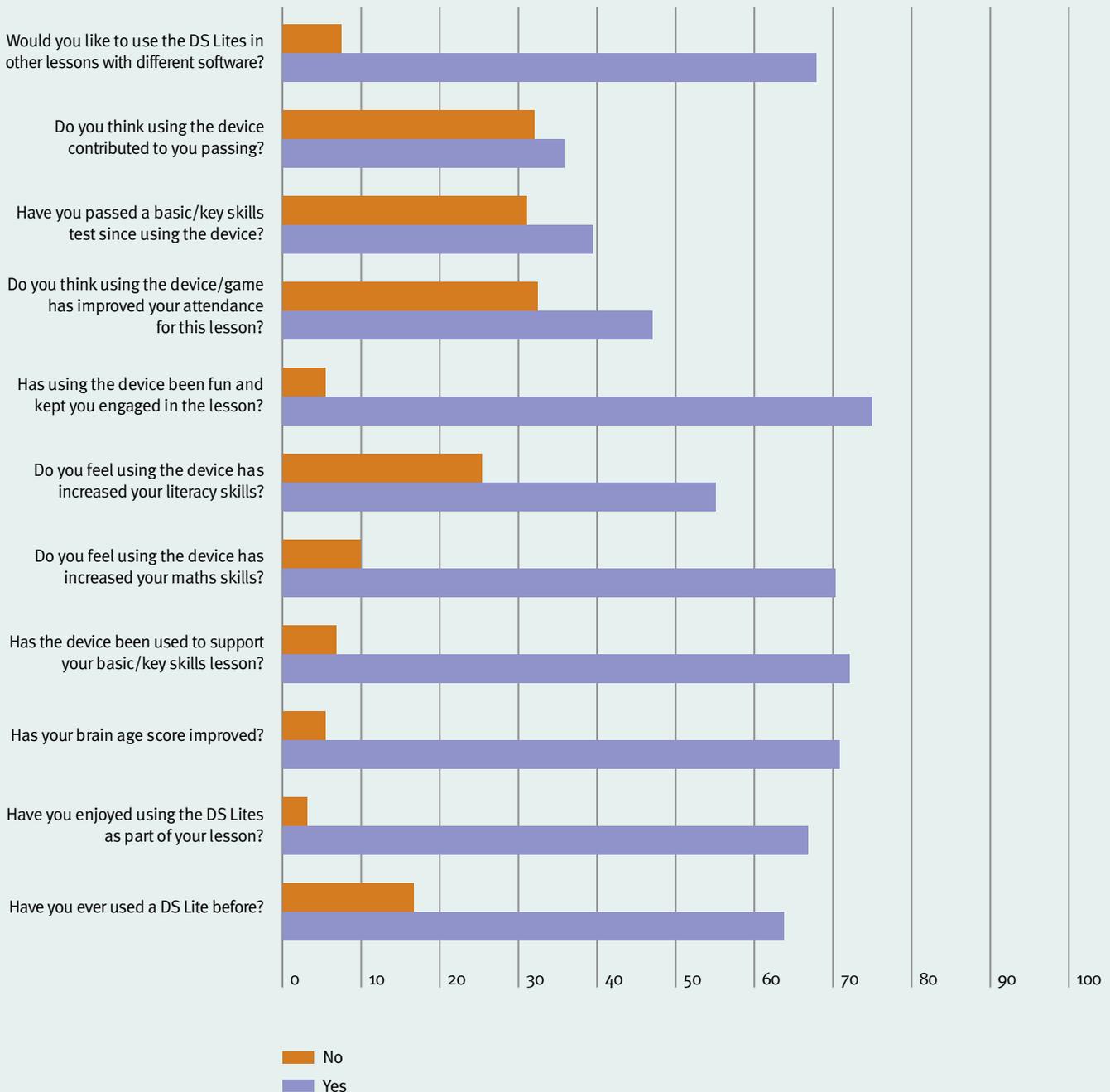
Learners were generally happy to be working with new technology; they found it gave their tutorial and class time a more dynamic edge. Some learners were less enthusiastic than others, perhaps because they were over-familiar with the DS Lites and similar technology, but most were keen to use the devices in class, and not deterred by the educational slant of the content. Comments from learners included:

*Yeah, let me know about that feedback podcast thingy. I'd be well up for it.*

*Makes you want to come in for key skills.*

Construction students said it increased their maths skills in the areas that were covered by the device.

### DS Lite survey result



### Teachers' reactions

Teachers' reactions were generally positive. They were eager to embrace new technology for the benefit of the learner and willing to take risks and try something new:

*I'm a cynic and if I think something won't work and won't benefit us and the students, I'll say ... teaching and learning has to be modern and evolving, and I think this will work.*

*It doesn't really matter if the students don't see how the 'Brain Training' is helping them learn, as long as they are. In fact it might make it more exciting for them.*

*The DS Lites will be good for 'rewarding' the learners at the end of a lesson.*

*Try taking them off me! (Referring to DS Lites)*

### Managers' reactions

SMT and managers have given the project their complete backing and support. They have responded to staff requests and purchased extra equipment in some subject areas to continue the good work.

### Lessons learned

- Make sure students are fully briefed before giving them devices – they tend not to listen as well once the devices are in their possession!
- Support staff in developing and obtaining content to ensure maximum usage.
- Use the same games (e.g. 'Dr Kawashima's Brain Training' and 'Dr Kawashima's More Brain Training') for everyone, rather than different ones for different learners.
- Using the devices at the beginning of a lesson sometimes made it harder for learners to concentrate afterwards.

### Next steps

Use of the devices will be included in staff development sessions.

### Links

For videos of teacher and learner reactions go to MoLeTV and search using keyword 'oldham'.

## Using the Nintendo DS in combination with the Senteo Voting System for a literacy quiz

**Northampton College: Academic year 2008/09**

### Introduction

The Entry to Employment (E2E) initiative is aimed at 16–19 year olds looking for full-time employment or wanting to progress to FE courses. E2E works with learners of varying abilities (from entry-level 2 to level 2). The programme has three core strands: basic and key skills, personal and social development, and vocational development, and learners work towards these strands in a 16-hour weekly programme.

During this case study, learners were working towards developing their literacy levels for the key skills communication level 1 examination. Before they used the 'Senteo Voting System' learners were preparing for this via written mock tests or PowerPoint quizzes, using individual whiteboards to display their answers.

### Aims

The intended outcomes of the session were to improve levels of learner engagement by introducing new and emerging technologies and to develop effective ways to monitor learner assessments.

### **Addressing the challenge**

The learners were split into two teams and completed a 40-question quiz, using the interactive whiteboard and the 'Senteo Voting System'. After 10 questions, three team-mates from each team were asked to complete an individual team challenge using the 'Dr Kawashima's Brain Training' games on the Nintendo DSs. The best result gained 10 bonus points for their team. At the end of the quiz the results were clearly displayed to the group, and the overall winner and winning team were announced.

### **Outcomes and reactions**

The session allowed learners to complete a literacy assessment in an interesting and engaging way. The use of the 'Senteo Voting System' and the Nintendo DSs maintained levels of learner engagement and the overall test results improved. This may have been because learners remained motivated and further supported by the friendly competitiveness of the quiz and the team challenges using the Nintendos. Team-building, communication skills, learner self-esteem and ICT skills also improved and learners were better behaved.

Success rates for the key skills course showed improvement and an Ofsted inspection highlighted the positive use of new technologies and good levels of learner engagement.

### **Learners' reactions**

Learners had to complete an evaluation at the end of the session and most learners enjoyed the session, marking it 9 or 10 out of 10.

### **Teacher's reaction**

The teacher felt that the devices were simple to use and the learner results easy to monitor; it was clear which learners had answered the questions and which were left to complete.

### **Lessons learned**

It is advisable for teaching staff to practise using the 'Senteo Voting System' before using it in the classroom, as the technology does take a while to set up.

### **Next steps**

This session has now been included in the key skills schemes of work for literacy, numeracy and ICT as a new method for exam preparation.

## **We're playing a game...**

### **Gloucestershire College: Academic year 2008/09**

#### **Introduction**

Gloucestershire College is one of the largest FE colleges in the UK, offering a wide range of education and training programmes. The college has undertaken two MoLeNET projects; the Glossy project and the Shiny project, and is now on its third: the Sparkly project.

## Aims

Engaging learners with activities that improve their numeracy and literacy can be a challenge for many practitioners. Staff from Gloucestershire College looked at work done by Learning and Teaching Scotland, using ‘Dr Kawashima’s Brain Training’ games on the Nintendo DS, which found that ‘a small, cleverly designed handheld game can significantly enhance learner performance in mental maths as well as having a positive impact on other aspects of classroom life’. Despite research from the University of Rennes, Brittany, which concluded that ‘playing Scrabble or completing Sudoku puzzles is just as effective at improving mental sharpness as playing games such as ‘Dr Kawashima’s Brain Training’ on the Nintendo DS’, the college decided that their learners would probably prefer to use the Nintendo DS and would benefit from using ‘Dr Kawashima’s Brain Training’ games.

## Addressing the challenge

The college’s original plan was to get the Nintendo DS, but the pace of technological change and procurement problems resulted in the college getting the new Nintendo DSi. Unlike previous models, this has two cameras and a SD memory card slot.



## Outcomes and reactions

### Learners’ reactions

Following a MoLeNET training event, practitioners from motor vehicle engineering were very enthusiastic about using the Nintendo DSi with their learners, who enjoyed the practical and vocational aspects of their studies but often found the numeracy sessions more challenging. They started by using the Nintendo DSi, with ‘Dr Kawashima’s Brain Training’ games and saw an improvement in learners’ numeracy skills. Learners then also began to use the DSi camera to record evidence of their progress for their portfolios. A parallel trial was undertaken with health and social care students and similar results were achieved.

### Practitioners’ reactions

Encouraged by the learners, practitioners in motor vehicle started to use the DSs themselves to record images and video for presentations and for learning resources. Other curriculum teams in the college in similar vocational areas watched the project with interest and started to see how they could use the Nintendo DSi too.

### Lessons learned

- The Nintendo DSi, though designed and sold as a handheld games device, has the potential to enhance and enrich learning through the ‘Dr Kawashima’s Brain Training’ games and the dual cameras.
- Although the primary objective was to enhance numeracy and literacy, the added functionality of the DSi meant it could be used in other learning scenarios.
- Be prepared for unintended consequences as learners will often discover new and interesting ways in which the handheld device can be used.

### Next steps

The college is looking at other games for the DSi that can be used to enhance learning and teaching, including ‘100 Classic Book Collection’, ‘What’s Cooking? Jamie Oliver’ and ‘Cooking Guide: Can’t Decide What to Eat?’ The college also intends to make use of the Wi-Fi and chat functionality.

### Links

Learning and Teaching Scotland – ‘Dr Kawashima’s “Brain Training” – go to [www.ltscotland.org.uk](http://www.ltscotland.org.uk) and search for “dr kawashima”’.

## Numeracy uplift project: using Sony PSPs to support young people not in education, employment or training

**Matthew Boulton College: Academic year 2007/08**

### Introduction

Devices were chosen according to their perceived appropriateness for the groups involved. Games devices seemed appropriate for younger learners and the Sony PSP was chosen for the learners in this case study. It is a stable, sustainable and robust hardware device that provides great levels of accessibility through its wireless browser to deliver podcasting, VLEs and streaming video – all of which are used extensively within the college. The digital camera now allows self-authoring of video and audio, as well as video-conferencing from one PSP to another and connectivity to an interactive whiteboard.

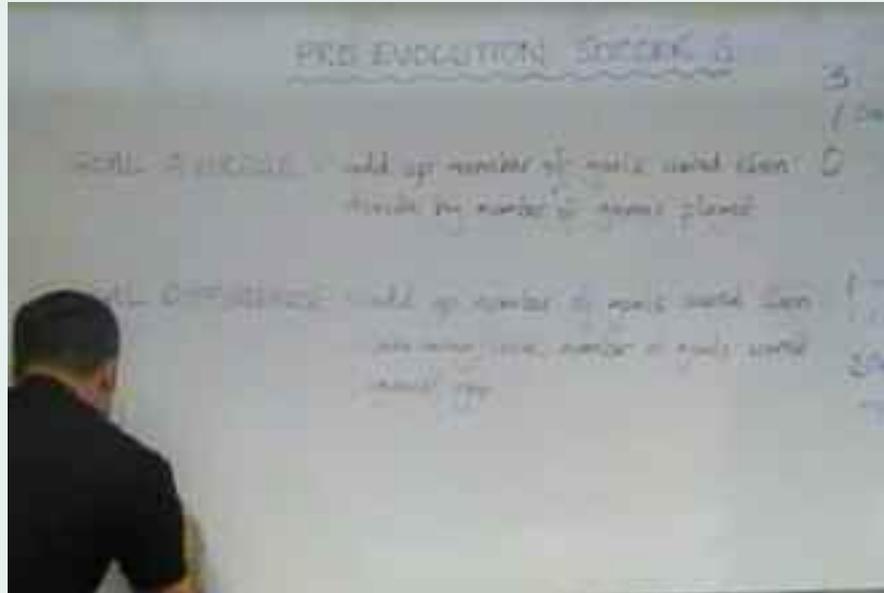
### Aims

Stephen Thorne led the ‘numeracy uplift project’ at Matthew Boulton College. The target group consisted mainly of young, working-class males classified as NEET. At the end of the course of eight sessions, it was hoped that learners would have improved not only their problem-solving and numeracy skills generally, but also their communication and interpersonal skills, their self-confidence and self-esteem, as well as their hand-eye co-ordination and appreciation of the capabilities of multimedia devices.

### Addressing the challenge

The PSP games used as part of the project included ‘Ridge Racer’, ‘Pro Evolution Soccer 5’ and ‘F1 Grand Prix’. All the learning outcomes were mapped across to the Adult Numeracy Core Curriculum (DfES 2001 [www.excellencegateway.org.uk/sflcurriculum](http://www.excellencegateway.org.uk/sflcurriculum)). Each session had specific numeracy aims and objectives, beginning with an introductory session focusing on the basics of PSP gaming and moving on to numeracy topics such as rounding numbers, addition and subtraction, ratio,

averages, range and probability. The format of these sessions was a mixture of traditional teaching methods, games playing, and evaluation of the results of the games. This was designed to make the problem-solving exercises more relevant to the learners and so increase active participation and learning.



### Outcomes and reactions

The project was very successful in improving attendance, attainment and achievement – in all three areas there was an unprecedented 100% success rate. There were also improvements in student behaviour and in engagement in the classroom activities.

This group consisted of 10 learners, and it is hoped that further future research with a larger cohort of learners will not only support these findings, but also reveal other benefits.

*The project was initially about improving recruitment and retention. The games themselves were fun for the students but they were also designed to test their numeracy skills. The project was successful and not only was retention increased but the students tended to be better behaved in the classroom.*

Stephen Thorne, Lecturer and Project Leader

*The use of PSPs has allowed a more personalised, individual learning experience, and the students seemed genuinely more engaged. We have invested in more equipment to support this initiative, and more tutors are now experimenting with using PSPs within their teaching and learning.*

Chris Evans, E-Learning Manager

### Lessons learned

- The Nintendo DS appears to be better supported by academic software than the PSP – though games similar to ‘Dr. Kawashima’s Brain Training’ are becoming available for the PSP.
- Do your homework when investing in software for a large quantity of machines. There is a bewildering choice in academic software, not to mention the sports simulations. ‘Platinum’ games are often a good choice and combine low cost with high quality.

- The NEET learners so far have been young men – but would a sports simulation appeal equally as much to females? A more diverse range of games would cater for a wider audience but would require higher investment both in cost and in lesson preparation time.
- Future proofing is difficult with any kind of technology and this is especially true in the new and dynamic world of handheld games devices. The PSP is, however, a sturdy machine and although a couple have been slightly damaged, they are all still fully functional.
- As well as games/applications being used effectively with NEET and other learners, the PSP has been used as a recording device (video and audio); as a research tool by accessing the internet and the VLE; as a storage device, and as a media platform for displaying podcasts and other curriculum resources in areas that have neither IT equipment nor wireless internet connectivity.

### **Next steps**

Due to the excellent results of the first year of the programme, using handheld games devices with NEET students will continue into the next academic year. The initial software consisted primarily of sports simulations such as football and car-racing games but recently, ‘Dr Kawashima’s Brain Training’ style games have also been successfully trialled by both this department and others – though currently the PSP is less well supported for this type of software than the Nintendo DS. Stephen is currently drawing up plans on how the Nintendo Wii and the Wii Fit will benefit his learners in the next academic year. The College recognises the potential that this project has uncovered and has invested in a further 50 PSPs to support this and other similar initiatives.

### **Links**

For the scheme of work used for the Numeracy Uplift project go to MoLeShare and search using keywords ‘numeracy uplift’.

# Supporting learners with learning difficulties and/or disabilities

## Measuring the effect of using the Nintendo DS to improve short-term memory skills

**Ashton Under Lyne Sixth Form College: Academic year 2008/09**

### Introduction

Many students with specific learning difficulties (SpLDs) have difficulties with their visual and auditory short-term memory skills. Using the Nintendo DS with 'Dr Kawashima's Brain Training' games, it was hoped these skills would improve. The Nintendo DS was chosen to introduce a 'fun' element to the learning programme. The students taking part in the project (20 females and 5 males) were selected on the basis that they attended weekly additional learning support sessions to help them manage their SpLD (usually dyslexia, dyspraxia or Asperger's syndrome). They were either on a level 2 course (four learners) or a level 3 course (twenty-one learners).

All the students taking part in the project had their short-term visual and auditory memory skills measured at the beginning of the project, part way through and at the end. This was done using the Turner and Ridsdale (1994) Digit Span test (a procedure to assess verbal memory difficulties) and the Smith (1973) Symbol Digit Modalities test (a visual symbol substitution test used to assess cerebral dysfunction). For more information see [www.dyslexiaaction.org.uk](http://www.dyslexiaaction.org.uk). The assessments were carried out by a qualified assessor of SpLDs. The scoring followed the standard scores used when assessing for SpLDs with the average being 100 and 15 points representing one standard deviation from the mean. Nine students used the handheld games devices, eight used paper-based memory activities and a further eight acted as the control. The students were randomly allocated to their group.



### Aims

The aim was to collect statistical data and anecdotal evidence that would demonstrate the value of using games technologies with students who have a specific learning difficulty. The focus of the activity was on improving short-term memory skills and thus improving self-esteem, retention, performance and assessment.

### Addressing the challenge

The learners had free access to the devices and were encouraged to use them at least five times a week. The choice of activities in 'Dr Kawashima's Brain Training' was left to the students to maintain their interest levels. The students also used the devices under supervised conditions each week as part of their support session.

### Outcomes and reactions

Re-testing at both the interim and final stages showed a substantial increase in short-term memory performance for those using the Nintendo DS. The level of increase was less at the final testing stage, probably because the students had had to return their devices to college two weeks before the final testing date. It will be interesting to see if those students who had access to the devices have achieved at or above their minimum target grades when the exam results are published.

### Learners' reactions

Evidence of the learners' reactions was gathered anecdotally and through a focus group. Comments included:

*I really enjoyed using the DS, especially the maths game.*

*I liked the game where you had to guess where the number went.*

*It does not seem like learning when you play the games on the Nintendo.*

*I'll be really interested to see if it improves my memory.*

All the learners took the project seriously and were committed to the practice sessions. They valued being trusted with the expensive equipment.

### Teachers' reactions

Two teachers were involved in the project. Both were open-minded from the outset as to the benefits of using the technology. Their comments included

*It will be interesting to see if the Nintendo group really do improve significantly more than the other groups.*

*Will any benefits be sustained in the longer term when the student is no longer using the equipment?*

### Manager's reaction

The head of the Additional Learning Support department was not directly involved in the project but did take an interest in the process and the findings. He stated:

*I think that the Nintendo DS could be a very exciting and motivating tool in improving the working memory of students. However, I would like to see what impact this has on the learners' qualifications when the results come out, to decide whether we can make effective use of the equipment on an on-going basis.*

### Lessons learned

Very few problems were encountered during the project except for an earlier than anticipated deadline for the return of the equipment. It meant that because of the dates of examination study leave, the final testing was carried out after the students had returned the devices, which may well have affected the final results. In future, the college intends to make sure that all dates are clear from the outset and that testing takes place well before the end of term or study leave periods.

### Next steps

There is a great deal of potential for future development of this sort of project. Ideas include extending the range of games used; increasing the number of students who have access to the devices; extending the loan period of the devices and writing our own games for the Nintendo to better match the needs of students who have a specific learning difficulty.

### Links

Video case study: [www.moletv.org.uk/watch.aspx?v=5ECKG](http://www.moletv.org.uk/watch.aspx?v=5ECKG)

## Using the Nintendo DS to support a child with autism

### St Anthony's School: Academic year 2008/09

#### Introduction

The learner in this case study has a diagnosis of autism with associated speech and language difficulties. He is in the Autistic Spectrum Disorder (ASD) department of 14 pupils, all with a diagnosis. The pupils have a key worker and there is a ratio of two pupils to one adult. This particular learner is a verbally able pupil who can read and write but has difficulties with social understanding. He is working within the P levels (towards level 1) and NC levels 1 and 2 for some subjects.

#### Aims

The learner in this case study finds taking turns and sharing things very difficult. He also lacks motivation to learn in certain tasks. It was hoped that using the Nintendo DS would help him to share his ideas and talk more without realising it.

#### Addressing the challenge

The device was used in two ways:

- to familiarise the pupil with the device as it stands, i.e. Nintendogs for free choice time (this was done specifically to allow him to get used to how it works but also as an incentive to complete paper activities set by the key worker that may be less motivating).
- to use 'PictoChat' to send messages backwards and forwards between the pupil and the key worker.

#### Outcomes and reactions

The learner was able to use the device successfully and independently for his free choice activity, taking care of the dog. He was also motivated to complete work and able to take turns with his key worker. The device also provoked interest from other pupils and so the peer cooperation, collaborative working, turn-taking, vocalisations and conversations were way beyond what we were expecting.

### Learner's reaction

The learner was able to use the device independently and with other peers or a key worker. He was highly motivated by the device and also seemed to develop more tolerance of some of the other pupils in the group after he had shared the 'PictoChat' with them.

*For work time I did maths on 'PictoChat' with my key worker. I learnt about harder numbers. For Nintendo dogs you can give the dog a bath and feed it.*

*You can practise how to do maths. You can use it to write down and "talk" to each other to take turns. It's sometimes fun.*



### Teacher's reaction

The key worker was highly motivated by the device and positive. She was keen to see if it could be used with other pupils: it could be built into a pupil's individual schedule of work on a daily basis to promote their self-esteem, confidence, turn-taking, conversational skills and independent working, depending on what the device was used for and when.

*The equipment is engaging and motivating. Pupils are keen to use it as it is something they are familiar with and associate with fun. The 'PictoChat' option can be used to develop turn-taking skills and co-operative and collaborative working.*

*Very motivating and easy to use.*

### Managers' reactions

Management were enthusiastic about the great progress being made using handheld games devices.

### Lessons learned

The dog game needs a quiet setting and so can be difficult to use if the environment is busy. Pupils can become possessive over the equipment, although this also means they learn about waiting their turn and sharing. Pupils can become so engrossed in the Nintendo DS that they find it difficult to switch off and return to more traditional learning methods. The device, however, does support concentration skills.

### Next steps

- Continue to build it into the learner's individual programme to develop his turn-taking and conversational skills.
- Build in more devices to work more collaboratively with peers.
- Investigate using the device in other ways to promote specific areas of learning for pupils on the autistic spectrum.

## Supporting therapy routines through the use of the Nintendo Wii



### Gloucestershire and National Star Colleges: Academic year 2007/08

#### Introduction

Gloucestershire and National Star Colleges were partners in a project in the first year of MoLeNET with each college focusing on local priorities and target groups. National Star College, a specialist college that caters for learners with learning difficulties and/or disabilities, addressed in particular the problem of young learners avoiding and therefore not benefiting from physiotherapy sessions which they considered to be boring.

#### Aims

The aim was to use the Nintendo DS and Nintendo Wii to allow learners to continue learning and therapy routines in their own residences or around the college campus.

#### Addressing the challenge

Physiotherapists researched the use of both the handheld Wii and the Wii board for specific therapy routines and supported students in the use of these tools to enhance their physiotherapy sessions.

#### Outcomes and reactions

The development of games devices such as the Nintendo Wii has had a significant impact on the work of physiotherapists. Students have been able to voluntarily coordinate movements in response to the onscreen games, where previously limb movement would have been prompted by the physical action of the therapist. One student used a downhill skiing game by sitting on a Wii board and voluntarily rotating his torso to navigate down a slalom route on screen. He was able to practise this routine regularly in his own room outside the therapy sessions and when he returned home in the holidays. This sustained the therapy, was enjoyable for the student and because it was a game, his response times and level of accuracy could be measured over time.

#### Lessons learned

It is important to develop and establish structured plans for the use of the Wii, as learners might not always choose to play the game that is appropriate for their physiotherapy needs. For example, they might choose a game that they particularly enjoy, but which helps gross motor control, when actually they need to work on fine motor control.

#### Links

Video clip of Wii use in physiotherapy: [www.moletv.org.uk/watch.aspx?v=UWRAE](http://www.moletv.org.uk/watch.aspx?v=UWRAE)

## Using the Nintendo Wii as a physiotherapy tool

### Regent Consortium teaching and learning snapshot: Academic year 2007/08

A decision was made to use the Nintendo Wii with learners who had learning difficulties and/or disabilities. Many of these students were pre-level 1 and studying entry-level qualifications such as the Challenge programme. Many had care assistants and support workers, whose views were paramount in ensuring that any use of the equipment strictly adhered to the individual parameters of the learners' stated capabilities.

Once started the learners clearly enjoyed the experience and were allowed to borrow the equipment to take home (with parental permission). Students who were normally reluctant to take part in a class were enthused. Teachers and care assistants stated that the independence and self-esteem of many of the students improved and there was a waiting list for the equipment. Since the project began, another Nintendo Wii has been bought to keep up with demand. One student claimed it was the best physiotherapy ever!

## Wii Fit for students with learning difficulties and/or disabilities

### Trafford College: Academic year 2008/09

#### Introduction

This case study describes part of a wider MoLeNET project that enabled a wide range of learners to benefit from handheld technology/games technology across the college. The main aims of the project were to provide mobile learning for Train to Gain, work-based learning and teacher education students. However, an opportunity arose for an unexpected use of games technologies within the Supported Learning Department (SLD). For this extended element of the project, we were keen to engage with learners with learning difficulties and/or disabilities and to provide opportunities for enrichment that would also benefit their confidence and health.

#### Aims

The aim was to provide accessible and enjoyable physical activities that could be carried out in a safe and familiar environment, i.e. the students' base room. It was envisaged that using new technologies (the Wii Fit) would enable learners to enhance their balance and coordination skills and improve their physical mobility, and thus lead to greater levels of confidence.

#### Addressing the challenge

Two Wii machines were set up in the students' base room so that learners could drop in during their lunch break. The machines were set up and maintained by the sectional technician, and teachers staffed the room on a rota. An average of 15–20 students dropped in each day.

#### Outcomes and reactions

Early use of the devices has exceeded the team's expectations, both in physical improvement for the learners and in social communication and student esteem.

Students had been aware from media advertising that the Wii Fit, endorsed by celebrities, was currently popular, and they were excited to be part of this 'mainstream' cultural lifestyle choice. It also provided them with a new topic of conversation both in college and at home.

One unexpected outcome of the project was improved communication and social support within peer groups. This emerged within the sessions, and continued outside, both in classes and in social situations.

One important aspect of the use of the devices was the chance for students to make personal choices about their type of activity. Previously, group physical exercise was predetermined by practical resources but the Wii provided the opportunity for students to experience a range of games and sports (including new areas), enabling informed individual choice, including gender-specific and personal preferences. The software enabled these personal choices to be quickly and easily fulfilled, as each learner took their turn. Behavioural protocols associated with turn-taking also improved, as learners anticipated their turn.

The ability to try a range of different sports/leisure activities linked well to the curriculum as part of the students' life skills programmes, in that they could try new 'virtual' activities in a 'safe' environment for possible future exploration in the 'real' world; for example, the skiing activity could link with a visit to the Chill Factor ski centre.

### Learners' reactions

The use of the Wii Fit created a real buzz among the students; they quickly gained confidence and were willing and excited to try something that was new. They were also enthused to be part of something that they recognised was very 'current', and which they might not have got an opportunity to try outside of college. They quickly gained a real sense of achievement, and wanted to share their excitement and pride with their peers and staff. This was reinforced by a visit from the college marketing team, who completed an article for the college magazine.

### Teachers' reactions

Teachers were as enthused as the students about the new technology. Some had had previous experience of using the Wii, and they were able to cascade that knowledge to other teachers. Teachers in other departments are also now curious, and teachers within the Supported Learning Department are now more confident about training others as part of the college continuing professional development (CPD) programme, exploring opportunities pertinent to other departments.

### Managers' reactions

Principal Sir Bill Moorcroft stated

*This is an exciting development for our Supported Learning students, and the Trafford College leadership team are delighted that our students and staff have the opportunity to engage in such an innovative project.*

### Lessons learned

Initially only one machine was set up in the base room, but demand outstripped supply, and some students had to wait a little too long. Two machines in the same room has been much more effective.

When we first bought the Wii, we only had the basic two handsets, however we have since purchased a further six handsets, which means that two groups of four can play simultaneously on some of the games packages.

### Next steps

We are keen to explore new possibilities that are available as part of the Wii Mii: the creation of students' personal avatars. Students have created their own Wii Mii image, which in some cases is an external expression of internal desires or conflicts that had not previously been recognised. This software has provided the opportunity to further explore issues of citizenship, stereotypes, cultural values and personal desires through tutorial processes.

### Links

For a video of students using the Wii Fit go to [www.moletv.org.uk](http://www.moletv.org.uk) and search using the keyword 'Wii'.

## The PSP Go!Cam

### Gloucestershire Consortium teaching and learning snapshot: Academic year 2007/08

In order to capture video and audio podcasts, various pieces of equipment were purchased to see which worked well with staff and learners. The most successful was the PSP camera; a 1.3MP USB camera that sits on top of the PSP. Although technically inferior to most modern digital cameras, it captured the imagination of both staff and learners.

It was used to view photos of landmarks to support learners with learning difficulties and disabilities with independent travel, and for instructional videos to help them to learn daily routines. Both staff and learners found it useful to be able to take resources between different sessions. Some were loaded onto PSPs, among other devices, and some transferred from the college VLE onto the devices via wireless connection. Tutors reported that learners picked up on the transferability of their skills between different activities more quickly and in some cases this speeded up achievement.

For an example – 'Using the PSP' – please go to MoLeShare and search using the keyword Gloucestershire.

# Supporting vocational, work-based and diploma learners

## Supporting food technology classes with the DSi

### St Anthony's School teaching and learning snapshot: Academic year 2008/09

Year 10 food technology students at St Anthony's School used Nintendo DSs to search the internet for, and evaluate, pizza recipes. The DSi was chosen over traditional laptops because they were small (useful in a busy kitchen environment); for their price, bearing in mind that any food spills could potentially damage devices; and because they require less time to distribute, start up and connect to the internet.

Malcolm Ferris, a network manager at St Anthony's School, ensured that the Opera internet browser was downloaded onto each DSi (this can be done for free) and made the web browsing experience more accessible by making some custom web interfaces online, creating links to mobile versions of websites and setting the default webpage to these interfaces. Malcolm explains:

*Pupils were chomping at the bit to use these (Nintendo DSs) today. Year 10 searched for pizza recipes and took to the DSi with ease. They did not need any instruction or intervention. The DSi certainly holds high kudos with our pupils and for this particular exercise the pupils saved valuable time.*

*The immediate effect was that the learners were able to progress at their own speed. The Nintendos enabled them to go forwards and backwards without always asking me for help. They almost immediately became more independent and less dependent on me... The children were so excited and motivated... They needed stands though and we came up with the idea of designing some... we had a discussion, the children came up with some ideas and then made them in design technology... they work brilliantly.*

[www.moletv.org.uk/watch.aspx?v=DN5RC](http://www.moletv.org.uk/watch.aspx?v=DN5RC)

## Creating a video diary for the RHS Tatton flower show

### St Helens College: Academic year: 2008/09

#### Introduction

St Helens College is a large FE provider in the Northwest. Part of our MoLeNET funding helped introduce handheld technologies into the teacher-training curriculum. Learners on horticulture courses were able to take equipment and incorporate it into their learning programme. Rob Hogan took the PSP 3000 into his NVQ/National Certificate in horticulture learning environments.

#### Aims

To give learners the opportunity to generate a video diary of the work completed when involved with the prestigious RHS show at Tatton in 2009.



### Addressing the challenge

In the groups, learners were working at various levels. The PSP was used to video learners completing tasks during the lead up to the show and throughout the show itself. Learners also used the PSP to capture evidence for their portfolios and produced video evidence of tasks they had completed during portfolio building.

### Outcomes and benefits

Initially, creating the videos was time-consuming but Rob Hogan soon built up a library of video clips. The exercise itself allowed us to collate information and record the learner experiences to use when showcasing the event to new students. Learners enjoyed the activities, and were soon drawn into the project, developing confidence at every stage.

### Learners' reactions

I used the device with two groups of learners. Group 1, a more mature group, were initially reluctant to get involved in the project. The second group were 16–18 year old NVQ students who engaged quickly with the technology involved and enjoyed all aspects of the project right up to completion. Coupled with the result of gaining a silver gilt medal at the show this made the whole experience worthwhile and a unique way of learning was established.

### Teacher's reaction:

*The implementation of this and similar technology would be very valuable in delivering content and building portfolios. We now have a record of the process of building an exhibit that we can show to new recruits. The opportunity to practise with the devices was great and it was a pleasure to use them.*



### Manager's reaction

*I appreciate the work that Rob has done this year and we are now working with our external verifier to ensure that portfolio evidence is of a suitable quality for assessment.*

### Lessons learned

Enjoy the challenge, and let your learners lead the way! Very often, learners had previous experience of using the devices, usually to play games on. They quickly got the hang of the camera facility, and downloading the content to their PCs.

### Next steps

To develop the resource bank available for learners. It would be nice to have a large bank of the devices available for use in classes. Using a central resource like MoLeTV to upload the videos to will enable my learners to access them from home or on their phones.

## Engaging student teachers with handheld learning technology

### St Helens College: Academic year 2008/09

#### Introduction

St Helens College is a large FE provider in the Northwest. They used part of the MoLeNET funding to help introduce handheld technologies into the teacher-training curriculum. Learners on the certificate in teaching in the lifelong learning sector (CTLLS) course were able to take equipment and incorporate them into their teaching practice.

### **Aims**

- To give student teachers the opportunity to use and evaluate a variety of handheld devices as part of their CTLLS training.
- To engage student teachers with handheld technology at an early stage of their CPD.

### **Addressing the challenge**

Teacher training at St Helens includes a module asking students to investigate the impact that using ILT would make on their curriculum area. In the past, this has only ever been a theoretical module but this year, as part of MoLeNET phase two, a range of technological devices were available for students to take and use in their teaching for the life of the project. Students were able to return devices that they found unsuitable, and choose alternatives. They were then in a better position to judge the impact that technology can make on learning and teaching in their curriculum area.

### **Example: PSPs and family maths**

One such student teacher took the PSP 3000 into her family learning environments to give her learners the opportunity to revisit mathematical strategies stored as movie files. Learners in her groups were working at different levels so she used the PSP to video herself carrying out various calculations to suit the different levels of understanding. The PSP was then available for learners to refer to for support when she was working with another learner, rather than having to wait for her to become free. She also wanted to use 'Dr Kawashima's Brain Training' games to give valuable practise to learners without them realising that they were learning.

### **Outcomes and reactions**

#### **The CTLLS course – the tutor's perspective**

Students were able to access a range of devices and decide for themselves what impact, if any, the equipment would have on their learners. This vastly increased the motivation levels of all students – making a module previously theoretical come alive! Virtually every observation of teaching practice carried out by tutor Mark Hodgetts included handheld devices as part of their plan, although this was not a mandatory requirement in the observation standards.

#### **The family maths example – the trainee teacher's perspective**

*Creating the videos was time-consuming, however I soon built up a library of video clips. The exercise itself helped me to break topics down into small chunks as I created the video demonstrations in stages of calculations. This was particularly useful in meeting the learning style of a dyslexic learner. One group of learners used the PSP to look at alternative methods of multiplication. This was time-saving for me as a tutor as I was able to continue giving one-to-one support to the other learners rather than having to demonstrate alternative methods to the whole group. The main outcome was the independence it gave learners. It meant that they did not have to ask me how to do something, and could progress at their own speed, without drawing attention to themselves or slowing the class up.*

*I used the device with two groups of learners. Group 1 was a more mature group, and they did not seem to want to use the PSP. My original intention was to use the 'Dr Kawashima's) Brain Training' game with them to practise fractions. Learners were reluctant to use it, possibly because they were a group of mature learners (no teens) who saw the PSP as a games device for children. Generally this group's IT skills were also limited. The second group were predominantly younger and were confident and keen to use the device. Two learners within my second group accessed the PSP to view an alternative method for multiplication as they were struggling with the standard method. They said they found it easy to use following my instructions and were able to see and hear step-by-step instructions and gain additional support without holding the rest of the group back. They were keen to use it again to view other demonstrations and said it could be useful to e-mail these demonstrations home to assist with homework.*

*I plan to develop the resource bank available for learners and it would also be nice to have several devices for use in class. Using a central resource like MoLeTV to upload the videos to will enable my learners to access them from home, or on their phones.*

### **Links**

This student teacher has uploaded 20 videos to MoLeTV, each focussing on a small element of the maths curriculum e.g. converting percentages to fractions, dividing a decimal, etc. To view/download these go to [www.moletv.org.uk](http://www.moletv.org.uk) and search for maths.

## **Integrating the use of handheld technologies into the level 3 IT Diploma curriculum**

### **The Manchester College: Academic year 2008/09**

#### **Introduction**

One of the target groups for The Manchester College's phase two project was the level 3 IT specialised Diploma cohort. This new specialised Diploma features a comprehensive project that allows students to pursue an area of IT to improve their skills and create a custom solution to an industrial IT problem or need. Learners were able to choose their project from eight different IT areas. Although learners in this group were keen, able and responsible, the diverse nature of the project suggested that class time dedicated for staff to support this was unlikely to be adequate as learners could potentially be working on eight different areas. One viable solution however was the simultaneous delivery of different skills required to complete learner projects through ubiquitous access to a bank of handheld IT/media skills tutorials covering the identified IT disciplines.

As part of the assessment criteria, learners were required to design websites and evaluate the differences in usability and navigation across a range of platforms. This range of platforms had previously not been freely available, which had made it difficult for learners to successfully complete the specified unit criteria.

## Aims

The aim of the project was to facilitate the delivery of course-related materials on PSPs and iPAQs to enable increased differentiation and the teaching of different skills to different learners simultaneously. Units do not usually require such contrasting methods of delivery, but to successfully support a project unit in which each student uses different computing skills, access to a wide range of learning content becomes essential. It was envisaged that tutors would record tutorial instructions on a range of IT applications and convert them into a series of podcasts. Also, PowerPoint slides on instructions/guides would be converted to handheld formats that could be accessed by learners on the handheld devices. This should enhance differentiation and enable the simultaneous delivery of a range of skills to learners as appropriate. Learners would also use the different platforms on their handheld devices to evaluate the websites they have designed and built.

## Addressing the challenge

- A series of short revision tutorial podcasts was produced using Camtasia Studio and made available for use on learners' PSPs and iPAQs.
- A wireless server was set up on a laptop to duplicate the existing VLE course site to facilitate access to learning content on the VLE. The contents were then uploaded to learners' handheld devices.
- A web server was set up on a laptop and learners' PSPs and iPAQs were connected to it in a wireless local area network. By entering the web-server address on the handheld devices, learners were able to view their websites on both platforms and judge their effectiveness based on specific criteria.

## Outcomes and Reactions

Access to MoLeNET funding provided the avenue to develop and distribute multimedia-rich content to learners on handheld devices. Learners were particularly inspired and engaged with using the PSPs and iPAQs to test their websites, and to access a range of learning content whenever and wherever they wished to. Also, because they offered unprecedented, innovative and bespoke support to each learner, learners were able to work more independently and efficiently. For the organisation, it has reinforced the huge potential of enhancing learner engagement and encouraging autonomous learning through the use of handheld devices and technologies.



Another unintended outcome is that the teaching staff have undergone a very steep learning curve in the use of e-learning that has had repercussions in the department. There has been more training in the use of podcasting and tutors have seen how technology can be further integrated into the classroom. A major challenge was the difficulty in using the Sony PSPs as a viewer for PDFs and PowerPoint slides but this was overcome by converting PowerPoint slides to movie files and PDF documents to image files (JPEGs), thus enabling them to be viewed on the PSPs.

### Learners' reactions

Students are really pleased with how the devices have made learning more flexible, more practical and more interesting:

*Because now I do not have to go on the computer and look at the VLE. I can easily revise all my work using the PSP – even at home.*

*It has made technology sessions during the unit more practical as the devices were examples of what could be implemented within a business.*

*I used the device to access a version of the Moodcat (VLE) site with all the course material on it for our course. It was a good way to view and a change from the computer making it more interesting.*

### Teachers' reactions

Teachers were impressed with the impact the devices had on learner achievement and the difference it made to the way they were able to deliver learning materials and support the development of various skills.

*The group is very able and motivated, so I do not feel it has had a direct impact on their retention, but I feel that the impact of the use of these devices on achievement has been dramatic. The use of revision podcasts, videos and access to a VLE via a mobile device has enabled a media-rich access to course materials. The technologies became a permanent feature of classroom activities and the students now see them as an essential tool enabling them to learn effectively.*

*I am able to differentiate my learning materials based upon the learning styles of my students. I have also been able to give more tutorials and revision exercises to students struggling with certain course materials, whilst allowing the more able students to have separate podcasts and exercises which are more challenging to them.*

### Managers' reactions

Managers feel that the devices have improved opportunities for learners and this has had a positive impact on attitudes and behaviour, as well as developing the skills of the staff involved.

*Students have been able to access a wide variety of advanced technologies that they have not previously had access to, which has improved motivation and their attitude towards work. This project has had a very positive impact on the resource development skills of all the teachers involved.*

### Lessons learned

Although it is not a panacea to all learner challenges, the use of handheld devices is an enormous benefit to delivery and improves learner engagement in the classroom. If not used properly the devices can be a hindrance but equally their potential is only just becoming realised. Staff development is key to the successful implementation of mobile learning projects, as is the involvement of staff keen to drive innovations and creativity within curriculum areas.

### **Next steps**

It was evident that learners who were able to access the internet on the handheld devices at home were at a distinct advantage. Given the opportunity to access extra funding, the department will be very keen to explore the possibility of providing learners with devices that enable controlled access to the internet in order to further enhance learner experience and efficiency.

## **Plumbing with PSPs**

### **Bridgwater College: Academic year 2008/09**

#### **Introduction**

At Bridgwater College this case study was one component of a number of different projects, which used a variety of mobile devices including iPhones, PSPs, Nintendo DSs and mobile phones. The projects were carried out across a range of curriculum areas that included entry level, levels 1 & 2 for Train2Gain, NVQ and level 3 A level students.

The range of different elements of the project allowed Bridgwater College to experience and develop a variety of materials and to repurpose existing materials that can work with mobile technologies. In addition, the different groups allowed Bridgwater to investigate the effect that mobile technologies has on progression, success and retention.

#### **Aims**

The aim of the project was to engage levels 1 & 2 NVQ plumbing students, and to enable them to capture evidence of skills and to review sessions outside of formal timetabled classes. The use of the PSPs would enable students to video and photograph skill completion for inclusion in their portfolios.

#### **Addressing the challenge**

Students were issued with a PSP that was preloaded with some learning materials, including PowerPoints and instructional videos. The challenge was for students to access the materials and to then produce their own video of themselves carrying out a specific skill, such as soldering a pipe joint. The video of this could then be transferred to the student's online portfolio using the wireless connection available on the PSP. This video could then be used as evidence to meet specific learning criteria.

#### **Outcomes and reactions**

The outcomes of the project were varied, but generally the findings were positive. On the whole the students fully engaged in the capture of specific learning outcomes and produced materials that were suitable for inclusion in their portfolios. They were able to produce video evidence with more ease than before, which had consisted of completing the demonstration under observation and then writing and explaining what they had done and why. The use of video removed the pressure of being observed and they could then explain verbally what they had done and why. This also produced a better standard of work.

There were a number of unexpected outcomes with students using the PSP wireless connectivity to find and download additional resources including videos and instructional materials. This added engagement was not expected but did demonstrate that students were receptive to the use of PSPs as learning tools.

### Learners' reactions

The reaction to the PSPs was initially one of disbelief that they would be expected to do their work via this gaming tool. However, once they had instructions and an opportunity to view the preloaded resources the idea of using the PSP became quite exciting. Very little instruction on how to use the device was needed as most had used one previously (or could work with someone who had).

The PSP engaged students who had previously been 'at risk' of withdrawing, resulting in a total turnaround in performance, an experience which was shared across the group.

### Teachers' reactions

The staff involved were extremely keen to investigate the use of PSPs and mobile devices. They were not convinced that there would be any positive use of the device but they also believed that there would unlikely be any negative outcome. The staff were, however, very delighted with the actual response and the greater level of student engagement. An added benefit for staff was that the resources that the students produced could be used with future groups of learners.

### Manager's reaction

Fiona McMillan, Principle of Bridgwater College stated that:

*MoLeNET...is something that we at Bridgwater College fully embrace and will continue to pioneer.*

### Lessons learned

Any learning resources that are repurposed to work on mobile devices must be of a suitable design to stand alone (i.e. make sense with no additional input) and have text and pictures that can be seen on the small screens. Additionally any video must have a clear learning outcome, as video for its own sake places a greater emphasis on the learner decoding the purpose and the benefit.

### Next steps

The use of mobile learning technologies has been introduced at Bridgwater College and was a key role of the annual teaching and learning conference in September. There have been a number of small projects formed based on the equipment from MoLeNET and these are designed to further the project's aims for, and experiences of, mobile learning. The involvement in MoLeNET has influenced a new approach to ILT within Bridgwater College, creation of a new breed of ILT Champions, a VLE Developer and a much clearer purpose as to the benefit of ILT for teaching and learning.

## PSPs and assignment tasks for sports learners

**St Helens College: Academic year 2008/09**

### Introduction

St Helens College is a large FE provider in the Northwest that used part of the MoLeNET funding to help introduce handheld technologies into the sports curriculum. Learners on the sports course were able to use the equipment for their learning and assignments.

### Aims

At the end of the project we wanted learners to understand and learn the underpinning outcome of describing the FITT (frequency, intensity, time and type of exercise) principles in sports training. Students are inclined to copy and paste information from the internet or regurgitate class notes and then forget the knowledge immediately. Using technology associated with their age group, we hoped to encourage learners to take a more proactive approach to their learning.

### Addressing the challenge

Learners were set the task of producing a short video using the PSPs, computers and Windows Movie Maker, describing the FITT principles of sports training. They were asked to use their imagination to describe the FITT principles. Using the college's gym and the surrounding local area, we gave learners free rein to develop their resource.

### Outcomes and reactions

The results of the assignment tasks were better than expected. Teachers reported that the learners were far more engaged in the task than in any other task that had been set throughout the year. They were motivated and enjoyed planning, appearing in and producing their video. Every video submitted was imaginative and met the outcome of describing the FITT principle. Learners not only enjoyed the task but retained the FITT principles. Discussion among colleagues afterwards showed we all agreed that learners knew the information rather than just remembering it. Weeks after the task, learners could still show a far greater knowledge and understanding on that topic than on other topics that had been covered in the course.

The main unexpected outcome was the competition engendered between the learners. They all wanted to produce the best video and this competitiveness motivated them to produce good quality videos and to complete the task on time. The other unexpected outcome was that attendance improved because of the nature of the task. Learners working in groups did not want to let other members of the group down by being absent while making and producing the videos.



Learners took pictures of the treadmill display to help describe intensity and time from the FITT principle of training.



Learners took pictures of themselves on the treadmill to help explain type from the FITT principle of training.

### Learners' reactions

Observations by teachers showed how much the learners enjoyed the task and the responsibility and independence of completing a 'mini project'. Learners said that this was 'the best assignment task we have done so far in college', and they were keen to know if we had planned for them to 'be doing more stuff like this?'

*I loved how we had control of what we could put in the video.*

*We were disappointed when the task was over.*

### Graph to show improvement in average score on the 'instructing physical activity and exercise module' assignment following mobile learning intervention



This graph shows an improvement in assignment scores following the mobile learning intervention. More dramatically, however, compared to the previous year four more merits were gained and 2 more distinctions (there were none in the previous year).

### Teachers' reactions

Teachers saw a greater volume of work during lessons and found that the learners actually learnt the information they were putting into the videos rather than just copying information and placing it in a written assignment. One teacher said:

*after using this type of assessment and seeing how the learners enjoyed it so much, I will definitely be incorporating more handheld technology type assessments in the future*

*it was good to see the students throw themselves into their work and actually enjoy and learn the information.*

### Managers' reactions

*It is an ideal assessment method to use with our students and has definitely inspired me personally to revisit assessment methods. The students clearly had an understanding of the topic, rather than just copying and pasting definitions, and obviously enjoyed the activity. The other bonus is that wider skills are developed and students' own personal learning styles are encouraged. Well done.*

### Lessons learned

- Make the most of the handheld technology you have at your disposal; plan the assessment, as this is new for you as well as for the learner.
- Make sure the learners have time to film the content of the video and to produce the video and put it all together.
- With the students working in groups make sure everybody has input into the assessment otherwise you may get some learners letting others do the hard work.
- Let your learners have some time to become familiar with the equipment so they can use it to its full potential.

### Next steps

Tutors will be encouraged to use more handheld technology type assessments in other areas of the course and learners will be encouraged to develop their existing skills on the equipment and widen their knowledge of other handheld devices.

### Links

Examples of learners' videos:

[www.moletv.org.uk/watch.aspx?v=1FAY5](http://www.moletv.org.uk/watch.aspx?v=1FAY5)

[www.moletv.org.uk/watch.aspx?v=72XFS](http://www.moletv.org.uk/watch.aspx?v=72XFS)

[www.moletv.org.uk/watch.aspx?v=7Y533](http://www.moletv.org.uk/watch.aspx?v=7Y533)

## Supporting learning and reflection in motor vehicle and hair and beauty with the Sony PSP

### Chichester College: Academic year 2008/09

#### Introduction

Chichester College have been involved in MoLeNET projects in years one and two and have targeted several different groups of vocational learners using several different handheld technologies, including the Sony PSP.

For Chichester College, the most used tool on the Sony PSP to date has been the camera. The great thing about the Sony PSP is that it enables video to be recorded quickly and easily, then watched back and reviewed instantly. It is this immediate opportunity for reflection and feedback that makes the PSP such a powerful tool. Furthermore, the camera is also able to take stills, and recordings can be downloaded for editing and sharing. The College has also purchased 'SUMS Online' software for use in the classroom in the next academic year, thus extending the functionality of the Sony PSP.

#### Aims

The aim was to use the recording capabilities of the PSP to enable teachers and learners to create resources and to reflect on progress. The PSPs have only been in action for a few weeks in some cases but they are already playing an important role for staff and learners and are expected to play an even greater part in the next academic year.

## Addressing the challenge plus outcomes and reactions

### Hair and beauty

Individual hair and beauty students aged 16–40 have used the Sony PSP to record demonstrations carried out by their tutors. They are then able to use them for revision or to replay as a tutorial when practising a particular technique or task inside and outside college. The PSPs also enable tutors and learners to upload recordings created by other tutors and even other colleges via the internet. This provides learners with a wealth of learning and revision material to support their individual needs at a time and location convenient to them. In addition, the PSPs are used to record the learner's own work in progress so that they can reflect on what they have done and recognise both their achievements and also how they could improve or change their practice next time.

*There's a huge gap between the fact that we know that we all learn more by watching and then doing and by doing and watching than sitting there and listening to someone and I think that the PSPs bridge that gap.*

*There is no doubt that come September 2009 the PSP will really become an important tool for teaching and learning.*

Helene Loizides-Dickson, additional support teacher

### Motor vehicle

Kim Woods, learning support assistant (LSA), has been using the Sony PSP for about a fortnight to great effect with her group of 16–19 year-old motor vehicle students. The learners have been working on building a stock car from an old car, and Kim has been using the PSP to record their progress. The learners were really keen to be involved in the video and Kim believes that with a video record of their work the students will be able to look back on what they have done and feel a real sense of pride in their achievements.

*They all like being in on it, and they can't wait to see the final product.*

*They can actually see where they got it wrong; the actual student can actually look back for themselves.*

Kim Woods, LSA

Next year, Kim is planning to video the learners at work so that they can review and reflect on the task either alone or with their tutor so that they can identify their strengths and weaknesses and what they should do differently in the future. As with the hair and beauty learners, this opportunity for instant reflection, either one-on-one using the PSP, or connected to a UMPC or interactive whiteboard for group analysis, really enables learners to improve their practice. Kim also plans to record demonstrations and theory lessons, and create notes on these, so that learners can download them onto USB sticks to carry with them for use inside and outside the college. Helene explains that

*The PSP is good for students with low levels of literacy or poor working memories as it provides a visual backup and also helps to motivate them.*

## Taking learning into the workplace

**Chichester Consortium: Academic year 2007/08**

### Introduction

Sony PSPs were chosen for this project for three main reasons:

- limited or no access to resources in the workplace and learners unable to easily access resources due to distance from college or lack of access to online resources
- lack of familiarity with computers and/or Windows-based systems
- ease of use, i.e. screen size and ease of navigation



Another criterion for choosing the PSP was the availability of the Go!Cam for recording evidence of performance in the workplace and/or learner reflections. As both colleges (Chichester College and Sussex Downs College) use electronic portfolios (one laptop-based, one web-based), this would aid the gathering of evidence for candidates who are uncomfortable with paper-based portfolios.

### Aims

To enable learners in the workplace to access resources and learning materials easily and to collect evidence for their portfolios.

### Addressing the challenge

Health care and social service work-based apprentices (predominantly females aged 18+) were allocated Sony PSPs to enable them to take their learning into the working environment by viewing and replaying created and re-purposed visual learning materials in the form of short movie clips. The devices were stand-alone and designed for learners with limited or no access to the internet. The group consisted of work-based learners, most of whom were the only learners in their workplace, where resources to support learning were largely unavailable or inaccessible.

### Outcomes and reactions

Evidence from this study indicates that the provision of extra resources via the PSP provides the candidate with support and information that they would not necessarily be able to access elsewhere. Learners working at a lower level, younger learners, and learners for whom English was not their first language found the PSPs particularly useful, and all staff across both colleges involved generally felt that they would lead to improved retention and achievement in time.

The provision of learning resources and being able to take handheld devices into the workplace made learners feel more supported. Moreover, preliminary data suggests that it may increase networking between learners in the workplace. There was evidence of increased quality of work, improved submission times and more involvement of learners in accessing resources and completing coursework. Furthermore, the low cost of delivering resources through handheld learning devices indicates that this could be an effective way of meeting the needs of work-based learners.

*The PSPs are good for getting up-to-date learning, particularly for those who cannot access it any other way.*

### Lessons learned

- Creating and re-purposing resources: there have been extra time and resource costs involved in the PSPs but most of the time was spent researching or developing resources, and once developed, the sharing of resources can be very successful, as demonstrated in this project. Inter-college or interdepartmental working within the colleges enables some of these additional costs to be shared. Moreover, as more suitable resources become available on Moodle/MoLeShare/MoLeTV, the cost of resource development will reduce.
- Barriers to successful implementation are small as the PSPs were well liked, easy to use and did not require much training. Some training costs, however, will need to be included to ensure maximum use of the camera and the interactive functions.
- Effective training of assessors is crucial if they are to hand over the devices to the students and provide them with ongoing support.
- One device is not suitable for all: some learners felt that the screen size was too small and the keyboard a little difficult to use, and one student did not feel that the resources on the PSP suited their learning style. They were less popular with the more mature students and those studying at a higher level.

## Using the PSP in health and social care

### Chichester College teaching and learning snapshot: Academic year 2007/08

Maureen Horswell, course leader for the introductory Diploma in health and social care at Chichester College used Sony PSPs with her level 1 learners. This group tended to have quite severe difficulties with writing and spelling, which was demoralising and frustrating when they were faced with completing a number of written assignments. Behavioural issues within the group were also a problem, even during breaks.

Maureen used the PSPs with her learners to enable them to capture video, photographic and audio evidence that could be used to stimulate discussion, show skills and progress, prompt writing and support role-playing. The learners were able to complete units of their course in a much more enjoyable, interactive and stimulating way, which not only helped them to develop new ways of learning and reduce the barrier of writing, but also resulted in improvements in individual behaviour and group dynamics. Learners were able to work both independently and collaboratively, inside and outside the classroom, and felt less pressure as they were much more comfortable with this style of working.

The learners were also able to use the PSPs to play games during break times and this seemed to solve the behavioural issues that had previously been a cause for concern. Furthermore, during class time if behaviour did become a problem, specific individuals could be given time out but would still be able to continue their learning using the device, which previously had not been possible and had often resulted in further frustration felt on the part of the learner.

Harnessing Mobile Technology for Learning video:

<http://www.moletv.org.uk/watch.aspx?v=M2ELG>

## Using the PSP in media games development

### **Manchester College of Arts and Technology (now The Manchester College) teaching and learning snapshot: Academic year 2007/08**

At MANCAT 16–19 year-old IT students used Sony PSPs to support their learning within the 'Games Story Unit' of their level 3 National Diploma in media games development. Learners created photographic mood boards to enhance the ideas for their story-telling. They then created video presentations for the story and converted them for use on a PSP. This enhanced the idea of developing concepts and working to a professional standard. Tutors were also able to allow the learners to make peer assessments of their storyboarding by using the comic book reader; each group's work was shared on handheld consoles so they could review one another's.

# Using games technologies throughout college

## One day they'll make games for this...

**Gloucestershire College: Academic year 2008/09**

### Introduction

Gloucestershire College is one of the largest FE colleges in the UK, offering a wide range of education and training programmes. The College has undertaken two MoLeNET projects; the Glossy project and the Shiny project, and is now on its third: the Sparkly project.

The PSP was originally designed as a games device with the functionality to play back video through the proprietary UMD disc format. As the product has evolved, extra and enhancing functionality has turned a handheld games device into a handheld learning tool. As well as games and video on UMD, the PSP can play back video from a Memory Stick Duo, play audio and show images. It has Wi-Fi capability and a browser. Newer versions of the PSP allow the user to access RSS feeds, instant messaging and Skype for voice calls.



One attachment for the PSP, though, takes the PSP one stage further from a device for media consumption to a device for media creation – the Go!Cam. It is a 1.3MP camera that uses the USB port on the PSP and can be used to take photographs or record video. With a 4GB memory stick it can record two hours of video footage or over 40,000 photographs. The main advantage of the Go!Cam over a traditional digital camera or video camera is that the photos and video footage can be viewed immediately on the large 4.5” screen of the PSP without a computer. If required, a composite video cable allows the PSP to be connected to a large screen or a projector for whole-class viewing.

### Aims

Engaging learners on a regular and systematic basis is a challenge for many practitioners in further education. Repetitive learning activities and assessment can result in disengaged and disaffected learners. The PSP seems to help to enhance and enrich the learning experience for many learners, engaging them with interactive and enjoyable activities.

### Addressing the challenge plus outcomes and reactions

The PSP with the Go!Cam has been used in many different curriculum areas. Learners doing sports studies used it to record sporting activities and analyse body movements, and on the golf course to record and analyse golfing strokes. Health and social care learners used the PSPs to support them in preparing materials for an assessed presentation. Practitioners working with NEET learners found that the PSP engaged disaffected youngsters. Learners on a business administration course used the PSPs to create images that were converted into animations using iMovie on an Apple Mac.



Practitioners and managers across the college also used the PSPs. Practitioners in teacher training and access created short video recordings and images for use in lessons. The college's teaching improvement managers used images and video taken using the PSP to create presentations for staff development activities. They used the PSP to video and play back lesson observations to observed practitioners, as the PSP was less intrusive than a traditional video camera. The college's information and learning technology manager used the PSP to demonstrate to practitioners how video and images could be used to support learning and teaching.

The PSP with Go!Cam is not the best camera, the best video camera or even a handheld device with an intuitive interface, but as a handheld learning tool it allows practitioners to create enhanced learning activities and enrich the learning process.



### Lessons learned

- Despite the low-quality camera and a nonintuitive interface the PSP with Go!Cam was very popular with learners and practitioners.
- Having a dedicated custom case for charging devices makes whole-class use logistically easier to manage and maintain.
- Practitioners and learners were often more familiar with the PSP than with specialist digital or video cameras.
- Ensure that any card readers you use support the (smaller) Memory Stick Duo, or ensure you have enough Memory Stick Duo adapters to hand.

### Next steps

Having made the best use of the PSP's Go!Cam functionality, there is still further potential to use the in-built web browser. The college's VLE was accessible from the browser, but this function was rarely used by learners. They also made little use of the RSS reader or Skype functions. The college has purchased a few Go!Explore attachments which add GPS to the PSP. They intend to use these alongside PSPs with the Go!Cam so that they can add location-based learning to their current learning activities.

## PSP usage for student induction feedback

### St Helens College: Academic year 2009/10

#### Introduction and overview

This project formed part of a wider MoLeNET initiative which enabled a wide range of learners to benefit from mobile technologies across the College. The main aims of the mini project were to incorporate the use of mobile technology into the induction process. For this we decided to use the PSP's video function to film the learners providing feedback about themselves and their thoughts of the college and course so far. This is something that all courses participate in within the sports and public service department as a tutorial activity.

#### Aims

The aim was to be able to provide students with an alternative means to vocalise their thoughts about the college and their course as part of the induction process rather than just filling in a questionnaire. We also thought that using a video format/diary room style log would elicit more truthful and thought provoking responses than a questionnaire. It was also the intention to familiarise the students with the basic functions of the PSPs for future use within their course modules.

#### Addressing the challenge

In tutorial sessions students were asked to devise answers to the question 'what are the positives, negatives, likes and dislikes of the college and your course so far?' This task was then to be filmed using the PSPs. This task was completed 3 weeks into the course as a follow up to the induction process, and approximately 40 students completed the task.

### Outcomes and reactions

The results of the videos were good as students gave good thoughtful feedback to the questions. From observation, and questioning and answering, students at first found it difficult to speak whilst being filmed, but after a few practise attempts enjoyed the process better than just filling out a questionnaire. They thought that by providing feedback in the form of a video log that they had more of a voice about the college which would be listened to more than if they had just filled in a questionnaire. The process also benefited the students in basic navigation of the PSPs, as since the mini project students have used the devices again with no need for the tutors to instruct on how to use the equipment. This has saved lesson time and facilitated a better standard of work. An unexpected benefit was that from filming each other on the devices students broke down friendship barriers and the taboo of speaking in front of new people and classmates, which is an issue for some students when enrolling into a new college and new course.

### Learners' reactions

The students enjoyed the task of using the PSPs to produce this feedback as they found it was not like work as they were using a gaming device. Students also said that it was fulfilling to do something that they weren't confident about i.e. speaking in front of new people. Other reactions were that of enjoyment and the sense that their opinions were being listened to because they were giving feedback via video. Learner quotes included

*I really enjoyed using the PSPs, it's so much better than school cause we use equipment like this.*

*Even though I was a bit nervous being filmed by someone I'd only known for a few weeks I found it enjoyable and thought that it was better than filling in a form.*

### Teachers' reactions

Teachers were just as enthused to learn about this new technology and found that the students, once they were comfortable speaking in front of the camera, really enjoyed the task and were asking when they could use the devices again. Teachers were quoted saying:

*Seeing the students' positive reactions to the use of this equipment would make me use it more within lessons...a great introduction to a new course and college within the actual induction process itself.*

### Lessons learned

Even though the students enjoyed the use of the PSPs they still needed to be constantly supervised with the devices so that they were producing the work that had been set. One of the major lessons learnt was that of volume on the devices as a lot of students had to repeat the task as the sound had not picked up on the PSPs. One of the main outcomes of the mini project was that teachers found the PSPs would be of great benefit if used more in the actual induction process itself.

### Next steps

We are keen to explore ideas for using the PSPs in the actual induction process with some suggestions being college treasure hunts to find college landmarks and take photographic evidence and using second sight technology when in the actual college induction days.

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## 7 Useful links

**MoLeNET:** [www.molenet.org.uk](http://www.molenet.org.uk)

**MoLeShare:** [www.moleshare.org.uk](http://www.moleshare.org.uk)

**MoLeTV:** [www.moletv.org.uk](http://www.moletv.org.uk)

**MoLeNET Moodle:** [www.molenetprojects.org.uk](http://www.molenetprojects.org.uk)

**LSN:** [www.lsnlearning.org.uk](http://www.lsnlearning.org.uk)

**LSC:** [www.lsc.gov.uk](http://www.lsc.gov.uk)

**AdventureMaker:** [www.adventuremaker.com/games.htm](http://www.adventuremaker.com/games.htm)

**Ban Ryan's article in full:** [www.cesi.ie/digiteach-dsandwii](http://www.cesi.ie/digiteach-dsandwii)

**Becta:** <http://partners.becta.org.uk/index.php?section=rh&rid=13595>

**ConnectED:** [www.connectededucation.com](http://www.connectededucation.com)

**Educational Games Research:** An update on where the Nintendo DS is heading  
<http://edugamesblog.wordpress.com/2009/07/31/on-the-way-nintendo-ds-classroom>

**Futurelab:** [www.futurelab.org.uk](http://www.futurelab.org.uk)

**Gomanga:** [www.gomanga.com](http://www.gomanga.com)

**Learning and Teaching Scotland; Games-based learning:**  
[www.ltscotland.org.uk/ictineducation/gamesbasedlearning](http://www.ltscotland.org.uk/ictineducation/gamesbasedlearning)

**Mark Warner:** [www.ideastoinspire.co.uk/index.html#1](http://www.ideastoinspire.co.uk/index.html#1)

**More about teaching with Myst:** [www.timrylands.com/html/myst.html](http://www.timrylands.com/html/myst.html)

**MyBuzz:** [www.mybuzzquiz.com/en\\_GB/actions/Home.do](http://www.mybuzzquiz.com/en_GB/actions/Home.do)

**New Scientist:** [www.newscientist.com](http://www.newscientist.com)

**Nintendo:** [www.nintendo.co.uk](http://www.nintendo.co.uk)

**Sony PlayStation:** [www.uk.playstation.com](http://www.uk.playstation.com)

**Text walls:** [www.xlearn.co.uk/sms](http://www.xlearn.co.uk/sms)

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MoLeNET is a mobile learning initiative funded by the Learning and Skills Council (LSC) and participating English colleges and schools with support and evaluation provided by LSN. Many MoLeNET projects have utilised games technologies, including handheld Sony PSPs and Nintendo DSs and the Nintendo Wii, to support teaching and learning. This publication explores the benefits of game based learning and the additional functionality offered by games technologies. Thirty five case studies and snapshots from MoLeNET projects illustrate the ways in which teachers and learners have used games technologies, both inside and outside of the classroom, and describe the benefits realised.